



## **ADARSH MAHILA MAHAVIDYALAYA, BHIWANI**

**Affiliated to CBLU, Bhiwani**

**Session 2022-23**

1.1.1 The Institution ensures effective curriculum planning and delivery through a well-planned and documented process including Academic calendar and conduct of continuous internal Assessment

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**BACHELOR OF COMPUTER APPLICATIONS (BCA) Regular**  
**Syllabus and SCHEME OF EXAMINATION – Ist , IInd, IIIrd YEAR(6 semesters)**

**w.e.f. 2012-13**

**Period per week: 6 for each theory paper and 6 for each practical group in each semester.**

Paper No.	Title of Paper	Max. Marks		Pass Marks	Exam Duration
		External	Internal		
<b>Semester – I w.e.f. 2012-13</b>					
BCA-101	Computer & Programming Fundamentals	80	20	35	3hrs
BCA-102	PC Software	80	20	35	3hrs
BCA-103	Mathematics	80	20	35	3hrs
BCA-104	Logical Organization of Computer-I	80	20	35	3hrs
BCA-105	Practical software Lab – Based on paper BCA-102 i.e Word, Excel and Power point	80	20	35	3hrs
<b>Semester – II</b>					
BCA-106	'C' Programming	80	20	35	3hrs
BCA-107	Logical Organization of Computer-II	80	20	35	3hrs
BCA-108	Mathematical Foundations of Computer Science	80	20	35	3hrs
BCA-109	Structured System Analysis and Design	80	20	35	3hrs
BCA-110	Practical software Lab – Based on paper BCA-106, i.e.'C' Programming	80	20	35	3hrs
<b>Semester – III w.e.f. 2013-14</b>					
BCA-201	Introduction to Operating System	80	20	35	3hrs
BCA-202	DATA STRUCTURES – I	80	20	35	3hrs
BCA-203	Introduction to database system	80	20	35	3hrs
BCA-204	Communication skills (English)	80	20	35	3hrs
BCA-205	Practical software Lab – Based on paper BCA-202 & 203 using C Language and SQL	80	20	35	3hrs
<b>Semester – IV</b>					
BCA-206	WEB DESIGNING	80	20	35	3hrs
BCA-207	DATA STRUCTURES – II	80	20	35	3hrs
BCA-208	Object Oriented Programming Using C++	80	20	35	3hrs
BCA-209	Software Engineering	80	20	35	3hrs
BCA-210	Practical software Lab– Based on paper BCA-206 & 208, i.e.HTML and C++ Programming	80	20	35	3hrs
<b>Semester – V w.e.f. 2014-15</b>					
BCA-301	Management information system	80	20	35	3hrs
BCA-302	Computer Graphics	80	20	35	3hrs
BCA-303	Data Communication and Networking	80	20	35	3hrs
BCA-304	Visual Basic	80	20	35	3hrs
BCA-305	Practical software Lab– Based on paper BCA-304 i.e. Visual Basic	80	20	35	3hrs
<b>Semester – VI</b>					
BCA-306	E-Commerce	80	20	35	3hrs
BCA-307	Object Technologies & Programming using Java	80	20	35	3hrs
BCA-308	Artificial Intelligence	80	20	35	3hrs
BCA-309	Introduction to .net	80	20	35	3hrs
BCA-310	Practical software Lab– Based on paper BCA-307 & 309 using java & .net	80	20	35	3hrs

# Syllabus of BCA I and II semester effective from 2012-13

## BCA-101 : COMPUTER & PROGRAMMING FUNDAMENTALS

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT-I

Computer Fundamentals: Generations of Computers, Definition, Block Diagram along with its components, characteristics & classification of computers, Limitations of Computers, Human-Being VS Computer, Applications of computers in various fields.

Memory: Concept of primary & secondary memory, RAM, ROM, types of ROM, Cache Memory, flash memory, Secondary storage devices: Sequential & direct access devices viz. magnetic tape, magnetic disk, optical disks i.e. CD, DVD, virtual memory.

### UNIT-II

Computer hardware & software: I/O devices, definition of software, relationship between hardware and software, types of software.

Overview of operating system: Definition, functions of operating system, concept of multiprogramming, multitasking, multithreading, multiprocessing, time-sharing, real time, single-user & multi-user operating system.

Computer Virus: Definition, types of viruses, Characteristics of viruses, anti-virus software.

### UNIT-III

Computer Languages: Analogy with natural language, machine language, assembly language, high-level languages, forth generation languages, compiler, interpreter, assembler, Linker, Loader, characteristics of a good programming language, Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.

Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming, Advantages and disadvantages of Structured programming.

### UNIT-IV

Overview of Networking: An introduction to computer networking, Network types (LAN, WAN, MAN), Network topologies, Modes of data transmission, Forms of data transmission, Transmission channels(media), Introduction to internet and its uses, Applications of internet, Hardware and Software requirements for internet, Intranet, Applications of intranet.

### SUGGESTED READINGS

1. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
2. Balagurusamy E, Computing Fundamentals and C Programming, Tata McGraw Hill.
3. Norton, Peter, Introduction to Computer, McGraw-Hill
4. Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World
5. Rajaraman, V., Fundamentals of Computers, PHI
6. Ram, B., Computer Fundamentals, Architecture & Organization, New Age International (P) Ltd.
7. Chhillar, Rajender Singh: Application of IT to Business, Ramesh Publishers, Jaipur.

8. Gill, Nasib Singh: Essentials of Computer and Network Technology, Khanna Books Publishing Co., New Delhi

**Note:** Latest and additional good books may be suggested and added from time to time.

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

#### UNIT - I

MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance. Using windows accessories.

#### UNIT - II

Documentation Using MS-Word - Introduction to word processing interface, Toolbars, Menus, Creating & Editing Document, Formatting Document, Finding and replacing text, Format painter, Header and footer, Drop cap, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Previewing and printing document, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

#### UNIT - III

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Cell, cell address, Creating & Editing Worksheet, Formatting and Essential Operations, Moving and copying data in excel, Header and footer, Formulas and Functions, Charts, Cell referencing, Page setup, Macros, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel-Sorting, Filtering, Validation, What if analysis with Goal Seek, Conditional formatting.

#### UNIT - IV

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

#### SUGGESTED READINGS

1. Microsoft Office – Complete Reference – BPB Publication
2. Learn Microsoft Office – Russell A. Stultz – BPB Publication
3. Courter, G Marquis (1999). Microsoft Office 2000: Professional Edition. BPB.
4. Koers, D (2001). Microsoft Office XP Fast and Easy. PHI.
5. Nelson, S L and Kelly, J (2002). Office XP: The Complete Reference. Tata McGraw-Hill.

**Note:** Latest and additional good books may be suggested and added from time to time.

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT I

**SETS:** Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.

**DETERMINANTS:** Definition, Minors, Cofactors, Properties of Determinants, Applications of determinants in finding area of triangle, Solving a system of linear equations.

**MATRICES:** Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, solving system of linear equation Cramer's Rule.

### UNIT II

**RELATIONS AND FUNCTIONS:** Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions.

**LIMITS & CONTINUITY:** Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity of a function at a Point, Continuity Over an Interval, Sum, product and quotient of continuous functions, Intermediate Value Theorem, Type of Discontinuities.

### UNIT III

**DIFFERENTIATION:** Derivative of a function, Derivatives of Sum, Differences, Product & Quotient of functions, Derivatives of polynomial, trigonometric, exponential, logarithmic, inverse trigonometric and implicit functions, Logarithmic Differentiation, Chain Rule and differentiation by substitution.

### UNIT IV

**INTEGRATION:** Indefinite Integrals, Methods of Integration by Substitution, By Parts, Partial Fractions, Integration of Algebraic and Transcendental Functions, Reduction Formulae for simple and Trigonometric Functions, Definite Integral as Limit of Sum, Fundamental Theorem of Integral Calculus, Evaluation of definite integrals by substitution, using properties of definite integral,

### SUGGESTED READINGS

1. C.L.Liu: Elements of Discrete Mathematics, McGraw Hill.
2. Lipschutz, Seymour: Discrete Mathematics, Schaum's Series
3. Babu Ram: Discrete Mathematics, Vinayek Publishers, New Delhi.
4. Trembley, J.P & R. Manohar: Discrete Mathematical Structure with Application to Computer Science, TMH.
5. Kenneth H. Rosen: Discrete Mathematics and its applications, TMH.
6. Doerr Alan & Levasseur Kenneth: Applied Discrete Structures for Computer Science, Galgotia Pub. Pvt. Ltd.
7. Gersting: Mathematical Structure for Computer Science, WH Freeman & Macmillan.
8. Hopcroft J.E, Ullman J.D.: Introduction to Automata theory, Languages and Computation, Narosa Publishing House, New Delhi.

**Note:** Latest and additional good books may be suggested and added from time to time.

BCA-104 : LOGICAL ORGANIZATION OF COMPUTER-I

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Information Representation: Number Systems, Binary Arithmetic, Fixed-point and Floating-point representation of numbers, BCD Codes, Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Unicode

UNIT - II

Binary Logic: Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables, Canonical and Standard forms of Boolean functions, Simplification of Boolean Functions – Venn Diagram, Karnaugh Maps.

UNIT - III

Digital Logic: Introduction to digital signals, Basic Gates – AND, OR, NOT, Universal Gates and their implementation – NAND, NOR, Other Gates – XOR, XNOR etc. NAND, NOR, AND-OR-INVERT and OR-AND-INVERT implementations of digital circuits, Combinational Logic – Characteristics, Design Procedures, analysis procedures, Multilevel NAND and NOR circuits.

UNIT - IV

Combinational Circuits: Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor, Parallel binary adder/subtractor, Encoders, Decoders, Multiplexers, Demultiplexers, Comparators, Code Converters, BCD to Seven-Segment Decoder.

SUGGESTED READINGS

1. Gill, Nasib Singh and Dixit J.B.: Digital Design and Computer Organisation, University Science Press (Laxmi Publications), New Delhi.
2. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
3. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
4. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
5. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

**Note:** Latest and additional good books may be suggested and added from time to time.

**BCA-105 : Practical- Software lab**

(Based on paper BCA-102, PC Software)

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT-I

Overview of C: History of C, Importance of C, Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant, Structure of a C Program, printf(), scanf() Functions, Operators & Expression: Arithmetic, relational, logical, bitwise, unary, assignment, shorthand assignment operators, conditional operators and increment and decrement operators, Arithmetic expressions, evaluation of arithmetic expression, type casting and conversion, operator hierarchy & associativity.

### UNIT-II

Decision making & branching: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, goto statement.

Decision making & looping: For, while, and do-while loop, jumps in loops, break, continue statement, Nested loops.

### UNIT-III

Functions: Standard Mathematical functions, Input/output: Unformatted & formatted I/O function in C, Input functions viz. getch(), getche(), getchar(), gets(), output functions viz., putchar(), puts(), string manipulation functions.

User defined functions: Introduction/Definition, prototype, Local and global variables, passing parameters, recursion.

### UNIT-IV

Arrays, strings and pointers: Definition, types, initialization, processing an array, passing arrays to functions, Array of Strings. String constant and variables, Declaration and initialization of string, Input/output of string data, Introduction to pointers.

Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime.

Algorithm development, Flowcharting and Development of efficient program in C.

### SUGGESTED READINGS

1. Gottfried, Byron S., Programming with C, Tata McGraw Hill
2. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
3. Balagurusamy, E., Programming in ANSI C, 4E, Tata McGraw-Hill
4. Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison Wesley.
5. Yashwant Kanetker, Let us C, BPB.
6. Rajaraman, V., Computer Programming in C, PHI.
7. Yashwant Kanetker, Working with C, BPB.

**Note:** Latest and additional good books may be suggested and added from time to time.

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

#### UNIT - I

Sequential Logic: Characteristics, Flip-Flops, Clocked RS, D type, JK, T type and Master-Slave flip-flops. State table, state diagram and state equations. Flip-flop excitation tables

#### UNIT - II

Sequential Circuits: Designing registers – Serial Input Serial Output (SISO), Serial Input Parallel Output (SIPO), Parallel Input Serial Output (PISO), Parallel Input Parallel Output (PIPO) and shift registers. Designing counters – Asynchronous and Synchronous Binary Counters, Modulo-N Counters and Up-Down Counters

#### UNIT - III

Memory & I/O Devices: Memory Parameters, Semiconductor RAM, ROM, Magnetic and Optical Storage devices, Flash memory, I/O Devices and their controllers.

#### UNIT - IV

Instruction Design & I/O Organization: Machine instruction, Instruction set selection, Instruction cycle, Instruction Format and Addressing Modes. I/O Interface, Interrupt structure, Program-controlled, Interrupt-controlled & DMA transfer, I/O Channels, IOP.

#### SUGGESTED READINGS

1. Gill, Nasib Singh and Dixit J.B.: Digital Design and Computer Organisation, University Science Press (Laxmi Publications), New Delhi.
2. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
3. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
4. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
5. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

**Note:** Latest and additional good books may be suggested and added from time to time.



Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

#### UNIT-I

Basic Statistics: Measure of Central Tendency, Preparing frequency distribution table, Mean, Mode, Median, Measure of Dispersion: Range, Variance and Standard Deviations, Correlation and Regression.

#### UNIT-II

**Algorithm:** Algorithms, merits and demerits, Exponentiation, How to compute fast exponentiation. Linear Search, Binary Search, "Big Oh" notation, Worst case, Advantage of logarithmic algorithms over linear algorithms, complexity.

**Graph Theory:** Graphs, Types of graphs, degree of vertex, sub graph, isomorphic and homeomorphic graphs, Adjacent and incidence matrices, Path Circuit ; Eulerian, Hamiltonian path circuit.

#### UNIT-III

**Tree:** Trees, Minimum distance trees, Minimum weight and Minimum distance spanning trees.

**Recursion:** Recursively defined function.

Merge sort, Insertion sort, Bubble sort, and Decimal to Binary.

#### UNIT-IV

**Recurrence Relations:** LHRR, LHRRWCCs, DCRR. Recursive procedures.

**Number Theory:** Principle of Mathematical induction, GCD, Euclidean algorithm, Fibonacci numbers, congruences and equivalence relations, public key encryption schemes.

#### SUGGESTED READINGS

1. Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons, 1996.
2. Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995.
3. Graybill, Introduction to Statistics, McGraw.
4. Anderson, Statistical Modelling, McGraw.
5. Babu Ram : Discrete Mathematics

**Note:** Latest and additional good books may be suggested and added from time to time.

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

#### UNIT-I

Introduction to system, Definition and characteristics of a system, Elements of system, Types of system, System development life cycle, Role of system analyst, Analyst/user interface, System planning and initial investigation: Introduction, Bases for planning in system analysis, Sources of project requests, Initial investigation, Fact finding, Information gathering, information gathering tools, Fact analysis, Determination of feasibility.

#### UNIT-II

Structured analysis, Tools of structured analysis: DFD, Data dictionary, Flow charts, Gantt charts, decision tree, decision table, structured English, Pros and cons of each tool, Feasibility study: Introduction, Objective, Types, Steps in feasibility analysis, Feasibility report, Oral presentation, Cost and benefit analysis: Identification of costs and benefits, classification of costs and benefits, Methods of determining costs and benefits, Interpret results of analysis and take final action.

#### UNIT-III

System Design: System design objective, Logical and physical design, Design Methodologies, structured design, Form-Driven methodology(IPO charts), structured walkthrough, Input/Output and form design: Input design, Objectives of input design, Output design, Objectives of output design, Form design, Classification of forms, requirements of form design, Types of forms, Layout considerations, Form control.

#### UNIT-IV

System testing: Introduction, Objectives of testing, Test plan, testing techniques/Types of system tests, Quality assurance goals in system life cycle, System implementation, Process of implementation, System evaluation, System maintenance and its types, System documentation, Forms of documentation.

#### SUGGESTED READINGS

1. Systems Analysis and design BY e.m. aWAD Galgotia Pub.(P) Ltd.
2. Data Management and Data Structures by Loomis (PHI)
3. System Analysis and Design by Elias Awad.
4. Introductory System analysis and Design by Lee Vol. I & II

**Note:** Latest and additional good books may be suggested and added from time to time.

#### **BCA-110: Practical- Software lab**

**(Based on paper BCA-106, C Programming)**

## SYLLABUS OF B.C.A. III & IV SEMESTER **effective from 2013-14**

### **BCA-201 : Introduction to Operating System**

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

#### UNIT – I

**Fundamentals of Operating system:** Introduction to Operating System, its need and operating System services, Early systems, Structures - Simple Batch, Multi programmed, timeshared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems.

**Process Management:** Process concept, Operation on processes, Cooperating Processes, Threads, and Inter-process Communication.

#### UNIT-II

**CPU Scheduling:** Basic concepts, Scheduling criteria, Scheduling algorithms : FCFS, SJF, Round Robin & Queue Algorithms.

**Deadlocks:** Deadlock characterization, Methods for handling deadlocks, Banker's Algorithm.

#### UNIT-III

**Memory Management:** Logical versus Physical address space, Swapping, Contiguous allocation, Paging, Segmentation.

**Virtual Memory:** Demand paging, Performance of demand paging, Page replacement, Page replacement algorithms, Thrashing.

#### UNIT-IV

**File management:** File system Structure, Allocation methods: Contiguous allocation, Linked allocation, Indexed allocation, Free space management: Bit vector, Linked list, Grouping, Counting.

**Device Management:** Disk structure, Disk scheduling: FCFS, SSTF, SCAN, C-SCAN, LOOK, C-LOOK.

#### **Suggested Readings**

1. Abraham Silberschatz, Peter B. Galvin, " Operating System Concepts", Addison-Wesley publishing. Co., 7th. Ed., 2004.
2. Nutt Gary, "Operating Systems", Addison Wesley Publication, 2000.
3. Andrew S. Tannenbaum, "Modern Operating Systems", Pearson Education Asia, Second Edition, 2001.
4. William Stallings, "Operating Systems, "Internals and Design Principles", 4th Edition, PH, 2001.
5. Ekta Walia, "Operating Systems Concepts", Khanna Publishes, New Delhi, 2002.

**Note:** Latest and additional good books may be suggested and added from time to time.

## BCA – 202 : DATA STRUCTURES – I

External Marks: 80  
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT – I

Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space tradeoff, Big-O notation.

Strings: Introduction, Storing strings, String operations, Pattern matching algorithms.

### UNIT – II

Arrays: Introduction, Linear arrays, Representation of linear array in memory, address calculations, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Parallel arrays, Sparse arrays.

Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way linked list, Threaded lists, Garbage collection, Applications of linked lists.

### UNIT – III

Stack: Introduction, Array and linked representation of stacks, Operations on stacks, Applications of stacks: Polish notation, Recursion.

Queues: Introduction, Array and linked representation of queues, Operations on queues, Deques, Priority Queues, Applications of queues.

### UNIT – IV

Tree: Introduction, Definition, Representing Binary tree in memory, Traversing binary trees, Traversal algorithms using stacks.

Graph: Introduction, Graph theory terminology, Sequential and linked representation of graphs.

### SUGGESTED READINGS

1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C", Orient Longman.
3. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
4. Mark Allen Weiss Data Structures and Algorithm Analysis In C, Addison- Wesley, (An Imprint Of Pearson Education), Mexico City. Prentice- Hall Of India Pvt. Ltd., New Delhi.
5. Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, "Data Structures Using C", Prentice- Hall of India Pvt. Ltd., New Delhi.

**Note:** Latest and additional good books may be suggested and added from time to time.

## BCA – 203 : INTRODUCTION TO DATABASE SYSTEM

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT – I

Basic Concepts – Data, Information, Records and files. Traditional file –based Systems-File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics of Database Approach, advantages and disadvantages of database system, components of database system, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions and Components, DBMS users, Advantages and Disadvantages of DBMS, DBMS languages.

Roles in the Database Environment - Data and Database Administrator, Database Designers, Applications Developers and Users .

### UNIT – II

Database System Architecture – Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances .

Data Independence – Logical and Physical Data Independence .

Classification of Database Management System, Centralized and Client Server architecture to DBMS .

Data Models: Records- based Data Models, Object-based Data Models, Physical Data Models and Conceptual Modeling.

### UNIT – III

Entity-Relationship Model – Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams, abstraction and integration.

Basic Concepts of Hierarchical and Network Data Model, Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, .

### UNIT – IV

Relational algebra, Relational calculus, Relational database design: Functional dependencies, Modification anomalies, 1st to 3<sup>rd</sup> NFs, BCNF, 4<sup>th</sup> and 5<sup>th</sup> NFs, computing closures of set FDs, SQL: Data types, Basic Queries in SQL, Insert, Delete and Update Statements, Views, Query processing: General strategies of query processing, query optimization, query processor, concept of security, concurrency and recovery.

### SUGGESTED READINGS

1. Elmasri & Navathe, "Fundamentals of Database Systems", 5th edition, Pearson Education.
2. Thomas Connolly Carolyn Begg, "Database Systems", 3/e, Pearson Education
3. C. J. Date, "An Introduction to Database Systems", 8<sup>th</sup> edition, Addison Wesley N. Delhi.

**Note:** Latest and additional good books may be suggested and added from time to time.

**BCA-204 : COMMUNICATION SKILLS (ENGLISH)**

**External Marks: 80**

**Internal Marks: 20**

**Time: 3 hours**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

**Introduction to Basics of Communication:** Communication and its various definition, features/characteristics of the communication, process of communication, communication model and theories, barrier to effective communication.

**UNIT-II**

**Improving LSRW:** introduction, verbal and nonverbal communication, listening process, group discussion, forms of oral presentation, self-presentation, dyadic communication, 5C's of communication, Developing dialogues, soft skill.

**UNIT-III**

**Basic vocabulary:** how to improve vocabulary, prefix/suffix, synonyms/antonyms, one word substitution, spellings

**Developing fluency:** grammar (conjunction, auxiliaries, prepositions, articles, tenses.....), language games.

**UNIT-IV**

**Proper use of Language:** The Communication Skills, The effective Speech.

**Effective self-presentation & facing interview:** The interview process & preparing for it, The presentation skills.

**SUGGESTED READINGS**

1. Vik, Gilsdorf, "Business Communication", Irwin
2. K K Sinha, "Business Communication", Himalaya Publishing House / Galgoria Publication
3. Bovee, "Business Communication", Pearson ' PHI
4. Mohan, Banerjee, Business Communication, Mac million
5. Raman, Singh – Business communication – Oxford Press

**Note:** Latest and additional good books may be suggested and added from time to time.

BCA-205 : PRACTICAL- SOFTWARE LAB  
PRACTICAL BASED ON PAPER BCA-202 & 203 USING C LANGUAGE AND SQL.

# SYLLABUS OF BCA IVTH SEMESTER

BCA – 206 : WEB DESIGNING

External Marks:80

Internal Marks:20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

## UNIT – I

Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic features; Web Browsers; Web Servers; Hypertext Transfer Protocol, Overview of TCP/IP and its services; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools;

## UNIT – II

Web Publishing: Hosting your Site; Internet Service Provider; Web terminologies, Phases of Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names, Front page views, Adding pictures, Links, Backgrounds, Relating Front Page to DHTML.

Creating a Website and the Markup Languages (HTML, DHTML);

## UNIT – III

Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts;

## UNIT – IV

Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes;

DHTML: Dynamic HTML, Features of DHTML, CSSP(cascading style sheet positioning) and JSSS(JavaScript assisted style sheet), Layers of netscape, The ID attributes, DHTML events.

## SUGGESTED READINGS

1. Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill.
2. Ramesh Bangia, "Multimedia and Web Technology", Firewall Media.
3. Thomas A. Powell, "Web Design: The Complete Reference" , 4/e, Tata McGraw-Hill
4. Wendy Willard, "HTML Beginners Guide", Tata McGraw-Hill.
5. Deitel and Goldberg, "Internet and World Wide Web, How to Program", PHI.

**Note:** Latest and additional good books may be suggested and added from time to time.

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

#### UNIT – I

Tree: Header nodes, Threads, Binary search trees, Searching, Insertion and deletion in a Binary search tree, AVL search trees, Insertion and deletion in AVL search tree, m-way search tree, Searching, Insertion and deletion in an m-way search tree, B-trees, Searching, Insertion and deletion in a B-tree, B+tree, Huffman's algorithm, General trees.

#### UNIT – II

Graphs: Warshall's algorithm for shortest path, Dijkstra algorithm for shortest path, Operations on graphs, Traversal of graph, Topological sorting.

#### UNIT – III

Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort, Tournament sort, Searching: Linear search, binary search, merging, Comparison of various sorting and searching algorithms on the basis of their complexity.

#### UNIT – IV

Files: Physical storage devices and their characteristics, Attributes of a file viz fields, records, Fixed and variable length records, Primary and secondary keys, Classification of files, File operations, Comparison of various types of files, File organization: Serial, Sequential, Indexed-sequential, Random-access/Direct, Inverted, Multilist file organization.  
Hashing: Introduction, Hashing functions and Collision resolution methods .

#### SUGGESTED READINGS

1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C", Orientlongman.
3. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
4. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison- Wesley, (An Imprint Of Pearson Education), Mexico City.Prentice- Hall Of India Pvt. Ltd., New Delhi.

**Note:** Latest and additional good books may be suggested and added from time to time.



## BCA-208: Object Oriented Programming Using C++

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT-I

**Object Oriented Programming Concepts :** Procedural Language and Object Oriented approach, Characteristics of OOP, user defined types, polymorphism and encapsulation. Getting started with C++: syntax, data types, variables, string, function, namespace and exception, operators, flow control, recursion, array and pointer, structure .

### UNIT-II

**Abstracting Mechanism:** classes, private and public, Constructor and Destructor , member function, static members, references;

**Memory Management:** new, delete, object copying, copy constructor, assignment operator, this input/output

### UNIT-III

**Inheritance and Polymorphism:** Derived Class and Base Class, Different types of Inheritance,

Overriding member function, Abstract Class, Public and Private Inheritance, Ambiguity in Multiple inheritance , Virtual function, Friend function, Static function.

### UNIT-IV

**Exception Handling:** Exception and derived class, function exception declaration, unexpected exception, exception when handling exception, resource capture and release.

**Template and Standard Template Library:** Template classes, declaration, template functions, namespace, string, iterators, hashes, iostreams and other types.

### SUGGESTED READINGS

1. Herbert Schildts : C++ - The Complete Reference, Tata McGraw Hill Publications.
2. Balaguru Swamy : C++, Tata McGraw Hill Publications.
3. Balaguruswamy : Object Oriented Programming and C++, TMH.
4. Shah & Thakker : Programming in C++, ISTE/EXCEL.
5. Johnston : C++ Programming Today, PHI.
6. Object Oriented Programming and C++, Rajaram, New Age International.
7. Samanta : Object Oriented Programming with C++ & JAVA, PHI.

**Note :** Latest and additional good books may be suggested and added from time to time.

## BCA-209 : Software Engineering

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT – I

**Introduction:** Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models.

**Software Requirements Analysis & Specifications:** Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS .

### UNIT – II

**Software Project Management Concepts:** The Management spectrum, The People The Problem, The Process, The Project.

**Software Project Planning:** Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

### UNIT - III

**Software Design:** Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics

**Software Implementation:** Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style.

### UNIT - IV

**Software Testing:** Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities.

**Software Maintenance:** Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

### Suggested Readings

1. Gill, Nasib Singh : Software Engineering, Khanna Book Publishing Co. (P) Ltd. N. Delhi.
2. Pressman : Software Engineering, TMH.
3. Jalote, Pankaj : An Integrated Approach to Software Engineering, Narosa Publications.
4. Chhillar Rajender Singh : Software Engineering : Testing, Faults, Metrics, Excel Books, New Delhi.
5. Ghezzi, Carlo : Fundamentals of Software Engineering, PHI.
6. Fairely, R.E. : Software Engineering Concepts, McGraw-Hill.
7. Lewis, T.G.: Software Engineering, McGraw-Hill.
8. Shere : Software Engineering & Management, Prentice Hall.

**Note :** Latest and additional good books may be suggested and added from time to time.

BCA-210 : PRACTICAL- SOFTWARE LAB  
PRACTICAL BASED ON PAPER BCA-206 & BCA-208 USING HTML AND C++  
LANGUAGE

**w.e.f. 2014-15**

**BCA – 301: MANAGEMENT INFORMATION SYSTEM**

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT – I**

Introduction to system and Basic System Concepts, Types of Systems, The Systems Approach, Information System: Definition & Characteristics, Types of information, Role of Information in Decision-Making, Sub-Systems of an Information system: EDP and MIS management levels, EDP/MIS/DSS.

**UNIT –II**

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Un-structured decisions, Formal vs. Informal systems.

**UNIT – III**

Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation, Pitfalls in MIS Development.

**UNIT – IV**

Functional MIS: A Study of Personnel, Financial and production MIS, Introduction to e-business systems, ecommerce – technologies, applications, Decision support systems – support systems for planning, control and decision-making

**SUGGESTED READINGS**

1. J. Kanter, "Management/Information Systems", PHI.
2. Gordon B. Davis, M. H. Olson, "Management Information Systems – Conceptual foundations, structure and Development", McGraw Hill.
3. James A. O'Brien, "Management Information Systems", Tata McGraw-Hill.
4. James A. Senn, "Analysis & Design of Information Systems", Second edition, McGraw Hill.
5. Robert G. Murdick & Joel E. Ross & James R. Claggett, "Information Systems for Modern Management", PHI.
6. Lucas, "Analysis, Design & Implementation of Information System", McGraw Hill.

**Note:** Latest and additional good books may be suggested and added from time to time.

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

#### **UNIT-I**

**Graphics Primitives:** Introduction to computer graphics, Basics of Graphics systems, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and workstations and input devices.

**Output Primitives:** Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary fill and flood-fill algorithms .

#### **UNIT-II**

**2-D Geometrical Transforms:** Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

**2-D Viewing:** The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

#### **UNIT-III**

**3-D Object Representation:** Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon-rendering methods.

#### **UNIT-IV**

**3-D Geometric Transformations:** Translation, rotation, scaling, reflection and shear transformations, composite transformations.

**3-D Viewing:** Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

#### **SUGGESTED READINGS**

1. Donald Hearn and M. Pauline Baker : Computer Graphics, PHI Publications.
2. Plastock : Theory & Problem of Computer Gaphics, Schaum Series.
3. Foley & Van Dam : Fundamentals of Interactive Computer Graphics, Addison-Wesley.
4. Newman : Principles of Interactive Computer Graphics, McGraw Hill.
5. Tosijas, L.K. : Computer Graphics, Springer-Verleg.

Note : Latest and additional good books may be suggested and added from time to time.

## BCA – 303 : Data Communication and Networking

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT – I

Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; Types of Computer Networks and their Topologies; Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; Network Applications and Application Protocols; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model, Peer-to-Peer Model, Web-Based Model, Network Architecture and the OSI Reference Model, TCP/IP reference model, Example Networks: The Internet, X.25, Frame Relay, ATM.

### UNIT – II

Analog and Digital Communications Concepts: Concept of data, signal, channel, bit-rate, maximum data-rate of channel, Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Asynchronous and synchronous transmission, data encoding techniques, Modulation techniques, Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Dialup Networking; Analog Modem Concepts; DSL Service.

### UNIT - III

Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Sliding Window Protocols; Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring; Introduction to LAN technologies: Ethernet, switched Ethernet, VLAN, fast Ethernet, gigabit Ethernet, token ring, FDDI, Wireless LANs; Bluetooth; Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways.

### UNIT – IV

Network Layer and Routing Concepts: Virtual Circuits and Datagrams; Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; Congestion Control Algorithms; Internetworking; Network Security Issues: Security threats; Encryption Methods; Authentication; Symmetric – Key Algorithms; Public-Key Algorithms.

### SUGGESTED READINGS

1. Michael A. Gallo, William M. Hancock, "Computer Communications and Networking Technologies", CENGAGE Learning.
2. Andrew S. Tanenbaum, "Computer Networks", Pearson Education.
3. James F. Kurose, Keith W. Ross, "Computer Networking", Pearson Education.
4. Behrouz A Forouzan, "Data Communications and Networking", McGraw Hill.

**Note:** Latest and additional good books may be suggested and added from time to time.

## BCA – 304 : Visual Basic

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT – I

Introduction to VB: Visual & non-visual programming, Procedural, Object-oriented and eventdriven programming languages, The VB environment: Menu bar, Toolbar, Project explorer, Toolbox, Properties window, Form designer, Form layout, Immediate window. Visual Development and Event Driven programming.

### UNIT – II

Basics of Programming: Variables: Declaring variables, Types of variables, Converting variables types, User-defined data types, Forcing variable declaration, Scope & lifetime of variables. Constants: Named & intrinsic. Operators: Arithmetic, Relational & Logical operators. I/O in VB: Various controls for I/O in VB, Message box, Input Box, Print statement.

### UNIT – III

Programming with VB: Decisions and conditions: If statement, If-then-else, Select-case. Looping statements: Do-loops, For-next, While-wend, Exit statement. Nested control structures. Arrays: Declaring and using arrays, one-dimensional and multi-dimensional arrays, Static & dynamic arrays, Arrays of array. Collections: Adding, Removing, Counting, Returning items in a collection, Processing a collection.

### UNIT – IV

Programming with VB: Procedures: General & event procedures, Subroutines, Functions, Calling procedures, Arguments- passing mechanisms, Optional arguments, Named arguments, Functions returning custom data types, Functions returning arrays. Working with forms and menus : Adding multiple forms in VB, Hiding & showing forms, Load & unload statements, creating menu, submenu, popup menus, Activate & deactivate events, Form-load event, menu designing in VB Simple programs in VB.

### SUGGESTED READINGS

1. Steven Holzner, "Visual Basic 6 Programming: Black Book", Dreamtech Press.
2. Evangelos Petroustos. "Mastering Visual Basic 6", BPB Publications.
3. Julia Case Bradley & Anita C. Millsbaugh, "Programming in Visual Basic 6.0", Tata McGraw-Hill Edition
4. Michael Halvorson, "Step by Step Microsoft Visual Basic 6.0 Professional", PHI
5. "Visual basic 6 Complete", BPB Publications.
6. Scott Warner, "Teach Yourself Visual basic 6", Tata McGraw-Hill Edition
7. Brian Siler and Jeff Spotts, "Using Visual Basic 6", Special Edition, PHI.

**Note:** Latest and additional good books may be suggested and added from time to time.

BCA-305 : PRACTICAL- SOFTWARE LAB  
PRACTICAL BASED ON PAPER BCA-304 (VB LANGUAGE) AND BCA-302

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT – I

Electronic Commerce: Overview of Electronic Commerce, Scope of Electronic Commerce, Traditional Commerce vs. Electronic Commerce, Impact of E-Commerce, Electronic Markets, Internet Commerce, e-commerce in perspective, Application of E Commerce in Direct Marketing and Selling, Obstacles in adopting E-Commerce Applications; Future of E-Commerce.

### Unit-II

Value Chains in electronic Commerce, Supply chain, Porter's value chain Model, Inter Organizational value chains, Strategic Business unit chains, Industry value chains. Security Threats to E-commerce: Security Overview, Computer Security Classification, Copyright and Intellectual Property, security Policy and Integrated Security, Intellectual Property Threats, electronic Commerce Threats, Clients Threats, Communication Channel Threats, server Threats.

### Unit-III

Implementing security for E-Commerce: Protecting E-Commerce Assets, Protecting Intellectual Property, Protecting Client Computers, Protecting E-commerce Channels, Insuring Transaction Integrity, Protecting the Commerce Server. Electronic Payment System: Electronic Cash, Electronic Wallets, Smart Card, Credit and Change Card.

### Unit – IV

Business to Business E-Commerce: Inter-organizational Transitions, Credit Transaction Trade Cycle, a variety of transactions. Electronic Data Interchange (EDI): Introduction to EDI, Benefits of EDI, EDI Technology, EDI standards, EDI Communication, EDI Implementation, EDI agreement, EDI security.

### Suggested Readings:

1. R.Kalakota and A.B.Whinston, Readings in Electronic Commerce, Addison Wesley,
- 2 David Kosiur, Understanding E- Commerce, Microsoft Press, 1997. 3) Soka, From EDI to Electronic Commerce , McGraw Hill, 1995.
- 3 David whitely, E-commerce Strategy, Technology and application, Tata McGraw Hill.
- 4 Gary P. Schneider and Jame Perry, Electronic Commerce Thomson Publication.
- 5 Doing Business on the Internet E-COMMERCE S. Jaiswal; Galgotia Publications.
- 6 E-Commerce An Indian Perspective; P.T.Joseph; S.J.; PHI.
- 7 E-Commerce; S.Jaiswal – Glgotia.
- 8 E-Commerce; Efrain Turbon; Jae Lee; David King; H.Michael Chang.

**Note:** Latest and additional good books may be suggested and added from time to time.



## BCA-307 : Object Technologies & Programming using Java

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT-I

**Object Oriented Methodology-1:** Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Introduction to Common OO Language, Applications of OOPs .

**Object Oriented Methodology-2:** Classes and Objects, Abstraction and Encapsulation, Inheritance, Method Overriding and Polymorphism.

### UNIT-II

**Java Language Basics:** Introduction To Java, Basic Features, Java Virtual Machine Concepts, Primitive Data Type And Variables, Java Operators, Expressions, Statements and Arrays.

**Object Oriented Concepts:** Class and Objects-- Class Fundamentals, Creating objects , Assigning object reference variables; Introducing Methods, Static methods, Constructors , Overloading constructors; This Keyword; Using Objects as Parameters, Argument passing, Returning objects , Method overloading, Garbage Collection, The Finalize ( ) Method.

**Inheritance and Polymorphism:** Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword.

### UNIT-III

**Packages :** Defining Package, CLASSPATH, Package naming, Accessibility of Packages , using Package Members.

**Interfaces:** Implementing Interfaces, Interface and Abstract Classes, Extends and Implements together .

**Exceptions Handling :** Exception , Handling of Exception, Using try-catch , Catching Multiple Exceptions , Using finally clause , Types of Exceptions, Throwing Exceptions, Writing Exception Subclasses.

### UNIT-IV

**Multithreading :** Introduction , The Main Thread, Java Thread Model, Thread Priorities, Synchronization in Java, Inter thread Communication.

**I/O in Java :** I/O Basics, Streams and Stream Classes ,The Predefined Streams, Reading from, and Writing to, Console, Reading and Writing Files , The Transient and Volatile Modifiers , Using Instance of Native Methods.

**Strings and Characters :** Fundamentals of Characters and Strings, The String Class , String Operations , Data Conversion using Value Of ( ) Methods , String Buffer Class and Methods.

### Suggested Readings

1. Programming in Java, E Balagurusamy .
2. The Complete Reference JAVA, TMH Publication.
3. Begining JAVA, Ivor Horton, WROX Public.
4. JAVA 2 UNLEASHED, Tech Media Publications.
5. Patrick Naughton and Herbertz Schildt, "Java-2 The Complete Reference", 1999, TMH.

**Note:** Latest and additional good books may be suggested and added from time to time.

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

#### **UNIT – I**

**Overview of A.I:** Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success.

**Problems, problem space and search:** Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem

**Heuristic search techniques :** Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

#### **UNIT - II**

**Knowledge Representation:** Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation.

**Using Predicate Logic :** Representing Simple Facts in logic, Representing instances and is\_a relationship, Computable function and predicate.

#### **UNIT - III**

**Natural language processing :** Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing.

**Learning:** Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.

#### **UNIT - IV**

**Expert System:** Introduction, Representing using domain specific knowledge, Expert system shells.

#### **Suggested Readings**

1. David W. Rolston : Principles of Artificial Intelligence and Expert System Development, McGraw Hill Book Company.
2. Elaine Rich, Kevin Knight : Artificial Intelligence, Tata McGraw Hill.
3. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999 .
4. Nils J Nilsson , "Artificial Intelligence -A new Synthesis" 2nd Edition (2000), Harcourt Asia Ltd.

**Note:** Latest and additional good books may be suggested and added from time to time.

External Marks: 80

Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

### UNIT – I

The Framework of .Net: Building blocks of .Net Platform (the CLR, CTS and CLS), Features of .Net, Deploying the .Net Runtime, Architecture of .Net platform, Introduction to namespaces & type distinction. Types & Object in .Net, the evolution of Web development .

### UNIT – II

Class Libraries in .Net, Introduction to Assemblies & Manifest in .Net, Metadata & attributes . Introduction to C#: Characteristics of C#, Data types: Value types, reference types, default value, constants, variables, scope of variables, boxing and unboxing.

### UNIT – III

Operators and expressions: Arithmetic, relational, logical, bitwise, special operators, evolution of expressions, operator precedence & associativity, Control constructs in C#: Decision making, loops, Classes & methods: Class, methods, constructors, destructors, overloading of operators & functions.

### UNIT – IV

Inheritance & polymorphism: visibility control, overriding, abstract class & methods, sealed classes & methods, interfaces.

Advanced features of C#: Exception handling & error handling, automatic memory management, Input and output (Directories, Files, and streams).

### SUGGESTED READINGS

1. Introduction to C# using .NET By Robert J. Oberg, PHI, 2002.
2. Programming in C# By E. Balaguruswamy, Tata McGraw Hill.
3. The Complete Guide to C# Programming by V. P. Jain.
4. C# : A Beginner's Guide, Herbert Schildt, Tata McGraw Hill.
5. C# and .NET Platform by Andrew Troelsen, Apress, 1<sup>st</sup> edition, 2001.

**Note:** Latest and additional good books may be suggested and added from time to time.

BCA-310 : PRACTICAL- SOFTWARE LAB

– Based on paper

BCA-307 and BCA-309

# **Semester-I**

**Financial Accounting –I  
19BC-101**

**Internal Assessment: 20 Marks  
Theory Paper: 80 Marks**

**Time: 3Hrs.**

**Note:** The Examiner shall set nine questions in all covering the whole syllabus. Question No. 1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the 8 questions will be set from all the four units. The examiner will set 2 questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Important:** The Examiner will set at least *THREE* Numerical and *THREE* theoretical questions in the question paper.

**Unit-1**

Introduction: Meaning, Objectives, Process, Limitations and basic terms of Accounting, Users of Accounting information; Qualitative characteristics of Accounting information; Generally Accepted Accounting Principles (GAAP)

Financial Accounting Standards: Concepts, Benefits, Procedures for issuing accounting standards in India; International Financial Reporting Standards (IFRS): - Need and Procedures, Convergence to IFRS.

**UNIT-II**

Capital and Revenue items; Reserves and Provisions: Meaning, Difference between Reserves and Provisions, Categories of Provisions- Provision for Bad Debts, Provision for Depreciation, Provision for Tax, Categories of Reserves- Capital Reserve and Revenue Reserve.

Depreciation: - Meaning, Causes, Accounting procedure, Methods of computing depreciation: - Straight line method, Diminishing balance method and change of method (Practical Problems).

**UNIT-II**

Rectifications of Errors: Meaning and Types of Errors, Errors not Affecting the Trial Balance, Errors Affecting the Trial Balance, Suspense Account, Rectification of Errors in the Next Accounting Year, (Practical Problems).

Final Accounts with Adjustments: Meaning, Objectives, Manufacturing Account, Trading Account, Profit and Loss Account, Balance Sheet, Various Adjustment Entries in Final Accounts (Practical Problems).

**UNIT-IV**

Accounting for Non-Profit Organizations: Meaning, Characteristics, Final Accounts- Receipts and Payment Account, Income and Expenditure Account and Balance Sheet (Practical Problems)

Consignment Accounts: Meaning, Accounting Treatment in the Books of Consignor and Consignee (Practical Problems)

**Text Book**

1. P.C. Tulsian, Financial Accounting, Tata McGraw Hill, New Delhi.

**Reference Books: -**

1. Lal, Jawahar and Seema Srivastava, Financial Accounting, Himalaya Publishing House.
2. Monga, J.R., Financial Accounting: Concepts and Applications, Mayoor Paper Backs, New Delhi.
3. Shukla, M.C., T.S. Grewal and S.C.Gupta. Advanced Accounts. Vol.-I. S. Chand & Co., New Delhi.
4. S. N. Maheshwari, Financial Accounting, Vikas Publication, New Delhi. T.S, Grewal, Introduction to Accounting, S. Chand and Co., New Delhi
5. Bhushan Kumar Goyal and HN Tiwari, Financial Accounting, Vikas publishing House, New Delhi.
6. Jain, S.P. and K.L. Narang. Financial Accounting. Kalyani Publishers, New Delhi.
7. *Compendium of Statements and Standards of Accounting*. The Institute of Chartered Accountants of India, New Delhi

**Business Management  
19BC-102**

**Internal Assessment: 20 Marks  
Theory Paper: 80 Marks**

**Time: 3Hrs.**

**Note:** The Examiner shall set nine questions in all covering the whole syllabus. Question No. 1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the 8 questions will be set from all the four units. The examiner will set 2 questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Unit-1**

Business- Concept, Nature and Spectrum of Business Activities. Basic Considerations in Setting up a Business Enterprise.

Management: Introduction, Process, Development of Management Thoughts, Contribution of Taylor and Henry Fayol in Management

**UNIT-II**

Planning: Objectives, Strategies and Planning process. Organizing: concept, Organizational Structure and Process. Staffing: concept and Scope. Recruitment and Selection.

**UNIT-III**

Directing: Leadership concept and Style, Theories: - Trait theory, Style & Behavior theory, Contingency theory.

Motivation: - Concept, Theories: - ERG theory, Reinforcement theory, Expectancy theory.

Decision Making

**UNIT-IV**

Controlling: Concept, Process and Techniques.

Management by Objectives, Management of Change: Resistance to Change and Strategies to manage change.

**Text Book**

1. Tripathi, P.C.; *Principles of Management*, Tata McGraw Hill Publishing, New Delhi.

**Reference Books**

1. Singh, B.P. & Chhabra, T.N., *Business Organisation and Management*, Sun India Publications, New Delhi.
2. Shankar, Gauri; *Modern Business Organisation*, Mahavir Book Depot, New Delhi.
3. Tulsian, P.C.; *Business Organisation & Management*, Pearson Education, New Delhi.



**Business Economics  
19BC-103**

**Internal Assessment: 20 Marks  
Theory Paper: 80Marks**

**Time: 3Hrs.**

**Note:** The Examiner shall set nine questions in all covering the whole syllabus. Question No. 1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the 8 questions will be set from all the four units. The examiner will set 2 questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Unit-I**

Introduction: Basic problem of an economy: working of price mechanism, Law of Demand, Elasticity of demand; measurement, importance, determinants of elasticity of demand, Average revenue; marginal revenue and elasticity of demand and elasticity of supply

**Unit-II**

Production Function: Law of variable proportions; Isoquants; Economic regions and optimum factor combination; expansion path; returns to scale; Internal and external economies and diseconomies; Ridge lines; Theory of costs: concepts of cost; Short run and Long run cost curves- Traditional and Modern approaches.

**Unit- III**

Ordinal Utility theory: (Indifference curve approach): Consumer's preferences; Indifference curves; Budget line; Consumer's equilibrium; Income and substitution effect; Price consumption curve and the derivation of demand curve for a commodity; Criticisms of the law of demand.

Cardinal Utility Analysis: Defining Utility-Total Utility, Marginal Utility, Law of Diminishing Marginal Utility and Law of Equi-marginal Utility, Consumer Equilibrium.

**Unit-IV**

Market, classification and structure: Price and Output Determination under Perfect Competition, Monopoly.

Price and Output Determination under Monopolistic Competition and Oligopoly

**Text Book**

1. Ahuja, H.L., *Business Economics*, S. Chand & Co., New Delhi.

**Suggested Book:**

1. Pindyck, R.S., and D.L. Rubinfeld, *Microeconomics*, Prentice-Hall of India Pvt. Ltd.
2. Deepashree, *Business Economics*, Ane Books Pvt. Ltd., New Delhi.
3. Varian, H.R., *Intermediate Microeconomics: A Modern Approach*, Affiliated East- West Press, New Delhi.

**English**  
**19BC-104**

**Internal Assessment: 20 Marks**  
**Theory Paper: 80 Marks**

**Time: 3Hrs.**

**Note:** The Examiner shall set nine questions in all covering the whole syllabus. Question No. 1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the 8 questions will be set from all the four units. The examiner will set 2 questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Unit - I**

**A. Prose writings:**

- i. "The Homecoming" by Rabindranath Tagore
- ii. "Playing the English Gentleman" by M.K. Gandhi
- iii. "Prospects of Democracy in India" by Dr. B.R. Ambedkar

**A. Poems:**

- i. "The Village Schoolmaster" by Oliver Goldsmith
- ii. "If" by Rudyard Kipling
- iii. "My Grandmother's House" by Kamala Das

**Unit - II**

**Parts of speech:** Nouns, Pronouns, Adjectives, Articles, Verbs, Adverbs, Prepositions, Conjunction, Interjection, Identifying parts of speech, Structures: Verb patterns, Question tags; Subject – Verb agreement (concord)

**Unit - III**

**Basic grammatical concepts and common errors:** Tenses, Modals, Passive Voice, Prepositions, Punctuation, Relative Clause, Reported speech, Speech acts, Tags

**Unit - IV**

**Listening:** Barriers to Listening, Academic Listening, Listening to Talks and Descriptions, Listening to Announcements, Listening to News on the Radio and Television Listening

**Conversational English:** Casual Conversations, Understanding Communication, Greeting and Introducing, Making Requests, Asking for and Giving Permission, Offering Help, Giving Instructions and Directions, Art of Small Talk, Participating in Conversations

**Speech and Oration:** Making a Short Formal Speech, Describing People, Places, Events and Things.

**Text Book**

1. Fundamentals of Business Communication, Chaturvedi P.D., Chaturvedi Mukesh, Pearson Education India, 2012

**Reference Books**

1. Prelude, (Dr Shiram G. Gahane), Orient Black Swan
2. A Course in Communication Skills, (P Kiranmai Dutt, Geetha Rajeevan, CLN Prakash) Foundation Books, CUP.
3. English Grammar Today (Workbook), Cambridge University Press.

4. Intermediate Grammar, Usage and Composition (M.L. Tickoo, A.E. Subramanian, P.R. Subramaniam), Orient BlackSwan.

**Fundamentals of Computer  
19BC-105**

**Internal Assessment: 10 Marks  
Theory Paper: 40 Marks  
Practical Examination: 50 Marks**

**Time: 3Hrs.**

- Note:**
1. Written examination in the paper “Fundamentals of Computer-I” of 40 marks shall be held at the term end of the course. Internal assessment shall be awarded by the teacher concerned out of 10 marks.
  2. The Examiner shall set nine questions in all covering the whole syllabus. Question No. 1 will be compulsory covering all the units and shall carry 4 small questions of 2 marks each. The rest of the 8 questions will be set from all the four units. The examiner will set 2 questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 08 marks each.
  3. There shall be a practical examination of 50 Marks (Practical-30 Marks, Viva-10 Marks and Work Book- 10 Marks) and duration of Examination shall be 3 Hrs.
  4. Teaching arrangements need to be made in the computer lab.

**Unit I**

Introduction of Computers: Organisation, Characteristics, Types of Computers, types of Memories, Hardware and Software Concepts.

**Unit II**

Operating System: Introduction of OS, Types of OS, Functions of OS, MS-DOS Internal Commands: chdir, cls, path, prompt, label, ver, bol, echo, set.

External Commands: scandisk, discopy, diskcomp, format, backup, restore. Windows-Windows Explorer, Print Manager, Control Panel, Paint Brush. Dialog box: Text box, Check box, slide boxes, Desktop.

**Unit III**

MS-Office (Word and Excel): Introduction of Word Processing, MS-Word; Creating, Editing, Printing, Page Formatting, Sorting and Tables, Mail Merge. MS- Excel: Introduction to Spread Sheet, Creating, Editing, Printing, Formatting of Worksheets, Preparation of Graphs.

**Unit IV**

Data Communication and Networks: Data Communication Concept, Medias, Modes, Multiplexers. Networking; Need, Types of Network, Distributed Networking, Client- Server Concepts, OSI Models.

**Text Books:**

1. Summer, M.: Computers Concepts and Uses, Engewood Cliffs, New Jersey, PHI
2. V. Rajaraman: Fundamental of Computers.

**Reference Books**

1. Curtis D. Frye, Step by Step Microsoft Excel 2010, PHI.
2. Rajaraman, V. Introduction to Information Technology. PHI.
3. Sinha, Pradeep K. and Preeti Sinha. Foundation of Computing. BPB Publication.

# Semester-II

**Financial Accounting – II  
19BC-201**

**Internal Assessment: 20 Marks  
Theory Paper: 80Marks**

**Time: 3Hrs.**

**Note:** The Examiner shall set nine questions in all covering the whole syllabus. Question No. 1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the 8 questions will be set from all the four units. The examiner will set 2 questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Unit-1**

Dissolution of Partnership firm-Insolvency of Partners (including Garner v/s Murrey Rule), Amalgamation and Sale of Partnership firms, Gradual Realization and Piecemeal Distribution.

**UNIT-II**

Hire Purchase System and Installment Payment Systems: Accounting for Hire Purchase Transactions, Journal entries and ledger accounts in the books of Hire Vendors and Hire purchaser for large value items including default and repossession, stock and debtors system.

Joint Ventures: Joint Venture: Accounting procedures: Joint Bank Account, Records Maintained by Co-venturer of (a) all transactions (b) only his own transactions, Memorandum joint venture account.

**UNIT-III**

Royalty Account: Meaning, Types of Royalties, Basis of Royalty, Accounting Entries.

Branch Account: Meaning, Methods- Debtor System, Income Statement System, Stock and Debtor, Final Account System, Pros and Cons of Branch Accounting, Accounting Treatment.

**UNIT-IV**

Insolvency Accounts for Non Corporate Entities: Defining Insolvency, Statement of Affairs as on date of order, Difference between Balance Sheet Statement of Affairs and Accounting Treatment



**Text Book**

1. P.C. Tulsian, Financial Accounting, Tata McGraw Hill, New Delhi.

**Reference Books: -**

1. Lal, Jawahar and Seema Srivastava, Financial Accounting, Himalaya Publishing House.
2. Monga, J.R., Financial Accounting: Concepts and Applications, Mayoor Paper Backs, New Delhi.
3. Shukla, M.C., T.S. Grewal and S.C.Gupta. Advanced Accounts. Vol.-I. S. Chand & Co., New Delhi.
4. S. N. Maheshwari, Financial Accounting, Vikas Publication, New Delhi. T.S, Grewal, Introduction to Accounting, S. Chand and Co., New Delhi
5. Bhushan Kumar Goyal and HN Tiwari, Financial Accounting, Vikas publishing House, New Delhi.
6. Jain, S.P. and K.L. Narang. Financial Accounting. Kalyani Publishers, New Delhi.
7. *Compendium of Statements and Standards of Accounting*. The Institute of Chartered Accountants of India, New Delhi

**Indian Economy and Business Environment  
19BC-202**

**Internal Assessment: 20 Marks  
Theory Paper: 80 Marks**

**Time: 3Hrs.**

**Note:** The Examiner shall set nine questions in all covering the whole syllabus. Question No. 1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the 8 questions will be set from all the four units. The examiner will set 2 questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Unit – I**

Introduction to Business Environment: Meaning, Elements, Importance of Business Environment, Current Indian Business Environment

Environmental Analysis: Objectives, Process, Environmental Limitations, SWOT / SWOC, ETOP Analysis with special reference to Indian Industry.

**Unit – II**

Dimensions of Business Environment: National Institution for Transforming India (NITI Aayog), Economic Environment.

Balance of Trade & Balance of Payment: Definition, Difference between Balance of Trade & Balance of Payment, Uses, Components

**Unit – III**

Problems of Growth: Unemployment, Inflation, Industrial Sickness Regional Imbalances

Industrial Policy: Meaning, Objectives, History, Industrial Policy for the Growth of Industries (latest)

**Unit- IV**

Economic Policies: Monetary Policy, Fiscal Policy, Liberalization, Privatisation & Globalisation

International Economic Institutions: International Monetary Fund, World Trade Organisation, World Bank.

***Important Note: The paper should be taught with special reference to Indian Economy.***

**Text Books**

1. Economic Environment of Business (Macro Eco. Analysis), 7/e by H. L. Ahuja, S. Chand Publishing
2. Misra and Puri; Indian Economy; Himalaya Publishing House, New Delhi

**Reference Books**

1. Aggarwal A.N., Indian Economy, Vikas Publishing House, New Delhi.
2. Hedge Lanl, Environmental Economics; McMillan Hampshire

**Business Mathematics**  
**19BC-203**

**Internal Assessment: 20 Marks**  
**Theory Paper: 80 Marks**

**Time: 3 Hours**

**Note:** -The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

- Notes:**
1. Use of simple calculator is allowed.
  2. Proofs of theorems/formulae are not required.
  3. Trigonometric functions are not to be covered.

**Unit-I**

**Matrices:** Definition of a matrix. Types of matrices. Algebra of matrices. Applications of matrices operations for solution to simple business and economic problems.

**Determinants and inverse of a matrix:** Calculation of values of determinants up to third order. Finding inverse of a matrix through determinant method. Solution of system of linear equation up to three variables.

**Unit-II**

**Compound Interest:** Certain different types of interest rate; Concept of present value and amount of a sum

**Annuities:** Types of annuities; Present value and amount of an annuity, including the case of continuous compounding

**Unit-III**

**Differentiation:** Concept of differentiation. Rules of differentiation – simple standard forms.

Applications of differentiation -elasticity of demand and supply. Maxima and Minima of functions (involving second or third order derivatives) relating to cost, revenue and profit.

**Unit-IV**

**Permutations and Combinations:** Definition, Formulas, Difference between Permutations and Combinations, Fundamental Principle of Counting, N and R in Permutations and Combinations (Simple Problems)

**Sequence and Series:** Definition, Types- Arithmetic Progression, Geometric Progression, Formulas, Difference between Sequence and Series (Simple Problems).

**Text Book**

Kapoor V.K. Business Mathematics: Sultan Chand and Sons, Delhi

**Reference Books**

1. *Allen B.G.D: Basic Mathematics; McMillan, New Delhi.*
2. *Vohra. N. D. Quantitative Techniques in Management, Tata McGraw Hill, New Delhi.*

**Prayojanmulak Hindi**  
(प्रयोजनमूलक हिंदी)  
19BC-204

आंतरिक मूल्यांकन: 20  
पूर्णांक: 80

**समय: 3 घंटे**

**नोट:** प्रश्न पत्र दो भागों में विभक्त होगा। पहला भाग अनिवार्य है, जिसमें एक प्रश्न के अंतर्गत 8 वस्तुनिष्ठ बहुविकल्पीय प्रश्न पूछे जाएंगे। वस्तुनिष्ठ प्रश्न समान रूप से चारों इकाइयों में से पूछे जाएंगे। दूसरे भाग के अंतर्गत चारों इकाइयों में से 2-2 प्रश्न पूछे जाएंगे, सभी प्रश्न अनिवार्य होंगे। प्रत्येक प्रश्न को दो उप-विभागों में विभाजित किया जा सकता है, जिसमें प्रत्येक प्रश्न के लिए कुल 16 अंक निर्धारित किए गए हैं।

**इकाई - 1**

पत्र लेखन, प्रारूपण, टिप्पण, प्रतिवेदन, पत्राचार: अर्थ एवं प्रकार, व्यावहारिक, व्यावसायिक एवं सरकारी पत्र लेखन, अनुवाद: परिभाषा, विशेषता एवं उपयोगिता

**इकाई - 2**

मुहावरे एवं लोकोक्तियां: अर्थ, परिभाषा एवं विभिन्न मुहावरे तथा लोकोक्तियां; शब्द शुद्धि, वाक्य शुद्धि और शब्द ज्ञान (तत्सम तद्भव, देशज तथा विदेशज)

**इकाई - 3**

पर्यायवाची एवं विलोम शब्द; अनेकार्थी, वाक्य या वाक्यांश के लिए एक शब्द अथवा अनेक शब्दों के लिए एक शब्द; देवनागरी लिपि: अर्थ, नामकरण, विशेषताएं, वैज्ञानिकता, मानकीकरण एवं सुधार के उपाय

**इकाई - 4**

कंप्यूटर में हिंदी प्रयोग: कंप्यूटर की संरचना, वर्तनी संशोधन; पारिभाषिक शब्दावली; कार्यालयी हिंदी और अनुवाद: विशेषताएं, अनुवाद प्रक्रिया, समस्याएं एवं कठिनाइयां

**निर्धारित पुस्तक:**

प्रयोजनमूलक हिंदी, प्रोफेसर श्रीराम शर्मा, कमल प्रकाशन, बिलासपुर, हिमाचल प्रदेश।

**Business Communication Skills**  
**19BC-205**

**Internal Assessment: 20 Marks**  
**Theory Paper: 80 Marks**

**Time: 3 Hours**

**Note:** -The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Unit-I**

Introduction: Basics of communication, Seven C's of effective communication, barriers to communication, ethical context of communication.

**Unit-II**

Business Communication at workplace: Letter writing- component, layout and process, E-mail communication, bad news messages, persuasive written communication, memos, notice, agenda and minutes of meeting.

**Unit-III**

Report Writing: Types of business reports, structure of reports, short reports, long reports, abstracts and summaries, proposals.

**Unit-IV**

Communication Skills: Reading skills, listening skills, note making, persuasive speaking. Body language, Gestures.

**Text Book**

*Murphy, Herta A., Herbert W. Hildebrandj and Jane P. Thomas, Effective Business Communication, Tata McGraw Hill, New Delhi.*

**Reference Books:**

1. *Konera Arun, Professional Communication, Tata McGraw Hill, New Delhi.*
2. *McGrath, E. H., Basic Managerial Skills for All, PHI, New Delhi.*
3. *Meenakshi Raman and Parkash Singh, Business Communication, Oxford University Press, New Delhi.*

# **B.Com.- Vocational**

## **Advertising and Sales Promotion**



**Marketing Management**  
**19BCVA-102**

**Internal Assessment: 20 Marks**

**Theory Paper: 80 Marks**

**Time: 3 Hours**

**Note:** - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Unit- I**

Introduction: - Nature, Scope, Importance of marketing; Marketing concepts- Traditional and Modern 7P's of Marketing; Market Segmentation: - Concept, Importance and basis of market segmentation; E-Marketing.

**Unit- II**

Consumer Behavior: Nature, Scope, Importance, Factors affecting buyer behavior; Product Planning and Development: Importance and scope of Product Planning in marketing; Stages of New product development; Product Lifecycle: Stages of Product life cycle, factors affecting product life cycle.

**Unit- III**

Branding and Trademark: Difference between brand and trademark; Advantages and criticism of branding; types of branding; Brand Policies and Strategies. Pricing: - Meaning; Importance, Factors affecting pricing, pricing objectives, Types of price policy and pricing strategies.

**Unit- IV**

Advertising: Concept; Importance and criticism of advertising; Media of advertising; Evaluating advertising effectiveness; Sales Promotion: Importance, Methods, Functions and Publicity.

***Suggested Reading/s:***

*1. Kotler Philip, Marketing Management, Prentice Hall of India, New Delhi.*

**Advertising and Sales Management**  
**19BCVA-202**

**Internal Assessment: 20 Marks**

**Theory Paper: 80 Marks**

**Time: 3 Hours**

**Note:** - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Unit- I**

Concept and Importance of Advertising, Advertising Objectives and Advertising Function; Types of Advertising Commercial and Non-Commercial Advertising; Advertising Media: Different types of Media

**Unit- II**

Media Planning, Impact of Advertising Agencies' relationship with Clients (AAAI, ASCI); Advertising Budget: Factors affecting to Advertising Expenditure.

**Unit- III**

Ethics and Code of Conduct in Advertising; Advertising Classified and Display Advertising, Comparative Advertising Regulatory Agencies in Advertising

**Unit- IV**

Advertising Message: Preparation of an Advertising Message, Elements: Print Copy, Broadcast Copy, Copy for Direct Mail.

***Suggested Reading/s:***

1. *Kotler Philip, Marketing Management, Prentice Hall of India, New Delhi.*
2. *Patel J.S.K., Salesmanship and Publicity, Sultan Chand & Sons, New Delhi.*
3. *Bansal Jay, Advertising Management, SBPD Publications.*
4. *Mehta Jogender, Advertising, Marketing and Sales Management, Book Enclave Publications.*
5. *Mathur S.C., Sales Management, New Age Publishers.*

# **B.Com.- Vocational Computer Applications**

**Operating Systems  
19BCVC-102**

**Internal Assessment: 20 Marks  
Theory Paper: 80 Marks**

**Time: 3 Hours**

**Note:** - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

**Unit- I**

Introduction to various categories of software: Application software and system software, operating system and its functions, interaction of operating system with user programs, components of operating system, memory management, file management, introduction to disk operating system (DOS), DOS commands-move copy, rename, delete files in DOS.

**Unit- II**

Device Management, control of various devices, device drivers. BIOS, DOS internal & external commands, restore and backup commands, DOS interrupts. Multi-user, multi-tasking, multi-processing and real time OS, brief introduction to memory management techniques.

**Unit- III**

File System, File Management, Process Management and Scheduling. Multi-processing OS, Introduction to UNIX Operating System.

**Unit- IV**

Introduction to Data processing, records and file data collection, presentation, verification, editing and checking.

Business files, introduction to data structure, elements fields and records, classification of files, master file and transaction file.

***Suggested Reading/s:***

1. Silberschatz and Galvin, "Operating System Concepts", Persons India.
2. Madnick E., Donovan J., "Operating Systems:",Tata McGraw Hill.
3. Tannenbaum, "Operating Systems", PHI Publications.

**Data Base Management Systems  
19BCVC-202**

**Internal Assessment: 10 Marks  
Theory Paper: 40 Marks  
Practical Examination: 50 Marks**

**Time: 3Hrs.**

**Note:** - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 4 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 08 marks each.

**Unit- I**

Introduction to database, concept and components of database, attributes of DBMS, different model of databases, three tier schema of database, advantages and disadvantages of database, Comparison with traditional file system.

**Unit- II**

Database design and ER Model: overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, Relational Schemas, Introduction to UML Relational database model: Logical view of data, keys, integrity rules. Relational Database design: features of good relational database design, atomic domain and Normalization

**Unit- III**

Different application of DBMS, Structured Query Language (SQL), DDL and DML, Database Security and Privacy.

**Unit- IV**

Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, database recovery management.

**Practical:**

***Practical work on the basis of MS-ACCESS and SQL.***

***Suggested Reading/s:***

1. Abraham Silberschatz, Henry Korth, S.Sudarshan, "Database Systems Concepts", McGraw Hill.
2. A.K.Majumdar, P. Bhattacharya, "Database Management Systems", TMH.
3. Bipin Desai, "An Introduction to database systems", Galgotia Publications.

# Chaudhary Bansi Lal University, Bhiwani

(A State University established under Haryana Act No. 25 of 2014)



**EXAMINATION SCHEME**

&

Syllabus

for

**Bachelor of Commerce**

**(Pass Course)**

**(Semester- I to VI)**

**(w.e.f. 2019-22)**



# Chaudhary Bansi Lal University, Bhiwani

(A State University established under Haryana Act No. 25 of 2014)

## Study & Evaluation Scheme w.e.f. 2019-2022 of Bachelor of Commerce (Pass Course)

<b>-Programme</b>	:	B.Com. (Pass Course)
<b>Duration</b>	:	Three year full time (Six Semesters)
<b>Medium</b>	:	English/Hindi
<b>Minimum Required Attendance</b>	:	75%
<b>Total Marks</b>	:	3500 (Excluding Non-CGPA Paper/s and Open Elective Paper/s)
<b>Total Credits</b>	:	130 (Excluding Non-CGPA Paper/s)

<b>Assessment/Evaluation</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>
	20	80	100

<b>Internal Evaluation (Theory Papers)</b>	<b>Minor</b>	<b>Attendance</b>	<b>Assignment</b>	<b>Total</b>
	10	5	5	20

<b>Duration of Examination</b>	<b>External</b>	<b>Internal (Minor Test)</b>
	3 Hrs.	1 Hr.

*To qualify the course, a student is required to secure a minimum of 40% marks in aggregate including the end semester examination and internal evaluation i.e. both internal and external. A candidate who secures less than 40% of marks in a course shall be deemed to have failed in that course. The student should have to secure at least 40% marks in aggregate to clear the semester.*

## **Question Paper Structure**

1. *The question paper shall consist of 9 questions. Out of which, first question shall be of short answer type and will be compulsory. Question no. 1 shall contain 8 parts representing all units of the syllabus and students shall have to answer all parts.*
2. *The remaining 8 questions shall have internal choice. The weightage for each question shall be of 16 marks.*

## **Important Note/s**

1. *The paper of Business Mathematics, English, Prayojanmulak Hindi, Environmental Studies should be taught by the teachers of the specific subjects and not by the Commerce teachers.*
2. *All the papers related to Computers except the E-Commerce paper should be taught by the teachers of Computer discipline. However, the E-Commerce paper should be taught by the Commerce teachers only.*
3. *The batch size for the practical/ tutorial should be of 20 students each unless the enrolment is lower than this.*



## B.Com. (Pass Course)

### Scheme of Examination & Syllabi w.e.f. Academic Year 2019-20

#### B.Com.- I (1<sup>st</sup> Semester)

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-101	Financial Accounting-I	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-102	Business Management	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-103	Business Economics	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-104	English	A.E.C.C.	2	-	2	2	-	2	80	20	-	100
19BC-105	Fundamentals of Computer	S.E.C.	2	4	6	2	2	4	40	10	50*	100
Hobby Club		G.E. Non-CGPA	At least one hour will be conducted per week or 16 hours per semester.						As per University Policy framed for Hobby Club			
<b>Total</b>			<b>15</b>	<b>7</b>	<b>22</b>	<b>15</b>	<b>3</b>	<b>18</b>	<b>360</b>	<b>90</b>	<b>50</b>	<b>500 (Excluding Marks Awarded for Hobby Club)</b>

*\*End Term Evaluation by the external examiner appointed by university.*

**B.Com.- I (2<sup>nd</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total	
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical		
19BC-201	Financial Accounting-II	C.C.	3	2	5	3	1	4	80	20	-	100	
19BC-202	Indian Economy and Business Environment	C.C.	4	-	4	4	-	4	80	20	-	100	
19BC-203	Business Mathematics	G.E.	3	2	5	3	1	4	80	20	-	100	
19BC-204	Prayojanmulak Hindi	A.E.C.C.	2	-	2	2	-	2	80	20	-	100	
19BC-205	Business Communication Skills	A.E.C.C.	2	-	2	2	-	2	80	20	-	100	
Hobby Club		G.E. Non-CGPA	At least one hour will be conducted per week or 16 hours per semester.						As per University Policy framed for Hobby Club				
<b>Total</b>			<b>14</b>	<b>5</b>	<b>19</b>	<b>14</b>	<b>2</b>	<b>16</b>	<b>400</b>	<b>100</b>	<b>-</b>	<b>500 (Excluding Marks awarded for Hobby Club)</b>	

**B.Com.- II (3<sup>rd</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-301	Corporate Accounting-I	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-302	Business Regulatory Framework	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-303	Human Resource Management	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-304	Environmental Science	A.E.C.C.	2	-	2	2	-	2	80	20	-	100
19BC-305	E-Commerce	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-306	Computerised Accounting System	S.E.C.	-	4	4	-	2	2	-	50	50*	100
Hobby Club		G.E. Non-CGPA	At least one hour will be conducted per week or 16 hours per semester.						As per University Policy framed for Hobby Club			
<b>Total</b>			<b>17</b>	<b>7</b>	<b>24</b>	<b>17</b>	<b>3</b>	<b>20</b>	<b>400</b>	<b>150</b>	<b>50</b>	<b>600 (Excluding Marks awarded for Hobby Club)</b>

*\*End Term Evaluation by the external examiner appointed by university.*

**B.Com.- II (4<sup>th</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-401	Corporate Accounting-II	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-402	Corporate Law	C.C	4	-	4	4	-	4	80	20	-	100
19BC-403	Marketing Management	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-404	Business Statistics	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-405	Banking And Banking Law	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-406	Business Ethics	C.C.	2	-	2	2	-	2	80	20	-	100
19BC-407	Statistical Analysis through Software	S.E.C.	-	4	4	-	2	2	-	50	50*	100
Hobby Club		G.E. Non-CGPA	At least one hour will be conducted per week or 16 hours per semester.						As per University Policy framed for Hobby Club			
<b>Total</b>			<b>20</b>	<b>9</b>	<b>29</b>	<b>20</b>	<b>4</b>	<b>24</b>	<b>480</b>	<b>170</b>	<b>50</b>	<b>700 (Excluding Marks awarded for Hobby Club)</b>

*\*End Term Evaluation by the external examiner appointed by university.*

**B.Com.- III (5<sup>th</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-501	Income Tax Law	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-502	Cost Accounting-I	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-503	Management Accounting	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-504	Auditing	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-505 (A)*	Advertising and Sales Management	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BC-505 (B)*	Cyber Security	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BC-506 (A)**	Production Management	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BC-506 (B)**	Retail Management	D.S.E.	4	-	4	4	-	4	80	20	-	100
Open Elective Paper ***		G.E.	2	-	2	2	-	2	As per University Policy framed for Open Elective Papers			
<b>Total</b>			<b>23</b>	<b>6</b>	<b>29</b>	<b>23</b>	<b>3</b>	<b>26</b>	<b>480</b>	<b>120</b>	<b>-</b>	<b>600 (Excluding Marks awarded for Open Elective Papers)</b>

\* Students will have to choose one out of 19BC-505 (A): Advertising and Sales Management & 19BC-505 (B): Cyber Security.

\*\* Students will have to choose one out of 19BC-506 (A): Production Management & 19BC-506 (B): Retail Management.

\*\*\* To be chosen from the list of open elective papers provided by the University.

**B.Com.- III (6<sup>th</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-601	Tax Procedure and Practices	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-602	Cost Accounting-II	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-603	Financial Management	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-604	GST	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-605 (A)*	Investment Management	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BC-605 (B)*	Financial Market Operations	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BC-606 (A)**	Entrepreneurship and Small Scale Business	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BC-606 (B)**	Entrepreneurship and Family Business	D.S.E.	4	-	4	4	-	4	80	20	-	100
Open Elective Paper ***		G.E.	2	-	2	2	-	2	As per University Policy framed for Open Elective Papers			
<b>Total</b>			<b>22</b>	<b>8</b>	<b>30</b>	<b>22</b>	<b>4</b>	<b>26</b>	<b>480</b>	<b>120</b>	<b>-</b>	<b>600 (Excluding Marks awarded for Open Elective Papers)</b>

\* Students will have to choose one out of 19BC-605 (A): Investment Management & 19BC-605 (B): Financial Market Operations.

\*\* Students will have to choose one out of 19BC-606 (A): Entrepreneurship and Small Scale Business & 19BC-606 (B): Entrepreneurship and Family Business.

\*\*\* To be chosen from the list of open elective papers provided by the University but it should not be same as was chosen in semester fifth.

Abbreviation Used:

C.C.	Core Course
D.S.E.	Discipline Specific Elective
G.E.	Generic Elective
A.E.C.C.	Ability-Enhancement Compulsory Course
S.E.C.	Skill-Enhancement Elective Course

## POLICY ON HOBBY CLUB

### 1. List of Clubs (Both for UG and PG Programmes):

1. IT Innovators Club (IT Club)
2. Performing Arts (Dance, Drama, Singing)
3. Sports and Fitness Club (Including the Indoor and Outdoor games, Yoga and Meditation)
4. Outreach (Extension and Rural Activities Club like social awareness programmes and sensitization)
5. Literary (Debate, Declamation, and Writing skills)
6. Fine Arts (Painting, Drawing, Sculpture, and Graphics)
7. Photography and Videography
8. Gardening & Landscaping
9. Entrepreneurship
10. Media Club
11. Culinary Skills (Cooking)

### 2. Criteria for Evaluation (Both for UG and PG programme):

The criteria for the evaluation of the same may be framed as:

#### (a) Attendance (50%)

Less than 60%:	No Marks
60%-75%:	30 Marks
76%-90%:	40 Marks
91%-100%:	50 Marks

#### (b) Participation in the Events organised by the club (15%)

- (c) Organising the In-House Club Events (15%)
- (d) Participation/ organizing a National or State level event (10%)
- (e) Positions in the National / State Level event (10%)

### **3. Mode of Conduct:**

List of clubs and their faculty coordinators will be floated at the beginning of each session and every student will mandatory choose one club as per his / her choice. This hobby club will be evaluated for 1 credits each in each semester for the first four semesters (Semester 1-4) in both UG as well as in PG Courses) as per the evaluation policy. However, these credits will not be added to the SGPA / CGPA. They will be counted together and the final letter grade will be reflected in the final DMC of the students with the name as **“Hobby club”**.

These hobby clubs will primarily run in the workshop mode, where one teacher will be assigned as coordinator to look after the over-all responsibility of the clubs. It is suggested that one workshop / meeting of at least 1 hr will be conducted per week or 16 hours per semester (if in the long workshop mode). At least one event will be organised by the club during each semester. Students will be encouraged to organise and participate in the events. They will also be encouraged to participate in the national and state level programmes.

### **4. Review:**

The structure and implementation of the clubs will be reviewed after every three years.

## **Details on the Club/s**

### **1. IT Innovators (Information and Technology)**

This group will focus on encouraging students with interest in Information and Technology to come up with new ideas. It will be a platform for young budding talent to share their thoughts. It will also focus on increasing awareness about latest trends in technology by way of seminars, competitions etc. Students will also get an exposure for showcasing any new inventions they make. The group will expose the students to professionals of the industry and help them get correct guidance from industry experts

### **2. Performing Arts (Theatre, Drama, Music- Vocal and Instrumental)**

This group will focus on activities related to various arts like singing, dancing, drawing, theatre etc. The group will organize cultural programmes on different occasions as feasible. They will take charge of all the cultural activities that take place in the university. The students will get an opportunity to showcase their creativity. They will be guided regularly by expert artists by way of seminars, movies, activities etc. It will help in overall development of the students and harness their creative energies.

### **3. Sports and fitness (Yoga, Meditation, Indoor Games and Outdoor Games)**



In today's world people are living very stressful lives. They are losing their health for earning money. People are not able to perform to their most optimum capacity because of health; stress etc. This group will try to bring the very much needed work life balance. This group will focus on mental and physical fitness. They will start yoga, meditation, aerobics etc. They will also encourage increased participation in university sports teams. The group will organize regular camps of yoga, meditation, to increase the concentration and stamina of students.

#### **4. Outreach (Activities having social Impact)**

Youth is the future of society and has the power to change it. This group will strive for making a social impact, bringing about the positive changes in the society we live in. The students will regularly engage in activities that will create a better society. This group will organize events for improving our society. It will provide hands on experience, of dealing with people, to the participants and raise a socially sensitive youth.

#### **5. Literary (Debates, Declamations and Writing skills)**

The Literary club will endeavor to promote languages and literature. From time to time, the club will organize a rich and diverse array of literary activities such as debates, declamations, group discussions, poetry writing and recitation, short story writing, interactive/lecture sessions, etc. Through these activities, literary coordinators (student and teacher) reach out to language and literature lovers and try to create a space for sharing emotions and thoughts.

#### **6. Fine Arts (Painting, Drawing, sculpture and Graphics)**

The fine art club aims to encourage students to express their thoughts, feelings and creativity through the various multidimensional art forms like sketching, painting, Sculpturing etc. It attempts to tap the inherent talents and potentials of the student community at all levels of life. It provides an opportunity to the students to let their imagination run wild and provides them with the sight to see things in a different way. Students learn from one another and share their prowess in different aspects of art.

#### **7. Photography and Videography**

This club aims at providing a supportive environment for students interested in photography and videography to share their creativity, knowledge and Hobby. The club will hold regular meetings and discussions and organize events such as; photo-walks, field trips, museum and gallery visits, and lectures and workshops by visiting artists. Members will also explore the possible opportunities for photography projects in collaboration with other campus departments, organize peer to peer portfolio reviews and explore the possibilities of exhibitions on and off campus.

#### **8. Gardening and Landscaping**

This is a group for people with shared interests in gardens, gardening, plants and nature around us. In the current scenario it has become imperative that we take care of the environment we live in. this club is for people who are sensitive towards the natural environment we live in and find joy in getting close with the nature. This group will organize activities like tree plantation, lectures for enhancing knowledge about different plants, participating in social events pertaining to creating awareness about plants.

## **9. Entrepreneurship**

Entrepreneurs are the present and future of our country. We need people who can generate employment for themselves and others as well. The Entrepreneurship Club aims to provide a conduit by which students can access entrepreneurial resources, network with community entrepreneurs, and share ideas. The club is dedicated to furthering understanding about new and small businesses.

## **10. Media**

The Media Club is an exclusive platform for the college students which gives students hands on experience of the real world, behind the scenes with many diverse types of activities planned and designed to understand the importance of journalism and media. The club brings together like minded people who have a keen interest in the media industry. The club will regularly organize workshops, information sessions and field trips to gain better and deeper understanding of the field.

## **11. Culinary skills (Cooking)**

Learning how to cook healthy and enjoyable meals is an important and valuable skill. Food brings people together and this club would do so in a way that integrates learning as well. The goals of this club are not only to cook these meals as a community but also to teach culinary skills, bring awareness, and dedicate our time to food justice and sustainability; advocating for the right to healthy, nutritious, fresh food.

# Chaudhary Bansi Lal University, Bhiwani

(A State University established under Haryana Act No. 25 of 2014)



**EXAMINATION SCHEME**

&

Syllabus

for

**Bachelor of Commerce- Vocational**

(Computer Applications)

(Semester- I to VI)

(w.e.f. 2019-22)



# Chaudhary Bansi Lal University, Bhiwani

(A State University established under Haryana Act No. 25 of 2014)

## Study & Evaluation Scheme w.e.f. 2019-2022 of Bachelor of Commerce- Vocational

<b>Programme</b>	:	B.Com.- Vocational (Computer Applications)
<b>Duration</b>	:	Three year full time (Six Semesters)
<b>Medium</b>	:	English/Hindi
<b>Minimum Required Attendance</b>	:	75%
<b>Total Marks</b>	:	3500 (Excluding Non-CGPA Paper/s and Open Elective Paper/s)
<b>Total Credits</b>	:	130 (Excluding Non-CGPA Paper/s)

### Assessment/Evaluation

Internal	External	Total
20	80	100

### Internal Evaluation (Theory Papers)

Minor	Attendance	Assignment	Total
10	5	5	20

### Duration of Examination

External	Internal (Minor Test)
3 Hrs.	1 Hr.

*To qualify the course, a student is required to secure a minimum of 40% marks in aggregate including the end semester examination and internal evaluation i.e. both internal and external. A candidate who secures less than 40% of marks in a course shall be deemed to have failed in that course. The student should have to secure at least 40% marks in aggregate to clear the semester.*

## **Question Paper Structure**

- 1. The question paper shall consist of 9 questions. Out of which, first question shall be of short answer type and will be compulsory. Question no. 1 shall contain 8 parts representing all units of the syllabus and students shall have to answer all parts.*
- 2. The remaining 8 questions shall have internal choice. The weightage for each question shall be of 16 marks.*

## **Important Note/s**

- 1. The paper of Business Mathematics, English, Prayojanmulak Hindi, Environmental Studies should be taught by the teachers of the specific subjects and not by the Commerce teachers.*
- 2. All the papers related to Computers except the E-Commerce paper should be taught by the teachers of Computer discipline. However, the E-Commerce paper should be taught by the Commerce teachers only.*
- 3. The batch size for the practical/ tutorial should be of 20 students each unless the enrolment is lower than this.*

**B.Com.- Vocational (Computer Applications)**  
**Scheme of Examination & Syllabi w.e.f. Academic Year 2019-20**

**B.Com.- I (1<sup>st</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-101	Financial Accounting-I	C.C.	3	2	5	3	1	4	80	20	-	100
19BCVC-102	Operating Systems	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-103	Business Economics	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-104	English	A.E.C.C.	2	-	2	2	-	2	80	20	-	100
19BC-105	Fundamentals of Computer	S.E.C.	2	4	6	2	2	4	40	10	50*	100
Hobby Club		G.E. Non-CGPA	At least one hour will be conducted per week or 16 hours per semester.						As per University Policy framed for Hobby Club			
<b>Total</b>			<b>15</b>	<b>7</b>	<b>22</b>	<b>15</b>	<b>3</b>	<b>18</b>	<b>360</b>	<b>90</b>	<b>50</b>	<b>500 (Excluding Marks Awarded for Hobby Club)</b>

*\*End Term Evaluation by the external examiner appointed by University.*

**B.Com.- I (2<sup>nd</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-201	Financial Accounting-II	C.C.	3	2	5	3	1	4	80	20	-	100
19BCVC-202	Data Base Management Systems	C.C.	2	4	6	2	2	4	40	10	50*	100
19BC-203	Business Mathematics	G.E.	3	2	5	3	1	4	80	20	-	100
19BC-204	Prayojanmulak Hindi	A.E.C.C.	2	-	2	2	-	2	80	20	-	100
19BC-205	Business Communication Skills	A.E.C.C.	2	-	2	2	-	2	80	20	-	100
Hobby Club		G.E. Non-CGPA	<i>At least one hour will be conducted per week or 16 hours per semester.</i>						As per University Policy framed for Hobby Club			
<b>Total</b>			<b>12</b>	<b>9</b>	<b>21</b>	<b>12</b>	<b>4</b>	<b>16</b>	<b>360</b>	<b>90</b>	<b>50</b>	<b>500 (Excluding Marks awarded for Hobby Club)</b>

\* End Term Evaluation by the external examiner appointed by University.

**B.Com.- II (3<sup>rd</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-301	Corporate Accounting-I	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-302	Business Regulatory Framework	C.C.	4	-	4	4	-	4	80	20	-	100
19BCVC-303	Networking and Internet	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-304	Environmental Science	A.E.C.C.	2	-	2	2	-	2	80	20	-	100
19BC-305	E-Commerce	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-306	Computerised Accounting System	S.E.C.	-	4	4	-	2	2	-	50	50*	100
Hobby Club		G.E. Non-CGPA	<i>At least one hour will be conducted per week or 16 hours per semester.</i>						As per University Policy framed for Hobby Club			
<b>Total</b>			<b>17</b>	<b>7</b>	<b>24</b>	<b>17</b>	<b>3</b>	<b>20</b>	<b>400</b>	<b>150</b>	<b>50</b>	<b>600 (Excluding Marks awarded for Hobby Club)</b>

*\*End Term Evaluation by the external examiner appointed by university.*



**B.Com.- II (4<sup>th</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-401	Corporate Accounting-II	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-402	Corporate Law	C.C	4	-	4	4	-	4	80	20	-	100
19BCVC-403	Structured Programming using C	C.C.	2	4	6	2	2	4	40	10	50*	100
19BC-404	Business Statistics	C.C.	3	2	5	3	1	4	80	20	-	100
19BCVC-405	System Analysis and Design	C.C.	4	-	4	4	-	4	80	20	-	100
19BC-406	Business Ethics	C.C.	2	-	2	2	-	2	80	20	-	100
19BC-407	Statistical Analysis through Software	S.E.C.	-	4	4	-	2	2	-	50	50*	100
Hobby Club		G.E. Non-CGPA	<i>At least one hour will be conducted per week or 16 hours per semester.</i>						As per University Policy framed for Hobby Club			
<b>Total</b>			<b>18</b>	<b>13</b>	<b>31</b>	<b>18</b>	<b>6</b>	<b>24</b>	<b>440</b>	<b>160</b>	<b>100</b>	<b>700 (Excluding Marks awarded for Hobby Club)</b>

*\*End Term Evaluation by the external examiner appointed by University.*

**B.Com.- III (5<sup>th</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-501	Income Tax Law	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-502	Cost Accounting-I	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-503	Management Accounting	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-504	Auditing	C.C.	4	-	4	4	-	4	80	20	-	100
19BCVC-505 (A)*	Object Oriented Programming Using C++	D.S.E.	2	4	6	2	2	4	40	10	50*	100
19BCV-505 (B)*	Digital Marketing	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BCVC-506 (A)**	Business Information Systems	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BCVC-506 (B)**	Multimedia and Computer Graphics	D.S.E.	4	-	4	4	-	4	80	20	-	100
Open Elective Paper****		G.E.	2	-	2	2	-	2	As per University Policy framed for Open Elective Papers			
<b>Total</b>			<b>21/23</b>	<b>10/6</b>	<b>31/29</b>	<b>21/23</b>	<b>5/3</b>	<b>26</b>	<b>440/480</b>	<b>110/120</b>	<b>50/00</b>	<b>600 (Excluding Marks awarded for Open Elective Paper)</b>

\* End Term Evaluation by the external examiner appointed by university.

\*\* Students will have to choose one out of 19BCVC-505 (A): Object Oriented Programming Using C++ & 19BCV-505 (B): Digital Marketing.

\*\*\* Students will have to choose one out of 19BCVC-506 (A): Business Information Systems & 19BCVC-506 (B): Multimedia and Computer Graphics.

\*\*\*\* To be chosen from the list of open elective papers provided by the University.

**B.Com.- III (6<sup>th</sup> Semester)**

Course No.	Course Title	Course Type	Contact Hours per week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical/ Tutorial	Total	Theory	Internal Assessment	Practical	
19BC-601	Tax Procedure and Practices	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-602	Cost Accounting-II	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-603	Financial Management	C.C.	3	2	5	3	1	4	80	20	-	100
19BC-604	GST	C.C.	3	2	5	3	1	4	80	20	-	100
19BCVC-605 (A)*	Introduction to Business Analytics	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BCVC-605 (B)*	Emerging Technologies	D.S.E.	4	-	4	4	-	4	80	20	-	100
19BCVC-606	Project Work Dissertation	C.C.	4	-	4	4	-	4	-	50	50**	100
Open Elective Paper***		G.E.	2	-	2	2	-	2	As per University Policy framed for Open Elective Papers			
<b>Total</b>			<b>22</b>	<b>8</b>	<b>30</b>	<b>22</b>	<b>4</b>	<b>26</b>	<b>400</b>	<b>150</b>	<b>50</b>	<b>600 (Excluding Marks awarded for Open Elective Paper)</b>

\* Students will have to choose one out of 19BCVC-605 (A): Introduction to Business Analytics & 19BCVC-605 (B): Emerging Technologies.

\*\* End Term Evaluation by the external examiner appointed by university.

\*\*\* To be chosen from the list of open elective papers provided by the University but it should not be same as was chosen in semester fifth.

Abbreviation Used:

C.C.	Core Course
D.S.E.	Discipline Specific Elective
G.E.	Generic Elective
A.E.C.C.	Ability-Enhancement Compulsory Course
S.E.C.	Skill-Enhancement Elective Course

## POLICY ON HOBBY CLUB

### 1. List of Clubs (Both for UG and PG Programmes):

1. IT Innovators Club (IT Club)
2. Performing Arts (Dance, Drama, Singing)
3. Sports and Fitness Club (Including the Indoor and Outdoor games, Yoga and Meditation)
4. Outreach (Extension and Rural Activities Club like social awareness programmes and sensitization)
5. Literary (Debate, Declamation, and Writing skills)
6. Fine Arts (Painting, Drawing, Sculpture, and Graphics)
7. Photography and Videography
8. Gardening & Landscaping
9. Entrepreneurship
10. Media Club
11. Culinary Skills (Cooking)

### 2. Criteria for Evaluation (Both for UG and PG programme):

The criteria for the evaluation of the same may be framed as:

#### (a) Attendance (50%)

Less than 60%:	No Marks
60%-75%:	30 Marks
76%-90%:	40 Marks
91%-100%:	50 Marks

#### (b) Participation in the Events organised by the club (15%)

#### (c) Organising the In-House Club Events (15%)

- (d) Participation/ organizing a National or State level event (10%)
- (e) Positions in the National / State Level event (10%)

### **3. Mode of Conduct:**

List of clubs and their faculty coordinators will be floated at the beginning of each session and every student will mandatory choose one club as per his / her choice. This hobby club will be evaluated for 1 credits each in each semester for the first four semesters (Semester 1-4) in both UG as well as in PG Courses) as per the evaluation policy. However, these credits will not be added to the SGPA / CGPA. They will be counted together and the final letter grade will be reflected in the final DMC of the students with the name as **“Hobby club”**.

These hobby clubs will primarily run in the workshop mode, where one teacher will be assigned as coordinator to look after the over-all responsibility of the clubs. It is suggested that one workshop / meeting of at least 1 hr will be conducted per week or 16 hours per semester (if in the long workshop mode). At least one event will be organised by the club during each semester. Students will be encouraged to organise and participate in the events. They will also be encouraged to participate in the national and state level programmes.

### **4. Review:**

The structure and implementation of the clubs will be reviewed after every three years.

## **Details on the Club/s**

### **1. IT Innovators (Information and Technology)**

This group will focus on encouraging students with interest in Information and Technology to come up with new ideas. It will be a platform for young budding talent to share their thoughts. It will also focus on increasing awareness about latest trends in technology by way of seminars, competitions etc. Students will also get an exposure for showcasing any new inventions they make. The group will expose the students to professionals of the industry and help them get correct guidance from industry experts

### **2. Performing Arts (Theatre, Drama, Music- Vocal and Instrumental)**

This group will focus on activities related to various arts like singing, dancing, drawing, theatre etc. The group will organize cultural programmes on different occasions as feasible. They will take charge of all the cultural activities that take place in the university. The students will get an opportunity to showcase their creativity. They will be guided regularly by expert artists by way of seminars, movies, activities etc. It will help in overall development of the students and harness their creative energies.

### **3. Sports and fitness (Yoga, Meditation, Indoor Games and Outdoor Games)**

In today's world people our living very stressful life. They are losing on their health for earning money. People are not able to perform to their most optimum capacity because of health; stress etc. This group will try to bring the vh much needed work life balance. This group will focus on mental and physical fitness. They will start yoga, meditation, aerobics etc. They will also encourage increased

participation in university sports teams. The group will organize regular camps of yoga, meditation, to increase the concentration and stamina of students.

#### **4. Outreach (Activities having social Impact)**

Youth is the future of society and has the power to change it. This group will strive for making a social impact, bringing about the positive changes in the society we live in. The students will regularly engage in activities that will create a better a society. This group will organize events for improving our society. It will provide hands on experience, of dealing with people, to the participants and raise a socially sensitive youth.

#### **5. Literary (Debates, Declamations and Writing skills)**

The Literary club will endeavor to promote languages and literature. From time to time, the club will organize a rich and diverse array of literary activities such as debates, declamations, group discussions, poetry writing and recitation, short story writing, interactive/lecture sessions, etc. Through these activities, literary coordinators (student and teacher) reach out to language and literature lovers and try to create a space for sharing emotions and thoughts.

#### **6. Fine Arts (Painting, Drawing, sculpture and Graphics)**

The fine art club aims to encourage students to express their thoughts, feelings and creativity through the various multidimensional art forms like sketching, painting, Sculpturing etc. It attempts to tap the inherent talents and potentials of the student community at all levels of life. It provides an opportunity to the students to let their imagination run wild and provides them with the sight to see things in a different way. Students learn from one another and share their prowess in different aspects of art.

#### **7. Photography and Videography**

This club aims at providing a supportive environment for students interested in photography and videography to share their creativity, knowledge and Hobby. The club will hold regular meetings and discussions and organize events such as; photo-walks, field trips, museum and gallery visits, and lectures and workshops by visiting artists. Members will also explore the possible opportunities for photography projects in collaboration with other campus departments, organize peer to peer portfolio reviews and explore the possibilities of exhibitions on and off campus.

#### **8. Gardening and Landscaping**

This is a group for people with shared interests in gardens, gardening, plants and nature around us. In the current scenario it has become imperative that we take care of the environment we live in. this club is for people who are sensitive towards the natural environment we live in and find joy in getting close with the nature. This group will organize activities like tree plantation, lectures for enhancing knowledge about different plants, participating in social events pertaining to creating awareness about plants.

#### **9. Entrepreneurship**

Entrepreneurs are the present and future of our country. We need people who can generate employment for themselves and others as well. The Entrepreneurship Club aims to provide a conduit by which students can access entrepreneurial resources, network with community entrepreneurs, and share ideas. The club is dedicated to furthering understanding about new and small businesses.

## **10. Media**

The Media Club is an exclusive platform for the college students which gives students hands on experience of the real world, behind the scenes with many diverse types of activities planned and designed to understand the importance of journalism and media. The club brings together like minded people who have a keen interest in the media industry. The club will regularly organize workshops, information sessions and field trips to gain better and deeper understanding of the field.

## **11. Culinary skills (Cooking)**

Learning how to cook healthy and enjoyable meals is an important and valuable skill. Food brings people together and this club would do so in a way that integrates learning as well. The goals of this club are not only to cook these meals as a community but also to teach culinary skills, bring awareness, and dedicate our time to food justice and sustainability; advocating for the right to healthy, nutritious, fresh food.

**SCHEME OF EXAMINATION**  
**Semester-I**

**Paper I- 20UPHY 101:Mechanics I**

Max. Marks: 40  
Internal Assessment: 10  
Time: 3Hrs.

**NOTE:**

1. The syllabus is divided into 4 units. Nine questions will be set up. Question no. 1 is compulsory. Question no. 1 will consist of 8 short questions covering the entire syllabus. At least two questions will be set from each unit and the student will have to attempt one question from each unit. A student has to attempt five questions in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**UNIT I**

Dynamics of a single particle, Dynamics of a system of particles. Centre of Mass. Conservation of Linear momentum, Conservation of energy.

**UNIT II**

Angular displacement, Angular velocity, Angular acceleration and angular momentum. Torque. Conservation of Angular momentum, Motion of Rocket. Frame of reference, Non-inertial frame of reference: Pseudo-forces

**UNIT III**

Rotation of Rigid body, moment of inertia, torque, angular momentum, kinetic energy of rotation. Theorems of perpendicular and parallel axes with proof. Moment of inertia of solid sphere, hollow sphere, spherical shell, solid cylinder, hollow cylinder and solid bar of rectangular cross-section. Acceleration of a body rolling down on an inclined plane.

**UNIT IV**

Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped and forced harmonic oscillations.

**Reference Books:**

- Classical Physics by V.K. Jain (Ane 2009)
- Physics – Resnick, Halliday & Walker 9/e, 2010, Wiley
- Engineering Mechanics, Basudeb Bhattacharya, 2<sup>nd</sup> edn., 2015, Oxford University Press
- University Physics. FW Sears, MW Zemansky & HD Young 13/e, 1986. Addison- Wesley
- Mechanics Berkeley Physics course, V.1: Charles Kittel, et.al. 2007, Tata McGraw- Hill
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole





**SCHEME OF EXAMINATION**  
**Semester-I**

**Paper II- 20UPHY 102:Electrostatics and Magnetism**

Max. Marks: 40  
Internal Assessment: 10  
Time: 3Hrs.

**NOTE:**

1. The syllabus is divided into 4 units. Nine questions will be set up. Question no. 1 is compulsory. Question no. 1 will consist of 8 short questions covering the entire syllabus. At least two questions will be set from each unit and the student will have to attempt one question from each unit. A student has to attempt five questions in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**UNIT I**

Review of vector algebra (Scalar and Vector product), gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only).

**UNIT II**

Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential.

**UNIT III**

Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric.

**UNIT IV**

Magnetostatics: Biot-Savart's law & its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para- and ferro-magnetic materials.

**Reference Books:**

- D.J. Griffiths, Introduction to Electrodynamics, 3rd Edn, 1998, Benjamin Cummings.
- Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education.
- Electricity and Magnetism, J.H. Fewkes & J. Yarwood. Vol. I, 1991, Oxford Univ. Press.
- Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

**SCHEME OF EXAMINATION**  
**Semester-II**

**Paper I-20UPHY 201:Mechanics II**

Max. Marks: 40  
Internal Assessment:10  
Time: 3Hrs.

**NOTE:**

1. The syllabus is divided into 4 units. Nine questions will be set up. Question no. 1 is compulsory. Question no. 1 will consist of 8 short questions covering the entire syllabus. At least two questions will be set from each unit and the student will have to attempt one question from each unit. A student has to attempt five questions in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**UNIT I**

Degree of freedom, constraints and its classifications Generalised coordinates, principle of virtual work, D'Alembert principle, Lagrange's equations of D'Alembert principle, Simple & compound Pendulum, Atwood Machine, Hamilton's principle and derivation of Lagrange's from Hamilton's equation.

**UNIT II**

Reference systems, inertial frames, Galilean invariance and conservation laws, Newtonian relativity principle, Michelson-Morley experiment and its outcome, Special Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity, Lorentz transformation, length contraction and time dilation.

**UNIT III**

Relativistic velocity addition theorem, variation of mass with velocity and mass energy equivalence, massless particles, Relativistic Doppler effect, relativistic kinematics, transformation of energy and momentum

**UNIT IV**

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion - Torsional pendulum-Determination of Rigidity modulus and moment of inertia -  $q$ ,  $\eta$  and  $\sigma$  by Searles method.

**Reference Books:**

- Classical Physics by V.K. Jain (Ane 2009)
- Classical mechanics by H.Goldstein, 2<sup>nd</sup> edition, Pearson
- Classical Mechanics by J.C, Upadhyaya, 2<sup>nd</sup> edition, HPH
- Physics – Resnick, Halliday & Walker 9/e, 2010, Wiley
- Engineering Mechanics, Basudeb Bhattacharya, 2<sup>nd</sup>edn., 2015, Oxford University Press
- University Physics. FW Sears, MW Zemansky & HD Young 13/e, 1986. Addison- Wesley
- Mechanics Berkeley Physics course, V.1: Charles Kittel, et.al. 2007, Tata McGraw- Hill
- University Physics, Ronald Lane Reese, 2003, ThomsonBrooks/Cole



**SCHEME OF EXAMINATION**  
**Semester-II**

**Paper II- 20UPHY 202: Waves and Electrodynamics**

Max. Marks: 40  
Internal Assessment: 10  
Time: 3Hrs.

**NOTE:**

1. The syllabus is divided into 4 units. Nine questions will be set up. Question no. 1 is compulsory. Question no. 1 will consist of 8 short questions covering the entire syllabus. At least two questions will be set from each unit and the student will have to attempt one question from each unit. A student has to attempt five questions in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**UNIT I**

Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance,  $L$  of single coil,  $M$  of two coils. Energy stored in magnetic field. Equation of continuity of current, Displacement current, Maxwell's equations in vacuum and medium, Poynting vector, energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium.

**UNIT II**

Superposition of Two Collinear Harmonic oscillations: Linearity and Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures with equal and unequal frequency and their uses.

**UNIT III**

Wave Equation, Solution of wave equation, Particle and Wave Velocities, Intensity of Wave, Superposition Principle, Group velocity, Phase velocity, Definition and Properties of wave front, Huygens Principle, Longitudinal Waves: Velocity of Longitudinal Waves in a Fluid in a Pipe, Newton's Formula for Velocity of Sound, Laplace's Correction, Reflections and transmission of sound waves at a boundary.

**UNIT IV**

The string as a forced oscillator, Velocity of Transverse Vibrations of Stretched Strings, Reflections and transmission of waves on a string at a boundary, Transverse waves on a string, Travelling and standing waves on a string, Normal Modes of a string, Reflections and transmission of Energy.

- D.J. Griffiths, Introduction to Electrodynamics, 3rd Edn, 1998, Benjamin Cummings.
- Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education.
- Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
- Waves: Berkeley Physics Course, vol. 3, Francis Crawford, 2007, Tata McGraw-Hill.
- The Physics of Vibrations and Waves, H. J. Pain, 2013, John Wiley and Sons.



**B.Sc. PHYSICS**  
**SCHEME OF EXAMINATION**  
**Semester III**

**Paper I- PHY 301 : Computer Programming, Thermodynamics**

Max. Marks : 45  
Internal Assessment : 10  
Time : 3 Hrs.

**NOTE :**

1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**Unit-I**

Computer Programming : Computer organisation, Binary representation, Algorithm development, flow charts and their interpretation. Fortran Preliminaries; Integer and floating point arithmetic expression, built in functions executable and non-executable statements, input and output statements, Formats, I.F. DO and GO TO statements, Dimension arrays statement function and function subprogram.

**Unit-II**

Thermodynamics-I : Second law of thermodynamics, Carnot theorem, Absolute scale of temperature, Absolute Zero, Entropy, show that  $dQ/T=0$ , T-S diagram, Nernst heat law, Joule's free expansion, Joule Thomson (Porous plug) experiment. Joule - Thomson effect. Liquefaction of gases. Air pollution and internal combustion Engine.

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**Unit-III**

Thermodynamics-II : Derivation of Clausius - Claperyron latent heat equation. Phase diagram and triple point of a substance. Development of Maxwell thermodynamical relations. Application of Maxwell relations in the derivation of relations between entropy, specific heats and thermodynamic variables. Thermodynamic functions : Internal energy (U), Helmholtz function (F), Enthalpy (H), Gibbs function (G) and the relations between them.

**References :**

1. Rajaraman, Fortran Programming.
2. Schaum Series, Fortran 77.
3. Ram Kumar, Programming with Fortran - 77.
4. S. Lokanathan and R.S., Gambir, Statistical and Thermal Physics (An Introduction), Prentice Hall of India, Pvt., Ltd. (1991, New Delhi).
5. J.K. Sharma and K.K. Sarkar, Thermodynamics and statistical Physics, Himalaya Publishing House (1991, Bombay.)
6. M.W. Zemansky and R. Dittman, Heat and Thermodynamics, McGraw Hill, New York (1981).



**B.Sc. PHYSICS**  
**Paper-II PHY 302**  
**Optics – I**

Max. Marks : 45  
Internal Assessment : 10  
Time : 3 Hrs.

**NOTE :**

1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**Unit-I**

Fourier Analysis and Fourier Transforms : Speed of transverse waves on a uniform string. Speed of longitudinal waves in a fluid, superposition of waves (physical idea), Fourier Analysis of complex waves and its application for the solution of triangular and rectangular waves, half and full wave rectifier out puts. Fourier transforms and its properties. Application of fourier transform to following function.

$$\begin{aligned} \text{(I)} \quad f(x) &= e^{-x/2} \\ \text{(II)} \quad f(x) &= \begin{cases} |x| < a \\ 0 & |x| > a \end{cases} \end{aligned}$$

**Unit-II**

Geometrical Optics : Matrix methods in paraxial optics, effects of translation and refraction, derivation of thin lens and thick lens formulae, unit plane, nodal planes, system of thin lenses, Chromatic, spherical coma, astigmatism and distortion aberrations and their remedies.

Physical Optics

**Unit-III**

Interference : Interference by Division of Wavefront : Fresnel's Biprism and its applications to determination of wave length of sodium light and thickness of a mica sheet, Lloyd's mirror, phase change on reflection.

**References**

1. Mathematical Physics by B.S. Rajput and Yog Prakash Pragati Prakashan.
2. Theory and Problems of Laplace Transforms by Murrari R. Spiegel, McGraw Hill Book Company.
3. Optics by Ajay Ghatak, Tata McGraw Hill 1977.
4. Introduction of Optics by Frank L. Pedrotti and Leno S. Pedrotti, Prentice Hall 1987.

**B.Sc. PHYSICS**  
**Paper III- PHY 303**  
**PRACTICALS**

Max. Marks : 40

Time : 3 Hours

Note: Do eight experiments, selecting four from each section.

**Section A**

- 1 To measure the (a) area of a window (b) height of an inaccessible object.
- 2 Refractive index and dispersive power of a prism material by spectrometer.
- 3 Resolving power of a telescope.
- 4 Comparison of Illuminating Powers by a Photometer.
- 5 Ordinary and extra ordinary refractive indices for calcite or quartz.

**Section B**

**(i) Electronics**

- 1 To draw common base and common emitter characteristics of a transistor and calculate transistor and calculate transistor characteristics parameters.
- 2 To study the ripple factor in a.d.c. power supply.
- 3 Electronic Voltmeter measurement of peak, average & R.M.S. values of signal.
- 4 Study of voltage doubler and tripler circuits.

**(ii) Computer Experiments**

- 1 To print out all natural (even/odd) number between given limits using computer.
- 2 To find maximum, minimum and range of a given set of numbers using computer.
- 3 To evaluate sum of finite series.



**B.Sc. PHYSICS**  
**SCHEME OF EXAMINATION**  
**Semester IV**

**Paper I- PHY 401 : Statistical Mechanics**

Max. Marks : 45

Internal Assessment : 10

Time : 3 Hrs.

**NOTE :**

1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**Unit-I**

Probability, some probability considerations, combinations possessing maximum probability, combinations possessing minimum probability, distribution of molecules in two boxes. Case with weightage (general). Phase space, microstates and macrostates, statistical fluctuations constraints and accessible States Thermodynamical probability.

**Unit-II**

Postulates of Statistical Physics. Division of Phase space into cells, Condition of equilibrium between two system in thermal contact.  $\beta$ -Parameter. Entropy and Probability, Boltzman's distribution law. Evaluation of  $A$  and  $b$ . Bose-Einstein statistics, Application of B.E. Statistics to Planck's radiation law, B.E. gas.

**Unit-III**

Fermi-Dirac statistics, M.B. Law as limiting case of B.E. Degeneracy and B.E., Condensation. F.D. Gas, electron gas in metals. Zero point energy. Specific heat of metals and its solution.

**References**

1. B.B. Laud, "Introduction to Statistical Mechanics" (Macmillan 1981).
2. F. Reif, "Statistical Physics" (McGraw Hill 1988).
3. K. Huang, "Statistical Physics" (Wiley Eastern 1988).

**B.Sc. PHYSICS**  
**Paper-II PHY 402**  
**Optics – II**

Max. Marks : 45  
Internal Assessment : 10  
Time : 3 Hrs.

**NOTE :**

1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**Unit-I**

Interference by Division of Amplitude : Colour of thin, films, wedge shaped film, Newton's rings. Interferometers: Michelson's interferometer and its application to (I) Standardisation of a meter (II) determination of wave length. Fresnel's Diffraction : Fresnel's half period zones, zone plate, diffraction at a straight edge, rectangular slit and circular aperture.

**Unit-II**

Fraimhoffer diffraction : One slit diffraction, Two slit diffraction N-slit diffraction, Plane transmission grating spectrum, Dispersive power of a grating , Limit of resolution, Rayleigh's criterion, resolving power of telescope and a grating.

**Unit-III**

Polarization :Polarisation and Double Refraction : Polarisation by reflection, Polarisation by scattering, Malus law, Phenomenon of double refraction, Huytgen's wave theory of double refraction (Normal and oblique incidence), Analysis of Palorised light : Nicol prism, Quarter wave plate and half wave plate, production and detection of (i) Plane polarized light (ii) Circularly polarized light and (iii)Elliptically polarized light, Optical activity, Fresnel's theory of rotation, Specific rotation, Polarimeters (half shade and Biquartz).

**References**

1. Optics by Ajay Ghatak, Tata McGraw Hill 1977.
2. Introduction of Optics by Frank L. Pedrotti and Leno S. Pedrotti, Prentice Hall 1987.



**B.Sc. PHYSICS**  
**Paper III- PHY 403**  
**PRACTICALS**

Max. Marks : 40  
Time : 3 Hours

Note: Do eight experiments, selecting four from each section.

Note:- This course will contain two parts (i) Electronics and (ii) Computer experiments. Students have to perform a minimum of four experiments from each part.

**Section A**

- 1 To draw a graph between wave length and minimum deviation for various lines from a Mercury discharge source.
- 2 Determination of wave length of Na light and the number of lines per centimeter using a diffraction grating.
- 3 Wave length by Newton's Rings.
- 4 Measurement of (a) Specific rotation (b) concentration of sugar solution using polarimeter.
- 5 To find the equivalent focal length of a lens system by nodal slide assembly.

**Section B**

**(i) Electronics**

- 1 To draw frequency response curve of transistorised R.C. coupled amplifier.
- 2 Study of series and parallel resonance circuits.
- 3 To find out the frequency of a tuning fork by Melde's experiment.

**(ii) Computer Experiments**

- 1 Find the roots of a quadratic equation.
- 2 To find intergration of a definite integral by trapezoidal rule.
- 3 To find the area of a triangle, sphere and cylinder.
- 4 Given value for a,b,c and d and a set of values for the variable x evaluate the function defined by

$$F(x) = ax^2 + bx + c \quad \text{if } x < d$$

$$F(x) = 0 \quad \text{if } x = d$$

$$F(x) = ax^2 + bx + c \quad \text{if } x > d$$

For each value of x, and print the value of x and (fx). Write a program for an arbitrary number of x values.

**B.Sc. PHYSICS**  
**SCHEME OF EXAMINATION**  
**Semester -V**

**Paper I- PHY 501 : SOLID STATE PHYSICS**

Max. Marks : 45  
Internal Assessment : 10  
Time : 3 Hrs.

**NOTE :**

1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**Unit-I**

Crystalline and gallyssy forms, liquid crystals. Crystal structure, periodicity, lattice and basis, crystal translational vectors and axes. Unit cell and primitive cell, Winger Seitz primitive Cell, symmetry operations for a two dimensional crystal, Bravais lattices in two and three dimensions.

**Unit-II**

crystal planes and Miller indices, Interplanner spacing, Crystal structures of Zinc sulphide, Sodium Chloride and diamond, X-ray diffraction, Bragg's Law and experimental x-ray diffraction methods, K-space.

**Unit-III**

Reciprocal lattice and its physical significance, reciprocal lattice vectors, reciprocal lattice to a simple cubic lattice, b.c.c and f.c.c.  
Specific heat : Specific heat of solids, Einstein's theory of specific heat, Debye model of specific heat of solids.

**References**

1. Introduction to solid state Physics (5<sup>th</sup> Ed.) by kittel, Wiley eastern Limited



**B.Sc. PHYSICS**  
**Paper I- PHY 502 : QUANTUM MECHANICS**

Max. Marks : 45  
Internal Assessment : 10  
Time : 3 Hrs.

**NOTE :**

1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

**Unit-I**

Failure of (Classical) E.M. Theory. quantum theory of radiatio (old quantum theory), Photon, photoelectric effect and Einsteins photoelectric equation compton effect (theory and result). Inadequancy of old quantum theory, de-Broglie hypothesis. Davisson and Germer experiment. G.P. Thomson experiment. Phase velocity group velocity, Heisenberg's uncertainty principle. Time-energy and angular momentum, position uncertainty Uncertainty principle from de-Broglie wave, (wave-partice duality). Gamma Ray Maciroscope, Electron diffraction from a slit.

**Unit-II**

Derivation of time dependent Schrodinger wave equation, eigen values, eigen functions, wave functions and its significance. Normalization of wave function, concept of observable and operator. Solution of Schrodinger equation for harmomic oscillator ground states and excited states.

**Unit-III**

Application of Schrodinger equation in the solution of the following one-dimensional problems :  
Free particle in one dimensional box (solution of schrodinger wave equation, eigen function, eigen values, quantization of energy and momentum, nodes and antinodes, zero point energy).  
i) One-dimensional potential barrie  $E > V_0$  (Reflection and Transmission coefficient).  
ii) One-dimensional potential barrier,  $E > V_0$  (Reflection Coefficient, penetration of leakage coefficient, penetration depth).

**References :**

1. Quantum Mechanics by L.I. Schiff, McGraw Hill Book Company, Inc.
2. Quantum Mechanics by B. Crasemand and J.D. Powel (Addison Wesley).
3. Quantum Mechanics by A.P. Messiah.

## B.Sc. PHYSICS

### Paper III- PHY 503 PRACTICALS

Max. Marks : 40  
Time : 3 Hours

Note: Do eight experiments, selecting four from each section.

#### Section A

##### i) Solid State Electronics

- 1 Transistor as voltage Amplifier in C-B Configuration.
2. Transistor as voltage Amplifier in C-E Configuration.
3. Study of Hartley Oscillator (Calibration of Gang Condenser).
4. a) To Draw the Plateau of G.M. Counter.  
b) To Determine the Mass Attention Coefficient by G.M.Counter.

##### ii) Computer Experiment :

1. Compute the sum of an infinite series upto three significant figures. For example, compute. for different  $x$  using Do loops. Calculate factorials through function subprogram.
2. Let there be  $N$ (Say=100) students in a class. Arrange their marks in descending or ascending orders.
3. Write a Fortran Program which evaluates  $v$  and  $y$  as function of varying between and increments of using the relation.

#### Section B

1. Young's modulus by Newtons rings method.
2. Resolving power of a prism.
3. Thickness of a thin plate using air wedge.
4. Resolving Power of plane transmission grating.
5. Rydberg constant by Hydrogen gas spectrum.



## B.Sc. PHYSICS

### SCHEME OF EXAMINATION Semester -VI

#### Paper I- PHY 601 : ATOMIC MOLECULAR AND LASER PHYSICS

Max. Marks : 45  
Internal Assessment : 10  
Time : 3 Hrs.

#### NOTE :

1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed

#### Unit -I

Vector atom model, quantum numbers associated with vector atom model, penetrating and non-penetrating orbits (qualitative description), spectral lines in different series of alkali spectra, spin orbit interaction and doublet term separation LS or Russell-Saunders Coupling jj coupling (expressions for interaction energies for LS and jj coupling required).

#### Unit-II

Zeeman effect (normal and anomalous) Zeeman pattern of  $D_1$  and  $D_2$  lines of Na-atom, Paschen, Back effect of a single valence electron system. Weak field Stark effect of Hydrogen atom.

Discrete set of electronic energies of molecules. quantisation of vibrational and rotational energies Raman effect (Quantitative description) Stokes and anti Stokes lines.

#### Unit-III

Main features of a laser : Directionality, high intensity, high degree of coherence, spatial and temporal coherence, Einstein's coefficients and possibility of amplification, momentum transfer, life time of a level, kinetics of optical absorption. Threshold condition for laser emission, Laser pumping, He-Ne laser and RUBY laser (Principle, Construction and Working). Applications of laser in the field of medicine and industry.

#### References

1. Introduction to Atomic and Molecular Spectroscopy by V.K.Jain, Narosa (2007)
2. Introduction to Atomic Spectra by H.B. White.
3. Atomic spectra by G. Herzberg.
4. Molecular Spectra and Molecular Structure by G. Herzberg.
5. Fundamentals of molecular spectroscopy by Colin N. Banwell and Elaine M. Mc-Cash.
6. Lasers, Theory and Application (2nd Ed.) by Thagrajan and Ajay Ghatak.
7. Laser and Nonlinear Optics by B.B. Laud (2nd Ed.)
8. Introduction to Optics by Frank L. Pedrotti and Lens S. Pedrotti, Prentice Hall, 1987.

## B.Sc. PHYSICS

### Paper II- PHY 602 : NUCLEAR PHYSICS

Max. Marks : 45  
Internal Assessment : 10  
Time : 3 Hrs.

#### NOTE :

1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

#### Unit-I

Nuclear mass and binding energy, systematics nuclear binding energy, nuclear stability, Nuclear size, spin, parity, statistics magnetic dipole moment, quadrupole moment (shape concept), Determination of mass by Bain-Bridge, Bain-Bride and Jordan mass spectrograph, Determination of charge by Mosley law Determination of size of nuclei by Rutherford Back Scattering.

#### Unit-II

Interaction of heavy charged particles (Alpha particles), alpha disintegration and its theory Energy loss of heavy charged particle (idea of Bethe formula, no derivation), Energetics of alpha -decay, Range and straggling of alpha particles. Geiger-Nuttal law. Introduction of light charged particle (Beta-particle), Origin of continuous beta-spectrum (neutrino hypothesis) types of beta decay and energetics of beta decay, Energy loss of beta-particles (ionization), Range of electrons, absorption of beta-particles. Interaction of Gamma Ray, Nature of gamma rays, Energetics of gamma rays, passage of Gamma radiations through matter (photoelectric, compton and pair production effect) electron position annihilation. Absorption of Gamma rays (Mass attenuation coefficient) and its application.

#### Unit-III

Nuclear reactions, Elastic scattering, Inelastic scattering, Nuclear disintegration, photoneuclear reaction, Radiative capture, Direct reaction, heavy ion reactions and spallation Reactions, conservation laws. Q-value and reaction threshold. Nuclear Reactors General aspects of Reactor design. Nuclear fission and fusion reactors (Principles, construction, working and use) Linear accelerator, Tandem accelerator, Cyclotron and Betatron accelerators. Ionization chamber, proportional counter, G.M. counter detailed study, scintillation counter and semiconductor detector.

#### references :

1. Atomic and nuclear Physics, Vol. II by S.N. Ghoshal.
2. Nuclear Physics by D.C. Tayal, Umesh Prakashan, 125, Goblind Dev Khurja (UP).
3. Concept of Modern physics by arther Besier, Tata McGraw Hill Publications.
4. Nuclear Physics by W.E. Burcham.
5. Nuclear Radiation Detectors by S.S. Kapoor
6. Experimental Nuclear Physics by M. Singru.



**B.Sc. PHYSICS**  
**Paper III- PHY 603**  
**PRACTICALS**

**Max. Marks : 40**  
**Time : 3 Hours**

Note: Do eight experiments, selecting four from each section.

**Section A**

**(i) Electronics**

- 1 e/m by Thomson method.
- 2 Study of B-H Curve by C.R.O.
- 3 To study Hall effect.
- 4 Measurement of Energy Gap of Four Probe Method.

**(ii) Computer Experiments**

1. Program of compute product of two matrices A and B of different dimensions. This is an exercise to illustrate the use of subscripted variable and implied Do loops.
2. Evaluate the definite integral  $I = \int_a^b f(x) dx$  through Simpson's one. third rule.
3. Use of the least-square curve fitting to fit a straight line to a given set of data.
4. Consider an array X with subscripted variables  $x_i$ ;  $i = 1, 2, \dots, N$ .

It is desired to find the average and the standard deviation using the formulas.

**Section B**

**Optics**

1. Wave length of Sodium light by fresnel's biprism.
2. Velocity of ultrasonic waves by grating formation in CCl<sub>4</sub>.
3. Diameter of Lycopodium powder particles by Carona rings.
4. To study double slit interference by He-Ne laser.
5. Diameter of a thin wire by diffraction method (using He-Ne Laser).

Semester -I

ATOMIC STRUCTURE & BONDING AND  
GENERAL ORGANIC CHEMISTRY-I  
(Theory)

Credits: 2

Maximum Marks: 50

External: 40

Internal: 10

Time: 3 hrs

*Note: The examiner is requested to set nine questions in all by formulating two questions of 8 marks each from each UNIT and one compulsory question (Question No. 1 based on entire syllabus will consist of eight short answer type questions each of one mark). The student is required to attempt five questions in all selecting one question from each UNIT and compulsory Question No. 1.*

UNIT-I

**Atomic Structure:** *Review of: Bohr's theory and its limitations, dual behaviour of matter and radiation, de Broglie's relation, Heisenberg Uncertainty principle, Hydrogen atom Spectra*

What is Quantum mechanics? Time independent Schrodinger equation and meaning of various terms in it. Significance of  $\psi$  and  $\psi^2$ , Schrödinger equation for hydrogen atom. Radial and angular parts of the hydrogenic wavefunctions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (Only graphical representation). Radial and angular nodes and their significance. Radial distribution functions and the concept of the most probable distance with special reference to 1s and 2s atomic orbitals. Significance of quantum numbers, orbital angular momentum and quantum numbers  $m_l$  and  $m_s$ . Shapes of s, p and d atomic orbitals, nodal planes. Discovery of spin, spin quantum number ( $s$ ) and magnetic spin quantum number ( $m_s$ ).

UNIT-II

**Chemical Bonding:** *Review of Ionic Bonding: General characteristics and Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds.*

Statement of Born-Landé equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajan's rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.





Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.

MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for *s-s*, *s-p* and *p-p* combinations of atomic orbitals nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules of 1<sup>st</sup> and 2<sup>nd</sup> periods (including idea of *s-p* mixing) and heteronuclear diatomic molecules such as CO, NO and NO<sup>+</sup>. Comparison of VB and MO approaches.

### UNIT-III

**Fundamentals of Organic Chemistry:** Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis.

Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles.

Reactive Intermediates: Carbocations, Carbanions and free radicals.

Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values.

Aromaticity: Benzenoids and Hückel's rule.

### UNIT-IV

**Stereochemistry:** Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (upto two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). Threo and erythro; D and L; cis - trans nomenclature; CIP Rules: R / S (for upto 2 chiral carbon atoms) and E / Z Nomenclature (for upto two C=C systems).

#### Suggested Readings:

- Lee, J.D. Concise Inorganic Chemistry ELBS, 1991.
- Cotton, F.A., Wilkinson, G. & Gaus, P.L. Basic Inorganic Chemistry, 3rd ed., Wiley.
- Douglas, B.E., McDaniel, D.H. & Alexander, J.J. Concepts and Models in Inorganic Chemistry, John Wiley & Sons.
- Huheey, J.E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. Inorganic Chemistry: Principles of Structure and Reactivity, Pearson Education India, 2006.
- Graham Solomon, T.W., Fryhle, C.B. & Snyder, S.A. Organic Chemistry, John Wiley & Sons (2014).
- McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.
- Sykes, P. A Guidebook to Mechanism in Organic Chemistry, Orient Longman, New Delhi (1988).
- Eliel, E.L. Stereochemistry of Carbon Compounds, Tata McGraw Hill education, 2000.

MS

- Finar, I.L. Organic Chemistry (Vol. I & II), E.L.B.S.
- Morrison, R.T. & Boyd, R.N. Organic Chemistry, Pearson, 2010.
- Bahl, A. & Bahl, B.S. Advanced Organic Chemistry, S. Chand, 2010.

**Semester –I**  
**20UCHE102: STATES OF MATTER AND**  
**ALIPHATIC HYDROCARBONS**  
**(Theory)**

Credits: 2

Maximum Marks: 50

External: 40

Internal: 10

Time: 3 hrs

*Note: The examiner is requested to set nine questions in all by formulating two questions of 8 marks each from each UNIT and one compulsory question (Question No. 1 based on entire syllabus will consist of eight short answer type questions each of one mark). The student is required to attempt five questions in all selecting one question from each UNIT and compulsory Question No. 1.*

**UNIT-I**

**Kinetic Theory of Gases** Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation. Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. van der Waals equation of state for real gases. Boyle temperature (derivation not required). Critical phenomena, critical constants and their calculation from van der Waals equation. Andrews isotherms of CO<sub>2</sub>. Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation – derivation not required) and their importance. Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation). Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only).

**UNIT-II**

**Liquids** Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only).

*AAA*



**Solids** Forms of solids. Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes. Laws of Crystallography - Law of constancy of interfacial angles, Law of rational indices. Miller indices. X-Ray diffraction by crystals, Bragg's law. Structures of NaCl, KCl and CsCl (qualitative treatment only). Defects in crystals. Glasses and liquid crystals.

### UNIT-III

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure.

**Alkanes:** (Upto 5 Carbons). Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbe's synthesis, from Grignard reagent. Reactions: Free radical Substitution: Halogenation.

**Cycloalkanes:** nomenclature, synthesis of cycloalkanes and their derivatives - photochemical (2+2)cycloaddition reactions, dehalogenation of -dihalides, pyrolysis of calcium or barium salts of dicarboxylic acids, Baeyer's strain theory and its limitations., theory of strainless rings.

**Alkenes:** (Upto 5 Carbons) Preparation: Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeff's rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes (Birch reduction).

### UNIT-IV

**Alkenes:** Reactions: cis-addition (alk.  $\text{KMnO}_4$ ) and trans-addition (bromine), Addition of HX (Markownikoff's and anti-Markownikoff's addition), Hydration, Ozonolysis, oxymercuration-demercuration, Hydroboration-oxidation.

**Alkynes:** (Upto 5 Carbons) Preparation: Acetylene from  $\text{CaC}_2$  and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides. Reactions: formation of metal acetylides, addition of bromine and alkaline  $\text{KMnO}_4$ , ozonolysis and oxidation with hot alk.  $\text{KMnO}_4$ .

### Suggested Readings:

- Barrow, G.M. Physical Chemistry Tata McGraw-Hill (2007).
- Castellan, G.W. Physical Chemistry 4th Ed. Narosa (2004).
- Kotz, J.C., Treichel, P.M. & Townsend, J.R. General Chemistry Cengage Learning India Pvt. Ltd., New Delhi (2009).
- Mahan, B.H. University Chemistry 3rd Ed. Narosa (1998).
- Petrucci, R.Graham Solomon, T.W., Fryhle, C.B. & Snyder, S.A. Organic Chemistry, John Wiley & Sons (2014).
- McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.

- Sykes, P. A Guidebook to Mechanism in Organic Chemistry, Orient Longman, New Delhi (1988).
- Eliel, E.L. Stereochemistry of Carbon Compounds, Tata McGraw Hill education, 2000.
- Finar, I.L. Organic Chemistry (Vol. I & II), E.L.B.S. • Morrison, R.T. & Boyd, R.N. Organic Chemistry, Pearson, 2010.
- Bahl, A. & Bahl, B.S. Advanced Organic Chemistry, S. Chand, 2010.

Semester -I

20UCHE103: PRACTICAL-I

Credit: 2

Maximum Marks: 50  
Time: 3 hrs

PRACTICAL-I

**A: Inorganic Chemistry**

40 (2x20)

1. Estimation of oxalic acid by titrating it with  $\text{KMnO}_4$ .
2. Estimation of water of crystallization in Mohr's salt by titrating with  $\text{KMnO}_4$ .
3. Estimation of Fe (II) ions by titrating it with  $\text{K}_2\text{Cr}_2\text{O}_7$  using internal indicator.

**B: Physical Chemistry**

4. Determination of surface tension (use of organic solvents is excluded)
  - Surface tension of the given liquid using a stalagmometer by drop weight method and drop number method.
5. Determination of viscosity (use of organic solvents is excluded)
  - Determination of the relative viscosity of a liquid or dilute solution using an Ostwald's viscometer.

**C: Organic Chemistry**

6. To study the process of sublimation of (i) camphor and (ii) phthalic acid.
7. Separation of mixtures by Chromatography: Measure the  $R_f$  value in each case (combination of two compounds to be given)
  - (a) Identify and separate the components of a given mixture of 2 amino acids (glycine, aspartic acid, glutamic acid, tyrosine or any other amino acid) by paper chromatography.
  - (b) Identify and separate the sugars present in the given mixture by paper chromatography.

Note book: 5 Marks  
Viva voce: 5 Marks

**Suggested Readings:**

- Svehla, G. Vogel's Qualitative Inorganic Analysis, Pearson Education, 2012.
- Mendham, J. Vogel's Quantitative Chemical Analysis, Pearson, 2009.

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011)
- Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Textbook of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996.
- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry Orient-Longman, 1960.

**Semester -II**

**20UCHE201: CHEMISTRY of s & p BLOCK ELEMENTS AND  
AROMATIC HYDROCARBONS ALKYL AND ARYL HALIDES  
(Theory)**

Credits: 2

Maximum Marks: 50

External: 40

Internal: 10

Time: 3 hrs

*Note: The examiner is requested to set nine questions in all by formulating two questions of 8 marks each from each UNIT and one compulsory question (Question No. 1 based on entire syllabus will consist of eight short answer type questions each of one mark). The student is required to attempt five questions in all selecting one question from each UNIT and compulsory Question No. 1.*

**UNIT-I**

**Chemistry of s Block Elements:** Diagonal relationship, Anomalous behaviour of Lithium and Beryllium compared to other elements in the same, group, salient features of hydrides, oxides, halides, hydroxides (methods of preparation excluded), behaviour of solution in liquid  $\text{NH}_3$ , Complex formation tendency of s-block elements; structure of the following complexes: crown ethers and cryptates of Group

I.

**Chemistry of p Block Elements: Boron family (13th group):** Diborane: Preparation, properties and structure (as an example of electrondeficient compound and multicenter bonding), Borazine chemical properties and structure, relative strength of Trihalides of Boron as Lewis acids, structure of aluminium(III) chloride.

**Carbon family and (14th group)**

Catenation, Carbides, fluorocarbons, silicates (structural aspects), silicons-general method of preparations, properties and uses.

*MS*



## UNIT-II

**Nitrogen family (15th group) Oxides:** Structure of oxides of nitrogen and phosphorus, Oxyacids: Structure and relative acid strengths of oxy acids of nitrogen and phosphorus, structure of white, yellow and Red phosphorus.

**Oxygen family (16th group) :** Oxy acids of sulphur – structure and acidic strength, Hydrogen Peroxide – properties and uses.

**Halogen family (17th group):** Interhalogen compounds (their properties and structures), Hydra and oxy acids of chlorine – structure and comparison of acid strength, cationic nature of Iodine.

**Chemistry of Noble Gases:** Chemistry of xenon, structure and bonding in fluorides, oxides and oxyfluorides of xenon.

## UNIT-III

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure.

**Aromatic hydrocarbons:** Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid.

Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Craft's reaction (alkylation and acylation) (upto 4 carbons on benzene). Side chain oxidation of alkyl benzenes (upto 4 carbons on benzene).

## UNIT-III

### Alkyl and Aryl Halides

**Alkyl Halides (Upto 5 Carbons)** Types of Nucleophilic Substitution (SN1, SN2 and SNi) reactions.

Preparation: from alkenes and alcohols; Reactions: hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamson's ether synthesis: Elimination vs substitution.

**Aryl Halides** Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions. Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by -OH group) and effect of nitro substituent. Benzyne Mechanism:  $\text{KNH}_2/\text{NH}_3$  (or  $\text{NaNH}_2/\text{NH}_3$ ).

Reactivity and Relative strength of C-Halogen bond in alkyl, allyl, benzyl, vinyl and aryl halides.

### Suggested Readings:

- Lee, J.D., 2008, 5<sup>th</sup> Edition, John Wiley And Sons Ltd.
- Cotton, F.A., Wilkinson, G., Gaus, P.L., 1995, 3<sup>rd</sup> Edition John Wiley.
- Greenwood, N.N. & Earnshaw, 1997, Butterworth-Heinemann.
- Cotton, F.A. & Wilkinson, G., 1999, Wiley.

- Rodger, G.E., 2002, Cengage Learning India.
- Miessler, G. L. & Donald, A. Tarr., 2010, 4<sup>th</sup> Ed., Pearson.
- Atkin, P. Shriver & Atkins's, 2010, 5<sup>th</sup> Ed. Oxford University Press.
- Graham Solomon, T.W., Fryhle, C.B. & Snyder, S.A. Organic Chemistry, John Wiley & Sons (2014).
- McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.
- Sykes, P. A Guidebook to Mechanism in Organic Chemistry, Orient Longman, New Delhi (1988).
- Finar, I.L. Organic Chemistry (Vol. I & II), E.L.B.S.
- Morrison, R.T. & Boyd, R.N. Organic Chemistry, Pearson, 2010.
- Bahl, A. & Bahl, B.S. Advanced Organic Chemistry, S. Chand, 2010

#### Semester –II

### 20UCHE202: CHEMICAL ENERGETICS AND FUNCTIONAL GROUP ORGANIC CHEMISTRY-I (Theory)

Credits: 2

Maximum Marks: 50

External: 40

Internal: 10

Time: 3 hrs

*Note: The examiner is requested to set nine questions in all by formulating two questions of 8 marks each from each UNIT and one compulsory question (Question No. 1 based on entire syllabus will consist of eight short answer type questions each of one mark). The student is required to attempt five questions in all selecting one question from each UNIT and compulsory Question No. 1.*

#### UNIT-I

**Thermodynamics-I:** Zeroth Law of thermodynamics, First law of thermodynamics: statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law – Joule – Thomson coefficient for ideal gas and real gas: and inversion temperature. Calculation of  $w$ ,  $q$ ,  $dU$  &  $dH$  for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process, Temperature dependence of enthalpy, Kirchoffs equation. Bond energies and applications of bond energies.

#### UNIT-II

**Thermodynamics-II:** Second law of thermodynamics, Carnot's cycles and its efficiency, Concept of entropy – entropy as a state function, entropy as a function of  $V$  &  $T$ , entropy as a function of  $P$  &  $T$ ,



entropy change in physical change, entropy as a criterion of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases. Third law of thermodynamics: Nernst heat theorem, statement of concept of residual entropy, evaluation of absolute entropy from heat capacity data. Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P, V and T.

### Unit-III

**Alcohols:** Preparation: Preparation of 1°, 2° and 3° alcohols: using Grignard reagent, Esterhydrolysis, Reduction of aldehydes, ketones, carboxylic acid and esters. Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, alk.  $\text{KMnO}_4$ , acidic dichromate, conc.  $\text{HNO}_3$ ). Oppeneauer oxidation Diols: (Upto 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement.

**Phenols:** (Phenol case) Preparation: Cumene hydroperoxide method, from diazonium salts. Reactions: Electrophilic substitution: Nitration, halogenation and sulphonation. Reimer-Tiemann Reaction, Gattermann-Koch Reaction, Houben-Hoesch Condensation, Schotten-Baumann Reaction.

Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

### Unit IV

**Aldehydes and ketones (aliphatic and aromatic):** (Formaldehyde, acetaldehyde, acetone and benzaldehyde) Preparation: from acid chlorides and from nitriles. Reactions – Reaction with HCN, ROH,  $\text{NaHSO}_3$ ,  $\text{NH}_2$ -G derivatives. Iodoform test. Aldol Condensation, Cannizzaro's reaction, Wittig reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction. Meerwein-Ponndorf Verley reduction.

### Suggested Readings

- Graham Solomon, T.W., Fryhle, C.B. & Snyder, S.A. Organic Chemistry, John Wiley & Sons (2014).
- McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.
- Sykes, P. A Guidebook to Mechanism in Organic Chemistry, Orient Longman, New Delhi (1988).
- Finar, I.L. Organic Chemistry (Vol. I & II), E.L.B.S. • Morrison, R.T. & Boyd, R.N. Organic Chemistry, Pearson, 2010.
- Bahl, A. & Bahl, B.S. Advanced Organic Chemistry, S. Chand, 2010.
- Barrow, G.M. Physical Chemistry Tata McGraw-Hill (2007). • Castellan, G.W. Physical Chemistry 4th Ed. Narosa (2004).



- Kotz, J.C., Treichel, P.M. & Townsend, J.R. General Chemistry Cengage Learning India Pvt. Ltd., New Delhi (2009).
- Mahan, B.H. University Chemistry 3rd Ed. Narosa (1998).
- Petrucci, R.H. General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985)

**Semester -II**

**20UCHE203: PRACTICAL-II**

**Credit: 2**

**Maximum Marks: 50**  
**Time: 3 hrs**

**PRACTICAL-II**

**A: Inorganic Chemistry**

**40(2x20)**

**1. Iodo/Iodimetric Titrations**

- Estimation of Cu(II) using sodium thiosulphate solution (Iodometrically)

**2. Inorganic preparations**

- Cuprous Chloride,  $\text{Cu}_2\text{Cl}_2$
- Aluminium potassium sulphate  $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$  (Potash alum) or Chrome alum.
- Prussian blue

**B: Physical Chemistry**

**3. Thermochemistry**

- Determination of heat capacity of calorimeter for different volumes.
- Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- Determination of enthalpy of ionization of acetic acid.
- Determination of integral enthalpy of solution of salts ( $\text{KNO}_3$ ,  $\text{NH}_4\text{Cl}$ ).
- Determination of enthalpy of hydration of copper sulphate.
- Study of the solubility of benzoic acid in water and determination of  $\Delta H$ . i. Strong acid vs. strong base

**C: Organic Chemistry**

- Checking the calibration of the thermometer.

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- W.E.B.
5. Purification of organic compounds by crystallization using the following solvents: Water, Alcohol, Alcohol-Water.
  6. Preparation and purification through crystallization
    - Iodoform from ethanol (or acetone)
    - p-Bromoacetanilide from acetanilide.
  7. Determination of the melting points of unknown organic compounds (Kjeldahl method and electrically heated melting point apparatus).
  8. Effect of impurities on the melting point – mixed melting point of two unknown organic compounds.

Note book: 5  
Viva voce: 5

**Suggested Readings:**

- Svehla, G. Vogel's Qualitative Inorganic Analysis, Pearson Education, 2012.
  - Mendham, J. Vogel's Quantitative Chemical Analysis, Pearson, 2009.
  - Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011)
  - Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Textbook of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996.
  - Mann, F.G. & Saunders, B.C. Practical Organic Chemistry Orient-Longman, 1960.
- M/D

Semester -III  
CHEMICAL EQUILIBRIA AND  
FUNCTIONAL GROUP ORGANIC  
CHEMISTRY-II  
(Theory)

Credits: 2

Maximum Marks: 50

External: 40

Internal: 10

Time: 3 hrs

Note: The examiner is requested to set nine questions in all by formulating two questions of 8 marks each from each UNIT and one compulsory question (Question No. 1 based on entire syllabus will consist of eight type questions each of one mark). The student is required to attempt five questions in all selecting one question from each UNIT and compulsory Question No. 1.

UNIT-I

**Chemical Equilibrium:** Equilibrium constant and free energy, concept of chemical potential, Thermodynamic derivation of law of chemical equilibrium. Temperature dependence of equilibrium constant; Van't Hoff reaction isochore, Van't Hoff reaction isotherm. Le-Chatelier's principle and its applications, Clapeyron equation and Clausius - Clapeyron equation & its applications.

UNIT-II

**Distribution Law:** Nernst distribution law - its thermodynamic derivation, Modification of distribution law when solute undergoes dissociation, association and chemical combination. Applications of distribution law: Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride, Determination of equilibrium constant of potassium tri-iodide complex and process of extraction.

UNIT-III

**Carboxylic Acids I:** Nomenclature, structure and bonding of Carboxylic acids, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Methods of preparation of carboxylic acids. Reaction and mechanism of Hell-Volhard-Zelinsky reaction, reduction of carboxylic acids, decarboxylation.

UNIT-IV

**Carboxylic acids II:** Structure, nomenclature and preparation of acid chlorides, esters, amides and acid anhydrides. Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Mechanisms of esterification and hydrolysis (acidic and basic).

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## References

1. Atkins, P.W.; Paula, J.de. (2014), Atkin's Physical Chemistry Ed., 10th Edition, Oxford University Press.
2. Ball, D. W. (2017), Physical Chemistry, 2nd Edition, Cengage Learning, India.
3. Castellan, G. W. (2004), Physical Chemistry, 4th Edition, Narosa.
4. Kapoor, K.L. (2015), A Textbook of Physical Chemistry, Vol 1, 6th Edition, McGraw Hill Education.
5. Kapoor, K.L. (2013), A Textbook of Physical Chemistry, Vol 3, 3rd Edition, McGraw Hill Education.
6. Kapoor, K.L. (2015), A Textbook of Physical Chemistry, Vol 5, 3rd Edition, McGraw Hill Education.
7. Morrison, R. N.; Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
8. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
9. Ahluwalia, V.K.; Bhagat, P.; Aggarwal, R.; Chandra, R. (2005), Intermediate for Organic Synthesis, I.K. International.
10. Solomons, T. W. G.; Fryhle, C. B.; Snyder, S. A. (2016), Organic Chemistry, 12th Edition, Wiley.
11. Chandra, R., Singh, S.; Singh, A. (2019), Organic reactions and their nomenclature, Arcler Press.

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Semester -III  
COORDINATION CHEMISTRY AND  
CHEMICAL KINETICS  
(Theory)

Credits: 2

Maximum Marks: 50  
External: 40  
Internal: 10  
Time: 3 hrs

Note: The examiner is requested to set nine questions in all by formulating two questions of 8 marks each from each UNIT and one compulsory question (Question No. 1 based on entire syllabus will consist of eight type questions each of one mark). The student is required to attempt five questions in all selecting one question from each UNIT and compulsory Question No. 1.

UNIT-I

**Coordination Chemistry-I:** Werner's theory of coordination compounds, nomenclature of coordination compounds, Isomerism in coordination compounds, valence bond theory of transition metal complexes, and its limitations. Crystal field theory, crystal field splitting in octahedral, tetrahedral and square planer complexes, factors affecting the crystal field splitting.

UNIT-II

**Coordination Chemistry-II:** Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula. L-S coupling, orbital contribution to magnetic moments, application of magnetic moment data for 3d-metal complexes, Types of electronic transitions, selection rules for d-d transitions; spectroscopic ground states, spectrochemical series, Orgel-energy level diagram for  $d^1$  and  $d^9$  states, discussion of the electronic spectrum of  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  complex ion.

UNIT-III

**Kinetics-I:** Rate of reaction, rate equation, factors influencing the rate of a reaction: concentration, temperature, pressure, solvent, light, catalyst. Order of a reaction, integrated rate expression for zero order, first order, second and third order reaction. Half-life period of a reaction. Methods of determination of order of reaction, Consecutive Reaction, Series reaction, Parallel reactions (Elementary idea).

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## UNIT-IV

**Kinetics-II:** Effect of temperature on the rate of reaction – Arrhenius equation. Theories of reaction rate – Simple collision theory for unimolecular reaction, Transition state theory, Enzymatic reaction: Michaelis - Menton treatment, Acid-Base Catalysed reactions.

### References

1. Lee, J.D. Concise Inorganic Chemistry ELBS, 1991.
2. Cotton, F.A., Wilkinson, G. & Gaus, P.L. Basic Inorganic Chemistry, 3rd ed., Wiley.
3. Douglas, B.E., McDaniel, D.H. & Alexander, J.J. Concepts and Models in Inorganic Chemistry, John Wiley & Sons.
4. Huheey, J.E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. Inorganic Chemistry: Principles of Structure and Reactivity, Pearson Education India, 2006.
5. Atkins, P.W.; Paula, J.de. (2014), Atkin's Physical Chemistry Ed., 10th Edition, Oxford University Press
6. Kapoor, K.L. (2015), A Textbook of Physical Chemistry, Vol 5, 3rd Edition, McGraw Hill Education.
7. Puri, B. R., Pathania, M. S. & Sharma, L. R., Principles of Physical Chemistry, Vishal Publishing Co.
8. Moudgil, H. K. (2010), Textbook of Physical Chemistry, PHI Learning Pvt. Ltd.

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Semester -III

20UCHE303: PRACTICAL-III

Credit: 2

Maximum Marks: 50

External: 40

Internal: 10

Time: 3 hrs

**A: Inorganic Chemistry**

1. Complexometric titrations: Determination of  $Mg^{2+}$ ,  $Zn^{2+}$  by EDTA.
2. Gravimetric Analysis Quantitative estimations of,  $Cu^{2+}$  as copper thiocyanate and  $Ni^{2+}$  as Ni - dimethylglyoxime.

**B: Physical Chemistry**

1. To determine the specific reaction rate of the hydrolysis of methyl acetate/ethyl acetate catalyzed by hydrogen ions at room temperature.
2. To prepare arsenious sulphide sol and compare the precipitating power of mono-, bi - and trivalent anions.

**C: Organic Chemistry**

1. Preparation and purification through crystallization or distillation and ascertaining their purity through melting point or boiling point
  - i. m-Dinitrobenzene from nitrobenzene
  - ii. Dibenzalacetone from acetone and benzaldehyde
  - iii. Aspirin from salicylic acid
2. Preparation of at least one pure solid derivative of the following simple mono and bifunctional organic compounds: Naphthalene, anthracene, acenaphthene, benzyl chloride, p-dichlorobenzene, m-dinitrobenzene, p-nitrotoluene, resorcinol, hydroquinone, D-naphthol, E-naphthol, benzophenone, ethyl methyl ketone, benzaldehyde, vanillin, oxalic acid, succinic acid, benzoic acid, salicylic acid, aspirin, phthalic acid, cinnamic acid, benzamide, urea, acetanilide, benzanilide, aniline hydrochloride, p-toluidine, phenyl salicylate (salol), glucose, fructose, sucrose, o-, m-, p-nitroanilines, thiourea

Note book: 5 Marks

Viva voce: 5 Marks

**References**

1. Svehla, G. Vogel's Qualitative Inorganic Analysis, Pearson Education, 2012.
2. Mendham, J. Vogel's Quantitative Chemical Analysis, Pearson, 2009.

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Semester –III

20UCHE303: PRACTICAL-III

Credit: 2

Maximum Marks: 50

External: 40

Internal: 10

Time: 3 hrs

**A: Inorganic Chemistry**

1. Complexometric titrations: Determination of  $Mg^{2+}$ ,  $Zn^{2+}$  by EDTA.
2. Gravimetric Analysis Quantitative estimations of,  $Cu^{2+}$  as copper thiocyanate and  $Ni^{2+}$  as Ni – dimethylglyoxime.

**B: Physical Chemistry**

1. To determine the specific reaction rate of the hydrolysis of methyl acetate/ethyl acetate catalyzed by hydrogen ions at room temperature.
2. To prepare arsenious sulphide sol and compare the precipitating power of mono-, bi – and trivalent anions.

**C: Organic Chemistry**

1. Preparation and purification through crystallization or distillation and ascertaining their purity through melting point or boiling point
  - i. m-Dinitrobenzene from nitrobenzene
  - ii. Dibenzalacetone from acetone and benzaldehyde
  - iii. Aspirin from salicylic acid
2. Preparation of at least one pure solid derivative of the following simple mono and bifunctional organic compounds: Naphthalene, anthracene, acenaphthene, benzyl chloride, p-dichlorobenzene, m-dinitrobenzene, p-nitrotoluene, resorcinol, hydroquinone, D-naphthol, E-naphthol, benzophenone, ethyl methyl ketone, benzaldehyde, vanillin, oxalic acid, succinic acid, benzoic acid, salicylic acid, aspirin, phthalic acid, cinnamic acid, benzamide, urea, acetanilide, benzanilide, aniline hydrochloride, p-toluidine, phenyl salicylate (salol), glucose, fructose, sucrose, o-, m-, p-nitroanilines, thiourea

Note book: 5 Marks

Viva voce: 5 Marks

**References**

1. Svehla, G. Vogel's Qualitative Inorganic Analysis, Pearson Education, 2012.
2. Mendham, J. Vogel's Quantitative Chemical Analysis, Pearson, 2009.

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3. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011)
4. Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Textbook of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996.
5. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry Orient-Longman, 1960.

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Semester -IV

20UCHE403: PRACTICAL-IV

Credit: 2

Maximum Marks: 50

External: 40

Internal: 10

Time: 3 hrs

**A: Inorganic Chemistry**

1. Colorimetry: To verify Beer - Lambert law for  $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$  and determine the concentration of the given  $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$  solution.
2. Paper Chromatography Qualitative Analysis of the any one of the following Inorganic cations and anions by paper chromatography ( $\text{Pb}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{I}^-$  and  $\text{PO}_4^{3-}$  and  $\text{NO}_3^-$ ).

**B: Physical Chemistry**

1. To determine the specific refractivity of a given liquid
2. To determine the CST of phenol - water system.
3. To study the distribution of iodine between water and  $\text{CCl}_4$ .

**C: Organic Chemistry**

1. Steam distillation (non-evaluative) Naphthalene from its suspension in water  
Separation of o-and p-nitrophenols
2. Column chromatography (non evaluative) Separation of fluorescein and methylene blue  
Separation of leaf pigments from spinach leaves. Chromatography Method Determination of Rf values and identification of organic compounds.

Note book: 5 Marks

Viva voce: 5 Marks

**References**

1. Svehla, G. Vogel's Qualitative Inorganic Analysis, Pearson Education, 2012.
2. Mendham, J. Vogel's Quantitative Chemical Analysis, Pearson, 2009.
3. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011)
4. Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Textbook of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996.
5. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry Orient-Longman, 1960.
6. Jag Mohan, Organic Analytical Chemistry Theory and Practice, Alpha Science International Limited, 2003.

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**CORE COURSE I (Semester I)**  
**ANIMAL DIVERSITY NON CHORDATES I (20UZOO101)**  
**THEORY (Credits 2)**

**Max. Marks: 40+10 (Internal assessment)**

**Time allotted: 3 Hours**

**Note:** Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 8 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

**UNIT-I**

**Phylum- Protozoa**

- i) General characters and classification up to order level
- ii) Biodiversity and economic importance
- iii) Type study of *Plasmodium*;
- iv) Parasitic protozoans: Life history, mode of infection and pathogenicity of *Entamoeba*, *Trypanosoma*, *Leishmania* and *Giardia*.

**UNIT-II**

**Phylum- Porifera:**

- i) General characters and classification up to order level
- ii) Biodiversity and economic importance
- iii) Type study - *Sycon*.
- iv) Canal system in sponges
- v) Spicules in sponges

**UNIT-III**

**Phylum - Coelentrata:**

- i) General characters and classification up to order level
- ii) Biodiversity, economic importance
- iii) Type Study - *Obelia*
- iv) Corals and coral reefs
- v) Polymorphism in Siphonophores

**UNIT-IV**

**Phylum - Helminths:**

- i) General characters and classification up to order level
- ii) Biodiversity, economic importance
- iii) Type study - *Fasciola hepatica*
- iv) Helminths parasites: Brief account of life history, mode of infection and pathogenesis of *Schistosoma*, *Ancylostoma*, *Trichinella*, *Wuchereria* and *Oxyuris*.

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**CORE COURSE I (Semester I)**  
**ANIMAL DIVERSITY NON CHORDATES II (20UZOO102)**  
**THEORY (Credits 2)**

**Max Marks: 40+10 (Internal assessment)**

**Time allotted: 3 Hours**

**Note:** Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 8 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

**UNIT-I**

**Phylum - Annelida:**

- i) General characters and classification up to order level
- ii) Type study - *Pheretima* (Earthworm)
- iii) Metamerism in Annelida
- v) Trochophore larva: Affinities, evolutionary significance

**UNIT-II**

**Phylum - Arthropoda:**

- i) General characters and classification up to order level
- ii) Type study - *Periplaneta*

**UNIT-III**

**Phylum - Mollusca:**

- i) General characters and classification up to order level
- ii) Type study - *Pila*
- iii) Torsion and detorsion in gastropoda

**UNIT-IV**

**Phylum - Echinodermata:**

- i) General characters and classification up to order level
- ii) Type Study - *Asterias* (Sea Star)
- iii) Echinoderm larvae

**Phylum - Hemichordata:**

Type study: *Balanoglossus*

**SUGGESTED READINGS**

Ruppert and Barnes, R.D. (2006). Invertebrate Zoology, VIII Edition. Holt Saunders International Edition.  
 Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). The Invertebrates: A New Synthesis, III Edition, Blackwell Science.  
 Hickman, C.P. 1961. Principles of Zoology. Mosby, St. Louis.

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**CORE COURSE I (Semester I)**  
**ANIMAL DIVERSITY NON CHORDATES (20UZOO103)**

**PRACTICAL (Credits 2)**

Max. Marks:50

Time allowed: 3Hrs

**(A) Classification up to orders with ecological note and economic importance of the following animal:**

1. Protozoa: Permanent prepared slides: *Euglena, Trypanosoma, Noctiluca, Paramecium* (binary fission and conjugation), *Opalina, Verticella, Balantidium, Nyctotherus*
2. Parazoa (Porifera) Specimens: *Sycon, Grantia, Euplectella, Hyalonema, Spongilla, Euspongia*
3. Coelenterata Specimens: *Porpita, Vaella, Physalia, Aurelia, Metridium, Millipora, Alcyonium, Tubipora, Madrepora, Fungia, and Astrea.*
4. Platyhelminthes Specimens: *Dugesia, Fasciola, Taenia, Echinococcus,*
5. Aschelminthes *Ascaris* (male & female), *Trichinella, Ancylostoma, Meloidogyne.*
6. Annelida Specimens: *Pheretima, Heteronereis, Polynoe, Aphrodite, Chaetopterus, Arenicola, Tubifex* and *Pontobdella.*
7. Arthropoda Specimens: *Peripatus, Palaemon* (Prawn), *Lobster, Cancer, Sacculina, Eupagurus, Lepas, Balanus, Cyclops, Daphnia, Lepisma, Periplaneta, Schistocerca, Poecilocerces, Mantis, Cicada, termite queen, Apis, Bombyx, Millipedes, Centipedes, Scorpion, Aranea, Limulus.*
3. Mollusca Specimens: *Mytilus, Cardium, Solen, Pecten, Haliotis, Patella, Aplysia, Doris, Limax, Loligo, Sepia, Octopus, Chiton* and *Dentalium.*
4. Echinodermata Specimens: *Asterias, Echinus, Cucumara, Ophiotrix, Antedon* and *Asterophyton.*
5. Hemichordata Specimen: *Balanoglossus*

**(B) Study of the following permanent stained preparations:**

1. L.S. and T.S. *Sycon*; gemmules, spicules and sponging fibres of *Sycon*, canal system of sponges.
2. T.S. *Hydra* (testis and ovary region), W.M. of *Sertularia, Tubularia* and *Obelia.*
3. T.S. *Fasciola.*
4. T.S. *Ascaris* (male and female).
5. T.S. *Pheretima* (pharyngeal and typhlosolar regions)
6. Mouth parts of cockroach
7. Glochidium larva of *Anodonta*; radula of *Pila*

**(C) Preparation of the following slides:**

1. Temporary preparation of *Volvox, Paramecium, Gemmules* and spicules of *Sycon*
2. Preparation of permanent stained whole mounts of *Hydra, Obelia, Sertularia, Plumularia* and *Bougainvillea.*

**(D) Study of the different systems of the following animals by charts/models:**

1. Earthworm: Digestive, reproductive and nervous systems.
  2. Grasshopper/ cockroach: Digestive, reproductive and nervous systems.
- K<sub>3</sub>  
PS  
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**(E) Project:**

1. Parasitic adaptations (Protozoa to helminthes)
2. Survey- Diversity of particular family/taxa in your surrounding area

**SUGGESTED READINGS**

- Ruppert and Barnes, R.D. (2006). *Invertebrate Zoology*, VIII Edition. Holt Saunders International Edition.
- Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). *The Invertebrates: A New Synthesis*, III Edition, Blackwell Science.
- Hickman, C.P. 1961. *Principles of Zoology*. Mosby, St. Louis.
- PS  
K<sub>3</sub>

4

**CORE COURSE II (SEMESTER II)  
ANIMAL DIVERSITY CHORDATES I (20UZOO201)  
THEORY (CREDITS 2)**

**Max Marks: 40+10 (Internal assessment)**

**Time allotted: 3 Hours**

**Note:** Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

**UNIT-I**

**Chordates:**

Principles of classification; Origin and Evolutionary tree; Salient features of chordates; Functional morphology of the types with examples emphasizing their biodiversity, economic importance.

**UNIT-II**

General characters and classification of phyla Protochordata upto orders with examples emphasizing their biodiversity, economic importance.

**Protochordates:** Systematic position, distribution, ecology, morphology and affinities

Urochordata: *Herdmania* – type study

Cephalochordata: *Amphioxus* – type study

**UNIT-III**

General characters and classification of phyla cyclostomata upto orders with examples emphasizing their biodiversity, economic importance.

**Cyclostomes:** Classification and ecological significance. Type study of *Petromyzon*.

**UNIT-IV**

General characters and classification of pisces upto orders with examples emphasizing their biodiversity, economic importance. **Pisces:** Scales, Parental care in fishes, fish migration. Types study of Labeo

**Note:** Type study includes detailed study of various systems of the animal.

**SUGGESTED READINGS**

Young, J. Z. (2004). The Life of Vertebrates. III Edition. Oxford university press.

Pough H. Vertebrate life, VIII Edition, Pearson International.

Kotpal, R.L. Modern text book of Zoology Vertebrates. Rastogi Publications. Meerut.

Hickman, C.P. 1961. Principles of Zoology, Mosby, St. Louis.

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**CORE COURSE II (Semester II)**  
**ANIMAL DIVERSITY CHORDATES II (20UZOO202)**  
**THEORY (Credits 2)**

**Max Marks: 40+10 (Internal assessment)**

**Time allotted: 3 Hours**

**Note:** Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I

**Amphibia:** Type study of frog (*Rana tigrina*), Parental Care in Amphibia

UNIT-II

**Reptilia:** Type study of Lizard (*Hemidactylus*), Extinct reptiles; Poisonous and non-poisonous snakes.

UNIT-III

**Aves:** Type study of Pigeon (*Columba livia*); Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds.

UNIT-IV

**Mammals:** Type study of Rat; Dentition.

**Note:** Type study includes detailed study of various systems of the animal.

**SUGGESTED READINGS**

Young, J. Z. (2004). The Life of Vertebrates. III Edition. Oxford university press.

Pough H. Vertebrate life, VIII Edition, Pearson International.

Kotpal, R.L. Modern text book of Zoology Vertebrates. Rastogi Publications. Meerut.

Hickman, C.P. 1961. Principles of Zoology. Mosby, St. Louis.

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**CORE COURSE II (SEMESTER II)**  
**ANIMAL DIVERSITY CHORDATES (20UZOO203)**  
**PRACTICAL (CREDITS 2)**  
**Time allowed: 3Hrs**

Max. Marks:50

Time allowed: 3Hrs

Max. Marks:50

1. Classification upto orders, habit, habitats, external characters and economic importance (if any) of the following animals:-

Protochordata	:	<i>Molgula, Botryllus, Pyrosoma, Doliolum, Olikopleura, and Amphioxus.</i>
Cyclostomata	:	<i>Myxine, Petromyzon and Ammocoetus larva.</i>
Chondrichthyes:		<i>Zygaena, Pristis, Narcine (electric ray), Trygon, Rhinobatus, Raja and</i>
		<i>Chimaera.</i>
Osteichthyes	:	<i>Acipenser, Lepidosteus, Mystus, Catla, Hippocampus,</i>
		<i>Syngnathus, Exocoetus, Anabas, Diodon, Tetradon, Echinus.</i>
		<i>Solea. Any of the Lung Fishes.</i>
Amphibia	:	<i>Necturus, Proteus, Amphiuma, Salamandra, Amblystoma, Axolotl larva</i>
		<i>Alytes, Bufo, Rana.</i>
Reptilia	:	<i>Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhlops, Python, Eryx, Ptyas, Bungarus, Naja, Hydrus, Viper, Crocodilus, Gaviali, Chelone (Turtle) and Testudo (Tortoise).</i>
Aves		<i>Casuaris, Anas, Pavo, Eudynamis, Tyto, Halcyon</i>
Mammalia		<i>Ornithorhynchus, Echidna, Macropus, Macaque, Hystris, Funambulus.</i>

2. Study of models of the different systems of the following animals with the help of Charts/models:

*Herdmania*: General anatomy

*Labeo*: Digestive, reproductive systems and cranial nerves

*Hemidactylus*

Rat

3. Study of the skeleton of *Scoliodon, Labeo, Frog, Gallus and Rat*
4. Study of the following prepared slides: Tornaria larva, T.S. *Amphioxus* (through different regions).  
*Oikopleura*, different types of scales and histology of rat.
5. Make permanent stained preparations of the following: *Salpa*, Spicules, and Cycloid scales
6. Zoological excursion and its report
7. Project Report on any one  
 Parental care  
 Dentition in mammals  
 Migration in Birds

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**CORE COURSE III (Semester III)  
ANIMAL PHYSIOLOGY (20UZOO301)  
THEORY (Credits 2)**

**Max Marks: 50** [40 (Theory) +10 (Internal Assessment)]      Time Allotted: 3 hours

Note: Nine questions to be set in all and all the candidates are required to attempt five questions including compulsory question.

1. Question number 1 is compulsory constituting of 8 parts (1 Mark each) covering the entire syllabus.
2. Out of the remaining eight questions (8 marks each), two questions are to be set from each Unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

**Unit I**

**Digestion and Respiration**

Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids, Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood

**Unit II**

**Cardiovascular system and Excretion**

Composition of blood, Homeostasis, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle, Structure of nephron, Physiology of excretion

**Unit III**

**Nervous system and muscular system**

Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres, Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction

**Unit IV**

**Reproduction and Endocrine Glands**

Physiology of male reproduction: hormonal control of spermatogenesis; Physiology of female reproduction: hormonal control of menstrual cycle in human, Structure and function of pituitary, thyroid, Parathyroid, pancreas and adrenal

**SUGGESTED READINGS**

Tortora, G.J. and Derrickson, B.H. (2009). *Principles of Anatomy and Physiology*, XII Edition, John Wiley & Sons, Inc.

Widmaier, E.P., Raff, H. and Strang, K.T. (2008) *Vander's Human Physiology*, XI Edition., McGraw Hill

Guyton, A.C. and Hall, J.E. (2011): *Textbook of Medical Physiology*, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company

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**CORE COURSE III (Semester III)  
ANIMAL BIOCHEMISTRY (20UZOO302)  
THEORY (Credits 2)**

**Max Marks: 50** [40 (Theory) +10 (Internal Assessment)] **Time Allotted: 3 hours**  
Note: Nine questions to be set in all and all the candidates are required to attempt five questions including compulsory question.

1. Question number 1 is compulsory constituting of 8 parts (1 Mark each) covering the entire syllabus.
2. Out of the remaining eight questions (8 marks each), two questions are to be set from each Unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

**Unit I**

Carbohydrates and their Metabolism  
Structure and Biological Importance, Monosaccharides, Disaccharides, Oligosaccharide, Polysaccharides,  
Glycolysis, Krebs Cycle, Electron transport chain

**Unit II**

Lipids and their Metabolism  
Structure and their biological importance of fatty acids, triacylglycerols, phospholipids, glycolipids,  
Biosynthesis and  $\beta$  oxidation of palmitic acid

**Unit III**

Introduction, Classification, Structure, function and general properties of proteins; Nomenclature, Classification and  
mechanisms of enzyme, Transport through biomembranes (Active and Passive), Buffers

**Unit IV**

Nucleic Acids  
Structure, functions and types of DNA, RNA and their components, Central dogma

**SUGGESTED READINGS**

Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). *Biochemistry*. VI Edition. W.H. Freeman and Co.

Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). *Principles of Biochemistry*. IV Edition. W.H. Freeman and Co.

Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). *Harper's Illustrated Biochemistry*. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.

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CORE COURSE III (Semester III)  
ANIMAL PHYSIOLOGY AND BIOCHEMISTRY (20UZOO303)  
PRACTICAL (Credits 2)

Maximum Marks- 50

Time allowed- 3 hours

1. Preparation of heme and hemochromogen crystals
2. Study of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland
3. Study of permanent slides of spinal cord, duodenum, liver, lung, kidney, bone, cartilage
4. Qualitative tests to identify functional groups of carbohydrates in given solutions (Glucose, Fructose, Sucrose, Lactose)
5. Estimation of total protein in given solutions by Lowry's method.
6. Study of activity of salivary amylase under optimum conditions.
7. Paper chromatography of amino acids

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**CORE COURSE IV (Semester IV)**  
**CELL BIOLOGY AND GENETICS (20UZOO401)**  
**THEORY (Credits 2)**

**Max Marks: 50** [40 (Theory) +10 (Internal Assessment)]

Time Allotted: 3 hours

Note: Nine questions to be set in all and all the candidates are required to attempt five questions including compulsory question.

1. Question number 1 is compulsory constituting of 8 parts (1 Mark each) covering the entire syllabus.
2. Out of the remaining eight questions (8 marks each), two questions are to be set from each Unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

**UNIT-I**

1. Plasma Membrane: Fluid mosaic model, various modes of transport across the membrane, mechanism of active and passive transport, endocytosis and exocytosis,
2. Endoplasmic reticulum (ER): types, role of ER in protein synthesis and transportation in animal cell.
3. Goigi complex: Structure, role of golgi-complex in animal cell.
4. Ribosomes: Types, biogenesis and role in protein synthesis.

**UNIT-II**

- 1 Lysosomes: Structure, enzyme and their role; polymorphism
- 2 Mitochondria: Mitochondrial DNA; as semiautonomous body, biogenesis, mitochondrial enzymes ( only names), role of mitochondria.
- 3 Cytoskeleton: Microtubules, microfilaments, centriole and basal body.  
Cilia and Flagella
- 4 Ultrastructure and functions of Nucleus: Nuclear membrane, nuclear lamina, nucleolus, Polytene chromosome

**Unit III**

Mendel's work on transmission of traits, Genetic Variation, Principles of Inheritance, Incomplete dominance and codominance, Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, sex linked inheritance, Sex Determination, Human karyotype, Chromosomal abnormalities involving autosomes and sex chromosomes, inborn errors of metabolism

**Unit VI**

Linkage and crossing over, Interference and coincidence, Chromosomal Mutations: Deletion, Duplication, Inversion, Translocation, Aneuploidy and Polyploidy; Gene mutations: Induced versus Spontaneous mutations, Extra-chromosomal Inheritance, Maternal effects. Polygenic inheritance with suitable examples; simple numericals based on it, Euthenics, Euphenics, aminocentesis

**SUGGESTED READINGS**

Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008). *Principles of Genetics*. VIII Edition. Wiley India.  
Snustad, D.P., Simmons, M.J. (2009). *Principles of Genetics*. V Edition. John Wiley and Sons Inc.  
Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). *Concepts of Genetics*. X Edition. Benjamin Cummings.  
Molecular Cell Biology, J. Darnell, H. Lodish and D. Baltimore Scientific American Book, Inc., USA.  
Cell Biology by C.B. Panwar, Himalaya Publication

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**CORE COURSE II (Semester IV)  
DEVELOPMENTAL BIOLOGY (20UZOO402)  
THEORY (Credits 2)**

**Max Marks: 40+10 (Internal Assessment) Time allotted: 3 Hours**

**Note :** Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1. Question 1 is compulsory consisting of 10 parts (1.0 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidates are required to attempt four questions, selecting one from each unit.

**Unit I**

1. Historical perspectives, aims and scope of developmental biology.
2. Generalized structure of mammalian ovum & sperm. Spermatogenesis and Oogenesis.

**Unit II**

1. Fertilization, parthenogenesis, different types of eggs and patterns of cleavage in invertebrates and vertebrates.
2. Process of blastulation in invertebrates and vertebrates
3. Fate-map construction in frog and chick.

**Unit III**

1. Gastrulation in invertebrates and vertebrates
2. Gastrulation & formation of three germinal layers in frog and chick.
3. Elementary knowledge of primary organizers.

**Unit IV**

1. Extra embryonic membranes: structure & significance in birds and mammals.
2. Concepts of competence, determination and differentiation.
3. Concept of regeneration.

**SUGGESTED READINGS**

Kardong, K.V. (2005) Vertebrates' Comparative Anatomy, Function and Evolution. IV Edition. McGraw-Hill Higher Education

Kent, G.C. and Carr R.K. (2000). Comparative Anatomy of the Vertebrates. IX Edition. The McGraw-Hill Companies

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**CORE COURSE IV (Semester IV)**  
**CELL BIOLOGY, GENETICS AND DEVELOPMENTAL BIOLOGY (20UZOO403)**  
**PRACTICAL (Credits 2)**

Maximum Marks- 50

Time allowed- 3 hours

- . Study of Mendelian Inheritance and gene interactions (Non Mendelian Inheritance) using suitable examples, Verify the results using Chi-square test.
- . Study of Linkage, recombination, gene mapping using the data.
- . Study of Human Karyotypes (normal and abnormal).
- . Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages)
- . Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages) .
- . Study of Mitosis using onion root tip and meiosis using permanent slides.
- . Project Report Salivary gland and polytene chromosome/ Human Karyotype

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## SYLLABUS (B.Sc.- ZOOLOGY)

w.e.f. Session 2016-17

B. Sc. SEMESTER – V

### PAPER 5.1

### FISH AND FISHERIES

**Max Marks: 40+10 (Internal Assessment)**

**Time allotted: 3 Hours**

**Note:** Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1. Question 1 is compulsory consisting of 10 parts (1.0 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidates are required to attempt four questions, selecting one from each unit.

#### Unit I

1. **Introduction to world fisheries:** Production, utilization and demand.
2. **Fresh Water fishes of India:** River system, reservoir, pond, tank fisheries; captive and culture fisheries, cold water fisheries.

#### Unit II

3. Fishing crafts and gears.
4. Fin fishes, Crustaceans, Molluscs and their culture.

#### Unit III

1. **Seed production:** Natural seed resources – its assessment, collection, Hatchery production.
2. **Nutrition:** Sources of food (Natural, Artificial) and feed composition (Calorie and Chemical ingredients).

#### Unit IV

3. **Field Culture:** Ponds-running water, recycled water, cage, culture; poly culture.
4. **Culture technology:** Biotechnology, gene manipulation and cryopreservation of gametes.

**SYLLABUS (B.Sc.- ZOOLOGY)**  
**w.e.f. Session 2016-17**  
**B. Sc. SEMESTER – V**

**PAPER – 5.2**  
**ECOLOGY & EVOLUTION**

**Max Marks: 40+10 (Internal Assessment)**

**Time allotted: 3 Hours**

**Note:** Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

3. Question 1 is compulsory consisting of 10 parts (1.0 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
4. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidates are required to attempt four questions, selecting one from each unit.

**Unit I**

1. **Basic concepts of ecology:** Definition, significance. Concepts of habitat and ecological niche.
2. **Factors affecting environment:** Abiotic factors (light-intensity, quality and duration), temperature, humidity, topography; edaphic factors; biotic factors.

**Unit II**

1. **Ecosystem:** Concept, components, properties and functions; Ecological energetics and energy flow-food chain, food web, trophic structure; ecological pyramids concept of productivity.
2. **Biogeochemical cycles:** Concept, reservoir pool, gaseous cycles and sedimentary cycles.
3. **Population:** Growth and regulation.

**Unit III**

**Origin of life.**

1. Concept and evidences of organic evolution.
2. Theories of organic evolution.
3. Concept of microevolution and concept of species

**Unit IV**

1. Concept of macro-and mega-evolution.
2. Phylogeny of horse.
3. Evolution of man.

**SYLLABUS (B.Sc.- ZOOLOGY)**  
**w.e.f. Session 2016-17**  
**B. Sc. SEMESTER – V**

**PRACTICAL (P-501)**

**Max. Marks:50**

**Time allowed: 3Hrs**

1. Identification of *Catle*, *Labeo rohita*, *L. calbasu*, *Cirrhius*, *mrigala* *Puntius sarana*, *Channa punctatus*, *C. marulius*, *C. stariatus*, *Trichogaster fasciata*, *Mystus seenghala*, *M. cavasius*, *M. tengra*, *Callichrous pabola*, *C. bimaculatus*, *Wallago attu*, *Prawns*, *Crabs*, *Lobsters*, *Calms*, *Mussels & Oysters*.
2. Chemical analysis of pond water and soil for pH, dissolved oxygen, free CO<sub>2</sub> nitrates, phosphates and chlorides.
3. A study of the slides of fish parasites.
4. A study of the different types of nets, e.g., cast net, gill net, drift net and drags net.
5. A visit to lake/reservoir/fish breeding centre.
6. Evolutionary evidences and/or its demonstration through models/video/CD etc and preparation of working models of the different systems of the following animals:
  - Adaptive modifications in feet and beaks of birds
  - Evolutionary evidences of man and horse.
7. Project report :
  - i) Pearl culture
  - ii) Prawn culture

**SYLLABUS (B.Sc.- ZOOLOGY)**  
**w.e.f. Session 2016-17**  
**B. Sc. SEMESTER - VI**

**PAPER 6.1**  
**ENTOMOLOGY**

**Max Marks: 40+10 (Internal Assessment)**

**Time allotted: 3 Hours**

**Note:** Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1. Question 1 is compulsory consisting of 10 parts (1.0 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidates are required to attempt four questions, selecting one from each unit.

**Unit I**

Study of important insect pests of crops and vegetables:

1 **Sugarcane:**

- (a) Sugarcane leaf-hopper (*Pyrilla perpusilla*)
- (b) Sugarcane Whitefly (*Aleurolobus barodensis*)
- (c) Sugarcane top borer (*Scirpophaga nivella*)
- (d) Sugarcane root borer (*Emmalocera depressella*)
- (e) Gurdaspur borer (*Bissetia steniellus*)

With their systematic position, habits and nature of damage caused. Life cycle and control of *Pyrilla perpusilla* only.

2 **Cotton:**

- (a) Pink bollworm (*Pestiphora gossypifolia*)
- (b) Red cotton bug (*Dysdercus Cingulatus*)
- (c) Cotton grey weevil (*Myllocerus undecimpustulatus*)
- (d) Cotton Jassid (*Amrasca devastans*)

With their systematic position, habits and nature of damage caused. Life cycle and control of *Pectinophore gossypiella*.

**Unit II**

3 **Wheat:**

Wheat stem borer (*Sesamia inferens*) with its systematics position, habits, nature of damage caused. Life cycle and control.

4 **Paddy:**

- (a) Gundhi bug (*Leptocoris acuta*)
- (b) Rice grasshopper (*Hieroglyphus banian*)
- (c) Rice stem borer (*Scirpophaga incertullus*)
- (d) Rice Hispa (*Diceladisa armigera*)

With their systematic position, habits and nature of damage caused. Life cycle and control of *Loptocoris acuta*.

**Unit III**

5 **Vegetables**

- (a) *Raphidopalpa faveicollis* – The Red pumpkin beetle.
- (b) *Dacus cucurbitas* – The pumpkin fruit fly.
- (c) *Tetranychus tecarius* – The vegetable mite.
- (d) *Epilachna* – The Hadda beetle.

Their systematics position, habits and nature of damage caused. Life cycle and control of *Aulacophora faveicollis*.

6 **Stored grains:**

- (a) Pulse beetle (*Callosobruchus maculatus*)

- (b) Rice weevil (*Sitophilus oryzae*)
- (c) Wheat weevil (*Trogoderma granarium*)
- (d) Rust Red Flour beetles (*Tribolium castaneum*)
- (e) Lesser grain borer (*Rhizopertha dominica*)
- (f) Grain & Flour moth (*Sitotroga cerealella*)

Their systematic position, habits and nature of damage caused. Life cycle and control of *Trogoderma granarium*.

**Unit IV**

6. **Insect control:** Biological control, its history, requirement and precautions and feasibility of biological agents for control.
7. **Chemical control:** History, Categories of pesticides. Important pesticides from each category to pests against which they can be used. Insect repellants and attractants.
8. Integrated pest management.
9. Important bird and rodent pests of agriculture & their management.



**SYLLABUS (B.Sc.- ZOOLOGY)**  
**w.e.f. Session 2016-17**  
**B. Sc. SEMESTER – VI**

**PAPER 6.2**  
**DEVELOPMENTAL BIOLOGY**

**Max Marks: 40+10 (Internal Assessment)**

**Time allotted: 3 Hours**

**Note :** Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1. Question 1 is compulsory consisting of 10 parts (1.0 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidates are required to attempt four questions, selecting one from each unit.

**Unit I**

1. Historical perspectives, aims and scope of developmental biology.
2. Generalized structure of mammalian ovum & sperm. Spermatogenesis and Oogenesis.

**Unit II**

1. Fertilization, parthenogenesis, different types of eggs and patterns of cleavage in invertebrates and vertebrates.
2. Process of blastulation in invertebrates and vertebrates
3. Fate-map construction in frog and chick.

**Unit III**

1. Gastrulation in invertebrates and vertebrates
2. Gastrulation & formation of three germinal layers in frog and chick.
2. Elementary knowledge of primary organizers.

**Unit IV**

1. Extra embryonic membranes: structure & significance in birds and mammals.
2. Concepts of competence, determination and differentiation.
3. Concept of regeneration.

**SYLLABUS (B.Sc.- ZOOLOGY)**  
**w.e.f. Session 2016-17**  
**B. Sc. SEMESTER – VI**

**PRACTICAL (P-601)**

**Max. Marks:50**

**Time allowed: 3Hrs**

1. External morphology, identification marks, nature of damage and host of the following pests:
  - i. **Sugarcane:** Sugarcane leaf-hopper, Sugarcane whitefly, Sugarcane top borer, Sugarcane root borer, Gurdaspur borer (any two).
  - ii. **Cotton :** Red Cotton bug
  - iii. **Wheat:** Wheat stem borer
  - iv. **Paddy:** Gundhi bug, Rice grasshopper, Rice stem borer, Rice hispa (any one).
  - v. **Vegetables:** *Aulocophora faveicollis*, *Dacus cucurbitas*, *Tetranychus tecarius*, *Epilachna* (any three).
  - vi. **Pests of stored grains:** Pulse beetle, Rice weevil, Grain & Flour moth, Rust-red flour beetle, lessergrain borer (any three).
2. Preparation of permanent/temporary slides of developmental stages of frog/mosquito
3. Study of permanent slides of WM of chick embryo (13-18h, 24-36h, 36-48h, 48-72h).
4. Window preparation and identification of stages of development in chick egg.
5. Project report:
  1. Apiculture
  2. Sericulture



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CP. 8

**Semester I**  
**Paper I-20UBOT101-Diversity of Microbes**

**Max Marks: 40**  
**Internal Assessment: 10**  
**Time: 3 hours**

**Objective:-**This course is intended to provide the basic understands microorganism, algae, fungi. It also covers the classification, life history & their economic importance.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

**Unit1: Diversity of Microbes-I (Bacteria)**

Biology of Bacteria-Discovery, General characteristics and cell structure, Reproduction modes- vegetative, asexual and recombination (conjugation, transformation and transduction), Economic importance of bacteria, Life cycle and economic importance of Citrus canker (*Xanthomonascitri*), Crown gall (*Agrobacterium tumefaciens*), Bacterial leaf blight (BLB) (*Xanthomonasoryzae*).

**Unit2: Diversity of Microbes-II (Virus)**

Discovery, General characters, Nature (Biological status) of viruses, replication & reproduction: Lytic and lysogenic cycle, Structure: DNA virus (T-phage), RNA virus (TMV), transmission of plant viral diseases, Economic importance of Viruses.

**Unit3: Algae**

General characteristics, Classification upto class level (Smith 1955), Economic importance of algae, Important features and life-history of *Nostoc* (Cyanophyceae), *Volvox*, *Oedogonium* (Chlorophyceae), *Vaucheria* (Xanthophyceae), *Ectocarpus* (Phaeophyceae) and *Polysiphonia* (Rhodophyceae).

**Unit 4: Fungi**

General characteristics, Classification upto classes (Ainsworth), life cycle of *Rhizopus* (Zygomycota), *Penicillium* (Ascomycota), *Puccinia* (Basidiomycota), *Collectotrichum* (Deutromycotina), Lichens & Mycorrhiza: general account, types and significance, Economic importance of Fungi. **Suggested Readings:-**

1. Kumar, H.D., 1999. Introductory Phycology. Affiliated East-West Press, Pvt. Ltd., Delhi. 2<sup>nd</sup> edition.
2. Tortora, G.J., Funke, B.R., Case, C.L., 2010. Microbiology: An Introduction. Pearson Benjamin Cummings, U.S.A. 10<sup>th</sup> edition.
3. Sethi, I.K. and Walia, S.K., 2011. Text book of Fungi & Their Allies, MacMillan Publishers, Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M., 1996. Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4<sup>th</sup> edition.

Prof Lalita Gupta

Dr. Monika Miglani

Dr. Amita

Dr. Poonam

Sh Mohan Lal

Ms Deepika

Dr. K D Sharma

Dr. Sunder Singh Arya

Mr. Abhijit Das

Mrs. Monika

Ms. Sudha

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**Paper II-20UBOT102-Diversity of Archegoniates & Gymnosperms**

**Max Marks: 40**  
**Internal Assessment: 10**  
**Time: 3 hour**

**Objective:-**The course provides information about the diversity of Archegoniates and Gymnospermic Plants. It also covers the general classification along with Economic importance of these groups.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

**Unit 1: Introduction to Archegoniate (Bryophytes)**

General characteristics, Classification (upto class), Alternation of generation and economic importance of Bryophyta. Morphology, anatomy and reproduction of Marchantia, Anthoceros and Funaria (Developmental details not to be included), Economic importance of Bryophytes with special reference of Sphagnum.

**Unit 2: Pteridophytes-I**

General characteristics, classification upto classes (Smith 1955, Bold 1959), General account of fossils & types, Fossil Pteridophytes (Rhynia, Lyginopteris). Stellar system and its evolution, Heterospory and seed habit, Apogamy and apospory, Economic importance of Pteridophytes.

**Unit 3: Pteridophytes-II**

Structure and reproduction of Selaginella, Equisetum and Pteris.

**Unit 4: Gymnosperms**

General characters, Classification up to classes (Pelger and Melchir 1954), Morphology, anatomy and reproduction of Cycas and Pinus (Developmental details not to be included), Economic importance of gymnosperms.

**Suggested Readings:-**

1. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., 2005. Biology. Tata McGraw Hill, Delhi, India.
2. Vashishta, P.C., Sinha, A.K., Kumar, A., 2010. Pteridophyta, S. Chand., Delhi, India.
3. Bhatnagar, S.P., Moitra, A., 1996. Gymnosperms. New Age International (P) Ltd., Publishers, New Delhi, India.
4. Parihar, N.S., 1991. An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.

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**Paper III-20UBOT103-Botany Lab-I(Diversity of Microbes + Diversity of Archegoniates& Gymnosperms)**

**Max Marks: 50**

**Time: 4 hours**

1. Study of Bacteria from slides/charts/ models.
2. Study of Viruses (TMV & Bacteriophages) from charts/ models.
3. *Study of Morphological & reproductive characters of algal members:*Oscillatoria,Volvox, Oedogonium, Vaucheria, Ectocarpus and Polysiphonia .
4. *Study of Morphological& reproductive characters of fungal members:*Rhizopus, Penicillium , Puccinia, Collectotrichum .
5. *Lichens-* Study of growth forms of lichens (crustose, foliose and fruticose)
6. *Mycorrhiza-* ectomycorrhiza and endomycorrhiza(Photographs and slides)
7. *Marchantia-*morphology of thallus, W.M. rhizoids and scales, V.S. thallus through gemma cup, W.M. gemmae (all temporary slides), V.S. antheridiophore, archegoniophore, L.S. sporophyte (all permanent slides).
8. *Funaria-* morphology, W.M. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, L.S. capsule and protonema.
9. *Selaginella-* morphology, W.M. leaf with ligule, T.S. stem, W.M. strobilus, W.M. microsporophyll and megasporophyll (temporary slides), L.S. strobilus (permanent slide).
10. *Equisetum-* morphology, T.S. internode, L.S. strobilus, T.S. strobilus, W.M. sporangiophore, W.M. spores (wet and dry)(temporary slides); T.S. rhizome (permanent slide).
11. *Pteris-* morphology, T.S. rachis, V.S. sporophyll, W.M. sporangium, W.M. spores (temporary slides), T.S. rhizome, W.M. prothallus with sex organs and young sporophyte (permanent slide).
12. *Cycas-*morphology(coralloid roots, bulbil, leaf), T.S. coralloid root, T.S. rachis, V.S. leaflet, V.S. of microsporophyll, W.M. spores (temporary slides), L.S. ovule, T.S. root (permanent slide).
13. *Pinus-* morphology (long and dwarf shoots, W.M. of dwarf shoot, male and female), W.M. dwarf shoot, T.S. needle, T.S. stem, L.S./T.S. male cone, W.M. microsporophyll, W.M. microspores (temporary slides), L.S. female cone, T.L.S. & R.L.S. stem (permanent slide).

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**Semester II**

**Paper I-20UBOT201-Ecology & Phytogeography**

Max Marks: 40

**Internal Assessment:**  
**10Time: 3 hours**

**Objective:-**This course includes basic concepts of Ecology, Phytogeography and Biogeochemical cycles.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

**Unit1: Introduction to Ecology and related Factors**

Soil:Formation,composition,soilprofile, Precipitation, Types of water and water cycle, Lightandtemperature,Shelford’s law of Tolerance in brief.

**Unit 2: Ecologicaladaptations**

Ecological adaptation of hydrophytes, halophytes andxerophytes.

**Unit 3:Plantcommunities and Phytogeography**

Population Ecology: Basic concept and Characteristics, Biotic potential and growth curve,Community ecology: Concepts, qualitative and quantitative characteristics (including biological spectrum), Phytogeographical regions of India.

**Unit4:Ecosystem and biogeochemical cycles**

Ecosystem: Structure and function (Trophic level, food chain, food web and ecological pyramids),Ecological efficiencies,Biogeochemical cycling: Carbon, Nitrogen and Phosphorous Cycle,Succession: Process and types.

**Suggested Readings:-**

1. Kormondy, E.J.,1996. Concepts of Ecology. Prentice Hall, U.S.A. 4<sup>th</sup>edition.
2. Sharma, P.D., 2010. Ecology and Environment. Rastogi Publications, Meerut, India. 8<sup>th</sup>edition.
3. Odum, E.P., Barrett, G.W., 2005. Fundamental of Ecology. Belmont, CA: Thomson Brooks/Cole. 5<sup>th</sup> edition.
4. Mishra and Kumar, 2017. Concepts of Environmental Science. Rajesh publications, Delhi, India.

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### Paper II-20UBOT202-Plant Systematics

Max Marks: 40  
Internal Assessment: 10  
Time: 3 hours

**Objective:-**This course deals with basic concepts of taxonomy, nomenclature & classification of Angiospermic plants.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### Unit 1: Introduction to Plant Taxonomy

Identification, Classification, Nomenclature, Role of modern tools (Chemotaxonomy, cytotaxonomy and Numerical taxonomy) in relation to taxonomy, Functions of Herbarium, Important herbarium and botanical gardens of India and the world, Taxonomic literature: Flora, Monographs and Journals.

#### Unit 2: Botanical Nomenclature and Classification

Principles and rules (ICBN), Ranks and names, Binominal system, Typification, Author citation, valid publication, Rejection of names, principle of priority and its limitations, Types of classification- Artificial, Natural and Phylogenetic, Bentham and Hooker's Classification (upto order), Engler and Prantl Classification (upto order).

#### Unit 3: Biology and Diversity of Angiosperms-I

Types of inflorescence, Diagnostic features and economic importance of the following families: Ranunculaceae, Brassicaceae, Malvaceae, Euphorbiaceae, Fabaceae, Apiaceae.

#### Unit 4: Biology and Diversity of Angiosperms-II

Diagnostic features and economic importance of the following families: Asclepiadaceae, Lamiaceae, Asteraceae, Solanaceae, Cucurbitaceae, Liliaceae and Poaceae.

#### Suggested Readings:-

1. Stace, C.A., 1989. Plant Taxonomy and Biosystematics. Edward Arnold, London. 2<sup>nd</sup> edition.
2. Radford, A.E., 1986. Fundamentals of Plant Systematics. Harper and Row, New York.
3. Simpson, M.G., 2006. Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.
5. Singh, G., 2012. Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi.



**Paper III-20UBOT203-Botany Lab-II**  
**(Ecology & Phytogeography + Plant Taxonomy)**

**Max Marks: 50**

**Time: 4 hours**

1. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
2. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
3. Study of morphological adaptations of hydrophytes and xerophytes (four each).
4. Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (Orobanche), Epiphytes, Predation (Insectivorous plants)
5. Study of vegetative and floral characters of the following families: *Ranunculaceae*, *Brassicaceae*, *Malvaceae*, *Euphorbiaceae*, *Fabaceae*, *Cucurbitaceae*, *Apiaceae*, *Asclepiadaceae*, *Lamiaceae*, *Solanaceae*, *Asteraceae*, *Liliaceae* and *Poaceae*
6. Description, V.S. flower, T.S. of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification.
7. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label to be submitted in the record book.
8. Describe/Compare the given flower A and B in Semi technical language giving V.S. of flower, T.S. of ovary(ies), floral diagrams, floral formulae and systematic position according to Bentham & Hooker's system of classification.
9. Identify the important characters for Inflorescence & placentation.
10. Field visit and collection records.





**B.Sc. Botany**  
**SEMESTER-III**  
**PAPER CODE: BOT. 3.1**

**Paper -I BIOLOGY AND DIVERSITY OF SEED PLANTS –I**

**Internal Assessment-10**

**Max. Marks - 40**

**Time – 3 hrs.**

**Note : Attempt five questions in all, selecting one question from each unit.  
Question No.1 is compulsory (short answer type).  
Nine questions are to be set spread over the entire syllabus. All  
questions carry equal marks.**

**UNIT-I**

General characters, origin and evolution of Gymnosperms

Geological Time Table; Evolution of Seed Habit.

Pilger and Melchior's (1954) system of classification of Gymnosperms.

**UNIT-II**

Palaeobotany- Fossils and Fossilization (Process involved, types of fossils and importance of fossils);

Reconstruction of the following fossil plants:

*Lyginopteris*

*Williamsonia*

*Cycadeoidea (= Bennettites)*

**UNIT-III**

Morphology and anatomy of root, stem, leaf/leaflet and reproductive parts including mode of reproduction, life-cycle and economic importance of following plants:

*Cycas*

*Pinus*

**UNIT-IV**

Morphology and anatomy of root, stem, leaf/leaflet and reproductive parts including mode of reproduction, life-cycle and economic importance of *Ephedra*

Economic importance of Gymnosperms

General characters, origin and evolution of Angiosperms

**B.Sc. Botany**  
**SEMESTER-III**  
**PAPER CODE: BOT. 3.2**  
**PAPER-II PLANT ANATOMY**

**Internal Assessment-10**  
**Max. Marks - 40**  
**Time – 3 hrs.**

**Note :** Attempt five questions in all, selecting one question from each unit.  
**Question No.1 is compulsory (short answer type).**  
**Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

**UNIT-I**

Tissues - meristematic and permanent (simple, complex and secretory) Tissue systems (Epidermal, ground and vascular)  
The Shoot system - shoot apical meristem and its histological organizations.

**UNIT-II**

Cambium - structure and functions.  
Secondary growth in dicot stem; characteristics of growth rings; sap wood and heart wood, periderm;  
Anomalous secondary growth (*Dracaena*, *Boerhaavia* and *Achyranthes*)

**UNIT-III**

Leaf: Types of leaves (simple and compound); phyllotaxy. Epidermis - uniseriate and tetraseriate, epidermal appendages and their morphological types.  
Anatomy of typical Monocot and Dicot leaf and cell inclusions in leaves, leaf abscission, Stomatal apparatus and their morphological types

**UNIT-IV**

Root system: Root apical meristem; histological organization  
Secondary growth in dicot root.  
Structural modifications in roots: Storage (*Beta*), Respiratory (*Rhizophora*), Epiphytic (*Vanda*).

## PRACTICALS

**B.Sc. II<sup>nd</sup> Botany (Third Semester)**

**Biology & Diversity of Seed Plants-I and Plant Anatomy(Code: P 301)**

**Max. Marks: 50**

**Time : 3Hours**

1. Cut the section of given material A and prepare a double-stained permanent mount of the given material. Identify giving reasons and show it to the examiner. (10)
2. Identify, classify and write morphological notes on the given material/specimens B & C from Gymnosperms. (10)
3. Identify, giving the important characters of identification of the spots/specimen 1 and 2 from Gymnosperms and 3 and 4 from angiosperms (10)
4. Filed visit and collection records. (10)
5. Note-book (5)
6. Viva-voce (5)

### **Suggested Readings**

- Bhatnagar, S. and Moitra, A. 1996. Gymnosperms. New Age International Limited, New Delhi.
- Davis, P.H. and Heywood, V.H. 1963. Principles of Angiosperms Taxonomy, Oliver and Boyd. London.
- Gifford, E.M. and Foster, A.S. 1988. Morphology and Evolution of Vascular Plants, W.H. Freeman & Company, New York.
- Heywood, V.H. and Moore, D.M. (eds) 1984. Current concepts in Plant Taxonomy. Academic Press, London.
- Jeffrey, C. 1982. An introduction to Plant Taxonomy. Cambridge University Press, Cambridge, London.

- Jones, S.B. , Jr. Luchsinger, A.E. 1986. Plants Systematics 2<sup>nd</sup> edition). McGraw Hill Book Co. New York.
- Maheshwari, J.K. 1963. Flora of Delhi, CSIR, New Delhi.
- Radford, A.E. 1986. Fundamentals of Plant Systematics. Harper and Row, New York.
- Singh, G. 1999. Plant Systematics: Theory and Practical. Oxford and IBH Pvt. Ltd., New Delhi.
- Sporn, K.R. 1965. The Morphology of Gymnosperms. Hutchinson & Co. Ltd., London.
- Stace, C.A. 1989. Plant Taxonomy and Biosystematics (2<sup>nd</sup> edition). Edward Arnold, London.
- Steward, W.M. Paleobotany and the Evolution of Plants. Cambridge University Press, Cambridge.

**B.Sc. Botany**

**SEMESTER- IV**

**PAPER CODE: BOT. 4.1**

**PAPER-I BIOLOGY AND DIVERSITY OF SEED PLANTS-II**

**Internal Assessment-10**

**Max. Marks - 40**

**Time – 3 hrs**

**Note: Attempt five questions in all, selecting one question from each unit. Question No.1 is compulsory (short answer type).Nine questions are to be set spread over the entire syllabus. All questions carry equal marks**

**UNIT-I**

Taxonomy and Systematics, fundamental components of taxonomy (identification, classification, description, nomenclature and phylogeny), Role of chemotaxonomy, cytotaxonomy and taximetrics in relation to taxonomy, Botanical Nomenclature, principles and rules, principle of priority, Keys to identification of plants.

**UNIT-II**

Type concept, taxonomic ranks, Salient features of the systems of classification of angiosperms proposed by Bentham & Hooker and Engler & Prantl, Floral Terms and Types of Inflorescence

**UNIT-III**

Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Ranunculaceae, Brassicaceae, Malvaceae, Euphorbiaceae, Rutaceae, Fabaceae, Cucurbitaceae

**UNIT-IV**

Diversity of Flowering Plants: Diagnostic features and economic importance of the families: Apiaceae, Asclepiadaceae, Lamiaceae, Solanaceae, Asteraceae, Liliaceae and Poaceae

**B.Sc. Botany**

**SEMESTER- IV**

**PAPER CODE: BOT. 4.2**

**PAPER-II PLANT EMBRYOLOGY**

**Internal Assessment-**

**10 Max. Marks - 40**

**Time – 3 hrs.**

**Note : Attempt five questions in all, selecting two questions from each unit.**

**Question No.1 is compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

**UNIT-I**

Flower-a modified shoot, Microsporangium, its wall and dehiscence mechanism.

Microsporogenesis, pollen grains and its structure (pollen wall).

**UNIT -II**

Pollen germination (microgametogenesis), Male gametophyte, Pollen-pistil interaction; self incompatibility, Pollination: types and agencies

**UNIT-III**

Structure of Megasporangium (ovule), its curvatures; Megasporogenesis and Megagametogenesis, Female gametophyte (mono, bi and tetrasporic), Double fertilization, Endosperm types and its biological importance.

**UNIT-IV**

Embryogenesis in Dicot and Monocot; Polyembryony, Structure of Dicot and Monocot seed, Fruit types; Dispersal mechanisms in fruits and seeds.



## PRACTICALS

### B.Sc. II<sup>nd</sup> Botany (Fourth Semester)

Max. Marks: 50

Time: 3Hours

- 1 Describe/compare the given flowers A and B in semi-technical language giving V.S. of flowers, T.S. of ovaries, floral diagrams and Floral Formulae. Identify and assign them to their respective families giving reasons. (12)
- 2 Dissect out the globular/heart-shaped embryo from the given material. (10)
- 3 Identify, giving the important characters of identification of the spots 1, 2 and 3 from embryology (9)
- 4 Field visit and collection records. (9)
- 5 Practical records (5)
- 6 Viva-voce (5)

#### Suggested Readings

- Bhojwani, S.S. and Bhatnagar, S.P. 2000. The Embryology of Angiosperms. 4<sup>th</sup> revised and enlarge edition. Vikas Publishing House, Delhi.
- Cutter, E.G. 1969. Plant Anatomy Part-I, Cells and Tissues, Edward Arnold, London.
- Cutter, E.G. 1971. Plant Anatomy: Experiment and Interpretation. Part-II Organs, Edward Arnold London.
- Esau, K. 1977. Anatomy of Seed Plants, 2<sup>nd</sup> edition. John Wiley & Sons, New York.
- Fageri, K and Van der Pijl 1979. The Principles of Pollination Ecology. Pergamon Press, Oxford.
- Fahn, A. 1974. Plant Anatomy, 2<sup>nd</sup> Edition. Pergamon Press, Oxford.
- Hartmann, H.T. and Kestler, D.E. 1976. Plant Propagation; Principles and Practices. 3<sup>rd</sup> edition. Prentice Hall of India Pvt. Ltd. New Delhi
- King. J. 1997. Reaching for the Sun: How Plants Works. Cambridge University Press, Cambridge, U.K.

Mauseth, J.D. 1988. *Plant Anatomy*. The Benjamin/Cummings Publishing Company Inc. Menlo Park, California, USA.

Proctor, M and Yeo, P. 1973. *The Pollination of Flowers*. William Collins Sons, London.

Raven, P.H. Evert, R.F. and Eichhorn, S.E. 1999. *Biology of Plants*. 5<sup>th</sup> edition. W.R. Freeman and Co., Worth Publishers, New York.

Thomas, P. 2000. *Trees: Their Natural History*. Cambridge University Press, Cambridge.

## **B. Sc. III (Botany) Syllabus**

**PAPER CODE: BOT. 5.1**

**SEMESTER-V**

**Paper – I Plant Physiology**

Internal Assessment-  
10 Max. Marks – 40  
Time – 3 hrs.

**Note:** Five questions to be attempted in all, selecting one question from each unit.  
Question No. 1 will be compulsory (short answer type).  
Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

### **UNIT-I**

Plant-water relations: Importance of water to plant life; physical properties of water; imbibition, diffusion and osmosis; absorption and transport of water; transpiration; physiology of stomata.

Mineral nutrition: Essential macro and micro elements and their role; mineral uptake; deficiency symptoms.

### **UNIT -II**

Transport of organic substances: Mechanism of phloem transport; source-sink relationship; factors affecting translocation.

Photosynthesis : significance; historical aspects; photosynthetic pigments; action spectra and enhancement effects; concept of two photosystems; Z-scheme; photo-phosphorylation; Calvin cycle; C4 pathway; CAM plants; photorespiration.

### **UNIT-III**

Growth and development : Definitions; phases of growth and development; seed dormancy; plant movements; the concept of photoperiodism; physiology of flowering; florigen concept; physiology of senescence; fruit ripening;

### **UNIT -IV**

Plant hormones- auxins, gibberellins, cytokinins, abscissic acid and ethylene, history of their discovery, mechanism of action; photo-morphogenesis;

Phytochromes and their discovery, physiological role and mechanism of action.

#### **Suggested Readings:**

1. Dennis, D.T., Turpin, D.H., Lefebvre, D.D. and Layzell (eds.). 1997: Plant Metabolism (2<sup>nd</sup> Edition), Longman, Essex, England.
2. Galston, A.W. 1989: Life Processes in Plants, Scientific American Library, Springer-Verlag, New York, USA.
3. Hopkins, W.G., 1995: Introduction to Plant Physiology, John Wiley & Sons, Inc., New York, USA.
4. Mohr, H. and Schopfer, P. 1995: Plant Physiology. Springer-Verlag, Berlin Germany.

**B. Sc. III (Botany) Syllabus  
SEMESTER-V**

**PAPER CODE: BOT. 5.2**

**Paper - II Ecology**

Internal  
Assessment-10  
Max. Marks – 40  
Time – 3 hrs.

**Note:** Five questions to be attempted in all, selecting two questions from each unit.  
Question No. 1 will be compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

**UNIT-I**

Introduction to Ecology: Definition; scope and importance; levels of organization .  
Environment: Introduction; environmental factors- climatic (water, humidity, wind, light, temperature), edaphic (soil profile, physico-chemical properties), topographic and biotic factors (species interaction).

**UNIT-II**

Adaptations of plants to water stress and salinity (morphological and anatomical features of hydrophytes, xerophytes and halophytes).  
Population ecology: Basic concept; characteristics; biotic potential, growth curves; ecotypes and ecads.

**UNIT-III**

Community ecology: Concepts; characteristics (qualitative and quantitative analytical and synthetic); methods of analysis; ecological succession.  
Ecosystem: Structure (components) and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow)  
Biogeochemical cycles: Carbon, nitrogen, phosphorus and hydrological cycle.

**UNIT-IV**

Phyto-geography: Phyto- geographical regions of India; vegetation types of India (forests). Environmental pollution: Sources, types and control of air and water pollution.  
Global change: Greenhouse effect and greenhouse gases; impacts of global warming; carbon trading; Ozone layer depletion; Biomagnification

**Suggested Readings:**

1. Odum, E.P. 1983: Basic Ecology, Saunders, Philadelphia.
2. Kormondy, E.J. 1996: Concepts of Ecology, Prantice-Hall of India Pvt. Ltd., New Delhi.
3. Mackenzie, A. et al. 1999: Instant Notes in Ecology, Viva Books Pvt. Ltd., New Delhi.

**Semester V**

**Practical**

**Plant Physiology and Ecology (P-501)**

**Max. Marks: 50**

**Time: 3hrs.**

- |   |    |
|---|----|
| 1. Devise an experiment to demonstrate the physiological process (As per list). Perform it and show it to the examiner. | 12 |
| 2. Comment on physiological experiment (Specimen set up/ model/chart).  | 10 |
| 3. Ecological experiment/ecological specimen (As per list)  | 12 |
| 4. Note Book, Collection and field report   | 10 |
| 5. Viva-voce  | 6  |

**B.Sc. Botany**

**SEMESTER-VI**

**PAPER CODE: BOT. 6.1**

**Paper – I Biochemistry and Plant Biotechnology**

**Internal Assessment-10**

**Max. Marks –40**

**Time – 3 hrs**

**Note: Five questions to be attempted in all, selecting two questions from each unit.**

**Question No. 1 will be compulsory (short answer type). Nine questions are to be set**

**spread over the entire syllabus. All questions carry equal marks.**

**UNIT-I**

Basics of Enzymology: Discovery and nomenclature; characteristics of enzymes; concept of holoenzyme, apoenzyme, coenzyme and co-factors; regulation of enzyme activity; mechanism of action.

**UNIT-II**

Respiration: ATP – the biological energy currency; aerobic and anaerobic respiration; Krebs cycle; electron transport mechanism (chemiosmotic theory); redox -potential; oxidative phosphorylation; pentose phosphate pathway.

**UNIT-III**

Lipid metabolism: Structure and functions of lipids; fatty acid biosynthesis;  $\beta$ -oxidation; saturated and unsaturated fatty acids; storage and mobilization of fatty acids.

Nitrogen metabolism: Biology of nitrogen fixation; importance of nitrate reductase and its regulation; ammonium assimilation.

**UNIT-IV**

Genetic engineering and Biotechnology: Tools and techniques of recombinant DNA technology; cloning vectors; genomic and cDNA library; transposable elements; aspects of plant tissue culture; cellular totipotency, differentiation and morphogenesis; biology of *Agrobacterium*; vectors for gene delivery and marker genes.



**Suggested Readings:**

1. Bhojwani, S.S. 1990: Plant Tissue Culture Applications and Limitations. Elsevier Science Publishers, New York, USA.
2. Lea, P.J. and Leegood, R.C. 1999: Plant Biochemistry and Molecular Biology, John Wiley & Sons, Chichester, England.
3. Old, R.W. and Primrose, S.B. 1989: Principles of Gene Manipulation, Blackwell Scientific Publications, Oxford, UK.
4. Raghavan, V. 1986: Embryogenesis in Angiosperms: A Developmental and Experimental Study, Cambridge University Press, New York, USA.

## SEMESTER-VI

PAPER CODE: BOT. 6.2

Paper – II Economic Botany

Internal Assessment-10

Max. Marks – 40

Time – 3 hrs.

Note: Five questions to be attempted in all, selecting two questions from each unit.

Question No. 1 will be compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

### UNIT-I

Vavilov's centres of origin of crop plants, Origin, distribution, botanical description, brief idea of cultivation and economic uses of the following:

Food plants - cereals (rice, wheat and maize), pulses ( gram, arhar and pea),  
vegetables ( potato, tomato and onion).

### UNIT-II

Origin, distribution, botanical description, brief idea of cultivation and economic uses of the following:

Fibers- cotton, jute and flax.

Oils- groundnut, mustard, sunflower and coconut.

### UNIT-III

Morphological description, brief idea of cultivation and economic uses of the following:

Spices- coriander, ferula, ginger, turmeric, cloves.

Medicinal plants- *Cinchona*, *Rauwolfia*, *Atropa*, *Opium*, *Cannabis*, *Azadirachta*, *Withania*.

### UNIT-IV

Botanical description, processing and uses of:

Beverages- tea and coffee;

Rubber - *Hevea*;

Sugar- sugarcane

General account and sources of timber; energy plantations and bio-fuels.

**Semester VI**

**Practical**

**Biochemistry, Biotechnology and Economic Botany (P-601)**

**Max. Marks: 50**

**Time: 3 hrs.**

1. Devise an experiment to test the carbohydrate/protein/fats/peroxidase activity.  
Perform it and show it to the examiner. 10
2. Perform /Comment on Biotechnological experiment 12  
(As per list).
3. Identify and classify spots 1,2,3 & 4 from the point of view of  
economic important and morphology of the plant part used 12
4. Note Book, Collection and field report. 10
5. Viva-voce 6

**Suggested Readings:**

1. Kocchar, S.L. 1998: Economic Botany in Tropics, 2<sup>nd</sup> edition, MacMillan India Ltd., New Delhi.
2. Sambammurthy, A.V.S.S. And Subramanyam, N.S. 1989: A Textbook of Economic Botany, Wiley Eastern Ltd., New Delhi.
3. Sharma, O.P. 1996: Hills Economic Botany (Late Dr. A.F. Hill adapted by O.P. Sharma), Tata McGraw Hill Co. Ltd., New Delhi.
4. Simpson, B.B. and Conner-Ogorzaly, M. 1986: Economic Botany- Plants in Our World, McGraw Hill, New York

# CHAUDHARY BANSI LAL UNIVERSITY, BHIWANI

## Scheme and Syllabi of B.Sc. Program with Computer Science under CBCS (Semester I to VI) (w.e.f. 2021-22)

SEMESTER -I					
Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UCS101	Digital Electronics	Core	4	4	40+10=50
20UCS102	Virtual Lab (Based on 20UCS101)	Core	2	4	40+10=50
20USECCS101	Fundamental of IT	SEC (Compulsory)	2	2	40+10=50
20USECCS106	IT Workshop (Based on 20USECCS101)	SEC (Compulsory)	1	2	40+10=50
SEMESTER -II					
20UCS201	Problem Solving using Computer	Core	4	4	40+10=50
20UCS202	Software Lab using C	Core	2	4	40+10=50
SEMESTER -III					
20UCS301	Data Structure and Algorithms	Core	4	4	40+10=50
20UCS302	Data Structure and Algorithms Lab	Core	2	4	40+10=50
SEMESTER -IV					
20UCS401	Operating Systems	Core	4	4	40+10=50
20UCS402	Operating Systems Lab	Core	2	4	40+10=50
SEMESTER -V					
<b>Choose One:</b>	<b>Choose One:</b>	Discipline Specific Elective	3	3	40+10=50
20UCS501	Database Management Systems				
20UCS502	Discrete Structures				
20UCS503	Internet Technologies				
20UCS504	Artificial Intelligence				
<b>Choose One:</b>	<b>Choose One:</b>	Discipline Specific Elective	3	3	40+10=50
20UCS505	Software Engineering				
20UCS506	Computer Networks				
20UCS507	Computer Architecture & Organization				
SEMESTER -VI					
<b>Choose One:</b>	<b>Choose One:</b>	Discipline	3	3	40+10=50
20UCS601	Data Mining				




20UCS602	Mobile Computing and Applications	Specific Elective			
20UCS603	E-Commerce Technologies				
20UCS604	Object Oriented Programming using C++				
<b>Choose One:</b>	<b>Choose One:</b>	Discipline Specific Elective	3	3	40+10=50
20UCS605	Cloud Computing				
20UCS606	Programming in JAVA				
20UCS607	Management Information Systems				
20UCS608	Project Work/Dissertation				

**Skill Enhancement Courses offered by  
Department of IC&T**

**Scheme of Examination of SEC for B.Sc. with Computer Science under CBCS  
(w.e.f. 2021-22)**

SEMESTER-IV					
<b>Choose One:</b>	Choose One:	Skill Enhancement	3	3	40+10=50
20USECCS401	Office Automation Tools				
20USECCS402	HTML Programming				
20USECCS403	MySQL				
20USECCS404	Multimedia and Applications				
SEMESTER-V					
<b>Choose One:</b>	Choose One:	Skill Enhancement	3	3	40+10=50
20USECCS501	PHP Programming				
20USECCS502	Programming in Visual Basic				
20USECCS503	System Administration and Maintenance				
20USECCS504	Programming in SCILAB				
SEMESTER-VI					
<b>Choose One:</b>	Choose One:	Skill Enhancement	3	3	40+10=50
20USECCS601	Software Testing Concepts				
20USECCS602	Android Programming				
20USECCS603	XML Programming				
20USECCS604	R Programming				



**Syllabi of B.Sc. with Computer Science 1<sup>st</sup> Semester  
(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UCS101	Digital Electronics	Core	4	4	40+10=50
20UCS102	Virtual Lab (Based on 20UCS101)	Core	2	4	40+10=50

**20UCS101  
Digital Electronics**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To review basic electronic concepts
2. To review data representation techniques
3. To introduce student to basic concepts of digital logic
4. To introduce the design of basic logical circuits.

**Unit-I**

Review of Basic Electronics: Diodes – half wave and full wave rectifiers. Zener diode, Zener diode as a voltage regulator, Bipolar Junction Transistors, Transistor configurations- CE characteristics, relation between transistor currents, Transistor biasing methods (CE configuration), small signal CE amplifiers, RC phase shift oscillator, Astable multi-vibrator.

**Unit-II**

Data Representation: Concept of number system bases – binary, decimal and hexadecimal number systems and conversion between each, Binary arithmetic: Addition, subtraction 1s and 2s complement system, multiplication. Codes: BCD, ASCII, Floating point representation.

**Unit-III**

Boolean Algebra: Boolean functions: AND, OR and NOT, NAND, NOR and XOR. Truth tables, Combinational logic in Venn diagrams. Realization of other logic gates using NAND and NOR. Laws of Boolean Algebra, DeMorgan's theorems. Min terms, SOP expressions, Max terms, POS expressions, Karnaugh maps. Flip flops – SR flip flop, JK flip flop, Master Slave, D and T flip flops.

**Unit-IV**

Digital Circuits: Multiplexer, Full and half adders, Subtractors – half and full subtractors, Comparators – 1 bit and 2 bit, Counters, Decoder and display, shift registers, de-multiplexer and keyboard encoder.

**Course Outcomes:** After completion of course, the student will be able to

1. Gain knowledge between different types of number systems, and their conversions.
2. Design various logic gates and simplify Boolean equations.
3. Design various flip flops, shift registers and determining outputs.
4. Design different types of counters.

**Suggested Readings:**

- a) **Text Books:**




1. B L Theraja –Basic Electronics-Chand Publications

**b) Reference Books:**

1. M Morris Mano – Digital Logic and Computer Design-Pearson, 2013
2. Thomas L Floyd –Digital Fundamentals- Pearson, 2013



**Syllabi of B.Sc. with Computer Science 1<sup>st</sup> Semester  
(w.e.f. 2021-22)**

**20UCS102**

**Virtual Lab (Based on 20UCS101)**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Note:** - Every student will maintain practical record of programs done during practical lab in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on the list of practicals as given under. An examinee will be asked to write the programs and run on computer. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

Practical Examination will be conducted externally as per the following distribution of marks:

Writing solutions of problems and executing on the Computer:	20 marks.
Presentation & Viva voce:	10 marks.
Practical record:	10 marks.
Internal Assessment:	10 marks (Attendance=5 marks, Assignment=5 marks)

**List of Practical:**

1. Study of Computer Hardware and Software
2. Creating Email Id
3. Study of components: Identification of resistors, capacitors and inductors
4. Full wave rectifier – ripple factor for different loads
5. Half wave rectifier - ripple factor for different loads
6. R-C coupled CE amplifier
7. R-C phase shift oscillator
8. Verification of truth table of logic gates
9. SR flip flop
10. JK flip flop
11. Half adder
12. Multiplexer
13. Decoder
14. Zener diode characteristics
15. Astable multi-vibrator
16. Diode characteristics (forward and reverse)
17. Transistor characteristics S



**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 1<sup>st</sup> Semester**  
**(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20USECCS101	Fundamental of IT	Skill	2	2	40+10=50
20USECCS106	IT Workshop (Based on 20USECCS101)	Enhancement (Compulsory)	1	2	40+10=50

**20USECCS101**  
**Fundamental of IT**

Maximum Marks-50  
 External Examination-40  
 Internal Assessment-10  
 Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To get the basic concepts of Computers.
2. To get the functional knowledge about PC hardware, operations and concepts.
3. To understand the functional units of a standard PC and it's working.

**Unit-I**

**Computer:** Definition, Block Diagram along with its components, characteristics & classification of computers, Limitations of Computers, Human-Being Vs Computer, Applications of computers in various fields. **Information Technology:** Definition, Scope, Applications, IT Tools.

**Operating System:** Operating System, Types of Operating System, Function of Operating System, Features of Window OS, Types of Software, Proprietary and Open Source Software.

**Unit-II**

Input devices, Output devices, Printers, Memory: Concept of primary & secondary memory, RAM, ROM, types of ROM, Secondary storage devices.

**Overview of Networking:** An introduction to computer networking, Types of Network, Network topologies, Modes of data transmission, Transmission media.

**Unit-III**

**Understanding Word Processing:** Word Processing Basics; Opening and Closing of documents; Saving a document, Menu Bar, Ribbon, Page setup, Formatting Text, Editing, Printing, drawing table, manipulating table, working with graphics, Mail merge, Inserting equation, Word Art, Smart Art, Header and Footer, Track Changes, Macros.

**Working with Presentation:** Basics of presentation software; Opening, Saving, creating a Presentation; Preparation and Presentation of Slides; entering and editing text, Insert and delete slides, adding clip art picture.



## Unit-IV

**Using Spread Sheet:** Basics of Spreadsheet; Elements of spreadsheet, Manipulation of cells, saving workbook, entering data, editing data, formatting worksheet, Formula and Function, Working with Charts and Graphics, Data Validation, Conditional Formatting, Sorting, Filtering, Advance Filter, Page Layout.

**Course Outcomes:** After completion of course, students would be able to understand:

1. Explain principal differences in various operating systems
2. Identify computer systems technical specifications
3. Assemble, disassemble, and configure a computer system.

**Suggested Readings:**

**a) Text Books:**

1. Gill, Nasib S.: Essentials of Computer and Network Technology, Khanna Book Publishing Co., New Delhi.
2. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.

**b) Reference Books:**

1. Chhillar, Rajender S.: Application of IT in Business, Ramesh Publishers, Jaipur.
2. Donald Sanders: Computers Today, McGraw-Hill Publishers.
3. Davis: Introduction to Computers, McGraw-Hill Publishers.



**Skill Enhancement Course**  
**Syllabi of B.Sc. with Computer Science 1<sup>st</sup> Semester**  
**(w.e.f. 2021-22)**

**20USECCS106**  
**IT Workshop (Based on 20USECCS101)**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Note:** - Every student will maintain practical record of programs done during practical lab in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on the list of practicals as given under. An examinee will be asked to write the programs and run on computer. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

Practical Examination will be conducted externally as per the following distribution of marks:

Writing solutions of problems and executing on the Computer:	20 marks.
Presentation & Viva voce:	10 marks.
Practical record:	10 marks.
Internal Assessment:	10 marks (Attendance=5 marks, Assignment=5 marks)

**List of Practical:**

1. Create a document in MS Word and apply formatting on text.
2. Create a list of 10 best friends. Use Mail Merge feature of MS-WORD to create a Thank You letter for each of your friends from the above two files.
3. Write a macro that is run using the shortcut Ctrl+F for formatting the files.
4. Create a Microsoft word document with the following contents of format?
5. -Insert a table giving number of theory and practical sessions per block.
6. -Demonstrate the Auto Text feature of MS-WORD.
7. Create a document using header footer.
8. Create an Excel Workbook and write all the steps to done with following instructions.
  - a) Save this file with name Myexcelfile.
  - b) Rename sheet1 with another name: Example.
  - c) How to use conditional formatting? Give at least three names of conditional formatting.
9. Create a table of student's data with marks and calculate total marks of all students, percentage of marks of all subjects of any student.
10. Create a power point presentation with name my ppt. Write the steps for following questions:
  - a) Insert a movie clip in slide1.
  - b) Insert an audio clip in slide2.
  - c) Insert a table with five rows and six columns in slide3.
  - d) Insert a chart in slide4 .
  - e) Insert two shapes in a slide and group those shapes.



**Syllabi of B.Sc. with Computer Science 2<sup>nd</sup> Semester  
(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UCS201	Problem Solving using Computer	Core	4	4	40+10=50
20UCS202	Software Lab using C	Core	2	4	40+10=50

**20UCS201  
Problem Solving using Computer**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To expose students to algorithmic thinking and algorithmic representations.
2. To introduce students to basic data types and control structures in C.
3. To introduce students to structured programming concepts.
4. To introduce students to standard library functions in C language.

**Unit-I**

**Computer Fundamentals:** Introduction to Computers: Characteristics of Computers, uses of computers, Types and generations of Computers, Block Diagram of Computer, Input/output Device.

**Planning the Computer Program:** Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.

**Unit-II**

**Techniques of Problem Solving:** Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

**Overview of Programming:** Programming Logic Using 'C', C Fundamentals: Introduction to C, C-Character set, Data types, Constants, Variables, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).

**Unit-III**

Input –Output Statement: I/O Functions, % Format Specifiers

Control Statement: Control Loops, Conditional Execution and Nesting of Loops and Conditional Statements.

Function: Defining, Accessing and Passing Arguments to a Function, Function Prototypes, Recursion.

**Unit-IV**




Arrays and Strings: Single and Multidimensional Arrays, Introduction to Strings, String processing. Pointer, Structure and Union: Understanding Pointers, Pointer and Arrays, Pointer to Function, Defining and processing structures, Pointer and Structures, Concepts of Union.

**Course Outcomes:** After completion of course, the students will be able to

1. Design an algorithmic solution to a problem using problem decomposition and step-wise refinement.
2. Implement program solution to an algorithm or design specification.
3. Learn the concepts of C Language.

**Suggested Readings:**

**a) Text Books:**

1. Sinha, P. K., Sinha, Priti, 2007. Computer Fundamentals. BPB Publications, New Delhi.
2. Balaguruswamy, E., 2017. Programming in C. Tata McGraw Hill, New Delhi.
3. Kanetkar, Y., 2016. Let us C. BPB Publication, New Delhi.

**b) Reference Books:**

1. Kernighan, W.B. and Dennis R., 2015. The C Programming Language, Pearson Publications, New Delhi.
2. Goel, A., 2010. Computer Fundamentals. Pearson Education.
3. Forouzan, B., Gilberg A., and Richard, F., 2007. Structured programming approach using C, Cengage learning, 2007

**Syllabi of B.Sc. with Computer Science 2<sup>nd</sup> Semester  
(w.e.f. 2021-22)**

**20UCS202  
Software Lab using C**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Note:** - Every student will maintain practical record of programs done during practical lab in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on problem solving techniques/algorithm using C Language. An examinee will be asked to write the programs and run on computer. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

Practical Examination will be conducted externally as per the following distribution of marks:

Writing solutions of problems and executing on the Computer:	20 marks.
Presentation & Viva voce:	10 marks.
Practical record:	10 marks.
Internal Assessment:	10 marks (Attendance=5 marks, Assignment=5 marks)

List of Practicals:

1. WAP to find the largest of n natural numbers.
2. WAP to find whether a given number is prime or not.
3. WAP to display a Fibonacci series.
4. WAP to compute Factorial of a number
5. WAP to check whether a given number is odd or even.
6. WAP to print the sum and product of digits of an Integer and reverse the Integer.
7. WAP to check whether a given string is palindrome or not.
8. WAP to check whether a character is VOWEL or CONSONANT with basic operation using switch.
9. Write a program to print all uppercase alphabets using while loop.
10. Write a program to print tables from numbers 2 to 20.
11. Write a program to create an array of 10 integers and find nearest lesser and greater element in an array.
12. Write a program to input N numbers in an array and print out the Armstrong numbers from the set.
13. Write a program to create, initialize, assign and access a pointer variable.
14. Write a program to swap two number using functions.
15. Write a program of simple interest using structure and union.
16. Write a program for the following string operations:
  - a. Compare two strings
  - b. Concatenate two strings
  - c. Compute length of a string



**Syllabi of B.Sc. with Computer Science 3<sup>rd</sup> Semester  
(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UCS301	Data Structure and Algorithms	Core	4	4	40+10=50
20UCS302	Data Structure and Algorithms Lab	Core	2	4	40+10=50

**20UCS301  
Data Structures and Algorithms**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Be able to analyze the complexity of algorithms
2. Be able to select good algorithms from among multiple solutions for a problem.
3. Have better knowledge on fundamental strategies of algorithm design and awareness on complex algorithm design strategies.
4. Implement some typical algorithms

**Unit-I**

Introduction to Data Structures, Arrays.

**Searching Techniques:** Linear and Binary Search.

**Sorting Techniques:** Elementary sorting Techniques-Bubble Sort, Insertion Sort, Merge Sort, Advanced Sorting Techniques-Heap Sort, Quick Sort, Sorting in Linear Time-Bucket Sort, Radix Sort and Count Sort, Recursion.

**Unit-II**

**Stacks:** Implementing stack using array and linked list, Prefix, Infix and Postfix expressions, Utility and conversion of these expressions from one to another; **Queues:** Array and Linked representation of Queue, De-queue, Priority Queues

**Unit-III**

**Linked Lists:** Singly, Doubly and Circular Lists, representation of Stack and Queue as Linked Lists. **Trees:** Introduction to Tree as a data structure: Binary Trees, Binary Search Tree, (Creation, and Traversals of Binary Search Trees).

**Unit-IV**

**Introduction:** Basic Design and Analysis techniques of Algorithms, Correctness of Algorithm  
**Algorithm Design Techniques:** Iterative techniques, Divide and Conquer, Dynamic Programming, Greedy Algorithms.  
**Complexity Analysis:** Medians & Order Statistics.

**Course Outcomes:** After completion of course, students would be able to:

1. Analyze the algorithms to determine the time and computation complexity and justify the correctness.
2. Implement given Search problem (Linear Search and Binary Search).
3. For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
4. Write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.
5. Implement Graph search and traversal algorithms and determine the time and computation complexity.

**Suggested Readings: -**

**a) Text Book:**

1. Sahni, S., 2011. Data Structures: Algorithms and applications in C++, Second Edition, Universities Press.
2. Tenenbaum, Aaron M., Augenstein M. J., Langsam, Yedidyah, 2009. Data Structures Using C and C++, Second edition, PHI, New Delhi.

**b) Reference Books:**

1. Cormen, T.H., Leiserson, Charles E., Rivest, Ronald L., 2009. Introduction to Algorithms, PHI, New Delhi.
2. Sarabasse & Gelder, A.V., 1999. Computer Algorithm—Introduction to Design and Analysis, Pearson Publications, 3rd Edition.
3. Drozdek, A., 2012. Data Structures and algorithm in C++, Third Edition, Cengage Learning.
4. Kruse, Robert L., 1999. Data Structures and Program Design in C++, Prentice Hall.
5. Malik, D.S., 2010. Data Structure using C++, Second edition, Cengage Learning.



**Syllabi of B.Sc. with Computer Science 3<sup>rd</sup> Semester  
(w.e.f. 2021-22)**

**20UCS302**

**Data Structure and Algorithms**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Note:** - Every student will maintain practical record of programs done during practical lab in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on the list of practicals as given under. An examinee will be asked to write the programs and run on computer. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

Practical Examination will be conducted externally as per the following distribution of marks:

Writing solutions of problems and executing on the Computer:	20 marks.
Presentation & Viva voce:	10 marks.
Practical record:	10 marks.
Internal Assessment:	10 marks (Attendance=5 marks, Assignment=5 marks)

**List of Practical:**

1. Implement Insertion Sort (The program should report the number of comparisons)
2. Implement Merge Sort (The program should report the number of comparisons)
3. Implement Heap Sort (The program should report the number of comparisons)
4. Implement Randomized Quick sort (The program should report the number of comparisons)
5. Implement Radix Sort.
6. Implement Searching Techniques
7. Implementation of Recursive function.
8. Array and Linked list implementation of Stack and Queue.
9. Implementation of Single, Double and circular Linked List
10. Creation and traversal of Binary Search Tree.



**Syllabi of B.Sc. with Computer Science 4<sup>th</sup> Semester  
(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UCS401	Operating Systems	Core	4	4	40+10=50
20UCS402	Operating Systems Lab	Core	2	4	40+10=50

**20UCS401  
Operating Systems**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Fundamental concepts of systems software and functions of operating systems as a resource manager
2. Strategies for constrained resource allocation and process scheduling
3. Memory and I/O Management techniques
4. Salient features of popular operating systems

**Unit-I**

**Introduction:** System Software, Resource Abstraction, OS strategies.

**Types of operating systems** - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.

**Unit-II**

**Operating System Organization:** Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs.

**Process Management:** System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy.

**Unit-III**

**Thread model Scheduling:** Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies. **File System:** Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms.

**Memory Management:** Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory




#### Unit-IV

Shell Scripting: Introduction, types of shell, editors in linux, vi editor, modes of operation in vi editor; Shell scripting: writing and executing the shell script, Shell variable (user defined and system variables), System calls, Using system calls, Pipes and Filters, Decision making in Shell Scripts (If else, switch), Loops in shell, Functions, Utility programs (cut, paste, join, tr, uniq utilities), Pattern matching utility (grep).

**Course Outcomes:** After completion of course, students would be able to:

1. Understanding basic operating system fundamentals
2. Know how an operating system can be used as a service
3. Learn Linux programming concepts
4. Have a foundation stone to understand operating systems working.

#### Suggested Readings: -

##### a) Text Books:

1. Silberschatz, A., Galvin, P.B., Gagne, G., 2008. Operating Systems Concepts, 8<sup>th</sup> Edition, John Wiley Publications.

##### b) Reference Books:

1. Tanenbaum, A.S., 2007. Modern Operating Systems, 3<sup>rd</sup> Edition, Pearson Education.
2. Nutt, G., 1997. Operating Systems: A Modern Perspective, 2<sup>nd</sup> Edition Pearson Education.
3. Stallings, W., 2008. Operating Systems, Internals & Design Principles, 5<sup>th</sup> Edition, Prentice Hall of India.
4. Milenkovic, M., 1992. Operating Systems- Concepts and design, Tata McGraw Hill.

**Syllabi of B.Sc. with Computer Science 4<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS402  
Operating Systems Lab**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Note:** - Every student will maintain practical record of programs done during practical lab in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on the list of practicals as given under. An examinee will be asked to write the programs and run on computer. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

Practical Examination will be conducted externally as per the following distribution of marks:

Writing solutions of problems and executing on the Computer:	20 marks.
Presentation & Viva voce:	10 marks.
Practical record:	10 marks.
Internal Assessment:	10 marks (Attendance=5 marks, Assignment=5 marks)

**List of Practical:**

1. Usage of commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.
2. Usage of commands: cal, cat(append), cat(concatenate), mv, cp, man, date.
3. Usage of commands: chmod, grep, tput (clear, highlight), bc.
4. Write a shell script to check if the number entered at the command line is prime or not.
5. Write a shell script to modify "cal" command to display calendars of the specified months.
6. Write a shell script to modify "cal" command to display calendars of the specified range of months.
7. Write a shell script to accept a login name. If not a valid login name display message – "Entered login name is invalid".
8. Write a shell script to display date in the mm/dd/yy format.
9. Write a shell script to display on the screen sorted output of "who" command along with the total number of users.
10. Write a shell script to display the multiplication table any number,
11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.
12. Write a shell script to find the sum of digits of a given number.
13. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.
14. Write a shell script to find the LCD (least common divisor) of two numbers.
15. Write a shell script to perform the tasks of basic calculator.
16. Write a shell script to find the power of a given number.
17. Write a shell script to find the factorial of a given number.
18. Write a shell script to check whether the number is Armstrong or not.





**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester  
(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
<b>Choose One:</b>	<b>Choose One:</b>	Discipline Specific Elective	3	3	40+10=50
20UCS501	Database Management Systems				
20UCS502	Discrete Structures				
20UCS503	Internet Technologies				
20UCS504	Artificial Intelligence				
<b>Choose One:</b>	<b>Choose One:</b>	Discipline Specific Elective	3	3	40+10=50
20UCS505	Software Engineering				
20UCS506	Computer Networks				
20UCS507	Computer Architecture & Organization				

**20UCS501  
Database Management Systems**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Be aware of basic concepts of data bases and data base management systems
2. Be aware of concepts of relational data bases.
3. Know to normalize relational data bases
4. Skilled in using relational algebra and relational calculus
5. Develop skills to write database queries

**Unit-I**

**Database system architecture:** Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML).

**Data models:** Entity-relationship model, network model, relational and object oriented data models, integrity constraints, data manipulation operations.

**Unit-II**

**Relational query languages:** Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server.

**Relational database design:** Domain and data dependency, Armstrong's axioms, Normal forms, Dependency preservation, Lossless design.

**UNIT III**

**Transaction processing:** Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery.

**Query processing and optimization:** Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.

#### UNIT IV

**Database Security:** Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection.

**Advanced topics:** Object oriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining.

**Course Outcomes:** After completion of course, students would be able to understand:

1. For a given query write relational algebra expressions for that query and optimize the developed expressions.
2. For a given specification of the requirement design the databases using E-R method and normalization.
3. For a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.
4. Implement the isolation property, including locking, time stamping based on concurrency control and serializability of scheduling.

**Suggested Readings: -**

**a) Text Books:**

1. Silberschatz A., Korth H. F. and Sudarshan S, Database System Concepts, 6th Edition, McGraw-Hill.
2. Elmasri R. and Navathe S., Fundamentals of Database Systems, 5th Edition, Pearson Education.

**b) Reference Books:**

1. Ullman J. D., Principles of Database and Knowledge-Base Systems, Vol 1, Computer Science Press.
2. Abiteboul S., Hull R. and Vianu V., Foundations of Databases, Addison-Wesley.

**Note:** - Every student has to practice the following list of practicals on the PC in the Computer Lab. The Examiner may ask questions in the final theory examinations based on the list of given practicals.

**List of Practical:**

1. Create table, alter table, drop table
2. Select, update, delete, insert statements
3. Condition specification using Boolean and comparison operators (and, or, not, =, <>, <, >, <=, >=)
4. Arithmetic operators and aggregate functions (Count, sum, avg, Min, Max)
5. Multiple table queries (join on different and same tables)
6. Nested select statements
7. Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union, intersect, minus, etc.)
8. Categorization using group by
9. Arranging using order by



**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS502**

**Discrete Structures**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Note:** *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To introduce proof methods in mathematics and mathematical logic
2. To review concepts and techniques of set theory, relations and functions
3. To introduce various algebraic structures
4. To introduce graph theory
5. To develop an excitement in mathematics by highlighting its hidden beauty and significance

**Unit-I**

**Introduction:** Introduction to Sets, Finite and Infinite Sets, Unaccountably Infinite Sets. Introduction to Functions and relations, Properties of Binary relations, Closure, Partial Ordering Relations.

**Unit-II**

Pigeonhole Principle, Permutation and Combinations, Mathematical Induction, Principle of Inclusion and Exclusion.

**Unit-III**

Asymptotic Notations, Recurrence Relations: Introduction, Generating Functions, Linear Recurrence Relations with constant coefficients and their solution; **Inference Theory:** Introduction, Logical Connectives, Well Formed Formulas, Tautologies, Equivalence.

**Unit-IV**

**Graphs Theory:** Basic Terminology of Graphs, Models and Types, Multigraphs, Weighted Graphs, Graph Representation. Graph Isomorphism Graph Connectivity, Euler and Hamiltonian Paths and Circuits, Planar Graphs, Graph Coloring, Basic Terminology of Trees, Properties of Trees, Spanning Trees.

**Course Outcome:** After completion of course, students would be able to:

1. Learn the basic notions of Sets, Relation and Functions.
2. Study the methods of Pigeonhole Principle, Permutations and Combinations.
3. Implement the concept of Graph Theory.

**Suggested Readings:**

**a) Text Books:**

1. Liu C. L. and Mohapatra D. P., 2008. Elements of Discrete Mathematics, 3<sup>rd</sup> Edition, Tata McGraw Hill.

**b) Reference Books:**

1. Rosen K., 2007. Discrete Mathematics and its Applications, 6<sup>th</sup> Edition, Tata McGraw Hill.



2. Cormen T. H., Leiserson C. E. and Rivest R. L., 2010. Introduction to Algorithms, 3<sup>rd</sup> Edition, Prentice Hall of India.
3. Trembley J. P. and Manohar R., 2001. Discrete Mathematical Structures with Application to Computer Science, First Edition, Tata McGraw Hill.
4. Gries D. and Schneider F. B., 2010. A Logical Approach to Discrete Math, Springer.



**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester  
(w.e.f. 2021-22)**

20UCS503

**Internet Technologies**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To impart basic skills in moderately complex use of the following tools/scripts/languages: HTML, DHTML, Perl, CSS, JavaScript.
2. To impart necessary ability to choose the appropriate web tools/languages for creating state-of-the-art websites.
3. To Expose students to current trends and styles in web design and applications.

**Unit-I**

**Introduction to Web Design:** Introduction to hypertext markup language (html) document type definition, creating web pages, graphical elements, lists, hyperlinks, tables, web forms, inserting images, frames.

**Customized Features:** Cascading style sheets, (CSS) for text formatting and other manipulations.

**Unit-II**

**JavaScript:** Data types, operators, functions, control structures, events and event handling.

**Java:** Use of Objects, Array and Array List class, Designing classes, Inheritance, Input/Output, Exception Handling.

**Unit-III**

**JDBC:** JDBC Fundamentals, Establishing Connectivity and working with connection interface, working with statements, Creating and Executing SQL Statements, Working with Result Set Objects.

**Unit-IV**

**JSP:** Introduction to JavaServer Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

**Course Outcomes:** After completion of course, students would be able to understand:

1. The client side and server side scripts used in programming
2. The basic concept of designing websites
3. Database connectivity with the web pages

**Suggested Readings:**

**a) Text Book:**

1. Schildt H., 2009. Java 7-The Complete Reference, 8th Edition.

2. Jain V. K., Advanced Programming in Web Design, Cyber Tech Publications.

**b) Reference Book:**

1. Bayross I., 2009. Web Enabled Commercial Application Development Using Html, Dhtml, JavaScript, Perl CGI, BPB Publications.
2. Horstmann C., 2009. BIG JAVA, 3rd Edition, Wiley Publication.
3. Keogh J., 2002. The Complete Reference J2EE, TMH.
4. Bergsten H., 2003. Java Server Pages, Third Edition, O'Reilly Media.



**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS504  
Artificial Intelligence**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To introduce the notion of machine intelligence.
2. To introduce the Symbolic processing paradigm of AI.
3. To introduce Knowledge representation formalism.
4. To introduce basic concepts and challenges of Speech and Language Processing.
5. To introduce basic concepts and challenges of Expert Systems.

**Unit-I**

Overview of Artificial Intelligence: What is AI, The importance of AI; Knowledge: Introduction, Definition and Importance of knowledge, Knowledge-Based Systems, Representation of Knowledge, Knowledge Organization, Knowledge Manipulation, Acquisition of Knowledge.

**Unit-II**

Formalized Symbolic Logics: Introduction, Syntax and Semantics for Propositional Logic and FOPL, Properties of Wffs, Conversion to Clausal Form, Inference Rules, The Resolution Principle; Structured Knowledge: Associative Networks, Frame Structures, Conceptual Dependencies and Scripts.

**Unit-III**

Search and Control Strategies: Preliminary concepts, Examples of Search Problems, Uniformed or blind Search, Informed Search, Searching And-Or graphs; Matching Techniques: Introduction, Structures Used in Matching, Measures for Matching, Partial Matching, The RETE Matching Algorithm.

**Unit-IV**

Natural Language Processing: Introduction, Overview of Linguistics, Grammars and Languages, Basic Parsing Techniques, Semantic Analysis and Representation Structures, Natural Language Generation, Natural Language Systems; Expert Systems: Introduction, Rule Based System Architecture, Knowledge Acquisition and Validation, Knowledge System Building Tools.

**Course Outcomes:** After completion of course, students would be able to:

1. Apply the basic principles, models, and algorithms of AI to recognize, model, and solve problems in the analysis and design of information systems.
2. Analyse the structures and algorithms of a selection of techniques related to searching, reasoning, machine learning, and language processing.

**Suggested Readings:**

**a) Text Books:**

1. Introduction to ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS, DAN W. PATTERSON, PHI Learning 2014.

**b) Reference Books:**

2. Artificial Intelligence, Third Edition, Elaine Rich, Kevin Knight, Shivashankar B Nair, McGraw Hill Education (India) PVT LTD





**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS505  
Software Engineering**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Understand the importance of basic processes in software Development life cycle.
2. Understand the various activities incorporate with different models and know their significance.
3. Familiarize the requirements in engineering and systematic approach in classical software design and development techniques.
4. Familiarize with various software testing techniques and tools.

**Unit-I**

**Software Process:** Introduction, S/W Engineering Paradigm, life cycle models (water fall, incremental, spiral, evolutionary, prototyping, object oriented), System engineering, computer based system, verification, validation, life cycle process, development process.

**Software requirements:** Functional and non-functional, user, system, requirement engineering process, requirements, elicitation, validation and management, software prototyping, prototyping in the software process, rapid prototyping techniques, user interface prototyping, S/W document. Analysis and modeling, data, functional and behavioral models, structured analysis and data dictionary.

**Unit-II**

**Design Concepts and Principles:** Design process and concepts, modular design, design model and document, Architectural design, software architecture, data design, architectural design, transform and transaction mapping, user interface design, user interface design principles. Real time systems, Real time software design, system design, real time executives, data acquisition system, monitoring and control system.

**Unit-III**

**Software Project Management:** Measures and measurements, S/W complexity and science measure, size measure, data and logic structure measure, information flow measure. Estimations for Software Projects, Empirical Estimation Models, Project Scheduling.

**Unit-IV**

**Testing:** Taxonomy of software testing, levels, test activities, types of s/w test, black box testing testing boundary conditions, structural testing, test coverage criteria based on data flow, mechanisms, regression testing, testing in the large. S/W testing strategies, strategic approach and issues, unit testing, integration testing, validation testing, system testing and debugging.



**Course Outcomes:** After completion of course, students would be able to understand:

1. The software engineering practice over the entire system lifecycle.
2. Requirement engineering, analysis, prototyping, design, implementation, testing, maintenance activities and management of risks involved in software and embedded systems.

**Suggested Readings:**

**a) Text Books:**

1. Pressman R. S., Software Engineering- A Practitioner's Approach, McGraw-Hill
2. Jalote P., 1997. An Integrated Approach to Software Engineering, Springer Verlag.

**b) Reference Books:**

1. Sommerville I., 2000. Software engineering, 6th edition, Pearson education Asia.
2. Peters J. F. and Pedryez W., 2000. Software Engineering – An Engineering Approach, John Wiley and Sons, New Delhi.
3. Behforooz A. and Hudson F. J., 1996. Software Engineering Fundamentals, Oxford University Press, New Delhi.
4. Pfleeger, 1999. Software Engineering, Pearson Education India, New Delhi.
5. Ghezzi C, Jazayari M. and Mandrioli D., 1991. Fundamentals of Software Engineering, Prentice Hall of India, New Delhi.



**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS506  
Computer Networks**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. The basic transmission technologies and characteristics
2. The use of layer architecture for networking systems
3. The main design issues of transport protocols and the mechanism to control traffic flow and congestion.

**Unit-I**

**Basic concepts:** Components of data communication, standards and organizations, Network Classification, Network Topologies; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.

**Unit-II**

**Physical Layer:** Cabling, Network Interface Card, Transmission Media Devices- Repeater, Hub, Bridge, Switch, Router, Gateway; **Data Link Layer:** Framing techniques; Error Control; Flow Control Protocols; Shared media protocols - CSMA/CD and CSMA/CA.

**Unit-III**

**Network Layer:** Virtual Circuits and Datagram approach, IP addressing methods – Subnetting; Routing Algorithms (adaptive and non-adaptive)

**Transport Layer:** Transport services, Transport Layer protocol of TCP and UDP

**Unit-IV**

**Application Layer:** Application layer protocols and services – Domain name system, HTTP, WWW, telnet, FTP, SMTP

**Network Security:** Cryptography Common Terms, Firewalls, Virtual Private Networks.

**Course Outcomes:** After completion of course, students would be able to understand:

1. Fundamental of Computer Networks
2. Basic Networking Protocols
3. Detailed understanding of various layers in OSI and TCP/IP reference models.

**Suggested Readings:**

**a) Text Books:**

1. Forouzan B. A., 2007. Data Communication and Networking, 4th Edition, Tata McGraw Hill.

**b) Reference Books**

1. Comer D. E., 1998. Internetworking with TCP/IP, Vol. I, Prentice Hall of India.
2. Stalling W., 2006. Data & Computer Communication, 8th edition, Prentice Hall of India.
3. Bertsekas D. and Gallager R., 1992. Data Networks, 2nd edition, Prentice Hall of India.



**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS507**

**Computer Architecture & Organization**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To get the basic concepts of Computers.
2. To get the functional knowledge about PC hardware, operations and concepts.
3. To understand the functional units of a standard PC and its working.
4. To understand the memory organization in a computer.

**Unit-I**

Characteristics of Computer; Von Neumann model; Inside a Computer: SMPS, Motherboard, BIOS, CMOS, Ports and Interfaces, Expansion Cards, Ribbon Cables, ASCII; Types of Input Devices, Types of Output Devices.

**Unit-II**

Memory Representation, Hierarchy, Memory Units: RAM (SRAM, DRAM); ROM; Secondary Storage Devices: Magnetic Tape, Magnetic Disk, Types of Magnetic Disks, Optical Disk, Types of Optical Disks; USB: Pen drive, External Hard Disk; Memory Stick; CPU Registers, Cache Memory, Operations in Cache memory, hit ratio; Virtual Memory.

**Unit-III**

Instruction Format; Instruction Cycle: Fetch Cycle, Execution Cycle; Instruction Set: CISC Architecture, RISC Architecture, Comparison; Memory Chips; Pipelining and Parallel Processing; Microprogrammed Control and Hardwired Control.

**Unit-IV**

Input/Output Organization: Asynchronous Data Transfer, Programmed I/O (concepts only); Interrupts: Types of interrupts, processing interrupts, interrupt hardware and priority, DMA: DMA Controller, DMA Transfer Modes; I/O Processor.

**Course Outcomes:** After completion of course, students would be able to understand:

1. Concepts of Logic gates, flip flops and counter
2. Concept of Computer Architecture
3. Pipeline processing
4. RISC and CISC architectures
5. Develop a base for advance micro-processors

**Suggested Readings:**

**a) Text Books:**

1. Introduction to Information Technology, 2nd Edition, ITL Education Solutions Limited, Pearson.
2. John D.Carpinelli, Computer systems Organization & Architecture, Pearson Education.

**b) Reference Books:**

1. E.Balaguruswamy, Fundamentals of Computers, McGraw hill, 2014
2. Carl Hamacher, Vranesic, Zaky, Computer Organization 4th Edition, McGraw-Hill





**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester  
(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
<b>Choose One:</b>	<b>Choose One:</b>	Discipline Specific Elective	3	3	40+10=50
20UCS601	Data Mining				
20UCS602	Mobile Computing and Applications				
20UCS603	E-Commerce Technologies				
20UCS604	Object Oriented Programming using C++				
<b>Choose One:</b>	<b>Choose One:</b>	Discipline Specific Elective	3	3	40+10=50
20UCS605	Cloud Computing				
20UCS606	Programming in JAVA & Lab (Credit: 2+1)				
20UCS607	Management Information Systems				
20UCS608	Project Work/Dissertation				

**20UCS601  
Data Mining**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To get an understanding of the general properties of data in large databases
2. Understand a variety of real-world applications that require data mining
3. How to discover useful patterns and associations in huge quantities of data

**Unit-I**

**Data Warehousing:** Introduction- Definition and description, need for data ware housing, need for strategic information, failures of past decision support systems, OLTP vs DWH-DWH requirements-trends in DWH-Application of DWH.

**Unit-II**

**Data Warehousing Architecture:** Reference architecture- Components of reference Architecture- Data warehouse building blocks, implementation, physical design process and DWH deployment process. A Multidimensional Data, Model Data Warehouse Architecture.

**Unit-III**

**Data Mining:** Data mining tasks-Data mining vs KDD- Issues in data mining, Data Mining metrics, Data mining architecture - Data cleaning- Data transformation- Data reduction - Data mining primitives.

**Association Rule Mining:** Introduction - Mining single dimensional Boolean association rules from transactional databases - Mining multi-dimensional association rules.

#### Unit-IV

**Classification and Prediction:** Classification Techniques - Issues regarding classification and prediction-decision tree - Bayesian classification -Classifier accuracy - Clustering - Clustering Methods - Outlier analysis.

**Applications and Other Data Mining Methods:** Distributed and parallel Data Mining Algorithms, Text mining- Web mining.

**Course Outcomes:** After completion of course, students would be able to understand:

1. Different Data Mining techniques on the pre-processed data set for extracting hidden patterns from data.
2. Data mining algorithms to solve real world problems.
3. Different data mining techniques like classification, prediction, clustering, etc.

#### Suggested Readings:

##### a) Text Books:

1. Han J. and Kamber M., 2006. Data Mining Concepts and Techniques, Morgan Kaufmann Publishers, USA.
2. Berson, 2004. Data Warehousing, Data Mining and OLAP, Tata McGraw Hill Ltd, New Delhi.

##### b) Reference Books:

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education.
2. Pujari A. K., 2003. Data mining techniques, Oxford University Press, London.
3. Dunham M. H., 2003. Data mining: Introductory and Advanced Topics. Pearson Education, New Delhi.
4. Kantardzic M., 2003. Data Mining Concepts, Methods and Algorithms, John Wiley and Sons, USA.
5. Soman K. P., Diwakar S. and Ajay V., 2006. Insight into Data mining: Theory and Practice. PHI.

**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester  
(w.e.f. 2021-22)**

20UCS602  
Mobile Computing and Applications

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To understand the basic concepts of Mobile Computing.
2. To learn the basics of mobile telecommunication.
3. Exposure to Ad-Hoc networks.

**Unit-I**

**Event Driven Programming:** UI event loop, Threading for background tasks, Outlets/actions, delegation, notification, Model View Controller (MVC) design pattern.

**Mobile application issues:** limited resources (memory, display, network, file system), input/output (multi-touch and gestures), sensors (camera, compass, accelerometer, GPS)

**Unit-II**

**Development tools:** Apple iOS toolchain: Objective-C, Xcode IDE, Interface Builder, Device simulator.

**Frameworks:** Objective-C and Foundation Frameworks, Cocoa Touch, UIKit, Others: Core Graphics, Core Animation, Core Location and Maps, Basic Interaction.

**Unit-III**

**Common UI's for mobile devices:** Navigation Controllers, Tab Bars, Table Views, Modal views, UI Layout. **Data Persistence:** Maintaining state between application invocations, File system, Property Lists, SQLite, Core Data

**Unit-IV**

**Remote Data-Storage and Communication:** Back End/server side of application, RESTful programming, HTTP get, post, put, delete, database design, server side JavaScript / JSON.

**Code signing:** security, Keychain, Developers and App Store License Agreement.

**Course Outcomes:** After completion of course, students would be able to understand:

1. concepts and features of mobile computing technologies and applications.

2. underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support.
3. The important issues of developing mobile computing systems and applications;
4. organize and manage software built for deployment and demonstration.

**Suggested Readings:**

**a) Text Books:**

1. Pattnaik P. K. and Mall R., 2012. Fundamentals of Mobile Computing, PHI Learning Pvt. Ltd., New Delhi.

**b) Reference Books:**

1. Ramnath R., Crawfis R. and Sivilotti P., 2011. Android SDK 3 for Dummies, Wiley.
2. Lee V., Schneider H. and Schell R., 2004. Mobile Applications: Architecture, Design, and Development, Prentice Hall.
3. Fling B., 2009. Mobile Design and Development, O'Reilly Media.
4. Firtman, 2010. Programming the Mobile Web, O'Reilly Media.
5. Crumlish C. and Malone E., 2009. Designing Social Interfaces, O'Reilly Media.





**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS603  
E-Commerce Technologies**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To study the concepts of E-commerce Online transactions.
2. To learn the e-commerce transactions by making it Safe and Secure.
3. Learning of Safe and secure solutions in the payment method.

**Unit-I**

**An introduction to Electronic commerce:** What is E-Commerce (Introduction and Definition), Main activities E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of E-Commerce, Electronic Commerce Applications, Electronic Commerce and Electronic Business (C2C, C2G, G2G, B2G, B2P, B2A, P2P, B2A, C2A, B2B, B2C)

**Unit-II**

**The Internet and WWW:** Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.), Types of Network, Internet Service Provider, World Wide Web, Internet & Extranet, Role of Internet in B2B Application, building own website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Exchange, Shopping Bots

**Unit-III**

**Internet Security:** Secure Transaction, Privacy on Internet, Computer Crime, Threats, Attack on Computer System, Computer Virus.

**Electronic Data Exchange:** Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model, Electronic Payment System: Introduction, Types of Electronic Payment System, Payment Types, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash

**Unit-IV**

**Planning for Electronic Commerce:** Planning Electronic Commerce initiates, linking objectives to business strategies, measuring cost objectives, comparing benefits to Costs, Strategies for developing electronic commerce web sites

**Internet Marketing:** The PROS and CONS of online shopping, Justify an Internet business, Internet



marketing techniques, The E-cycle of Internet marketing, Personalization e-commerce.

**Course Outcomes:** After completion of course, students would be able to understand:

1. To understand the complexity of e-commerce and its many facets.
2. To explore how e-business and e-commerce fit together.
3. To identify the impact of e-commerce.
4. To recognise the benefits and limitations of e-commerce.
5. To use classification frameworks for analysing e-commerce

**Suggested Readings:**

**a) Text Books:**

4. G.S.V. Murthy, 2011. E-Commerce Concepts, Models, Strategies, Himalaya Publishing House.

**b) Reference Books:**

1. Kamlesh K Bajaj and Debjani Nag, 2005. E- Commerce.
2. Gray P. Schneider, 2011. Electronic commerce, International Student Edition.
3. Chan H., Lee R., Dillon T. and Chang E., 2011. E-Commerce, Fundamentals and Applications, Wiley Student Edition.



**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS604**

**Object Oriented Programming using C++**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

Objectives:

1. To understand how C++ improves C with object-oriented features.
2. To learn how to write inline functions for efficiency and performance.
3. To learn the syntax and semantics of the C++ programming language.
4. To learn how to design C++ classes for code reuse.

**Unit-I**

Introduction to object oriented programming: Procedural vs. Object oriented programming, Characteristics of OOP: Objects, classes, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic Binding, and Message Passing. Structure of C++ program: Data-types, Variables, Static Variables, Operators in C++, Arrays, Strings, Structure, Functions, Recursion, Control Statements.

**Unit-II**

Introduction to Class: Class Definition, Classes and Objects, Access Specifiers: Private, Public and Protected, Member functions of the class, Constructor and Destructor, Parameterized Constructor, Copy Constructors. Inheritance: Reusability, Types of Inheritance: Single inheritance, Multiple, Multilevel, Hybrid Inheritance, Public, Private, and Protected Derivations, Constructor and destructor in derived class, Object initialization and conversion, Nested classes.

**Unit-III**

Polymorphism: Function Overloading, Static Class Members, Static Member Functions, Friend Functions, Operator Overloading: Unary and Binary Operator Overloading. Abstract class, Virtual function, Pure virtual function, Overloading vs. Overriding. Memory management: new, delete, object Creation at Run Time, This Pointer. Exception handling: Throwing, Catching, Re-throwing an exception, specifying exceptions, processing unexpected exceptions, Exceptions when handling exceptions.

**Unit-IV**

Templates: Introduction, Class templates and Function templates, Overloading of template function, namespaces. Introduction to STL: Standard Template Library: benefits of STL, containers, adapters, iterator, vector, list. Working with files: C++ streams, C++ stream classes, creating, opening, closing and deleting files, file pointers and their manipulators, Error handling during file operations.

**Course Outcomes:** After completion of course, students would be able to understand:

1. Difference between the top-down and bottom-up approach.
2. Concepts of Object Oriented Programming.
3. Object-oriented programming approach in connection with C++.
4. Data file manipulations using C++.
5. Virtual and pure virtual function and Complex programming situations.

**Suggested Readings:**

**a) Text Books:**

1. Schildt H., C++ - The Complete Reference, Tata McGraw Hill Publications.
2. Balaguruswamy E., Object Oriented Programming and C++, TMH.

**b) Reference Books:**

1. Balaguruswamy E., C++, Tata McGraw Hill Publications.
2. Shah and Thakker: Programming in C++, ISTE/EXCEL.
3. Johnston: C++ Programming Today, PHI.



**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS605  
Cloud Computing**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To introduce the broad perceptive of cloud architecture & model.
2. To explore the fundamental concepts of big data analytics.
3. To introduce basics of edge computing and application.
4. How problems solved using soft computing.

**Unit-I**

**Cloud Introduction:** Cloud Computing Fundamentals: Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing usage scenarios and Applications, Business models around Cloud- Major Players in Cloud Computing - Issues in Cloud - Eucalyptus - Nimbus - Open Nebula, CloudSim.

**Unit-II**

**Cloud Services and File System:** Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service – Communication as services. Service providers- Google App Engine, Amazon EC2, Microsoft Azure, Sales force. Introduction to MapReduce, GFS, HDFS, Hadoop Framework.

**Unit-III**

**Collaborating with Cloud:** Collaborating on Calendars, Schedules and Task Management- Collaborating on Event Management, Contact Management, Project Management – Collaborating on Word Processing, Databases – Storing and Sharing Files- Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Collaborating via Social Networks – Collaborating via Blogs and Wikis. 185 CS-Engg&Tech-SRM-2013

**Unit-IV**

**Virtualization for Cloud:** Need for Virtualization-Pros and cons of Virtualization-0Types of Virtualization-System Vm, Process VM, Virtual Machine monitor-Virtual machine Properties- Interpretation and binary translation, HLL VM - Hypervisors – Xen, KVM, VMWare, Virtual Box, Hyper-V. **Security, Standards, And Applications:** Security in Clouds: Cloud security challenges. Common Standards: The Open Cloud Consortium.



**Course Outcomes:** After completion of course, students would be able to understand:

1. The core concepts of the cloud computing paradigm;
2. Various models and services in cloud computing
3. System virtualization and outline its role in enabling the cloud computing system model.
5. Fundamental concepts of cloud storage and demonstrate their use in storage systems.
6. Analyze various cloud programming models and apply them to solve problems on the cloud

**Suggested Readings:**

**a) Text Books:**

1. Bloor R., Kanfman M., Halper F. and Hurwitz J., 2010. Cloud Computing, Wiley India Edition

**b) Reference Books:**

1. Rittinghouse J. & Ransome J., 2010. Cloud Computing Implementation Management and Strategy, CRC Press.
2. Velte A. T., 2009. Cloud Computing: A Practical Approach, McGraw Hill.
3. Miller M., 2008. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing.
4. Smith J. E. and Nair R., 2006. Virtual Machines, Morgan Kaufmann Publishers.

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**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS606  
Programming in JAVA**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Students will learn to install and work with JDK, also make them aware the use of java doc.
2. Students will practice basic data types, operators and control structures in Java
3. Practice basic handling of classes and objects in Java
4. Introduce the following selected APIs: I/O, Strings, Threads, AWT, Applet, Networking
5. Idea to approach and use a new package

**Unit-I**

**Introduction to Java:** Features of Java, JDK Environment; **Java Programming Fundamental:** Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch), Looping (for, while), Type Casting; **Object Oriented Programming Concept:** Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA.

**Unit-II**

**Classes and Objects:** Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes

**Unit-III**

**Arrays and Strings:** Arrays, Creating an array, Types of Arrays, String class Methods, String Buffer methods.

**Abstract Class, Interface and Packages:** Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, creating user defined packages

**Unit-IV**

**Exception Handling:** Exception types, using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions; **File Handling:** Byte Stream, Character Stream, File IO Basics, File Operations, creating file, reading file, Writing File; **Applet Programming:** Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag.

**Course Outcomes:** After completion of course, students would be able to understand:

1. Concepts of Object Oriented Programming (OOPS).
2. Classes and Objects in JAVA.
3. Concepts of Exceptional Handling

**Suggested Readings:**

**a) Text Book:**

1. Schildt, H., 2009. Java 7, 8<sup>th</sup> Edition, The Complete Reference.

**b) Reference Books:**

1. Horstmann, C., 2009. BIG Java, 3<sup>rd</sup> Edition Wiley Publication.
2. Balagurusamy, E., 2007. Programming with JAVA, TMH.

**Note:** - Every student has to practice the following list of practicals on the PC in the Computer Lab. The Examiner may ask questions in the final theory examinations based on the list of given practicals.

**List of Practical:**

1. Simple programs to demonstrate the syntax and use of the following features of the language: basic data types, operators and control structures.
2. Program related to Class definitions and usage involving variety of constructors and finalizers
3. Programs involving various kinds of inheritances,
4. Program involving Method Over-riding, Method Over-loading
5. Program involving Abstract Class and Methods
6. Program involving Interface,
7. Program to demonstrate creation and handling of packages, their imports and Class Path.
8. Programs involving a variety of Exception Handling situations
9. Program to define a class that generates Exceptions and using objects of the class.
10. Program involving creating and handling threads in applications and applets.
11. Programs to demonstrate methods of various i/o classes
13. Programs to demonstrate methods of string class
14. Program to demonstrate AWT/Swing graphic methods
15. Program for Loading and Viewing Images, Loading and Playing Sound
16. Programs to demonstrate various Layouts
17. Programs to demonstrate event handling.



**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS607  
Management Information System**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Note:** *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

This course will equip students with skills to analysis information requirements for managerial decision making.

**Unit-I**

Data and Information. MIS- need and concepts, factors influencing MIS and characteristics of MIS. Technology of MIS. Structure of MIS. Decision Making and role of MIS. Data communication. Basic H/W required, Channel features and concept of Distributed Databases Decision Support System: Overview, components and classification, steps in constructing a DSS, role in business, group decision support system.

**Unit-II**

Information system for strategic advantage, strategic role for information system, breaking business barriers, business process reengineering, improving business qualities.

**Unit-III**

Planning for MIS; System Development Methodologies; Conceptual and detailed designs of MIS. Information system analysis and design, information SDLC, hardware and software acquisition, system testing, documentation and its tools, conversion methods.

**Unit-IV**

System implementation Strategies and process; System Evaluation and Maintenance. Applications – cross-functional MIWS; ERP; CRM; SCM; Transaction Processing; Artificial Intelligence technologies in business: neural network, fuzzy logic, virtual reality; Executive information system.

**Course Outcomes:** After completion of course, students would be able to understand:

1. Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.
2. Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.
3. Effectively communicate strategic alternatives to facilitate decision making.

**Suggested Readings:**

**a) Text Books:**

1. Brien, James, Management Information System, Tata McGraw Hill, Delhi.
2. Stair, Principles of Management System, Thomson Learning, Bombay.

**b) Reference Books:**

1. Jawadekar, Management Information Systems, TMH, N Delhi.
2. Mckeown, Information Technology and the Networked Economy, Thomson Learning, Bombay.
3. Brady, Cases in MIS, Thomson Learning, Bombay.
4. Murdick & Ross, Management Information System, PHI, Delhi.
5. Kanter, J., Management Information System, PHI, Delhi.





**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester  
(w.e.f. 2021-22)**

**20UCS608  
Project Work/Dissertation**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Instructions regarding Project Work/Dissertation:**

- This option is to be offered only in 6<sup>th</sup> Semester.
- The students will be allowed to work on any project based on the concepts studied in core/elective or skill based elective courses.
- The group size should be maximum of three (03) students.
- Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes.
- A maximum of Four (04) projects would be assigned to one teacher.
- Theory classes will cover project management techniques.



**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 4<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
<b>Choose One:</b>	<b>Choose One:</b>	Skill Enhancement	3	3	40+10=50
20USECCS401	Office Automation Tools				
20USECCS402	HTML Programming				
20USECCS403	MySQL				
20USECCS404	Multimedia and Applications				

**20USECCS401**  
**Office Automation Tools**

Maximum Marks-50  
 External Examination-40  
 Internal Assessment-10  
 Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Students will learn the concept of MS Office.
2. To learn and practice some of the IT tools i.e. MS Word, MS Excel and MS PowerPoint.

**Unit-I**

Introduction to open office/MS office/Libre office, features, properties and applications.

**Unit-II**

**Word Processing:** Formatting Text, Pages, Lists, Tables, Graphics, Inserting Videos, Mail Merge.

**Unit-III**

**Spreadsheets:** Worksheets, formatting data, creating charts and graphs, using formulas and functions, macros, Pivot Table.

**Unit-IV**

**Presentation Tools:** Adding and formatting text, pictures, graphic objects, including charts, objects, formatting slides, notes, hand-outs, slide shows, using transitions, animations.

**Course Outcomes:** After completion of course, students would be able to:

1. perform documentation
2. perform accounting operations
3. perform presentation skills

**Suggested Readings:**

**a) Text Book:**

1. Madan S., 2009. Introduction to Essential tools, JBA.
2. Goel A., 2012. Computer Fundamentals, Pearson.

**b) Reference Books:**

1. Kumar A., 2011. Computer Basics with Office Automation, I K International Publishing House Pvt. Ltd.
2. Schwartz S., 2013. Microsoft Office 2013: Visual Quick Start Guide, 1<sup>st</sup> Edition, Pearson Education.

**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 4<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

20USECCS402  
HTML Programming

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To impart basic skills in moderately complex use of the following tools/scripts/languages: HTML, DHTML, Perl, CSS, JavaScript.
2. To impart necessary ability to choose the appropriate web tools/languages for creating state-of-the-art websites.
3. To Expose students to current trends and styles in web design and applications.

**Unit-I**

Introduction, The Basics, The Head, the Body, Colors, Attributes, basic formatting tags - heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image. Attributes - align, color, bgcolor, font face, border, size. Lists - ordered, unordered and definition, Table tag,

**Unit-II**

Navigation Links using anchor tag - internal, external, mail and image links, Relative Links, Absolute Links, Link Attributes, Using the ID Attribute to Link Within a Document.

**Unit-III**

Images: Putting an Image on a Page, Using Images as Links, Putting an Image in the Background  
Tables: Creating a Table, Table Headers, Captions, Spanning Multiple Columns, Styling Table.

**Unit-IV**

Forms: Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, where to Go from Here, HTML Form controls - form, text, password, text area, button, checkbox, radio button, select box, hidden controls.

**Course Outcomes:** After completion of course, students would be able to:

1. Use knowledge of HTML and CSS code and an HTML editor to create personal and/or business websites following current professional and/or industry standards.
2. Use critical thinking skills to design and create websites.
3. Use a stand-alone FTP program to upload files to a web server.

**Suggested Readings:**

**a) Text Books:**

1. Introduction to HTML and CSS -- O'Reilly, 2010

**b) Reference Books:**

1. Duckettm J., 2012. HTML and CSS, John Wiley.
2. Gill N. S., Essentials of Computer and Network Technology, Khanna Books Publishing Co., New Delhi.
3. Young M. L., Internet – The Complete Reference.
4. Hahn H., The Internet – Complete Reference, TMH.



**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 4<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

20USECCS403  
MySQL

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To impart basic skills in moderately complex use of the following tools/ scripts/ languages.
2. To choose the appropriate web tools/languages for creating state-of-the art web sites.
3. To expose students to current trends and styles in web design and applications.

**Unit-I**

SQL Vs. SQL \* Plus: SQL Commands and Data types, Operators and Expressions, Introduction to SQL \* Plus. Managing Tables and Data: Creating and Altering Tables (Including constraints).

**Unit-II**

Data Manipulation Command like Insert, update, delete, SELECT statement with WHERE, GROUP BY and HAVING, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL BETWEEN, EXISTS, LIKE.

**Unit-III**

Join, Built in functions, Other Database Objects: View, Synonyms, Index.  
Transaction Control Statements: Commit, Rollback, Savepoint.

**Unit-IV**

Introduction to PL/SQL: SQL v/s PL/SQL, PL/SQL Block Structure, Language construct of PL/SQL (Variables, Basic and Composite Data type, Conditions looping etc.), % TYPE and % ROWTYPE, Using Cursor (Implicit, Explicit).

**Course Outcomes:** After completion of course, students would be able to:

1. Establish a basic understanding of the analysis and design of a database.
2. Establish a basic understanding of the process of Database Development and Administration using SQL.
3. Enhance Programming and Software Engineering skills and techniques using SQL.
4. Establish a basic understanding of background materials needed for technical support using SQL.

**Suggested Readings:**

a) Text Books:





1. Schwartz B., 2012. High Performance MySQL, O'Reilly.
2. Ullman L., 2014. PHP and MySQL for Dynamic Web Sites: Visual QuickPro Guide, 4<sup>th</sup> Edition, Pearson Education India.

**b) Reference Books:**

1. Vaswani V., 2004. The Complete Reference MySQL, McGraw Hill Educations.
2. Welling L. and Thomson L., 2016. PHP and MySQL Web Development, 5<sup>th</sup> Edition, Pearson Education.

**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 4<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

20USECCS404  
Multimedia and Applications

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

Objectives:

1. Study of features of text, audio, images, video and active contents.
2. Familiar with the file formats for the above elements.
3. Aware of various application softwares used to process the above elements.
4. Aware of various applications of multimedia.

**Unit-I**

**Multimedia:** Introduction to multimedia, Components, Uses of multimedia.

**Making Multimedia:** Stages of a multimedia project, Requirements to make good multimedia, Multimedia Hardware- Macintosh and Windows production Platforms, Hardware peripherals- Connections, Memory and storage devices, Multimedia software and Authoring tools.

**Unit-II**

**Text:** Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext.

**Sound:** Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats.

**Unit-III**

**Images:** Still Images – Bitmaps, Vector Drawing, 3D Drawing & rendering, Natural Light & Colors, Computerized Colors, Color Palletes, Image File Formats.

**Unit-IV**

**Video:** How Video Works, Analog Video, Digital Video, Video File Formats, Video Shooting and Editing.

**Animation:** Principle of Animations. Animation Techniques, Animation File Formats.

**Course Outcomes:** After completion of course, students would be able to:

1. Identify and describe the function of the general skill sets in the multimedia industry.
2. Identify the basic components of a multimedia project.
3. Identify the basic hardware and software requirements for multimedia development and playback.

**Suggested Readings:**

a) **Text Books:**

1. Steinmetz R. and Naharstedt K., 1995. Multimedia: Computing, Communications

Applications, Pearson.

**b) Reference Books:**

1. Vaughan T., 2006. Multimedia: Making it work, Eighth edition, TMH.
2. Keyes, 2000. Multimedia Handbook, TMH.
3. Andleigh K. and Thakkar K., 2000. Multimedia System Design, PHI.



**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
<b>Choose One:</b>	Choose One:	Skill Enhancement	3	3	40+10=50
20USECCS501	PHP Programming				
20USECCS502	Programming in Visual Basic				
20USECCS503	System Administration and Maintenance				
20USECCS504	Programming in SCILAB				

**20USECCS501**  
**PHP Programming**

Maximum Marks-50  
 External Examination-40  
 Internal Assessment-10  
 Max. Time- 3 hrs.

**Note:** *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To impart basic skills in moderately complex use of the following tools/ scripts/ languages:
2. To choose the appropriate web tools/languages for creating state-of-the art web sites.

**Unit-I**

PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.), PHP with other technologies, scope of PHP, Basic Syntax, PHP variables and constants, Types of data in PHP, Expressions, scopes of a variable (local, global), PHP Operators: Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operator, PHP operator Precedence and associativity

**Unit-II**

Handling HTML form with PHP: Capturing Form Data, GET and POST form methods, dealing with multi value fields, Redirecting a form after submission.

PHP conditional events and Loops: PHP IF Else conditional statements (Nested IF and Else), Switch case, while, For and Do While Loop, Goto, Break, Continue and exit.

**Unit-III**

PHP Functions: Function, Need of Function, declaration and calling of a function, PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference  
 Scope of Function: Global and Local.

Array: Creating index based and Associative array, accessing array, looping with Index based array, with associative array using each () and foreach (), Some useful Library function.

#### Unit-IV

String Manipulation and Regular Expression: Creating and accessing String, Searching & Replacing String, Formatting, joining and splitting String, String Related Library functions, Use and advantage of regular expression over inbuilt function, Use of preg\_match(), preg\_replace(), preg\_split() functions in regular expression.

**Course Outcomes:** After completion of course, students would be able to:

1. Write PHP scripts to handle HTML forms.
2. Write regular expressions including modifiers, operators, and metacharacters.
3. Create PHP programs that use various PHP library functions, and that manipulate files and directories.
4. Analyze and solve various database tasks using the PHP language.
5. Analyze and solve common Web application tasks by writing PHP programs.

#### **Suggested Readings:**

##### **a) Text Books:**

1. Learning PHP, MySQL, books by 'O' riley Press.
2. Beighley L. and Morrison M., 2009. Head First PHP & MySQL, 1<sup>st</sup> Edition, O'Reilly Press.

##### **b) Reference Books:**

1. Yank K., 2012. PHP & MySQL-Novice to Ninja, 5<sup>th</sup> Edition, SitePoint.
2. Forbes A., 2012. The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL, 6<sup>th</sup> Edition, BeakCheck LLC.
3. Vasvani V., 2008. PHP: A Beginner's Guide, McGraw-Hill Education.



**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

**20USECCS502**

**Programming in Visual Basic**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Students will be able to analyze program requirements of Visual Basic
2. Design/develop programs with GUI interfaces
3. Code programs and develop interface using Visual Basic .Net
4. Perform tests, resolve defects and revise existing code

**Unit-I**

**GUI Environment:** Introduction to graphical user interface (GUI), programming language (procedural, object oriented, event driven), the GUI environment, compiling, debugging, and running the programs.

**Operations:** Data types, constants, named & intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data.

**Unit-II**

**Controls:** Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls.

**Unit-III**

**Decision Making:** If statement, comparing strings, compound conditions (and, or, not), nested if statements, case structure, using if statements with option buttons & check boxes, displaying message in message box, testing whether input is valid or not.

**Unit-IV**

**Forms Handling:** Multiple forms creating, adding, removing forms in project, hide, show method, load, unload statement, me keyword, referring to objects on a different form. Database connectivity with the form.

**Iteration Handling:** Do/loops, for/next loops, using msgbox function. Using string function.

**Course Outcomes:** After completion of course, students would be able to:

1. Explain basic concepts and definitions of Visual Basic
2. Express constants and arithmetic operations.

3. Distinguish variable and data types.
4. Students code visual programs by using Visual Basic work environment.
5. Students prepare various projects by helping visual programming.

**Suggested Readings:**

**a) Text Books:**

1. Bradley J. C. and Millispangh A. C., 2000. Programming in Visual Basic 6.0, Tata McGraw Hill Edition.

**b) Reference Books:**

1. Hoisington C., 2017. Microsoft Visual Basic 2017 for Windows, Web, and Database Applications: Comprehensive, 1st Edition, Cengage Learning.
2. Schneider D.I., 2019. Introduction to Programming Using Visual Basic, 11th Edition, Pearson.
3. McGrath M., 2019. Visual Basic in easy steps, 6th Edition.

**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

**20USECCS503**

**System Administration and Maintenance**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Explain the internal working of the system.
2. Discuss the principles of assemblers and narrate the working of loaders and linkers.
3. Discuss system development tools
4. Learn the concept of Linux and Windows systems.

**Unit-I**

Basics of operating system, services, Installation and configuration, maintenance.

**Linux/Unix:** What is Linux/Unix Operating systems, Kernel, API, C.I.I, GUI, Difference between Linux/Unix and other operating systems, Features and Architecture, Linux features, advantages, disadvantages.

**Unit-II**

**Linux Systems:** Booting and Shutting Down processes, Rootly Powers, Controlling Processes, The File System, Adding New Users, Periodic Processes, Syslog and Log Files.

**Unit-III**

**Windows:** Windows as operating system, history, versions, PC hardware, BIOS, Devices and drivers, Kernal Configuration and building, Application installation, configuration and maintenance, Server services and Client services, Difference between Windows XP/windows 7 and windows server 2003/2008.

**Unit-IV**

**Windows Systems:** Maintenance Strategies and Administrative Practices, Basics of Data Backup and Restore, Understanding and configuring Active Directory Domain services, Creating Active Directory groups, Organizational Units, and Sites, adding client computers and member servers to the domain, deploying group policy and network access, Working with network shares and the distributed file system.

**Course Outcomes:** After completion of course, students would be able to:

1. Explain how a modern Unix-based system is constructed.
2. rapidly locate, evaluate and structure information in standards, technical documentation and professional literature to create solutions to new problems.
3. design, implement and maintain a computer system suitable for a small office or company.
4. test and troubleshoot services and other functionality in a small computer system.

### Suggested Readings:

#### a) Text Books:

1. Bragg R., Windows Server 2003 Security: A Technical Reference. Addison-Wesley.
2. Nemeth E., Snyder G. and Hein T. R., Linux Administration Handbook, Second Edition, Prentice Hall.

#### b) Reference Books:

1. Nemeth E., Snyder G., Hein T. R., Whaley B. and Mackin D., 2019. Unix and Linux Handbook, 5<sup>th</sup> Edition, Pearson Education.
2. Colling T. and Wall K., 2005. Red Hat Linux Networking & System Administration, 3<sup>rd</sup> Edition, Wiley.

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**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 5<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

**20USECCS04**  
**Programming in SCILAB**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Students will learn about the SCILAB and their applications.
2. Studying of Plotting and Mathematical computations.

**Unit-I**

Introduction to Programming: Components of a computer, working with numbers, Machine code, Software hierarchy.

Programming Environment: SCILAB Environment, Workspace, Working Directory, Expressions, Constants, Variables and assignment statement, Arrays.

**Unit-II**

Graph Plots: Basic plotting, built in functions, generating waveforms, Sound replay, load and save. Matrices and Some Simple Matrix Operations, Sub- Matrices.

**Unit-III**

Procedures and Functions: Arguments and return values.

Control Statements: Conditional statements: If, Else, Else-if, Repetition statements: While, for loop.

**Unit-IV**

Manipulating Text: Writing to a text file, reading from a text file, Randomizing and sorting a list, searching a list.

**Course Outcomes:** After completion of course, students would be able to understand:

1. about SCILAB software environment.
2. the basics of SCILAB software and its data class.
3. basic SCILAB programming for engineering application.
4. SCILAB Simulink for simulation, analysis and design of the system.

**Suggested Readings:**

**a) Text Books:**

1. Ramchandran H. and Nair A. S., 2011. SCILAB, S. Chand.
2. Goyal R. and Aggarwal M., 2019. Programming in SCILAB, Alpha Science International Ltd.

**b) Reference Books:**

1. Affouf M., 2012. SCILAB by Example, Create Space Independent Publishing Platform.
2. Nagar S., 2017. Introduction to Scilab: For Engineers and Scientists, 1<sup>st</sup> Edition, APRESS.



**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
Choose One:	Choose One:	Skill Enhancement	3	3	40+10=50
20USECCS601	Software Testing Concepts				
20USECCS602	Android Programming				
20USECCS603	XML Programming				
20USECCS604	R Programming				

**20USECCS601**  
**Software Testing Concepts**

Maximum Marks-50  
 External Examination-40  
 Internal Assessment-10  
 Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Discuss the basic concept of testing.
2. Explain the different types of testing.
3. Describe the tools used for testing

**Unit-I**

**Software Testing:** Basics of software testing, Strategic Approach to Software Testing, Testing objectives, Test Strategies for Conventional Software, Principles of testing, Testing and debugging, Test metrics and measurements, STLC, Verification, Validation, Software Quality and Reliability, V Shaped Software Lifecycle Model.

**Unit-II**

Functional and non-functional Testing; system testing, recovery testing, security testing, stress testing, performance testing, usability testing, White box testing, static testing, static analysis tools.

**Unit-III**

Structural testing: Unit/Code functional testing, Code coverage testing, Code complexity testing, Black Box testing, Requirements based testing, Boundary value analysis, Equivalence partitioning, state/graph based testing, Scenario Testing, Alpha, Beta and Acceptance Testing: Acceptance criteria; test cases selection and execution, Decision Table Based Testing.

**Unit-IV**

Basis Path Testing: Program Graph, DD Path graph, Cyclomatic Complexity, Graph Matrices, Control

Flow Testing: Statement Coverage, Branch Coverage, Condition Coverage, Path Coverage.

**Course Outcomes:** After completion of course, students would be able to:

1. apply software testing knowledge and testing methods.
2. design and conduct a software test process for a software testing project.
3. identify the needs of software test automation, and define and develop a test tool to support test automation.

**Suggested Readings:**

**a) Text Book:**

1. Pressman R. S., 2009. Software Engineering: A Practitioner's Approach, 7<sup>th</sup> Edition, McGraw Hill Education.

**b) Reference Books:**

1. Singh Y., 2011. Software Testing, Cambridge University Press.
2. Dyer M., The Cleanroom approach to Quality Software Engineering, Wiley & Sons.
3. Jalote P., An Integrated Approach to Software Engineering, Narosa Publications.



**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

**20USECCS602**  
**Android Programming**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time-3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Students will be able to understand concepts of Android Programming.
2. Learn to develop an App based on Android.

**Unit-I**

**Introduction:** History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture.

**Unit-II**

**Overview of object oriented programming using Java:** OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

**User Interface Architecture:** Application context, intents, Activity life cycle, multiple screen sizes.

**Unit-III**

**Development Tools:** Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a android project – Hello Word, run on emulator, Deploy it on USB-connected Android device.

**Unit-IV**

**User Interface Design:** Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, and Dialog.

**Database:** Understanding of SQLite database, connecting with the database.

**Course Outcomes:** After completion of course, students would be able to:

1. Install and configure Android application development tools.
2. Design and develop user Interfaces for the Android platform.
3. Save state information across important operating system events.
4. Apply Java programming concepts to Android application development.

**Suggested Readings:**

**a) Text Books:**

1. Sheusi J. C., 2013. Android application development for Java Programmers, Cengage Learning.

2. Phillips B., Stewart C., Marsicano K. and Gardner B., 2019. Android Programming: The Big Nerd Ranch Guide, 4<sup>th</sup> Edition, Big Nerd Ranch Guides.

**b) Reference Books:**

1. Griffiths D., 2017. Head First Android Development: A Brain-Friendly Guide, 2nd Edition, O'Reilly Media.

2. Murach J., 2015. Murach's Android Programming, 2nd Edition, Mike Murach & Associates.

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**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

**20USECCS603**

**XML Programming**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Students will be able to learn the concepts of XML and its programming.
2. To learn about the web services and business system using XML.

**Unit-I**

**XML Programming:** Introduction, The Need for XML, Structured Data and Formatting, Advantages of XML, SGML, XML, and HTML, World Wide Web Consortium (W3C) Specifications and Grammars, XML Applications and Tools, Creating and Viewing XML Documents, Transforming XML Documents, XML Document Syntax, Validating XML Documents with DTDs, XML Namespaces.

**Unit-II**

Transforming XML Documents with XSLT and XPath, Formatting XML Documents with XSL-FO, Purpose of XSL Formatting Objects (XSL-FO), XSL-FO Documents and XSL-FO Processors, XSL-FO Namespace, Page Format Specifiers, Page Content Specifiers. Validating XML Documents with Schemas, Introduction to Simple Object Access Protocol (SOAP), SOAP's Use of XML and Schemas, Elements of a SOAP Message, Sending and Receiving SOAP Messages (SOAP Clients and Receivers), Handling SOAP Faults, Current SOAP Implementations.

**Unit-III**

**Introduction to Web Services:** Architecture and Advantages of Web Services, Purpose of Web Services Description Language (WSDL), WSDL Elements, Creating and Examining WSDL Files, Overview of Universal Description, Discovery, and Integration (UDDI), UDDI Registries (Public and Private), Core UDDI Elements, Deploying and Consuming Web Services, ebXML Specifications ebXML Registry and Repository, Introduction to the XML Document Object Model (XMLDOM)

**Unit-IV**

**XML applications:** B2B Scenarios, e-business system involved: delivery, sales, cross company communication: replacement for EDI, the document as the application, XML and relational databases, XML and dynamic Web publishing, benefits of XML schemas to applications, XML processors enforcing structure, application access to document structure, fixed values, channels.

**Course Outcomes:** After completion of course, students would be able to:

1. Learn the basics of creating XML documents.



2. Transform XML documents and validate XML documents.
3. Learn the basics and history of XML and how to write your own XML documents.

**Suggested Readings:**

**a) Text Books:**

1. Pardi W. J., 1999. XML in action Web Technology, Microsoft Press.
2. Young M. J., 2002. Step by Step XML, Microsoft Press.

**b) Reference Books:**

1. Mcgrath M., 2012. XML in easy steps, 2<sup>nd</sup> Edition, McGraw Hill Education.
2. Williamson H., 2001. XML: The Complete Reference, McGraw Hill Education.

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**Skill Enhancement Courses**  
**Syllabi of B.Sc. with Computer Science 6<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

**20USECCS604**  
**R Programming**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. Students will be able to understand the concept of R Programming.
2. To study Simulation and various Models in R.

**Unit - I**

**Introduction to R:** R Sessions and Functions, Basic Math, Variables, Data Types, Vectors, Conclusion, Advanced Data Structures, Strings, Data Frames, Lists, Matrices, Arrays, Classes, R Programming Structures, Control Statements, Loops, Looping Over Nonvector Sets- If-Else, Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values, Functions are Objective, No Pointers in R, Recursion.

**Unit - II**

**Doing Math and Simulation in R:** Math Function, Extended Example Calculating Probability-Cumulative Sums and Products-Minima and Maxima-Calculus, Functions for Statistical Distribution, Sorting, Linear Algebra Operation on Vectors and Matrices, Set Operation, Input /output, Accessing the Keyboard and Monitor, Reading and writer Files.

**Unit - III**

**Graphics:** Creating Graphs, The Workhorse of R Base Graphics, the plot() Function Customizing Graphs, Saving Graphs to Files, Probability Distributions, Normal Distribution, Binomial Distribution, Poisson Distributions Other Distribution, Basic Statistics, Correlation and Covariance, T-Tests, ANOVA Test

**Unit - IV**

**Linear Models:** Simple Linear Regression, -Multiple Regression Generalized Linear Models, Logistic Regression, - Poisson Regression- other Generalized Linear Models-Survival Analysis, Nonlinear Models, Splines- Decision- Random Forests.

**Course Outcomes:** After completion of course, students would be able to:

1. Study the practical issues in statistical computing which includes programming in R.
2. Import data into R, accessing R packages, writing R functions, debugging, and organizing and commenting R code.
3. Learn statistical data analysis and optimization with working examples.

**Suggested Readings:**

**a) Text Books:**

1. Venables, W. N. and Ripley, B. D. (2002), Modern Applied Statistics with S, 4th ed., Springer-Verlag, New York.
2. Weisberg, S. (1985), Applied Linear Regression, 2nd ed., John Wiley & Sons, New York.

**b) Reference Books:**

1. Siegel, S. (1956), Nonparametric Statistics for the Behavioral Sciences, McGraw-Hill International, Auckland.
2. Venables, W. N. and Ripley, B. D. (2000), S Programming, Springer-Verlag, New York.
3. Zar, J. H. (1999), Biostatistical Analysis, Prentice Hall, Englewood Cliffs, NJ.

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## Chaudhary Bansi Lal University, Bhiwani

(A State University established by Govt. of Haryana Act No. 25 of 2014)

### B.A. (Fine Arts)

#### Scheme of Examination

	Paper No./ Paper Code	Theory/ Practical	Nomenclature of Paper	Maximum Marks	Internal Assessment Marks	Total marks	Credit	Weekly period	Exam Hours	
<b>B.A. 1<sup>ST</sup> Year</b>	<b>First Semester</b>									
	21UFA101DP	Theory	History of Indian Arts-I	40	10	50	3	03	3H	
	21UFA102DP	Practical	Still Life	25	-	25	1.5	03	3H	
	21UFA103DP	Practical	Landscape Painting	25	-	25	1.5	03	3H	
	<b>Second Semester</b>									
	21UFA201DP	Theory	History of Indian Arts - II	40	10	50	3	03	3H	
	21UFA202DP	Practical	Still Life	25	-	25	1.5	03	3H	
	21UFA203DP	Practical	Landscape Painting	25	-	25	1.5	03	3H	
	<b>Grand Total</b>						200	12	18	18H
	<b>B.A. 2<sup>nd</sup> Year</b>	<b>Third Semester</b>								
21UFA301DP		Theory	History of Indian Arts and Temple	40	10	50	3	03	3H	
21UFA302DP		Practical	Portrait/Life study	25	-	25	1.5	03	3H	
21UFA303DP		Practical	Design	25	-	25	1.5	03	3H	
<b>Fourth Semester</b>										
21UFA401DP		Theory	History of Art and Aesthetics	40	10	50	3	03	3H	
21UFA402DP		Practical	Portrait/Life study	25	-	25	1.5	03	3H	
21UFA403DP		Practical	Design	25	-	25	1.5	03	3H	
<b>Grand Total</b>						200	12	18	18H	
<b>B.A. 3<sup>rd</sup> Year</b>		<b>Fifth Semester</b>								
	21UFA501DP	Theory	History of Art and Aesthetics (Europe-I)	40	10	50	3	03	3H	
	21UFA502DP	Practical	Collage on Canvas	25	-	25	1.5	03	3H	
	21UFA503DP	Practical	Composition (Painting)	25	-	25	1.5	03	3H	
	<b>Sixth Semester</b>									
	21UFA601DP	Theory	History of Art and Aesthetics (Western)	40	10	50	3	03	3H	
	21UFA602DP	Practical	Collage on canvas	25	-	25	1.5	03	3H	
	21UFA603DP	Practical	Composition ( painting)	25	-	25	1.5	03	3H	
	<b>Grand Total</b>						200	12	18	18H

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**Detailed Syllabus of Theory**

**B.A. Fine Arts**

**Instruction / Guidelines for Each Semester**

**Instructions:**

1. (No. of Questions to be set: 09 (02 Questions from each unit) and Question No. 01 is to be set from over the Units i.e., short type Questions)
2. No. of Questions to be attempted: 05 Question No. 01 is compulsory
3. All Questions will be of equal marks (it will be of 8 marks)
4. Internal Assessment should be based on any 2 different topics given in syllabus of particular semester. It should be hand written and research methodology based. Students can give Power Point Presentation on any topic as a 1 Assignment.

**Max. Marks: 40 + 10 (Internal Assessment) Time: 3 Hours**

**First Semester**

**Paper Name: History of Indian Art – I**

**Paper Code: 21UFA101DP**

**UNIT I**

Pre-History, Indus Valley, Stupa Barhut, Sanchi

**UNIT-II**

Kushan, Gupta Art, Mauryan Art

**UNIT-III (General)**

Definition of Art & Aesthetics, it's Scope, Philosophy and Art

**UNIT-IV (Principle of Art)**

Elements of Art: Line, Form, Space & Contents, Colour Theory, Texture, Tone, Hue, Pigment etc.

**Second Semester**

**Paper Name: History of Indian Art – II**

**Paper Code: 21UFA201DP**

**UNIT I**

Ajanta, Ellora, Elephanta

**UNIT-II**

Orissan Sculpture, Chandela

**UNIT-III (General Art)**

Principle of the Art Appreciation: Balance, Harmony, Rhythm, Perspective, Contrast, balance etc.

**UNIT-IV (Medium of Art)**

Mural – Fresco Buono, Fresco Secco, Mosaic Medium

Ceramic and Glass, Tempera Mold and Sand-Casting Technique

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### Third Semester

**Paper Name: History of Indian Art & Temple**

**Paper Code: 21UFA301DP**

**UNIT I**

Pala, Rashtrakuta, Vijaynagaras Temple

**UNIT-II**

Khajuraho, Hampi, Tanjavur Temple

**UNIT-III (Folk Art)**

Different Folk art of India, Sanjhi, Madhubani, Worli, Alpan, Kohbar, Tanjaur etc.

**UNIT-IV (Rasa Bhava)**

Rasa, Bhava, Chitrasutra, Shadanga

### Fourth Semester

**Paper Name: History of Art & Aesthetics**

**Paper Code: 21UFA401DP**

**UNIT I**

Badami cave paintings, Jain paintings, Pal painting, Indian Murals

**UNIT-II**

Rajasthani miniatures: Kishangarh, Bundi, Kota, Mewar, Jaipur Miniature

**UNIT-III**

Mughal Art: AAkbar, Jahandir etc., Pahari Painting: Bahohli, Kangara, Guler, Chamba Miniature

**UNIT-IV**

Indian Philosophy: Veda, Vedanta, Adwaitwad, Budhism, Indian

### Fifth Semester

**Paper Name: History of Art & Aesthetics (Europe – I)**

**Paper Code: 21UFA501DP**

**UNIT I**

Prehistoric Art: Altamira and Lascaux, Egyptian Art – Tomb and Pyramid Sculpture and Paintings

**UNIT-II**

Greek Art – four phases of Greek Sculptures

**UNIT-III**

Early Christian & Byzantine, Gothic

**UNIT-IV**

Intro of Western Aesthetics, Difference between Indian & Western Aesthetics, Philosopher:

Plato, Aristotle.

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## Sixth Semester

**Paper Name: History of Art & Aesthetics (Western)**

**Paper Code: 21UFA601DP**

### UNIT I

Early Renaissance: Giotto, Masaccio, Fra Angelico

Middle Renaissance: Mantegna, Donatello, Piero Della Francesca

### UNIT-II

High Renaissance: Leonardo, Michelangelo, Raphael, Tizian, Mannerism: El Greco, Tintoretto, Pontormo

### UNIT-III

Baroque: Bernini, Rubens, Rembrandt, Caravaggio, Poussin, Vermeer

### UNIT-IV

Western Philosopher: Immanuel Kant, Sigmund Freud, Karl Marx, Roger Fry

### Suggested Reading: (Indian Art)

1. Bhartiya Chitra Kala Ka Itihas- Vachaspati Gairola
2. Bhartiya Chitrakala Ka Itihas Avinash Bahadur verma.
3. Rupa prada Kala Ke Muladhar- R. A. agrawal and S. K. Sharma
4. Bhartiya Murtikala - Ramanath Mishra
5. Bhartiya Kala- A. L. Srivastava.
6. Bhartiya Chitrangan- R. K. Vishwakarma.
7. Arts and Architecture of India – Benjamin Rowland
8. History of Indian Art- Haumtington
9. Indian Sculpture-SteHakramrisch
10. A History of far Eastern Art-Thames and Hudson
11. कला इतिहास भारतीय और पश्चात्य - रामचन्द्र नारायण पाटकर
12. भारतीय तचत्रकला एवं मूर्तिकला का इतिहास - डा० री० प्रिप
13. कला तवलास भारतीय तचत्रकला का तवकास - आर० ए० अग्रवाल
14. भारि की तचत्रकला का संतिप्त इतिहास - डा० लोकेष चन्द्र शमाि

### Suggested Reading: (Western Art)

1. Razanl, Modern Paining, Skira-Useful references from plates and text.
2. Lake and Maillard-Dictionary of Modern Painting
3. Herbert Road-A concise History of Modem Paining,
4. William Vaughan-Romantic Art.
5. European Modern Movements in Encyclopedia of World Art.
6. Leymarie-Impressionism (Skira).
7. J. Rewald-History of impressionism-Museum of Modern Art, New York.
8. J. Rewald-Post Impressionism (Both these books are indispensable for the respective
9. Roger Fry-Vision and Design.
10. Deymatie: Fauvism (good introduction also in Encyclopedia of World Art.)

*R. K. Vishwakarma*

*R. K.*

# CBLU

## Details Syllabus of Practical Papers

### BA (Fine Arts)

#### Instructions:

- I The number of students in a practical group should not exceed to 15.
- II The examination should be conducted in two sessions i.e. 06 hours.
- III Maximum marks should be 50(25+25) for each practical in each semester.  
(See the scheme)

- Note:**
1. All Sessional works to be assigned by the concerned teacher and maintained by the students duly signed by the concerned teacher. Private candidates are also required sessional work duly attested by the teacher concerned.
  2. Students must to do sketching daily and minimum best 100 sketches should be submitted to concern teacher in each semester.

### BA (Fine Arts) 1<sup>st</sup> Year (1<sup>st</sup> & 2<sup>nd</sup> Sem.)

#### **Paper Code: 21UFA102DP and 21UFA 202DP**

##### **Practical : Still Life**

**No. of Assignments: Minimum 10 for each sem.**

**Maximum Marks: 25 marks**

**Size-** Max. Half Imperial

**Medium-** Pencil, Pastel Colour, Water Colour, Poster Colour, Pen & Ink etc.

**Assignment:** Sketching, Still Life, Different types of objects having different types of their texture , 10 sketches.

#### **Paper Code: 21UFA 103DP and 21UFA 203DP**

##### **Practical: Landscape Painting**

**No. of Assignments: Minimum 10 for each sem.**

**Maximum Marks: 25 marks**

**Size-** Max. Half Imperial

**Medium-** Pencil, Pastel Colour, Water Colour, Poster Colour, Pen & Ink etc.

**Assignment:** Practice of live landscape painting in different location of the campus with different angle and on different time. ( 10 landscape sketches in pencil on paper in different size 12"X 15"

### BA (Fine Arts) 2<sup>nd</sup> Year (3<sup>rd</sup> & 4<sup>th</sup> Sem.)

#### **Paper Code: 21UFA302DP and 21UFA402DP**

##### **Practical : Portrait/ Life Study**

**No. of Assignments: Minimum 10 for each sem.**

**Maximum Marks: 25 marks**

**Size-** Max. Full Imperial

**Medium-** Pencil, Pastel Colour, Water Colour, Pen & Ink, etc.

**Assignment:** Practice of making man/women in water colour and pastel colour size 12"X15", total items 10

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**Paper Code: 21UFA303DP and 21UFA403DP**

**Practical: - Design**

**No. of Assignments: Minimum 5 for each sem.**

**Maximum Marks: 25 marks**

**Size- Imperial and Half Imperial**

**Medium- Colour, inks**

**Assignment: Practice of designing Frame of picture, textile design on cloth, cusin, B.Sheets, pillow, 5 items for each sem.**

**BA (Fine Arts) 3<sup>rd</sup> Year (5<sup>th</sup> & 6<sup>th</sup> Sem.)**

**Paper Code: 21UFA502DP and 21UFA602DP**

**Practical : Collage on Canvas)**

**No. of Assignments: Minimum 10 for each sem.**

**Maximum Marks: 25 marks**

**Size- Half Imperial**

**Medium- Paper, oil colour ink on canvas**

**Assignment: 10compositions on the subjects like College/University campus etc.**

**Paper Code: 21UFA503DP and 21UFA603DP**

**Practical : Composition(Painting)**

**No. of Assignments: Minimum 10 for each sem.**

**Maximum Marks: 25 marks**

**Size- 30/40 Canvas, Imperial sheet**

**Medium- Canvas, Handmade sheet, Oil Sheet, Oil color, Acrylic Colour etc. size 18"X24"**

**Assignment: Practice of using different medium and colours on canvas. Practice of copying paintings by great Indian and western artist. Practice to visualize/ imagine the different subjects and to create new form on the basis of original thought of your own. 10 completions to be submitted.**

*S. K. K. / MS*

# पाठ्यक्रम

चौ. बंसीलाल विश्वविद्यालय, भिवानी

हिन्दी साहित्य का इतिहास  
बी.ए. हिन्दी अनिवार्य (प्रथम सेमेस्टर)  
[ PAPER CODE : 20UHND 101C ]

समय : 3 घण्टे

कुल अंक : 100  
लिखित परीक्षा अंक : 80, आंतरिक मूल्यांकन : 20

निर्देश :

1. पहला प्रश्न अनिवार्य है। पूरे पाठ्यक्रम से आठ लघूत्तरात्मक प्रश्न पूछे जाएँगे।  $8 \times 2 = 16$  अंक
2. दूसरे प्रश्न में प्रत्येक इकाई से दो-दो प्रश्न पूछे जाएँगे जिनमें से एक-एक प्रश्न करना होगा।  $16 \times 4 = 64$  अंक

## इकाई-1

- 1.1 आदिकाल का नामकरण एवं काल विभाजन
- 1.2 आदिकालीन काव्यधाराएँ—सिद्ध, नाथ एवं जैन साहित्य
- 1.3 आदिकालीन प्रमुख रासो काव्य
- 1.4 आदिकालीन हिंदी साहित्य की सामान्य विशेषताएँ

## इकाई-2

- 2.1 भक्ति आंदोलन—सामाजिक, राजनीतिक, सांस्कृतिक पृष्ठभूमि
- 2.2 प्रमुख निर्गुण कवि—कबीरदास, गुरु नानक देव, रविदास
- 2.3 प्रमुख सगुण कवि—सूरदास, तुलसीदास, मीराबाई
- 2.4 भक्तिकाल की सामान्य विशेषताएँ

## इकाई-3

- 3.1 रीतिकाल की ऐतिहासिक एवं सामाजिक पृष्ठभूमि
- 3.2 रीतिकाल का नामकरण
- 3.3 रीतिकाल की विशेषताएँ
- 3.4 रीतिकालीन काव्यधाराएँ : रीतिबद्ध, रीतिसिद्ध, रीतिमुक्त

## इकाई-4

- 4.1 1857 का स्वतंत्रता संघर्ष और हिंदी नवजागरण एवं भारतेन्दु युगीन साहित्य की विशेषताएँ
- 4.2 महावीर प्रसाद द्विवेदी और उनका युग; द्विवेदी युग के प्रमुख गद्य लेखक और कवि
- 4.3 मैथिलीशरण गुप्त और राष्ट्रीय काव्यधारा
- 4.4 छायावाद, प्रगतिवाद, प्रयोगवाद और नई कविता एवं हिंदी में गद्य विधाओं का उद्भव और विकास—उपन्यास, कहानी, नाटक, निबंध।



# पाठ्यक्रम

## सृजनात्मक लेखन के विविध क्षेत्र

बी.ए. हिंदी अनिवार्य (प्रथम सेमेस्टर)

Course Code : 20UHND-101-(NCCC-1)

समय : 2 घंटे

पूर्णांक : 50

लिखित परीक्षा : 40, आन्तरिक मूल्यांकन : 10

निर्देश—

1. पहला प्रश्न अनिवार्य है, पूरे पाठ्यक्रम से चार लघूत्तरी प्रश्न पूछे जाएंगे।  $4 \times 2 = 8$  अंक
2. दूसरे प्रश्न में प्रत्येक इकाई से दो-दो प्रश्न पूछे जाएंगे, जिनमें से एक-एक प्रश्न करना होगा।  $8 \times 4 = 32$  अंक

### इकाई-1

- 1.1 सृजनात्मकता : अर्थ, स्वरूप और महत्त्व
- 1.2 सृजनात्मक लेखन के प्रमुख तत्त्व
- 1.3 सृजनात्मक लेखन की प्रमुख विशेषताएँ
- 1.4 सृजनात्मक लेखन के उद्देश्य

### इकाई-2

- 2.1 रिपोर्टाज : अर्थ एवं स्वरूप
- 2.2 रिपोर्टाज एवं अन्य गद्य रूप , रिपोर्टाज और फीचर लेखन प्रविधि
- 2.3 फीचर लेखन : विषय चयन, सामग्री निर्धारण, लेखन प्रविधि
- 2.4 सामाजिक, आर्थिक, सांस्कृतिक, विज्ञान, पर्यावरण, खेलकूद से सम्बद्ध विषयों पर फीचर लेखन

### इकाई-3

- 3.1 साक्षात्कार (इण्टरव्यू/भेंटवाती) : उद्देश्य एवं प्रकार
- 3.2 साक्षात्कार : प्रविधि और महत्त्व
- 3.3 स्तम्भ लेखन : समाचार पत्र के विविध स्तम्भ

### इकाई-4

- 4.1 स्लोगन और भाषण
- 4.2 बैनर, पोस्टर, होर्डिंग्स
- 4.3 बाल साहित्य लेखन
- 4.4 रेखाचित्र, छायाचित्र और कार्टून लेखन



# पाठ्यक्रम

## चौ. बंसीलाल विश्वविद्यालय, भिवानी

मध्यकालीन हिन्दी कविता

बी.ए. हिन्दी अनिवार्य (द्वितीय सेमेस्टर)

[ PAPER CODE : UHND 201 ]

समय : 3 घण्टे

कुल अंक : 100

लिखित परीक्षा अंक : 80; आंतरिक मूल्यांकन : 20

निर्देश :

1. पहला प्रश्न अनिवार्य है, जिसमें पूरे पाठ्यक्रम से आठ लघूत्तरीय प्रश्न पूछे जाएंगे।  $8 \times 2 = 16$  अंक
2. दूसरे प्रश्न में प्रत्येक इकाई से दो-दो प्रश्न पूछे जाएँगे जिनमें से एक-एक प्रश्न करना होगा।  
 $10 \times 4 = 40$  अंक
3. पाठ्यक्रम में निर्धारित (मध्यकालीन हिन्दी कविता) आठ कवियों की कविताओं में से पाँच व्याख्याएँ पूछी जाएंगी, जिनमें से तीन व्याख्याएँ करनी होंगी।  $8 + 8 + 8 = 24$  अंक

### इकाई-1

- 1.1 कबीर तथा सूरदास का व्यक्तित्व, कृतित्व एवं काव्यगत विशेषताएँ  
पाठ्यपुस्तक-कबीर ग्रंथावली सं. श्यामसुन्दर दास, काशी नागरी प्रचारिणी सभा।
- 1.2 कबीर की साखियाँ-गुरुदेव को अंग, दोहा संख्या-3, 4, 5, 6, 7  
कुसंगति को अंग 6, 7, 8, 9, 10  
पाठ्यपुस्तक-ध्रमरगीत सार, सम्पादक रामचन्द्र शुक्ल
- 1.3 सूरदास के पद-1, 2, 4, 5, 43, 44

### इकाई-2

- 2.1 तुलसीदास तथा मीराबाई का व्यक्तित्व, कृतित्व एवं काव्यगत विशेषताएँ  
पाठ्यपुस्तक-कवितावली, गीताप्रेस गोरखपुर
- 2.2 बालकांड-1, 2, 3  
उत्तरकांड-96, 97, 98, 99, 100, 105, 106  
पाठ्यपुस्तक-मीराबाई की पदावली, सं.आचार्य परशुराम चतुर्वेदी हिन्दी साहित्य सम्मेलन
- 2.3 मीरा के पद-5, 17, 18, 19, 22, 23, 25, 41, 73, 158

# पाठ्यक्रम

चौ. बंसीलाल विश्वविद्यालय, भिवानी

अनुवाद

बी.ए. हिन्दी अनिवार्य (द्वितीय सेमेस्टर)

[ PAPER CODE : UHND-203 (NCCC-II) ]

समय : 2 घण्टे

पूर्णांक : 100

लिखित परीक्षा : 80, आंतरिक मूल्यांकन : 20

निर्देश :

1. पहला प्रश्न अनिवार्य है। पूरे पाठ्यक्रम से आठ लघुतरीय प्रश्न पूछे जाएंगे।
2. दूसरे प्रश्न में प्रत्येक इकाई से दो-दो प्रश्न पूछे जाएंगे, जिनमें से एक-एक प्रश्न करना होगा।

8×2=16 अंक

16×4=64 अंक

## इकाई-1

- 1.1 अनुवाद का अर्थ, स्वरूप और विशेषताएँ
- 1.2 अनुवाद के प्रकार (शब्दानुवाद, भावानुवाद, छायानुवाद, सारानुवाद)
- 1.3 अनुवाद सिद्धांत
- 1.4 अनुवाद का महत्त्व

## इकाई-2

- 2.1 साहित्यिक संबंधी अनुवाद : पद्य और गद्य
- 2.2 विज्ञान संबंधी अनुवाद
- 2.3 वाणिज्यिक अनुवाद

## इकाई-3

- 3.1 वैज्ञानिक शब्दावली का अनुवाद
- 3.2 मुहावरों का अनुवाद
- 3.3 लोकोक्तियों का अनुवाद
- 3.4 भारत में अनुवाद प्रशिक्षण के प्रमुख केन्द्र

## इकाई-4

- 4.1 बैंकों में प्रयुक्त होने वाली पारिभाषिक शब्दावली के अंग्रेजी तथा हिन्दी रूप
- 4.2 रेलवे में प्रयुक्त होने वाली पारिभाषिक शब्दावली के अंग्रेजी तथा हिन्दी रूप
- 4.3 कार्यालयों में प्रयुक्त होने वाली पारिभाषिक शब्दावली के अंग्रेजी तथा हिन्दी रूप
- 4.4 प्रशासन में प्रयुक्त होने वाली पारिभाषिक शब्दावली के अंग्रेजी तथा हिन्दी रूप



## पाठ्यक्रम

कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र; चौ० देवी लाल विश्वविद्यालय, सिरसा  
एवं महर्षि दयानन्द विश्वविद्यालय, रोहतक

जुलाई 2012 से प्रभावी  
हिन्दी (अनिवार्य)  
बी.ए. द्वितीय वर्ष (तृतीय सेमेस्टर)

समय : 3 घंटे

कुल अंक : 100

लिखित परीक्षा : 80 अंक

आंतरिक मूल्यांकन : 20 अंक

### निर्धारित पाठ्यक्रम

- आधुनिक हिंदी कविता  
प्रधान सं० डॉ० सरिता वशिष्ठ, कुरुक्षेत्र विश्वविद्यालय, प्रकाशन, कुरुक्षेत्र
- हिंदी साहित्य का रीतिकाल
- प्रयोजनमूलक हिंदी : हिंदी कंप्यूटिंग और अनुवाद
- वस्तुनिष्ठ प्रश्न

### खण्ड-क : आधुनिक हिंदी कविता

#### निर्धारित आलोचनात्मक प्रश्न

पाठ्यक्रम में निर्धारित कवियों पर उनके साहित्यिक परिचय, अनुभूतिगत वैशिष्ट्य तथा अभिव्यक्तिगत सौष्ठव पर ही प्रश्न पूछे जाएँगे। कवियों की विशिष्ट रचनात्मक प्रवृत्ति पर प्रश्न नहीं पूछे जाएँगे।

### खण्ड-(ख) : हिंदी साहित्य का रीतिकाल

#### पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न

1. रीतिकालीन हिंदी कविता की पृष्ठभूमि ✓
2. रीतिकाल का नामकरण ✓
3. रीतिबद्ध काव्य की विशेषताएँ ✓
4. रीतिमुक्त काव्य की विशेषताएँ ✓
5. रीतिकालीन काव्य की उपलब्धियाँ

खण्ड-(ग) : प्रयोजनमूलक हिंदी : हिंदी कंप्यूटिंग और अनुवाद

पाठ्यक्रम में निर्धारित विषय

1. कम्प्यूटर : स्वरूप और महत्त्व
2. ई-मेल : प्रेषण-ग्रहण
3. इंटरनेट : स्वरूप और उपयोगिता
4. मशीनी अनुवाद
5. अनुवाद : परिभाषा और स्वरूप

खण्ड-(घ) : वस्तुनिष्ठ प्रश्न

निर्देश-

1. खण्ड (क) में निर्धारित पाठ्यपुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी।
2. खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को एक प्रश्न का उत्तर देना होगा।
3. खण्ड (क) में निर्धारित पाठ्यपुस्तक एवं आलोचनात्मक प्रश्नों में से छः लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होगा।
4. खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से चार प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा।
5. खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं दो प्रश्नों का उत्तर देना होगा।
6. खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा।
7. खण्ड (घ) में पूरे पाठ्यक्रम में से 8 वस्तुनिष्ठ प्रश्न पूछे जाएंगे।



## पाठ्यक्रम

कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र,  
चौधरी देवी लाल विश्वविद्यालय, सिरसा एवं  
महर्षि दयानन्द विश्वविद्यालय, रोहतक

## हिन्दी (अनिवार्य)

बी०ए० द्वितीय वर्ष (चतुर्थ सेमेस्टर)

समय : 3 घण्टे

कुल अंक : 100

लिखित परीक्षा : 80 अंक

आंतरिक मूल्यांकन : 20 अंक

## निर्धारित पाठ्यक्रम तथा अंक विभाजन

- ◆ कथाक्रम : संपा० डॉ० रोहिणी अग्रवाल
- ◆ हिंदी साहित्य का आधुनिक काल : गद्य
- ◆ पारिभाषिक शब्दावली
- ◆ वस्तुनिष्ठ प्रश्न

### खण्ड (क) : कथाक्रम

पाठ्यक्रम में निर्धारित कहानीकारों के साहित्यिक परिचय, निर्धारित कहानियों के वस्तु पक्ष तथा कला पक्ष पर ही प्रश्न पूछे जाएँगे।

### खण्ड (ख) : हिंदी साहित्य का आधुनिक काल : गद्य पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न

1. आधुनिक काल की परिस्थितियाँ
2. हिंदी उपन्यास : उद्भव और विकास
3. हिंदी कहानी : उद्भव और विकास
4. हिंदी नाटक : उद्भव और विकास
5. हिंदी निबन्ध : उद्भव और विकास

**खण्ड (ग) : पारिभाषिक शब्दावली  
निर्धारित विषय**

1. पारिभाषिक शब्दावली : स्वरूप और महत्त्व
2. पारिभाषिक शब्दावली के गुण
3. पारिभाषिक शब्दावली के निर्माण में सक्रिय विविध सम्प्रदाय : राष्ट्रीयतावादी, अन्तर्राष्ट्रीयतावादी, समन्वयवादी

**खण्ड (घ) : वस्तुनिष्ठ प्रश्न**

**निर्देश-**

1. खण्ड (क) में निर्धारित पाठ्यपुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी। प्रत्येक व्याख्या 5 अंक की होगी। पूरा प्रश्न 10 अंक का होगा।
2. खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को एक प्रश्न का उत्तर देना होगा। यह प्रश्न 8 अंक का होगा।
3. खण्ड (क) में निर्धारित पाठ्यपुस्तक एवं आलोचनात्मक प्रश्नों में से छः लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न के लिए चार अंक निर्धारित हैं। पूरा प्रश्न 16 अंक का होगा।
4. खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से चार प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न 8-8 अंक का होगा। इस प्रकार यह प्रश्न 16 अंक का होगा।
5. खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं दो प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न के लिए पाँच अंक निर्धारित हैं। पूरा प्रश्न दस अंक का होगा।
6. खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न 5 अंक का तथा पूरा प्रश्न 10 अंक का होगा।
7. खण्ड (घ) में पूरे पाठ्यक्रम में से 10 वस्तुनिष्ठ प्रश्न पूछे जाएंगे। प्रत्येक प्रश्न 1 अंक का तथा पूरा प्रश्न दस अंक का होगा।



# पाठ्यक्रम

कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र;  
चौ० देवीलाल विश्वविद्यालय, सिरसा एवं  
महर्षि दयानन्द विश्वविद्यालय, रोहतक

बी. ए. तृतीय वर्ष ( पाँचवाँ सेमेस्टर )

हिन्दी (अनिवार्य)

समय : 3 घंटे

कुल अंक : 100

लिखित परीक्षा : 80 अंक

आंतरिक मूल्यांकन : 20 अंक

## निर्धारित पाठ्यक्रम एवं अंक विभाजन

- समकालीन हिन्दी कविता पर आधारित पाठ्यपुस्तक
- हिन्दी साहित्य का आधुनिक काल : कविता
- प्रयोजनमूलक हिन्दी : पत्र लेखन, संक्षेपण तथा पल्लवन
- वस्तुनिष्ठ प्रश्न

## खण्ड-क : प्रस्तावित निर्धारित पाठ्यपुस्तक

- पंचम सेमेस्टर हिन्दी (अनिवार्य) की समकालीन हिन्दी कविता पर आधारित पाठ्यपुस्तक (जिसका नामकरण पुस्तक-निर्माण के साथ किया जाएगा) कुरुक्षेत्र विश्वविद्यालय का हिन्दी-विभाग तैयार करेगा। कुरुक्षेत्र विश्वविद्यालय के हिन्दी-विभाग का दायित्व होगा कि पाठ्यक्रम प्रभावी होने से पहले वह पाठ्यपुस्तक विद्यार्थियों को उपलब्ध कराएँ।

प्रस्तुत प्रस्तावित पाठ्यपुस्तक में निम्नलिखित रचनाकारों की रचनाओं को शामिल किया जाएगा-

1. स०ही० वात्स्यायन अज्ञेय
2. धर्मवीर भारती
3. श्री नरेश मेहता
4. नागार्जुन
5. रघुवीर सहाय
6. कुँवर नारायण
7. लीलाधर जगूड़ी

## निर्धारित आलोचनात्मक प्रश्न

पाठ्यक्रम में निर्धारित कवियों पर उनके साहित्यिक परिचय, अनुभूतिगत वैशिष्ट्य तथा अभिव्यक्तिगत सौष्ठव पर ही प्रश्न पूछे जाएँगे। कवियों की विशिष्ट रचनात्मक प्रवृत्ति पर प्रश्न नहीं पूछे जाएँगे।

**खण्ड-ख : हिन्दी साहित्य का आधुनिक काल : कविता  
पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न**

1. भारतेन्दुयुगीन हिन्दी कविता की प्रवृत्तियाँ
2. द्विवेदीयुगीन हिन्दी कविता की प्रवृत्तियाँ
3. छायावाद
4. प्रगतिवाद
5. प्रयोगवाद
6. नयी कविता
7. समकालीन कविता

**खण्ड-ग : प्रयोजनमूलक हिन्दी : पत्र लेखन, संक्षेपण तथा पल्लवन**

1. पत्र लेखन : स्वरूप और उसके विविध भेद
2. संक्षेपण
3. पल्लवन

**खण्ड-घ : वस्तुनिष्ठ प्रश्न**

**निर्देश-**

1. खण्ड (क) में निर्धारित पाठ्यपुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी।
2. खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को एक प्रश्न का उत्तर देना होगा।
3. खण्ड (क) में निर्धारित पाठ्यपुस्तक एवं आलोचनात्मक प्रश्नों में से छः लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में से किन्हीं चार प्रश्नों का उत्तर देना होगा।
4. खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं एक प्रश्न का उत्तर देना होगा।
5. खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150-150 शब्दों में किन्हीं दो प्रश्नों का उत्तर देना होगा।
6. खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा।
7. खण्ड (घ) में पूरे पाठ्यक्रम में से 10 वस्तुनिष्ठ प्रश्न पूछे जाएंगे।



# पाठ्यक्रम

महर्षि दयानंद विश्वविद्यालय, रोहतक एवं कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र

## हिन्दी अनिवार्य

बी०ए० तृतीय वर्ष (छटा सेमेस्टर)

समय : 3 घंटे

कुल अंक : 100, लिखित परीक्षा : 80

आंतरिक मूल्यांकन : 20 अंक

### निर्धारित पाठ्य-पुस्तक/ पाठ्य विषय

- नव्यतर विधाओं पर आधारित पाठ्य-पुस्तक (कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र)
- हरियाणवी लोक साहित्य का इतिहास
- हिन्दी पत्रकारिता
- वस्तुनिष्ठ प्रश्न

खण्ड-क : प्रस्तावित निर्धारित पाठ्य-पुस्तक (गद्य-गौरव)

#### निर्धारित पाठ:

1. बालमुकुंद गुप्त (निबंध)
2. आचार्य रामचन्द्र शुक्ल (निबंध)
3. महादेवी वर्मा (संस्मरण)
4. आचार्य हजारीप्रसाद द्विवेदी (ललित निबंध)
5. विद्यानिवास मिश्र (ललित निबंध)
6. हरिशंकर परसाई (व्यंग्य)
7. राहुल सांकृत्यायन (यात्रा वृत्तांत)

#### निर्धारित आलोचनात्मक प्रश्न-

पाठ्यक्रम में निर्धारित लेखकों के साहित्यिक परिचय, निबंधों के वस्तु पक्ष तथा कला पक्ष पर ही पूछे जाएंगे।

खण्ड-ख : हरियाणवी भाषा और साहित्य का इतिहास

#### पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न

1. हरियाणवी भाषा का उद्भव और विकास
2. हरियाणवी भाषा की प्रमुख बोलियाँ
3. हरियाणा की सांग परम्परा : उद्भव और विकास
4. हरियाणवी भाषा का आधुनिक साहित्य

(क) हरियाणवी कविता : परिचय और प्रवृत्तियाँ

(ख) हरियाणवी का गद्य-साहित्य

1. उपन्यास साहित्य
2. कहानी साहित्य
3. नाट्य साहित्य



खण्ड-ग : प्रयोजनमूलक हिन्दी : पत्रकारिता

1. पत्रकारिता : स्वरूप और प्रकार
2. शीर्षक की संरचना
3. सम्पादक के गुण और दायित्व
4. फीचर लेखन
5. स्वतंत्र प्रेस की अवधारणा

खण्ड-घ : वस्तुनिष्ठ प्रश्न

निर्देश-

1. खण्ड (क) में निर्धारित पाठ्य-पुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी। प्रत्येक व्याख्या 6 अंक की होगी। पूरा प्रश्न 12 अंक का होगा।
2. खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को एक प्रश्न का उत्तर देना होगा। यह प्रश्न 8 अंक का होगा।
3. खण्ड (क) में निर्धारित पाठ्य-पुस्तक एवं आलोचनात्मक प्रश्नों में से छः लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न के लिए चार अंक निर्धारित हैं। पूरा प्रश्न 16 अंक का होगा।
4. खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से चार प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को दो प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न 8-8 अंक का होगा। इस प्रकार यह प्रश्न 16 अंक का होगा।
5. खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में से किन्हीं दो प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न के लिए पांच अंक निर्धारित हैं। पूरा प्रश्न 10 अंक का होगा।
6. खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा। प्रत्येक उप-प्रश्न के लिए 5 अंक निर्धारित हैं। पूरा प्रश्न 10 अंक का होगा।
7. खण्ड (घ) में पूरे पाठ्यक्रम में से 8 वस्तुनिष्ठ प्रश्न पूछे जाएंगे। प्रत्येक प्रश्न 1 अंक का तथा पूरा प्रश्न 8 अंक का होगा।

**CHAUDHARY BANSI LAL UNIVERSITY, BHIWANI**  
**Scheme of Examination and Syllabi of B.Sc. / B.A. Ist Semester**  
**Mathematics**

(w.e.f. 2020-21)

**CHAUDHARY BANSI LAL UNIVERSITY, BHIWANI**  
**Scheme And Syllabi of Mathematics for B.Sc./B.A under CBCS**

(Semester I to VI)

(w.e.f. 2020-21)

SEMESTER -I					
Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UMTH101	Algebra	Core	2	2	40+10=50
20UMTH102	Calculus	Core	2	2	40+10=50
20UMTH103	Mathematical Lab-I	Core	2	4	40+10=50
SEMESTER -II					
20UMTH201	Number Theory & Trigonometry	Core	2	2	40+10=50
20UMTH202	Vector Calculus & Geometry	Core	2	2	40+10=50
20UMTH203	Mathematical Lab-II	Core	2	4	40+10=50
SEMESTER -III					
20UMTH301	Differential Equations	Core	2	2	40+10=50
20UMTH302	Numerical Methods with Programming in C	Core	2	2	40+10=50
20UMTH303	Mathematical Lab-III	Core	2	4	40+10=50
SEMESTER -IV					
20UMTH401	Mechanics	Core	2	2	40+10=50
20UMTH402	Groups & Rings	Core	2	2	40+10=50
20UMTH403	Mathematical Lab-IV	Core	2	4	40+10=50



SEMESTER -V					
<b>Choose One:</b> 20UMTH501 or 20UMTH502	Choose One:	Discipline Specific Elective	2	2	40+10=50
20UMTH501 Or	Statics & Dynamics				
20UMTH502	Statistical Inference				
<b>Choose One:</b> 20UMTH503 OR UMTH504	Choose One:	Discipline Specific Elective	2	2	40+10=50
20UMTH503 OR	Mathematical Analysis				
20UMTH504	Linear Algebra				
20UMTH505	Mathematical Lab-V	Discipline Specific Elective	2	4	40+10=50
SEMESTER -VI					
<b>Choose One:</b> 20UMTH601 OR 20UMTH602	Choose One:	Discipline Specific Elective	2	2	40+10=50
20UMTH601	Special Functions & Integral Transforms				
20UMTH602	Solid Geometry				
<b>Choose One:</b> 20UMTH603 OR 20UMTH604	Choose One:	Discipline Specific Elective	2	2	40+10=50
20UMTH603	Real Analysis				
20UMTH604	Advanced Calculus				
20UMTH605	Mathematical Lab-VI	Discipline Specific Elective	2	4	40+10=50

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## Skill Enhancement Courses offered by Department of Mathematics

Scheme of Examination of SEC for B.Sc. (Non-Medical & Computer Science)

(w.e.f. 2020-21)

<b>SEMESTER-IV</b>					
Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
<b>Choose One:</b>	<b>Choose One:</b>	Skill Enhancement	3	3	80+20=100
20USECM401	Logic and sets				
20USECM402	Analytical Geometry				
20USECM403	Probability & Statistics				
20USECM404	Vedic Arithmetic				
<b>SEMESTER-V</b>					
<b>Choose One:</b>	<b>Choose One:</b>	Skill Enhancement	3	3	80+20=100
20USECM501	Integral Calculus				
20USECM502	Theory of Equations				
20USECM503	Discrete Mathematics				
20USECM504	Vedic Algebra				
<b>SEMESTER-VI</b>					
<b>Choose One:</b>	<b>Choose One:</b>	Skill Enhancement	3	3	80+20=100
20USECM601	Boolean Algebra				
20USECM602	Transportation and Game Theory				
20USECM603	Mathematical Finance				
20USECM604	Vedic Geometry				

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**Scheme of Examination and Syllabi of B.Sc. / B.A. Ist Semester  
Mathematics  
(w.e.f. 2020-21)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UMTH101	Algebra	Core	2	2	40+10=50
20UMTH102	Calculus	Core	2	2	40+10=50
20UMTH103	Mathematical Lab-I	Core	2	4	40+10=50

**20UMTH101**

**Algebra**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

Review of matrices ( Algebra of matrices, rank of a matrix, Inverse of a matrix), Linear dependence and independence of rows and columns of matrices. Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix. Cayley Hamilton theorem and its use in finding the inverse of a matrix.

**Unit– II**

Applications of matrices to a system of linear (both homogeneous and non-homogeneous) equations. Theorems on consistency of a system of linear equations. Unitary and Orthogonal Matrices, Diagonalization of a matrices, Bilinear and Quadratic forms.

**Unit– III**

Relations between the roots and coefficients of general polynomial equation in one variable. Solutions of polynomial equations having conditions on roots. Common roots and multiple roots. Transformation of equations.

**Unit– IV**

Nature of the roots of an equation, Descartes's rule of signs. Solutions of cubic equations (Cardon's method). Biquadratic equations and their solutions.

**Suggested Readings:**

1. Hall, H.S., Knight S.R.,1994. Higher Algebra. H.M. Publications.
2. Narayan S., Mittal P.K., 1953. A Text Books of Matrices. S. Chand Publishing House,New Delhi.
3. Ayers,F.,1962.Schaum's Theory and Problems of Matrices. McGraw Hill Book Company, New York.
4. Grewal,B.S.2015. Higher Engineering Mathematics, Khanna Publications,India



**20UMTH102**  
**Calculus**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

***Unit – I***

Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves. Newton's method. Radius of curvature for pedal curves. Tangential polar equations. Centre of curvature. Circle of curvature. Chord of curvature, evolutes.

***Unit – II***

Asymptotes in Cartesian and polar coordinates, intersection of curve and its asymptotes. Tests for concavity and convexity. Points of inflexion. Multiple points. Cusps, nodes & conjugate points. Type of cusps.

***Unit – III***

Reduction formulae. Rectification, intrinsic equations of curve. Applications of single integration: Quadrature (area), Sectorial area. Area bounded by closed curves. Volumes and surfaces of solids of revolution (Applications Only). Theorems of Pappu's and Guilden.

***Unit – IV***

Multiple Integrals: Double integrals in cartesian and polar coordinates, area and volume by Double integrals, Triple integrals cartesian, cylindrical and spherical coordinates, volume of solids by Triple integrals

**Suggested Readings:**

1. Narayan S., 1962. Differential Calculus. S. Chand and Company. India
2. Spiegel S., Murray R., 1963. Theory and Problems of Advanced Calculus, Mc- Graw Hill, New York.
3. Piskunov N., 1996, Differential and integral Calculus, CBS Publishers, India.
4. Narayan, S. and Mittal P.K., 1962. Integral Calculus. S. Chand and Co. New Delhi, India



20UMTH103

## Mathematical Lab- I

Maximum Marks-50  
External Practical Examination-40  
Internal Assessment-10

Mathematical problem Solving Techniques based on courses **20UMTH101 to 20UMTH102** will be taught. Students will have to solve 15-20 problems based on 20UMTH101 & 20 UMTH102. Also Solve atleast 10 problems using programing software preferably MS-Excel. Programmes will be based on Algebra and Calculus.

**Note:-** Every student will maintain practical record of problems solved during practical class-work in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on problem solving techniques/algorithm. An examinee will be asked to write the solutions and run on computer. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

*Practical Examination will be conducted externally as per the following distribution of marks:*

<i>Writing solutions of problems:</i>	<i>20 marks.</i>
<i>Presentation &amp; Viva voce:</i>	<i>10 marks.</i>
<i>Practical record:</i>	<i>10 marks.</i>
<i>Internal Assessment:</i>	<i>10 marks (Attendance=5 marks, Assignment=5 marks)</i>





**Scheme of Examination and Syllabi of B.Sc. / B.A. IInd Semester  
Mathematics  
(w.e.f. 2020-21)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UMTH201	Number Theory & Trigonometry	Core	2	2	40+10=50
20UMTH202	Vector Calculus	Core	2	2	40+10=50
20UMTH203	Mathematical Lab-II	Core	2	4	40+10=50

**20UMTH201**

**Number Theory & Trigonometry**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

Divisibility, Greatest common divisor, Least common multiple, Primes, Fundamental theorem of Arithmetic. Linear congruencies, Fermat's theorem, Wilson's theorem and its converse,

**Unit – II**

Complete residue system and reduced residue system modulo  $m$ , Euler's  $\phi$  function and Euler's generalization of Fermat's theorem, Chinese Remainder theorem, Quadratic residues, Legendre symbol, Gauss's lemma, Gauss reciprocity law (Applications only), Greatest integer function, Divisor function ( $\tau(n)$ ), Sum function ( $\sigma(n)$ ),

**Unit – III**

De Moivre's theorem and its applications, Expansion of trigonometric functions, Direct circular and hyperbolic functions and their properties.

**Unit – IV**

Logarithm of a complex quantity, Gregory's series, Summation of trigonometric series.

**Suggested Readings:**

1. Loney, S.L., 2018. Plane Trigonometry, Creative Media Partners, LLC.
2. Verma, R.S., Sukla, K.S., 1969. Text Book on Trigonometry, Pothishala Pvt. Ltd. Allahabad.
3. Niven I., Zuckerman H.S., 1991. An Introduction to the Theory of Numbers, Willey Publication.



20UMTH202

## Vector Calculus & Geometry

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

Note: *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

### Unit – I

Gradient of a scalar point function, Directional derivatives, geometrical interpretation of  $\text{grad } \phi$ , character of gradient as a point function. Divergence and curl of vector point function and their geometrical significance, characters of  $\text{Div. } \vec{f}$  and  $\text{Curl } \vec{f}$  as point function, examples. Gradient, divergence and curl of sums and product and their related vector identities. Laplacian operator.

### Unit – II

Orthogonal curvilinear coordinates Conditions for orthogonality fundamental triad of mutually orthogonal unit vectors. Gradient, Divergence, Curl and Laplacian operators in terms of orthogonal curvilinear coordinates, Cylindrical co-ordinates and Spherical co-ordinates.

### Unit – III

Vector integration; Line integral, Surface integral, Volume integral. Problems based on Theorems of Gauss, Green & Stokes.

### Unit – IV

General equation of second degree. Tracing of conics. Tangent at any point to the conic, chord of contact, pole of line to the conic, director circle of conic.

### Suggested Readings:

1. Spiegel , Murraray R., 2009. Vector Analysis, Schaum Publishing Company, New York.
2. Saran , N. , Nigam, S.N.,1982. Introduction to Vector Analysis, Pothishala Pvt. Ltd., Allahabad.
3. Narayna S., 1955. A Text Book of Vector Calculus, S. Chand & Co., New Delhi.
4. Bill, R.J.T., 1994.Elementary Treatise on Co-Ordinary Geometry of Three Dimensions, MacMillan India Ltd.
5. Jain, P.K., Ahmad, Khalil, 1999 .A Textbook of Analytical Geometry of Three Dimensions, Wiley Eastern Ltd. .



20UMTH203

## Mathematical Lab- II

Maximum Marks-50  
External Practical Examination-40  
Internal Assessment-10

Mathematical problem Solving Techniques based on courses 20UMTH201 to 20UMTH202 will be taught. Students will have to solve 15-20 problems based on 20UMTH201 & 20 UMTH202. Also solve atleast 10 problems using programing software preferably MS-Excel. Programmes will be based on Number Theory & Trigonometry and Vector calculus & Geometry.

Note:- Every student will maintain practical record of problems solved during practical class-work in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on problem solving techniques/algorithm. An examinee will be asked to write the solutions in the answer book. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

*Practical Examination will be conducted externally as per the following distribution of marks:*

<i>Writing solutions of problems:</i>	<i>20 marks.</i>
<i>Presentation &amp; Viva voce:</i>	<i>10 marks.</i>
<i>Practical record:</i>	<i>10 marks.</i>
<i>Internal Assesment:</i>	<i>10 marks (Attendance=5 marks, Assignment=5 marks)</i>

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**Scheme of Examination and Syllabi of B.Sc. / B.A. IIIrd Semester  
Mathematics  
(w.e.f. 2020-21)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UMTH301	Differential Equations	Core	2	2	40+10=50
20UMTH302	Numerical Methods with Programming in C	Core	2	2	40+10=50
20UMTH303	Mathematical Lab-III	Core	2	4	40+10=50

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20UMTH301

## Differential Equations

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

Note: *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

### Unit – I

Geometrical meaning of a differential equation. Exact differential equations, integrating factors. Reduction to Exact differential equations, First order higher degree equations solvable for  $x$ ,  $y$ ,  $dy/dx$ , Lagrange's equations, Clairaut's equations. Equation reducible to Clairaut's form. Singular solutions.

### Unit – II

Orthogonal trajectories: in Cartesian coordinates and polar coordinates. Self-orthogonal family of curves. Linear differential equations with constant coefficients. Solution by variation of parameters. Homogeneous linear ordinary differential equations. Equations reducible to homogeneous linear ordinary differential equations.

### Unit – III

Partial differential equations: Formation, order and degree, Linear and Non-Linear Partial differential equations of the first order: Complete solution, singular solution, General solution, Solution of Lagrange's linear equations, Charpit's general method of solution.

### Unit – IV

Jacobi's method, Linear partial differential equations of second and higher orders, Linear and non-linear homogenous and non-homogenous equations with constant co-efficient, Method of separation of variables.

### Suggested Readings:

1. Murray, D.A., 1967. Introductory Course in Differential Equations. Orient Longman India.
2. Bronson, R. and Gabriel, B.C., 2006. Schaum's Outline of Differential Equations. McGraw Hill, New York.
3. Ross, S.R., 2004. Differential Equations, John Wiley & Sons
4. Rai, B. & Chaudhary, D.P., Ordinary Differential Equations; Narosa, Publishing House Pvt. Ltd.
5. Sneddon, I.N., 1988. Elements of Partial Differential Equations, McGraw Hill Book Company, New York.
6. Sharma J.N and Singh K. 2009. Partial Differential Equations for Engineers and Scientists, Alpha Science International.



20UMTH302

## Numerical Methods with Programming in C

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

Note: *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

### Unit – I

Programmer's model of a computer, Algorithms, Flow charts, Data types, Operators and expressions, Input / outputs functions. Decisions control structure: Decision statements, Logical and conditional statements, Implementation of Loops, Switch Statement & Case control structures. Functions, Preprocessors and Arrays.

### Unit – II

Strings: Character Data Type, Standard String handling Functions, Arithmetic Operations on Characters. Structures: Definition, using Structures, use of Structures in Arrays and Arrays in Structures.

### Unit – III

Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method, Secant method, Fixed Point iterative method, Newton-Raphson's method. Newton's iterative method for finding nth root of a number, Order of convergence of above methods.

### Unit – IV

Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method, Iterative method, Jacobi's method, Gauss-Seidal's method, Relaxation method. Convergence of Gauss Seidal Method.

### Suggested Readings:

1. Thareja,R.,Programming in C,2016. Oxford University Press.Oxford.
2. V. Rajaraman,1994. Programming in C, Prentice Hall of India.
3. M.K. Jain, S. R. K. Iyengar, R.K. Jain,1996. Numerical Method, Problems and Solutions, New Age International (P) Ltd.
4. Balagurusamy, E.,2008,Programming in ANSI C, Tata McGraw-Hill Publishing Co. Ltd.
5. Balagurusamy,E.,2010.Numerical Methods, Tata McGraw-Hill Publishing Co. Ltd,India

20UMTH303

### Mathematical Lab- III

Maximum Marks-50  
External Practical Examination-40  
Internal Assessment-10

Mathematical problem Solving Techniques based on courses **20UMTH301 to 20UMTH302** will be taught. Students will have to solve 15-20 problems based on 20UMTH301 & 20 UMTH302. Students will also have to solve atleast 10 problems using C-Language. Programmes will be based on Differential Equations and Numerical Methods.

Note:- Every student will maintain practical record of problems solved during practical class-work in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on problem solving techniques/algorithm. An examinee will be asked to write the solutions in the answer book. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

*Practical Examination will be conducted externally as per the following distribution of marks:*

<i>Writing solutions of problems:</i>	<i>20 marks.</i>
<i>Presentation &amp; Viva voce:</i>	<i>10 marks.</i>
<i>Practical record:</i>	<i>10 marks.</i>
<i>Internal Assesment:</i>	<i>10 marks (Attendance=5 marks, Assignment=5 marks)</i>





**Scheme of Examination and Syllabi of B.Sc. / B.A. IVth Semester  
Mathematics  
(w.e.f. 2020-21)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20UMTH401	Mechanics	Core	2	2	40+10=50
20UMTH402	Groups & Rings	Core	2	2	40+10=50
20UMTH403	Mathematical Lab-IV	Core	2	4	40+10=50

**20UMTH401  
Mechanics**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

Composition and resolution of forces, Resultant of two Parallel forces and their applications.

**Unit – II**

Moments and Couples, Analytical conditions of equilibrium of coplanar forces.

**Unit – III**

Velocity and acceleration along radial, transverse, tangential and normal directions. Relative velocity and acceleration. Simple harmonic motion.

**Unit – IV**

Elastic strings, Newton's laws of motion. Work, Power and Energy.

**Suggested Readings:**

1. Loney, S.L., 1912. Statics, Cambridge University Press
2. Verma, R.S., 1962. A Text Book on Statics, Pothishala Pvt. Ltd.,
3. Loney, S.L., 1956. An Elementary Treatise on the Dynamics of a Particle and a Rigid Bodies, Cambridge University Press.
4. Chorlton, F., 2002. Text book of Dynamics, CBS Publishers, New Delhi



20UMTH402

## Groups & Rings

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

### Unit – I

Definition of a group with example and simple properties of groups, Subgroups and Subgroup criteria, Generation of groups, cyclic groups, Cosets, Left and right cosets, Index of a sub-group Coset decomposition, Lagrange's theorem and its consequences, Normal subgroups.

### Unit – II

Quotient Groups. Homomorphism, isomorphism, automorphism and inner automorphism of a group. Automorphism of cyclic groups, Permutations groups. Even and odd permutations. Alternating groups, Cayley's theorem.

### Unit – III

Introduction to rings, subrings, integral domains and fields, Characteristics of a ring. Ring homomorphism, ideals (principal, prime and Maximal) and Quotient rings.

### Unit – IV

Euclidean rings, Polynomial rings, Polynomials over the rational field, The Eisenstein's criterion, Polynomial rings over commutative rings, Unique factorization domain.

### Suggested Readings:

1. Herstein, I.N., 1975. Topics in Algebra, Wiley Eastern Ltd., New Delhi.
2. Gallian, J.A., 1999. Abstract Algebra, Narosa Publishing House.
3. Ayres, F and Jaisingh L.R., 2005. Schaum's Outlines of Theory and Problems of Abstract Algebra, McGraw Hill Co. New York.



20UMTH403

## Mathematical Lab- IV

Maximum Marks-50  
External Practical Examination-40  
Internal Assessment-10

Mathematical problem Solving Techniques based on courses **20UMTH401 to 20UMTH402** will be taught. Students will have to solve 15-20 problems based on 20UMTH401 & 20 UMTH402. Students will also have to solve atleast 10 problems using programming software preferably MS-Excel/C-Language. Programmes will be based on Mechanics and Groups & Rings.

Note:- Every student will maintain practical record of problems solved during practical class-work in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on problem solving techniques/algorithm. An examinee will be asked to write the solutions in the answer book. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

*Practical Examination will be conducted externally as per the following distribution of marks:*

<i>Writing solutions of problems:</i>	<i>20 marks.</i>
<i>Presentation &amp; Viva voce:</i>	<i>10 marks.</i>
<i>Practical record:</i>	<i>10 marks.</i>
<i>Internal Assesment:</i>	<i>10 marks (Attendance=5 marks, Assignment=5 marks)</i>

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**Scheme of Examination and Syllabi of B.Sc. / B.A. Vth Semester  
Mathematics  
(w.e.f. 2020-21)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
Choose One from 20UMTH501 or 20UMTH502 & Choose One from 20UMTH503 or 20UMTH504					
20UMTH501	Statics & Dynamics	Discipline Specific Elective	2	2	40+10=50
20UMTH502	Statistical Inference				
20UMTH503	Mathematical Analysis	Discipline Specific Elective	2	2	40+10=50
20UMTH504	Linear Algebra				
20UMTH505	Mathematical Lab-V	Discipline Specific Elective	2	4	40+10=50

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20UMTH501  
**Statics & Dynamics**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

Friction, Centre of Gravity. Virtual work.

**Unit – II**

Forces in three dimensions, Poinso't's central axis. Wrenches, Null lines and planes.

**Unit – III**

.Definitions of Conservative forces and Impulsive forces. Projectile motion of a particle in a plane. Vector angular velocity.

**Unit – IV**

General motion of a rigid body. Central Orbits, Kepler laws of motion. Motion of a particle in three dimensions.

**Suggested Readings:**

1. Loney,S.L., 1912.Statics, Cambride University Press
2. Verma, R.S., 1962.A Text Book on Statics, Pothishala Pvt. Ltd.,
3. Loney,S.L.,1956. An Elementary Treatise on the Dynamics of a Particle and a Rigid Bodies, Cambridge University Press.
4. Chorlton,F.,2002. Text book of Dynamics, CBS Publishers, New Delhi

20UMTH502

## Statistical Inference

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

### Unit – I

Parameter and statistic, sampling distribution and standard error of estimate. Point and interval estimation, Unbiasedness, Efficiency, Consistency and Sufficiency. Method of maximum likelihood estimation.

### Unit – II

Null and alternative hypotheses, Simple and composite hypotheses, Critical region, Level of significance, One tailed and two tailed tests, Types of errors, Neyman- Pearson Lemma.

### Unit – III

Definition of Chi-square statistic, Chi-square tests for goodness of fit and independence of attributes. Student t-distribution, properties of t-distribution, significance test of single mean and difference between two sample means.

### UNIT-IV

Snedcor's F-statistics. Testing for the mean and variance of univariate normal distributions, Testing of equality of two means and two variances of two univariate normal distributions. Related confidence intervals. Analysis of variance(ANOVA) for one-way and two-way classifications.

### Suggested Readings:

1. Mood A.M, Graybill, F.A and Boes,D.C., 1974 Introduction to the theory of Statistics, McGraw Hill.
2. Goon,A.M , Gupta,M.K. and Gupta,B.D.,2002 Fundamentals of Statistics, Vol-II. World Press
3. Hogg,R.V. and Craig,A.T.2018, Introduction to Mathematical Statistics.Pearson Education.
4. S.C. Gupta and V.K. Kapoor, 2002. Fundamentals of Mathematical Statistics, Sultan Chand & Sons.





**20UMTH503**  
**Mathematical Analysis**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

***Unit – I***

Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, neighborhoods, interior points, isolated points, limit points, open sets, closed set, interior of a set, closure of a set in real numbers and their properties. Bolzano-Weierstrass theorem(Statement only), Open covers, Compact sets and Heine- Borel Theorem(Statement only).

***Unit – II***

Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence, Subsequences, Sub-sequential limits. Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series, Cauchy's general principle of Convergence of series,

***Unit – III***

Infinite series: Convergence and divergence of geometric series, p-series. Applications of D-Alembert's ratio test, Raabe's test, Cauchy's nth root test, Gauss Test, Cauchy's integral test, Cauchy's condensation test. Alternating series, Leibnitz's test, absolute and conditional convergence.

***Unit – IV***

Extended Complex Plane, Stereographic projection of complex numbers, Functions of complex variables: exponential, logarithmic, circular, hyperbolic, inverse hyperbolic functions, real and imaginary part of complex functions; continuity and differentiability of complex functions.

**Suggested Readings:**

1. Goldberg, R.R., 1970. Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi.
2. Malik, S.C. and Arora S, 1992. Mathematical Analysis, New Age International, India.
3. Narayan, S., 2013. A Course on Mathematical Analysis, S. Chand and company, New Delhi
4. Wrede, R. and Spiegel M.R., 2002. Theory and Problems of Advanced Calculus, Schaum Publishing co., New York
5. Apostol, T.M., 1985. Mathematical Analysis, Narosa Publishing House, New Delhi.
6. Shanti Narayan: Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.

**20UMTH504**  
**Linear Algebra**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space. Finitely generated vector space, Existence theorem for basis of a finitely generated vector space, Finite dimensional vector spaces, Invariance of the number of elements of bases sets, Dimensions, Quotient space and its dimension.

**Unit – II**

Homomorphism and isomorphism of vector spaces, linear transformations and linear forms on vector spaces, Vector space of all the linear transformations, Dual Spaces, Null Space, Range space of a linear transformation, Rank and Nullity Theorem(Statement and applications).

**Unit – III**

Algebra of Linear Transformation, Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations, Matrix of a linear Transformation, Change of basis,

**Unit – IV**

Eigen values and Eigen vectors of linear transformations. Inner product spaces, Cauchy-Schwarz inequality, orthogonal vectors, orthogonal complements, Orthogonal sets and Basis, Bessel's inequality for finite dimensional vector spaces(Statement only), Gram-Schmidt, Orthogonalization process.

**Suggested Readings:**

1. Herstein, I.N., 1975. Topics in Algebra, Wiley Eastern Ltd., New Delhi.
2. P.B. Bhattacharya, S.K. Jain and S.R. Nagpal: Basic Abstract Algebra (2nd edition).
3. Vivek Sahai and Vikas Bist: Algebra, Narosa Publishing House.
4. I.S. Luther and I.B.S. Passi: Algebra, Vol.-II, Narosa Publishing House
5. Lipschutz, S. and Lipson, M.L., 2009. Schaum's outline series of Linear Algebra, McGraw Hill Co. New York.

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**20UMTH505**

**Mathematical Lab- V**

Maximum Marks-50  
External Practical Examination-40  
Internal Assessment-10

Mathematical problem Solving Techniques based on courses **20UMTH501/ 20UMTH502 and 20UMTH503/ 20UMTH504** will be taught. Students will have to solve 15-20 problems based on **20UMTH501/ 20UMTH502 and 20UMTH503/ 20UMTH504**.

Students will also have to solve atleast 10 problems using Computer software preferably

Mathematica/MS-Excel. Programmes will be based on Statics & Dynamics / Statistical Inference and Mathematical Analysis/ Linear Algebra.

Note:- Every student will maintain practical record of problems solved during practical class-work in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on problem solving techniques/algorithm. An examinee will be asked to write the solutions in the answer book. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

*Practical Examination will be conducted externally as per the following distribution of marks:*

<i>Writing solutions of problems:</i>	<i>20 marks.</i>
<i>Presentation &amp; Viva voce:</i>	<i>10 marks.</i>
<i>Practical record:</i>	<i>10 marks.</i>
<i>Internal Assesment:</i>	<i>10 marks (Attendance=5 marks, Assignment=5 marks)</i>



**Scheme of Examination and Syllabi of B.Sc. / B.A. VIth Semester  
Mathematics  
(w.e.f. 2020-21)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
Choose One from 20UMTH601 or 20UMTH602 & Choose One from 20UMTH603 or 20UMTH604					
20UMTH601	Special Functions & Integral Transforms	Discipline Specific Elective	2	2	40+10=50
20UMTH602	Solid Geometry				
20UMTH603	Real Analysis	Discipline Specific Elective	2	2	40+10=50
20UMTH604	Advanced Calculus				
20UMTH605	Mathematical Lab-VI	Discipline Specific Elective	2	4	40+10=50

**20UMTH601**

**Special Functions & Integral Transforms**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

Series solution of differential equations – Power series method, Definitions of Beta and Gamma functions. Bessel equation and its solution: Bessel functions and their properties-Convergence, recurrence. Relations and generating functions, Orthogonality of Bessel functions.

**Unit – II**

Legendre differentials equations and their solutions: Legendre functions and their properties-Recurrence Relations and generating functions. Orthogonality of Legendre functions . Rodrigues' Formula for Legendre , Integral Representation of Legendre polynomial.

**Unit – III**

Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems, Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms, Convolution theorem, Inverse Laplace transforms, convolution theorem, Inverse Laplace transforms of derivatives and integrals, solution of ordinary differential equations with constant coefficients using Laplace transforms.





#### Unit – IV

Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem, Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms. Solution of ordinary differential Equations using Fourier Transforms.

#### Suggested Readings:

1. Kreyszing, E.,1999. Advanced Engineering Mathematics, John Wiley & Sons, Inc., New York.
2. Sneddon, I.N.,1956. Special Functions on Mathematical Physics & Chemistry. Interscience Publisher, New York.
3. Debnath L and Bhatta D.,2014. Integral Transform and their Applications, CRC, Press





**20UMTH602**  
**Solid Geometry**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

General equation of second degree. Tracing of conics. Tangent at any point to the conic, chord of contact, pole of line to the conic, director circle of conic. System of conics. Confocal conics. Polar equation of a conic, tangent and normal to the conic.

**Unit – II**

Sphere: Plane section of a sphere. Sphere through a given circle. Intersection of two spheres, radical plane of two spheres. Co-axial system of spheres,

**Unit-III**

cones. Right circular cone, enveloping cone and reciprocal cone. Cylinder: Right circular cylinder and enveloping cylinder.

**Unit – IV**

Central conicoids: Equation of tangent plane. Director sphere. Normal to the conicoids. Polar plane of a point. Enveloping cone of a conicoid. Enveloping cylinder of a conicoid.

**Suggested Readings:**

1. Bill, R.J.T.,1994.Elementary Treatise on Co-ordinary Geometry of Three Dimensions, MacMillan India Ltd.
2. Jain, P.K. and Ahmad,K.,1999. A Textbook of Analytical Geometry of Three Dimensions, Wiley Eastern Ltd.



**20UMTH603**  
Real Analysis

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Unit – I

Riemann integral, Integrability of continuous and monotonic functions, The Fundamental theorem of integral calculus. Mean value theorems of integral calculus.

Unit – II

Improper integrals and their convergence, Comparison tests, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter. Continuity, Differentiability and Integrability of an integral of a function of a parameter.

Unit – III

Definition and examples of metric spaces, neighborhoods, limit points, interior points, open and closed sets, closure and interior, boundary points, subspace of a metric space, equivalent metrics, Cauchy sequences, completeness, Cantor's intersection theorem(statement and applications), Baire's category theorem(Statements and applications), contraction Principle

Unit – IV

Continuous functions, uniform continuity, compactness for metric spaces, sequential compactness, Bolzano-Weierstrass property, total boundedness, finite intersection property, continuity in relation with compactness.

Suggested Readings:

1. Jain, P.K. and Ahmad, K., 2004 Metric Spaces, 2nd Ed., Narosa Publishing House, N. Delhi
2. Apostol, T.M., 1985. Mathematical Analysis, Narosa Publishing House, New Delhi.
3. Goldberg, R.R., 1970. Real analysis, Oxford & IBH publishing Co., New Delhi.
4. Narayan, S and Mittal P.K., 2013 A Course of Mathematical Analysis, S. Chand & Co., New Delhi
5. Copson, E.T., 1968. Metric Spaces, Cambridge University Press.
6. Simmons, G.F., 1963. Introduction to Topology and Modern Analysis, McGraw Hill.



**20UMTH604**  
**Advanced Calculus**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

Uniform continuity, chain rule of differentiability. Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations. Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives(statement only), Indeterminate forms.

**Unit – II**

Limit and continuity of real valued functions of two variables. Partial differentiation. Total Differentials; Composite functions & implicit functions. Change of variables. Homogenous functions & Euler's theorem on homogeneous functions.

**Unit – III**

Taylor's theorem for functions of two variables. Differentiability of real valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Maxima, Minima and saddle points of two variables.

**Unit – IV**

Lagrange's method of multipliers. Jacobian, Differentiation under integral sign, Applications of Triple integrals, Change of variable in Double and triple integrals.

**Suggested Readings:**

1. Narayan S., 1962. Differential Calculus. S. Chand and Company.India
2. Spiegel S., Murray R., 1963. Theory and Problems of Advanced Calculus, Mc- Graw Hill, New York.
3. Prasad,G. 1941. Text book on Differential Calculus, Pothishala Pvt. Ltd., Allahabad.
4. Ramana, B.V.,2008. Higher Engineering Mathematics,Tata McGraw Hill Publishing Co.Ltd. New Delhi



**20UMTH605**

## **Mathematical Lab- VI**

Maximum Marks-50  
External Practical Examination-40  
Internal Assessment-10

Mathematical problem Solving Techniques based on courses **20UMTH601/ 20UMTH602 and 20UMTH603/ 20UMTH604** will be taught. **20UMTH601/ 20UMTH602 and 20UMTH603/ 20UMTH604**

Students will also have to solve atleast 10 problems using Computer software preferably Mathematica/MS-Excel. Programmes will be based on Special Functions & Integral Transforms / Solid Geometry and Real Analysis/ Advanced Calculus.

Note:- Every student will maintain practical record of problems solved during practical class-work in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on problem solving techniques/algorithm. An examinee will be asked to write the solutions in the answer book. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

*Practical Examination will be conducted externally as per the following distribution of marks:*

*Writing solutions of problems: 20 marks.*

*Presentation & Viva voce: 10 marks.*

*Practical record: 10 marks.*

*Internal Assesment: 10 marks (Attendance=5 marks, Assignment=5 marks)*





# Skill Enhancement Courses offered by Department of Mathematics

## Scheme of Examination and Syllabi of SEC for B.Sc. (Non-Medical & Computer Science)/ B. A. Mathematics (w.e.f. 2020-21) SEMESTER-IV

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
Choose One out of following four papers:					
20USECM401	Logic and sets	Skill Enhancement	3	3	80+20=100
20USECM402	Analytical Geometry				
20USECM403	Probability & Statistics				
20USECM404	Vedic Arithmetic				

### 20USECM401 Logic and sets

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

#### *Unit – I*

Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, bi-conditional propositions, converse, contra positive and inverse propositions and precedence of logical operators.

#### *Unit – II*

Propositional equivalence: Logical equivalences. Predicates and quantifiers: Introduction, Quantifiers, Binding variables and Negations.

#### *Unit – III*

Sets, subsets, Set operations, the laws of set theory and Venn diagrams. Examples of finite and infinite sets. Finite sets and counting principle. Empty set, properties of empty set. Standard set operations. Classes of sets. Power set of a set.



### *Unit – IV*

Difference and Symmetric difference of two sets. Set identities, Generalized union and intersections. Relation: Product set, Composition of relations, Types of relations, Partitions, Equivalence Relations with example of congruence modulo relation.

#### **Suggested Readings:**

1. Grimaldi, R.P. 1998. Discrete Mathematics and Combinatorial Mathematics, Pearson Education.
2. Halmos, P.R., 1974. Naive Set Theory, Springer.
3. Kamke, E. 1950. Theory of Sets, Dover Publishers.

**20USECM402**

### **Analytical Geometry**

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

#### *Unit – I*

Techniques for sketching parabola, ellipse and hyperbola.

#### *Unit – II*

Reflection properties of parabola, ellipse and hyperbola.

#### *Unit – III*

Classification of quadratic equations representing lines, parabola, ellipse and hyperbola.

#### *Unit – IV*

Spheres, Cylindrical surfaces. Illustrations of graphing standard quadric surfaces like cone, ellipsoid.

#### **Suggested Readings:**

1. G.B. Thomas and R.L. Finney, *Calculus*, 9th Ed., Pearson Education, Delhi, 2005.
2. H. Anton, I. Bivens and S. Davis, *Calculus*, John Wiley and Sons (Asia) Pvt. Ltd., 2002.
3. S.L. Loney, *The Elements of Coordinate Geometry*, McMillan and Company, London. 1920.
4. R.J.T. Bill, *Elementary Treatise on Coordinate Geometry of Three Dimensions*, McMillan India Ltd., 1994.



**20USECM403**  
**Probability and Statistics**

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

Note: *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

***Unit – I***

Sample space, probability axioms, real random variables (discrete and continuous), cumulative distribution function, probability mass/density functions, mathematical expectation.

***Unit – II***

Moments, moment generating function, characteristic function, discrete distributions: uniform, binomial, Poisson, continuous distributions: uniform, normal, exponential.

***Unit – III***

Joint cumulative distribution function and its properties, joint probability density functions, marginal and conditional distributions.

***Unit – IV***

Expectation of function of two random variables, conditional expectations, independent random variables.

**Suggested Readings:**

1. Robert V. Hogg, Joseph W. McKean and Allen T. Craig, *Introduction to Mathematical Statistics*, Pearson Education, Asia, 2007.
2. Irwin Miller and Marylees Miller, John E. Freund, *Mathematical Statistics with Application*, 7th Ed., Pearson Education, Asia, 2006.
3. Sheldon Ross, *Introduction to Probability Model*, 9th Ed., Academic Press, Indian Reprint, 2007.



20USECM404  
Vedic Arithmetic

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

Note: *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

Multiplication: Ekadhikena Purvena method (multiplication of two numbers of two digits), Ekadhikena Purvena (multiplication of two numbers of three digits), Urdhvatiryakbhyam (multiplication of two numbers of three digits), Nikhilam Navtashcarman Dashtaha (multiplication of two numbers of three digits), Combined Operations.

**Unit – II**

Division: Nikhilam Navtashcarman Dashtaha (two digits divisor), Paravartya Yojayati-Sutra (three digits divisor). Divisibility: Ekadhikena Purvena method ( two digits divisor), Ekadhikena Purvena ( two digits divisor).

**Unit – III**

LCM and HCF in arithmetic and Algebra.

**Unit – IV**

Power: Square (four digits numbers), Cube(two digits numbers). Root: Square root (four digits numbers), Cube root(six digits numbers).

**Suggested Readings:**

1. Vedic Mathematics, Motilal Banarsi Das, New Delhi.
2. Vedic Ganita: Vihangama Drishti-1, Siksha Sanskriti Uthana Nyasa, New Delhi.
3. Vedic Ganita Praneta, Siksha Sanskriti Uthana Nyasa, New Delhi.
4. Vedic Mathematics: Past, Present and Future, Siksha Sanskriti Uthana Nyasa, New Delhi.
5. Leekavati, Chokhambba Vidya Bhawan, Varansi.
6. Bharatiya Mathematicians, Sharda Sanskriti Sansthan, Varanasi.



**Scheme of Examination and Syllabi of SEC for B.Sc. (Non-Medical  
& Computer Science)/ B. A. Mathematics  
(w.e.f. 2020-21)  
SEMESTER-V**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
Choose One out of following four papers:					
20USECM501	Integral Calculus	Skill Enhancement	3	3	80+20=100
20USECM502	Theory of Equations				
20USECM503	Discrete Mathematics				
20USECM504	Vedic Algebra				

**20USECM501**

**Integral Calculus**

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

Note: *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Unit – I**

Integration by Partial fractions, integration of rational and irrational functions. Properties of definite integrals.

**Unit – II**

Reduction formulae for integrals of rational, trigonometric, exponential and logarithmic functions and of their combinations.

**Unit – III**

Areas and lengths of curves in the plane, volumes and surfaces of solids of revolution.

**Unit – IV**

Double and Triple integrals.

**Suggested Readings:**

1. G.B. Thomas and R.L. Finney, *Calculus*, 9th Ed., Pearson Education, Delhi, 2005.
2. H. Anton, I. Bivens and S. Davis, *Calculus*, John Wiley and Sons (Asia) P. Ltd., 2002.



20USECM502

## Theory of Equations

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

Note: *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

### *Unit – I*

General properties of polynomials, Graphical representation of a polynomials, maximum and minimum values of a polynomials.

### *Unit – II*

General properties of equations, Descarte's rule of signs positive and negative rule, Relation between the roots and the coefficients of equations.

### *Unit – III*

Symmetric functions, Applications symmetric function of the roots, Transformation of equations.

### *Unit – IV*

Solutions of reciprocal and binomial equations. Algebraic solutions of the cubic and biquadratic. Properties of the derived functions.

### **Suggested Readings:**

1. W.S. Burnside and A.W. Panton, *The Theory of Equations*, Dublin University Press, 1954.
2. C. C. MacDuffee, *Theory of Equations*, John Wiley & Sons Inc., 1954.

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**20USECM503**  
Discrete Mathematics

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Unit – I

Sets, principle of inclusion and exclusion, relations, equivalence relations and partition, denumerable sets, partial order relations, Mathematical Induction, Pigeon Hole Principle and its applications.

Unit – II

Propositions, logical operations, logical equivalence, conditional propositions, Tautologies and contradictions. Quantifier, Predicates and Validity.

Unit – III

Permutations and combinations, probability, basic theory of Graphs and rings.

Unit – IV

Discrete numeric functions, Generating functions, recurrence relations with constant coefficients. Homogeneous solution, particular relations, total rotation, Solution of recurrence relation by the method Generating function.

Suggested Readings:

1. J.P. Tremblay & R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw-Hill Book Co., 1997.
2. J.L. Gersting, Mathematical Structures for Computer Science, (3rd edition), Computer Science Press, New York.2014.
3. Seymour Lipschutz, Finite Mathematics (International edition 1983), McGraw-Hill Book Company, New York.1983.
4. C.L. Liu, Elements of Discrete Mathematics, McGraw- Hill Book Co.1998.



**20USECM504**  
**Vedic Algebra**

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

Note: *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

***Unit – I***

Multiplication: Urdhvatiragbhyam Method, Combined Operations.

***Unit – II***

Division (Divisor: Linear Expression of Single Variable), Factorization (Quadratic Expression of single variable).

***Unit – III***

LCM and HCF

***Unit – IV***

Solutions of linear simultaneous equations.

**Suggested Readings:**

1. Vedic Mathematics, Motilal Banarsi Das, New Delhi.
2. Vedic Ganita: Vihangama Drishti-1, Siksha Sanskriti Uthana Nyasa, New Delhi.
3. Vedic Ganita Praneta, Siksha Sanskriti Uthana Nyasa, New Delhi.
4. Vedic Mathematics: Past, Present and Future, Siksha Sanskriti Uthana Nyasa, New Delhi.
5. Beejganitam, Chokhambba Vidya Bhawan, Varansi.
6. Bharatiya Mathematicians, Sharda Sanskriti Sansthan, Varanasi.

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**Scheme of Examination and Syllabi of SEC for B.Sc. (Non-Medical  
& Computer Science)/ B. A. Mathematics  
(w.e.f. 2020-21)  
SEMESTER-VI**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
Choose One out of following four papers:					
20USECM601	Boolean Algebra	Skill Enhancement	3	3	80+20=100
20USECM602	Transportation and Game Theory				
20USECM603	Mathematical Finance				
20USECM604	Vedic Geometry				

**20USECM601  
Boolean Algebra**

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

***Unit – I***

Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, maximal and minimal elements.

***Unit – II***

Lattices as ordered sets, complete lattices, lattices as algebraic structures, sub-lattices, products and homomorphism.

***Unit – III***

Definition, examples and properties of modular and distributive lattices, Boolean algebras, Boolean polynomials, minimal forms of Boolean polynomials.

***Unit – IV***

Quinn-McCluskey method, Karnaugh diagrams, switching circuits and applications of switching circuits.

**Suggested Readings:**

1. B A. Davey and H. A. Priestley, *Introduction to Lattices and Order*, Cambridge University Press, Cambridge, 1990.
2. Rudolf Lidl and Günter Pilz, *Applied Abstract Algebra*, 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.

20USECM602

## Transportation & Game Theory

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

Note: *There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

### *Unit – I*

Transportation problem and its mathematical formulation, northwest-corner method, least cost Method.

### *Unit – II*

Vogel approximation method for determination of starting basic solution.

### *Unit – III*

Algorithm for solving transportation problem, assignment problem and its mathematical formulation, Hungarian method for solving assignment problem.

### *Unit – IV*

Game theory: formulation of two person zero sum games, solving two person zero sum games, games with mixed strategies, graphical solution procedure.

### **Suggested Readings :**

1. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, *Linear Programming and Network Flows*, 2nd Ed., John Wiley and Sons, India, 2004.
2. F. S. Hillier and G. J. Lieberman, *Introduction to Operations Research*, 9th Ed., Tata McGraw Hill, Singapore, 2009.
3. Hamdy A. Taha, *Operations Research, An Introduction*, 8th Ed., Prentice-Hall India, 2006.

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**20USECM603**  
**Mathematical Finance**

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

***Unit – I***

Basic principles: Comparison, arbitrage and risk aversion, Interest (simple and compound, discrete and continuous), time value of money, inflation.

***Unit – II***

Net present value, internal rate of return (calculation by bisection and Newton-Raphson methods), comparison of NPV and IRR. Bonds, bond prices and yields. Floating-rate bonds, immunization.

***Unit – III***

Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance and correlation), random returns, portfolio mean return and variance.

***Unit – IV***

Diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints).

**Suggested Readings:**

1. David G. Luenberger, *Investment Science*, Oxford University Press, Delhi, 1998.
2. John C. Hull, *Options, Futures and Other Derivatives*, 6th Ed., Prentice-Hall India, Indian reprint, 2006.
3. Sheldon Ross, *An Elementary Introduction to Mathematical Finance*, 2nd Ed., Cambridge University Press, USA, 2003.



**20USECM604**  
**Vedic Geometry**

Maximum Marks-100  
External Examination-80  
Internal Assessment-20  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

***Unit – I***

Concept of Bhaudhayana Number (BN): BN of an angle, Multiplication of a constant in a BN, BN of complimentary angles, BN of sum and difference of an angle, BN of half angle.

***Unit – II***

Trigonometry: Definition of trigonometric ratios, Trigonometric identities.

***Unit – III***

Co-ordinate Geometry: Different forms of straight lines.

***Unit – IV***

Complex Numbers: Multiplication, division and square root.

**Suggested Readings:**

1. Vedic Mathematics, Motilal Banarsi Das, New Delhi.
2. Vedic Ganita: Vihangama Drishti-1, Siksha Sanskriti Uthana Nyasa, New Delhi.
3. Vedic Ganita Praneta, Siksha Sanskriti Uthana Nyasa, New Delhi.
4. Vedic Mathematics: Past, Present and Future, Siksha Sanskriti Uthana Nyasa, New Delhi.
5. Beejganitam, Chokhambba Vidya Bhawan, Varanasi.
6. Bharatiya Mathematicians, Sharda Sanskriti Sansthan, Varanasi.



SCHEME OF EXAMINATION OF B.A.I ( PHYSICAL EDUCATION)  
2011-12

	Name of Paper	Total marks
Semester- 1 <sup>st</sup>	<b>PRINCIPLE AND FOUNDATION OF PHYSICAL EDUCATION</b>	Ext. Marks : 60 Int. marks: 15 Total:- 75
Semester 2 <sup>nd</sup>	<b>HEALTH AND YOGA</b>	Ext. Marks : 60 Int. marks: 15 Total:- 75
Semester 1 <sup>st</sup> & 2 <sup>nd</sup>	<b>PRACTICAL Game* Athletics**</b>	(25+25)=50
	<b>Total Marks (Theory + Practical)</b>	150+50=200

**For semester 1<sup>st</sup>**

\* Volleyball, Softball, Judo, Cricket

\*\* Shot-put, 100 mtr race, 5000 mtr

**For semester 2<sup>nd</sup>**

\* Basketball, Netball, Boxing & Gymnastic

\*\* Discus Throw, 110 mtr. Hurdle, 10000 mtr.

Note:-

The students are required to prepare ten lesson plans (Games-4, Athletics-3 and Yoga-3) on the events mentioned in the syllabi of semester I & II on the loose sheets. There is no need of practical note book. The game, event of Athletics and Asan will be allotted for the final practical lesson on the basis of draw of lot which shall take place before 15 days of final practical examinations. All the lesson plans prepared by the students must be signed by the concerned teacher.

2. The practical classes shall be held through out the year. However, final practical examinations for both the Semesters i.e. (1<sup>st</sup> & 2<sup>nd</sup>) shall be conducted at the end of 2<sup>nd</sup> semester.

SCHEME OF EXAMINATION OF B.A.II Semester 3<sup>rd</sup> & 4<sup>th</sup>  
(PHYSICAL EDUCATION)  
2012-13

	Name of Paper	Total marks
Semester- 3 <sup>rd</sup>	<b>Physical Activity &amp; Health</b>	Ext. Marks :60 Int. marks: 15 Total:- 75
Semester 4 <sup>th</sup>	<b>Physical Fitness &amp; Yoga</b>	Ext. Marks : 60 Int. marks: 15 Total:- 75
Semester 3 <sup>rd</sup> & 4 <sup>th</sup>	<b>PRACTICAL Game* Athletics**</b>	(25+25)=50
	<b>Total Marks (Theory + Practical)</b>	150+50=200

**For semester 3<sup>rd</sup>**

\* Bandball, Baseball, Wrestling & Badminton

\*\* Javelin throw, Long-jump, 4x100 mtr relay

**For semester 4<sup>th</sup>**

\* Korfball, Lawn-tennis, Weightlifting, Swimming

\*\* Hamer throws, 800 mtr, High Jump,

Note:-

The students are required to prepare ten lesson plans (Games-4, Athletics-3 and Yoga-3) on the events mentioned in the syllabi of semester 3<sup>rd</sup> & 4<sup>th</sup> on the loose sheets. There is no need of practical note book. The game, event of Athletics and Asan will be allotted for the final practical lesson on the basis of draw of lot which shall take place before 15 days of final practical examinations. All the lesson plans prepared by the students must be signed by the concerned teacher.

2. The practical classes shall be held through out the year. However, final practical examinations for both the Semesters i.e. (3<sup>rd</sup> & 4<sup>th</sup>) shall be conducted at the end of 4<sup>th</sup> semester.

SCHEME OF EXAMINATION OF B.A.III Semester 5<sup>th</sup> & 6<sup>th</sup>  
(PHYSICAL EDUCATION)  
2012-13

	Name of Paper	Total marks
Semester- 5 <sup>th</sup>	<b>Socio-Psychological Foundation of Physical Education</b>	Ext. Marks : 60 Int. marks: 10 Total:- 70
Semester 6 <sup>th</sup>	<b>Organization &amp; Management of Physical Education</b>	Ext. Marks : 60 Int. marks: 10 Total:- 70
Semester 5 <sup>th</sup> & 6 <sup>th</sup>	<b>PRACTICAL Game* Athletics**</b>	(30+30)=60
	<b>Total Marks (Theory + Practical)</b>	140+60=200

**For semester 5<sup>th</sup>**

\* Hockey, Kabaddi, Water-polo & Table Tennis

\*\* 1500 mtr., 400 mtr. Hurdle, Triple Jump

**For semester 6<sup>th</sup>**

\* Football, Kho-kho, Chess, Kabaddi (Haryana Style)

\*\* 3000 mts., 4x400 relay races, Pole-vault

Note:-

The students are required to prepare ten lesson plans (Games-4, Athletics-3 and Yoga-3) on the events mentioned in the syllabi of semester 5<sup>th</sup> & 6<sup>th</sup> on the loose sheets. There is no need of practical note book. The game, event of Athletics and Asana will be allotted for the final practical lesson on the basis of draw of lot which shall take place before 15 days of final practical examinations. All the lesson plans prepared by the students must be signed by the concerned teacher.

2. The practical classes shall be held through out the year. However, final practical examinations for both the Semesters i.e. (5<sup>th</sup> & 6<sup>th</sup>) shall be conducted at the end of 6<sup>th</sup> semester.

B.A. Part I (Semester-1<sup>st</sup>)

**Paper-I PRINCIPLES AND FOUNDATIONS OF PHYSICAL EDUCATION**

Ext. Marks: 60

Int. marks: 15

Time: 3 hours

Note:- **(a) For paper setter**

1. Paper setter will set 9 questions in all, out of which students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will carry 12 marks. It will comprise of 6 short answer type questions of 2 marks each to be selected from the entire syllabus.
3. Two long answer type questions will be set from each of four units, out of which the students will be required to attempt one question from each unit. Long answer Type questions will carry 12 marks each.

**(b) for candidates**

1. Attempt five questions in all, selecting atleast one questions from each unit. Question No. 1 is compulsory. All questions carry equal marks.

UNIT-I

- Definition, Objectives, Scope & Importance of Physical Education.
- Historical development of Ancient Olympic
- Historical development of national games of India.

UNIT-II

- Biological Basis of Physical activity  
A-Exercise: Types of Exercise (b) Growth and Exercise, (c)Exercise and well being, (d) Body types
- Growth of Physical Education in India:  
(i) LNUPE (ii) SAI NSNIS (iii) YMCA (iv) IOA

UNIT-III

- Modern Olympic Revival and progress
- Performance of Indian Players in Modern Olympic and Asian games.

UNIT-IV Sports Awards in India

- (a) Arjuna Award (b) Daronacharya Award (c) Khel Ratan Award (d) Bhim Award (Haryana) (e) Maulana Abdul Kalam Azad Trophy

REFERENCES

1. Foundations of Physical Education, Chales A. Bucher
2. Foundations of Physical Eduction, M.L.Kamlesh
3. History and Principles in Physical Education, Dr. Karan Singh
4. Essentials of Physical Education, Dr. Ajmer Singh
5. Foundations of Physical Education, Dr. A.K.Uppal.



**Paper-II**

B.A.I Semester -II  
**HEALTH AND YOGA**

Ext. Marks: 60  
Int. Marks: 15  
Time: 3 hours

Note:- **(a) For paper setter**

1. Paper setter will set 9 questions in all, out of which students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will carry 12 marks. It will comprise of 6 short answer type questions of 2 marks each to be selected from the entire syllabus.
3. Two long answer type questions will be set from each of four units, out of which the students will be required to attempt one question from each unit. Long answer Type questions will carry 12 marks each.

**(b) for candidates**

1. Attempt five questions in all, selecting atleast one questions from each unit. Question No. 1 is compulsory. All questions carry equal marks.

**UNIT-I**

- Meaning, Importance of Health and Health Education in Modern Society.
- Guiding Principle of Health Education.

**UNIT-II**

- Importance of Light and Cross ventilation at School & Home
- Meaning of Personnel Hygiene and its Importance
- Meaning & Importance of personal hygiene. Personal hygiene of the following:
  - a) Teeth (b) Ears (c) Eyes (d) Skin (e) Nail & Fingers

**UNIT-III**

- Meaning of Communicable diseases
- Mode of transmission & prevention of the following:
- (i) HIV/AIDS (ii) HEPATITIS-B & C (iii) MALARIA (iv) TUBERCULOSIS (v) CHOLERA

**UNIT-IV**

- Meaning, types & aims of yoga
- Procedure and benefits of following Asans:
  1. Surya Namaskar: Bhujang Asan, Hal Asan, Dhanur Asan, Ardh Machhender Asan, Chakar Asan, Matsay Asan, Karan Peera Asan, Mayur Asan and Setu Bandh Asan

**REFERENCES:**

Health the basis of life: Dr. John Maclay  
Natural Health & Yoga, Brij Bhushan  
Health Education, S.K.Mangal  
Essential of Physical Education, Dr. Ajmer Singh & Dr. Bains

## **PRACTICAL WORK**

The practical of B.A.I (Semester 1<sup>st</sup> & 2<sup>nd</sup> ) shall consist of 50 marks (25 marks for each semester). The following events of Athletics, games and yogic activities will be the part of practical:

**Games: Semester 1<sup>st</sup> :**Basic Gymnastics, (Formation of class, Command and assembly)  
Kho-kho, Hockey and Volleyball

### **Athletic events:**

Sprint upto 400 mtrs, Shot-put and Long-jump

### **Yoga:-**

Surya Namaskar, Bhujang Asan, Hal asan, Dhanur asan, Machhender asan, Chakar asan, Matsay asan, Karan Peera asan, Mayur asan and Setu Bandh asan

### **Practical work for B.A. I Semester-II**

**Games:** Kabaddi, Basketball, Football and Wrestling

**Athletics:** Discus throw, Relay Races, Tripple Jump

**Yoga:-** Kriyas : (i) Kapal Bhati (ii) Nauli

### **Distribution of marks shall be as under:**

**Games:-** 25 marks (10 marks for performance on the basis of his/her position in event/game in AIU Championship, further authenticity of concerned performer will be verified by the Principal of concerned College at the time of practical.)  
10 marks for presentation & viva  
05 marks for lesson plan

### **Athletics:-**

25 marks (10 marks for performance) on the basis of his/her position in event/game in AIU Championship further authenticity of concerned performer will be verified by the Principal of concerned College at the time of practical.)  
10 marks for presentation & viva  
05 marks for lesson plan

### **Yoga:-**

10 marks on the basis of performance of Asans given in the syllabus

### **Note:-**

1. The students are required to prepare ten lesson plans (Games-4, Athletics-4 and Yoga-2) on the events mentioned in the syllabi of semester I & II on the loose sheets. There is no need of practical note book. The game, event of Athletics and Asan will be allotted for the final practical lesson on the basis of draw of lot which shall take place before 15 days of final practical examinations. All the lesson plans prepared by the students must be signed by the concerned teacher.

2 The practical classes shall be held through out the year. However, final practical examinations for both the Semesters i.e. (1<sup>st</sup> & 2<sup>nd</sup>) shall be conducted at the end of 2<sup>nd</sup> semester.

**B.A. II (Semester 3<sup>rd</sup>)**  
**Paper: - Physical Activity and Health**

Internal: 15 marks  
External: 60 marks  
Time: 3 hours

Note:- **(a) For paper setter**

1. Paper setter will set 9 questions in all, out of which students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will carry 12 marks. It will comprise of 6 short answer type questions of 2 marks each to be selected from the entire syllabus.
3. Two long answer type questions will be set from each of four units, out of which the students will be required to attempt one question from each unit. Long answer Type questions will carry 12 marks each.

**(b) for candidates**

1. Attempt five questions in all, selecting atleast one questions from each unit. Question No. 1 is compulsory. All questions carry equal marks.

**UNIT-I Health and Health Education**

- Concept of Health, Meaning and definitions of Health and Health Education, Aim and Objectives of Health Education, Health and Physical Fitness. WHO, UNICEF, Role of Physical Activity towards different dimension of health.

**UNIT-II Food and Nutrition:**

- Balance diet, Factors effecting diet, Elements and functions of the balance diet. Nutritional tips, Vegetarian verses non vegetarian diet.

**UNIT-III Posture**

- Posture: Concept of posture, value of posture, causes of poor posture, types of postural deformities, their causes and precautions

**First-Aid**

**General Principles of first aid, Common first-aid measures for:**

- a) Snake biting      (b) Choking    (c) Drawing (d) Fainting  
(e) Fracture (f) Burns (g) Poison and Unconsciousness (h) Heat Stroke

**UNIT-IV Exercise and life style disease**

- Exercise and life style disease
- Exercise and obesity
- Exercise & Heart disease
- Exercise & diabetes
- Exercise & Stress Management

REFERENCES:

1. **Stainbaus, A.H.**, Towards an understanding of Health and Physical Education, W.M.C. Brown Co. 1963.
2. Bogart, L.J., Nutrition and Physical fitness, Sauners.
3. Verma, KK, Health and Physical Education, Prakash Publications, Jalandhar.
4. W.H. Aykroid, The Nutritive value of Indian Foods and planning and satisfactory diet, New Delhi, Indian Council of Medical Research 1963.
5. Bograt, L.J., Company Nutrition and Physical Education.



## **B.A. II (Semester 4<sup>th</sup>) Physical Fitness & Yoga**

Internal: 15 marks  
External: 60 marks  
Time: 3 hours

Note:- **(a) For paper setter**

1. Paper setter will set 9 questions in all, out of which students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will carry 12 marks. It will comprise of 6 short answer type questions of 2 marks each to be selected from the entire syllabus.
3. Two long answer type questions will be set from each of four units, out of which the students will be required to attempt one question from each unit. Long answer Type questions will carry 12 marks each.

**(b) for candidates**

1. Attempt five questions in all, selecting atleast one questions from each unit. Question No. 1 is compulsory. All questions carry equal marks.

### **UNIT-I      Physical Education**

- Meaning and importance of Physical Education.
- Aims and objectives of Physical Education.
- Relationship of Physical Education with General Education.
- Need of Physical Education in the modern society

### **UNIT-II      Physical Fitness**

- Meaning and Components of Physical fitness, (Speed, strength, Endurance, Flexibility, Agility). Factors influencing Physical fitness.  
**Warming up - cooling down**
  - a) Types of warming up
  - b) Guiding principles of warming up
  - c) Importance of warming up and cooling down

### **UNIT-III      Yogic Kriyas**

- Meaning and objectives of Sudhi Kriya, Types of Sudhi Kriya, (Neti, Dhauti, Nauli, Basti, Kapalbhathi, Trataka).
- Physiological values of sudhi kiryas.

### **UNIT-IV      Camping**

- Meaning of camping
- types of camping

- Educational values of camping
  - Role of following agencies in promotion of games and sports**
  - a) All India Council of Sports (AICS)
  - b) International Olympic Committee (IOC)
  - c) Young Women Christian Association (YWCA)
  - d) Sports Physical Aptitude Test (SPAT)

#### REFERENCES:

1. Charles A. Buchen: Foundation of Physical Education (The C.V. Masby Company 1973 st. Luois)
2. Kamlesh M.K & M.S., Principles and History of Physical Education (Praksh Brothers, 1978)
3. N.M.Gora, Anatomy and Physiology of Yogic practices, Kanchan Prakasan Lonavala-410403
4. Ajmer Singh & Others, Physical Education and Olympic movement.
5. Joshi, K.S., Yoga and Personality, Udayana, Publication, Allahabad.

**B.A. III (Semester 5<sup>th</sup>)**  
**Socio-Psychological Foundation of Physical Education**

Internal: 10 marks  
External: 60 marks  
Time: 3 hours

Note:- **(a) For paper setter**

1. Paper setter will set 9 questions in all, out of which students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will carry 12 marks. It will comprise of 6 short answer type questions of 2 marks each to be selected from the entire syllabus.
3. Two long answer type questions will be set from each of four units, out of which the students will be required to attempt one question from each unit. Long answer Type questions will carry 12 marks each.

**(b) for candidates**

1. Attempt five questions in all, selecting atleast one questions from each unit. Question No. 1 is compulsory. All questions carry equal marks.

**U-I Psychological aspect of Physical Education**

- Learning of sports activity, Psycho-Physical Unity of human being, Law of learning, their application to situations on play ground. Theories of play, Individual differences, Adjustment, Motivation.

**UNIT-II Sports Socializing Agency:**

- Sports as medium of socialization, Effects of socio-economic status on sports, spectators and crowd behaviour (Positive, Negative and Neutral) Sports and Economy. Traditions and their influence on behaviour patterns.

**UNIT-III Conditioning**

- Need and Importance of conditioning, Methods of conditioning (Circuit Training, Interval training, Fartlek Training, Weight Training)

**UNIT-IV Doping**

- Types of doping, prevention of doping
- Hazard of smoking and drinking, prevention of smoking and drinking, quitting techniques of smoking and drinking habits.

REFERENCES:

1. Charles, A Bucher, Foundation & Physical Education, The C.V. Nos by company 1961 S.T. Louis.
2. Ball & Lay, Sports and Social Orders
3. Dr. A.K.Uppal, Foundation of Physical Education.

**B.A. III (Semester 6<sup>th</sup>)**  
**Organization and Management of Physical Education**

Internal: 10 marks

External: 60 marks

Time: 3 hours

Note:- **(a) For paper setter**

1. Paper setter will set 9 questions in all, out of which students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will carry 12 marks. It will comprise of 6 short answer type questions of 2 marks each to be selected from the entire syllabus.
3. Two long answer type questions will be set from each of four units, out of which the students will be required to attempt one question from each unit. Long answer Type questions will carry 12 marks each.

**(b) for candidates**

1. Attempt five questions in all, selecting atleast one questions from each unit. Question No. 1 is compulsory. All questions carry equal marks.

**UNIT-I Track:**

- Need, Importance & characteristics of Track, care and maintenance of Track.
- Conduct of Annual Athletic meet
- Organization and conduct of tournament,

**UNIT-II Sports Management**

- Meaning, importance and scope of sports management
- Factor influencing sports management
- Qualification and qualities of Physical Education teachers
- Duties of an official (Pre-game, during-game and post-game)

**UNIT-III Sports Injuries**

- Prevention of sports injury and rehabilitation, sports injury and various factors causing injury, Principles of prevention of sports injury. Meaning and scope of rehabilitation, facilities available for rehabilitation. Role of Physical Education teacher in rehabilitation.

**UNIT-IV Professional Preparation**

- Meaning of Professional Preparation, Definition and significance of profession preparation in Physical Education. Curriculum Design in Physical Education.



References:

1. Gupta Rakesh, Akhilesh and Santosh Sharma, Professional Preparation & Curriculum Design in Physical Education.
2. P.M. Loseph, Organization of Physical Education.
3. D.G.Waknerker, Manual of Physical Education
4. Kamlesh M.L., Management concept in Physical Education and Sports, New Delhi.
5. Doherty J. Manneth, Modern track and field, Englewood cliffe, N.J. Printice all, Ino.

# Chaudhary Bansilal University, Bhiwani

(A State University established under Haryana Act No. 25 of 2014)

## Examination Scheme Syllabus Bachelor of Art (Economics)

Course /Paper Code	Subjects	Type of Course	Contact Hours Per Week			Examination Scheme			Total
			Theory	Tutorial	Total	Theory	Internal Assessment	Practical	
Semester-1	Microeconomics-I)	C.C	5	1	6	80	20	-	100
Semester-2	Microeconomics-II)	C.C	5	1	6	80	20	-	100
Semester-3	Macroeconomics- I	C.C	5	1	6	80	20	-	100
Semester-4	Macroeconomics- II	C.C	5	1	6	80	20	-	100
Semester-5	DSEC-1: Indian Economy DSEC-2: Economy of Haryana DSEC-3: Agricultural Economics DSEC-4 : Introduction to Econometrics	D.S.E	5	1	6	80	20	-	100
Semester-6	DSEC-5: Development Economics DSEC-6: International Economics DSEC-7: Gender Economics DSEC-8: History of Economic Thought	D.S.E	5	1	6	80	20	-	100
<b>Total</b>			<b>30</b>	<b>6</b>	<b>36</b>	<b>480</b>	<b>120</b>	<b>0</b>	<b>600</b>

*Why kamran*  
2/1/2014  
Incharge, Economics  
C B L U, Bhiwani



**Chaudhary BansiLal University, Bhiwani**  
(A State University established under Haryana Act No. 25 of  
2014)

**Study & Evaluation**

**Scheme  
of  
Bachelor of Economics**

**Summary**

<b>Programme</b>	:	Bachelor of Art (Economics)
<b>Duration</b>	:	Three year full time (Six Semesters)
<b>Medium</b>	:	English/ Hindi
<b>Attendance</b>	:	75 percent
<b>Total Credits</b>	:	36
<b>Total Marks</b>	:	600
<b>Assessment/Evaluation</b>		

Paper	Internal	External
Theory	20%	80%
Practical	N.A	N.A

**Internal Evaluation**

Minor	Attendance	Assignment	Total
10	5	5	20

**Duration of Examination**

External Test	Minor Test
3 hrs	1 hr

*To qualify the course, a student is required to secure a minimum of 40% marks in aggregate including the end semester examination and internal evaluation. (i.e. both internal and external). A candidate who secures less than 40% of marks in a course shall be deemed to have failed in that course. The student should have at least 40% marks in aggregate to clear the semester.*

*Vishy Kumar*  
21/2/2020

Incharge, Economics  
C.B.L.U. Bhiwani

Year/ Semester	Course Code	Discipline Specific Core (DSC) Course	Discipline Specific Electives (DSEC) (Choose any 1)
1st Semester-1	20UECO-201	Core Economics I Microeconomics-I	
Semester-2	20UECO-202	Core Economics II Microeconomics-II	
2nd Semester-3	20UECO-203	Core Economics III Macroeconomics-I	
Semester-4	20UECO-204	Core Economics IV Macroeconomics-II	
3rd Semester-5	20UECO-205		<b>DSEC-I</b> <b>(one of the following)</b> <b>DSEC-1:</b> Indian Economy <b>DSEC-2:</b> Economy of Haryana <b>DSEC-3:</b> Agricultural Economics <b>DSEC-4:</b> Introduction to Econometrics
	20UECO-206		
	20UECO-207		
	20UECO-208		
Semester-6	20UECO-209		<b>DSEC-II</b> <b>(one of the following)</b> <b>DSEC-5:</b> Development Economics <b>DSEC-6:</b> International Economics <b>DSEC-7:</b> Gender Economics <b>DSEC-8:</b> History of Economic Thought
	20UECO-210		
	20UECO-211		
	20UECO-212		

Chaudhary Bansi Lal University, Bhiwani

Department of Economics

Table 1 - Types of Courses Offered by Department of Economics for B.A

*Vishv Kumar*  
 2/1/2020  
 Incharge, Economics  
 C.B.L.U, Bhiwani



**Semester-1**  
**External Marks : 80**  
**Internal Marks: 20**  
**Time : 3 hrs**

Course Code- 20UECO-201	Course Name	L-T-P
D.S.C-1	Microeconomics - I	5-1-0

*Note: The question paper shall be divided in two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions ( 2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All question will carry equal marks.*

**Course Objective :** To expose the students with basic concepts of micro-economics and enabling them to apply these concept in the formulation of pricing policies.

**Unit-1 Theory of Demand :** Nature of Demand for a product, individual demand, market demand, determinants of demand, Law of demand, Elasticity of demand and its determinants.

**Unit- 2 Analysis of Consumer Behavior:** Concept of utility, Cardinal utility analysis, marginal and total utility, consumer's equilibrium, Derivation of demand curve, consumer's surplus.

Ordinal Utility Theory: Indifference curves analysis, characteristics, budget line, marginal rate of substitution, Consumer's Equilibrium, Price, income and substitution effects, Derivation of demand curve, Limitations of utility theory of demand.

**Unit-3 Theory of Production:** Supply & Elasticity of supply, Law of variable proportions, Return to scale, characteristics of Iso-quants, Ridge lines, least cost combination of factors, Internal and external economies and diseconomies. Movements and shifts in supply curve

**Unit-4 Cost & Revenue Analysis:** Concepts of costs, short period costs and long period costs, Modern Theory of costs.

Revenue: Concepts of revenue; total, average and marginal revenue and their relationships, Break-even-analysis & its applications

**SUGGESTED READINGS: ( Latest Edition of books will be followed)**

**Textbook:** Ahuja.H.L: Microeconomics, S.Chand Publication, 20<sup>th</sup> Edition

1. Koutsoyiannis A. (1977): Modern Micro Economics, McMillan Press, London.
2. Salvatore Dominick (2003): Microeconomics: Theory and Applications, 4<sup>th</sup> Edition, Oxford Univ. Press.
3. Maddala, G.S. and Miler Ellen: Micro - Economics Theory and Applications, Tata McGraw Hill (2004).
4. Ryan, W.J.L. and Pearce, D.W. : Price Theory, McMillan India, New Delhi (1977)
5. Ferguson, C.E. and Gould, J.P: Micro Economic Theory (6<sup>th</sup> Edition), All India Book seller (1989)
6. Pindyck, Robert S. Rubinfeld: Micro- Economics, Prentice Hall of India, New Delhi

## Semester-2

External Marks : 80

Internal Marks: 20

Time : 3 hrs

Course Code 20UECO-202	Course Name	L-T-P
D.S.C-2	Microeconomics II	5-1-0

**Note:** The question paper shall be divided in two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions ( 2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All question will carry equal marks.

**Course Objective :** To expose the students with basic concepts of micro-economics and enabling them to apply these concept in the formulation of pricing policies.

**Unit- 1-Perfect Competition:** Characteristics and assumptions, Price determination under perfect competition, Equilibrium of the firm and industry in the short period and the long period.

Monopoly: Characteristics, Equilibrium of the monopoly firm in short period and long period, Concept of supply curve under monopoly, Price discrimination, Measure of monopoly power.

**Unit- 2- Monopolistic Competition :**Characteristics, short period and long period equilibrium of the firm, Group-equilibrium, selling costs, product differentiation, excess capacity.

**Unit-3- Oligopoly:** Characteristics, emergence of oligopoly, cournot's model, Bertrand's model, Price rigidity, Price leadership, Collusive and non-collusive oligopoly.

**Unit- 4- Theory of factor pricing:** Marginal productivity theory of distribution, Backward bending supply curve of labour, Ricardian and modern theory of rent, quasi-rent, net and gross interest, theories of interest, net and gross profit, Theories of profit.

**SUGGESTED READINGS: ( Latest Edition of books will be followed)**

**Textbook :** Ahuja.H.L:Microeconomics,S.ChandPublication,20<sup>th</sup>Edition

1. Koutsoyiannis A. (1977): Modern Micro Economics, McMillan Press, London.
2. Varian.H.R.(2010).IntermediateMicroeconomics:AModernApproach, W.W.NortonandCompany,9<sup>th</sup>ed
3. Salvatore Dominick (2003): Microeconomics: Theory and Applications, 4<sup>th</sup> Edition, Oxford Univ. Press.
4. Mankiw Gregory N.(1998): Principles of Economics, 3<sup>rd</sup> Edition, Thomson, 3<sup>rd</sup> Indian Reprint (2007)
5. Maddala, G.S. and Miler Ellen: Micro - Economics Theory and Applications, Tata McGraw Hill (2004).
6. Ryan, W.J.L. and Pearce, D.W. : Price Theory, McMillan India, New Delhi(1977)
7. Ferguson, C.E. and Gould, J.P: Micro Economic Theory (6<sup>th</sup> Edition), All India Book seller(1989)
8. Pindyck, Robert S. Rubinfeld: Micro- Economics, Prentice Hall of India, New Delhi.



Course Code <b>20UECO-203</b>	Course Name	L-T-P
<b>D.S.C-3</b>	<b>Macroeconomics-I</b>	<b>5-1-0</b>

**Note:** The question paper shall be divided in two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions ( 2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All question will carry equal marks.

**Course Objective :** Demonstrate understanding the basic concepts of macroeconomics and its various variables. Carry out the accounting of national income and balance payment analysis.

**Unit-1- Introduction to Macroeconomics and National Income Accounting :** Macroeconomics: Nature and Scope; Macroeconomic Issues in an Economy. Concepts of GDP and National Income; Measurement of National Income and Related Aggregates; Nominal and Real Income; Limitations of the GDP concept.

**Unit-2 -Income&EmploymentDetermination: Classical & Keynesian theory of Income& Employment, Say's law of markets, Principles of Effective Demand.**

**Unit-3-Consumption&Investment**

:ConsumptionFunction,ConceptsofMarginalPropensitytoConsume(MPC),AveragePropensitytoConsume(APC), MarginalPropensitytoSave(MPS),AveragePropensitytoSave(APS),PsychologicalLawofConsumption

InvestmentFunction,typesofinvestmentandMarginalEfficiencyofCapital,TheConcept&WorkingofMultiplier

**Unit -4- National Income Determination in an Open Economy:** Circular flow of National Income using two, three & four sector model, Net Export Function; Net Exports and Equilibrium GDP.

**SUGGESTED READINGS: ( Latest Edition of books will be followed)**

**Textbook-** Ahuja. H.L: Macroeconomics, S. Chand Publication, 20<sup>th</sup> Edition

1. Blanchard, O. J. and Fisher, S (1989): Lectures in Macroeconomics, MIT Press, Cambridge.
2. Mankiw, G: Macroeconomics, Worth Publication 2016
3. Mankiw, N. G. and D. Romer (eds.) (2002): New Keynesian Economics (2 Vols.), MIT Press, Cambridge
4. Branson, W. H. (1994) (3rd ed.): Macroeconomic Theory and Policy, Harper and Row, New York.
5. Dornbusch, R. (2004): Open Economy, Macro Economics, Basic Books, 9<sup>th</sup> Edition, New York.
6. Heijdra, B. J. & V. P. Frederick: Foundations of Modern Macroeconomics, Oxford University (2001) Press, New Delhi.
7. Jhingan, M.L: Macro Economic Theory.
8. Mankiw, N. G. and D. Romer (eds.) (2002): New Keynesian Economics (2 Vols.), MIT Press, Cambridge.
9. Shapiro, E. (1996): Macro-economic Analysis (5th ed.), Galgotia Publications, New Delhi.

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## Semester-4

External Marks : 80

Internal Marks: 20

Time : 3 hrs

Course Code 20UECO-204	Course Name	L-T-P
D.S.C-4	Macroeconomics-II	5-1-0

**Note:** The question paper shall be divided in two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions ( 2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All question will carry equal marks.

**Course Objective :** To expose the students with basic concepts of micro-economics and enabling them to apply these concept in the formulation of pricing policies.

**Unit-1-Money Demand & Money Supply in a Modern Economy:** Concept of Money in a Modern Economy; Monetary Aggregates; Functions of Money Demand for Money; Quantity Theory of Money - Fisher, Cambridge, Keynesian Theory .

Money Supply, Credit Creation Process, Liquidity Preference and Rate of Interest, Measures of Money Supply and determinants of Money Supply

**Unit-2- Inflation & Macro-Economic policies:** Concept & types of Inflation, determinants of inflation, Phillips curve in the short and long run

Fiscal Policy - Impact of Changes in Govt. Expenditure and Taxes

Monetary Policy and its instruments

**Unit- 3 IS-LM Analysis, Trade Cycle Theory:** Derivation of IS and LM Functions; IS-LM and Aggregate Demand; Shifts in AD Curve.

Features & Phases of Trade Cycle, Theories of Trade cycles: Samuelson and Hicks models

**Unit- 4 Balance of Payment & Exchange Rate:** Meaning, Current and Capital Account, Reasons of Disequilibrium and how to correct it, Market for Foreign Exchange, Determination of Exchange Rate

**SUGGESTED READINGS: ( Latest Edition of books will be followed)**

**Textbook-** Ahuja. H.L: Macroeconomics, S. Chand Publication, 20<sup>th</sup> Edition

1. Blanchard, O. J. and Fisher, S (1989): Lectures in Macroeconomics, MIT Press, Cambridge.
2. Branson, W. H. (1994) (3rd ed.): Macroeconomic Theory and Policy, Harper and Row, New York.
3. Dornbusch, R. (2004): Open Economy, Macro Economics, Basic Books, 9<sup>th</sup> Edition, New York.
4. Heijdra, B. J. & V. P. Frederick: Foundations of Modern Macroeconomics, Oxford University (2001) Press, New Delhi.
5. Jhingan, M.L: Macro Economic Theory.
6. Mankiw, N. G. and D. Romer (eds.) (2002): New Keynesian Economics (2 Vols.), MIT Press, Cambridge.
7. Mankiw, G: Macroeconomics, Worth Publication 2016
8. Dornbusch, R. Startz and Fisher (201804): Open Economy, Macro Economics, Basic Books, 12<sup>9</sup>th Edition, New York.



Semester-5

External Marks:80  
Internal Marks:20  
Time:3hrs

CourseCode	CourseName	L-T-P
20UECO-205		
DSEC-1	IndianEconomy	5-1-0

**Note:** The question papers shall be divided into two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions (2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

**Course Objective:** Demonstrate the understanding of basic concepts of Structural Changes in Indian Economy. Analyze the policy, programme and problems related to external sector

**Unit-1-**

**Features of Indian Economy:** Nature and Characteristics of Indian economy; Planning; objectives and strategies; failure and achievements of plans. Basic economic indicators- National income, performance of different sectors.

**Unit-2-** Recent Trends and Policy changes in Agricultural Sector.: Land-reforms in India; Agricultural marketing and warehousing; Issues in food security- policies for sustainable agriculture; Agricultural finance policy; Agricultural price policy.

**Unit-3-**

Recent Trends and Policy Changes in Industry and Service Sector: Industrial growth since Independence, Industrial Policy in Pre and post reforms period, Growth and Components of Service Sector in India

**Unit-4-**

**Recent Trends and Policy changes in Financial Sector:** Monetary policy of RBI; Money and Capital markets; Growth and problem; Role of Commercial banks in India; Banking sector reforms since 1991

**SUGGESTED READINGS: (Latest Edition of books will be followed)**

**Textbook:** Datt & Sundaram: Indian Economy, S. Chand Publication

1. Brahmananda, P.R. and Panchmukhi, V.R. (eds): The Development Process of Indian Economy, Himalaya Publishing House, Bombay
2. Byers, T.J. (Ed.) (1998): The Indian Economy: Major Debates since Independence; Oxford University Press, New Delhi.
3. Jalan, B. (1992): The Indian Economy - Problems and Prospects, Viking, New Delhi.
4. Kapila, Uma (2012-13): Indian Economy since Independence, Academic Foundation, New Delhi.
5. Kureger, A.O. (Ed) (2002): Economic Policy Reforms and the Indian Economy, Oxford University Press, New Delhi
6. Lucas, E.B. & Papanek, G.F. (Eds) (1988): The Indian Economy - Recent Development and Future Prospects, Oxford University Press, New Delhi.
7. Economic and Political Weekly: Various issues.
8. Government of India: Economic Survey (Annual), Ministry of Finance.
9. Misra, Puri, Indian Economy, Himalaya Publishing House, Bombay.

Semester-5

External Marks:80

Internal Marks:20

Time:3hrs

CourseCode	CourseName	L-T-P
20UECO-206		
DSEC-2	EconomyofHaryana	5-1-0

**Note:** The question papers shall be divided into two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions (2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All question will carry equal marks.

**Course Objective:** Interpret the some basic indicators of economy of Haryana. Special focus on development of power sector and urban infrastructure of Haryana.

**Unit-1-**

**Structure of Haryana's Economy:** Agriculture in Haryana, Green Revolution Strategy, Growth and Productivity Levels; Irrigation strategy & levels, Agricultural Diversification, Rural Credit and Rural Indebtedness, Agricultural Marketing, Status of Dairy Farming.

**Unit-2-**

**Industry in Haryana:** Pattern, Performance, Constraints and Challenges; Small Scale Industries: Role, Problems and future prospects; State and Industrial Development.

State Finances: Sources of Revenue and Expenditure Pattern, Budgetary Deficits/Surplus, Financial Health of the State.

**Unit-3-**

**Physical and Social Sector:** Power Sector: Organizational Structure, Performance, Haryana Electricity Regulatory Commission, Pricing Policies & Finances; Rural Electrification, Transport Sector, Urban Infrastructure, Haryana Urban Development Authority.

**Unit-4- Economic Structure & Inter-**

**sectoral Linkages:** Recent trends in sectoral output, employment & intersectoral transactions; Social & Demographic features: main religious communities, social groups/categories (Gen, OBC, SC), Growth of Population, Sex Ratio, Trends in Urbanization, Work Participation Rate (male & female), Development profile of Haryana (trends in SDP, Per Capita Income, HDI, Literacy Rate, Life Expectancy etc).

**SUGGESTED READINGS: (Latest Edition of books will be followed)**

**Textbook-** S.P. Gupta, Three Decades of Haryana Economy, SPPublications, 144, Shivalik Enclave (NAC) Manimajra-160101

1. Edger M. Hoover: An Introduction to Regional Economics, Alfred A. Knopf, New York
2. D.R. Choudhary (2007), Haryana At Cross Roads: Problems and Prospects National Book Trust, India, New Delhi.

3. S.P.Gupta, Three Decades of Economy of Haryana, S P Publications, 144, Shivalik Enclave (NAC) Manimajra-160101
4. Ministry of Finance; Government of Haryana: Haryana Statistical Abstract (various issues)

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Semester-5  
ExternalMarks:80  
InternalMarks:20  
Time:3hrs

CourseCode20UECO-207	CourseName	L-T-P
DSEC-3	AgriculturalEconomics	5-1-0

**Note:** The question papers shall be divided into two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions (2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All question will carry equal marks.

**Course Objective:** Demonstrate understanding the concept of Agricultural Economics and farm organization. Apply the measures of Micro Economic tools to analyze the productivity of Agriculture

#### Unit-1-

**Introduction:** Definition, scope and nature of agricultural economics; Need for a separate study of agricultural economics. Agricultural Linkages with other sectors, Role of agriculture in economic development and Declining importance of agriculture in Economic development.

**Unit-2-Production Function Analysis:** Facto-Product, Factor-Factor and Product-Product relationship. Types of farm organizations and organizations and their comparative production efficiency.

**Unit-3-Transformation of Agriculture:** Green Revolution in Indian agriculture, Diversification in Agriculture

**Agricultural Markets:** Aim, Types and Functions of agricultural markets, Criteria for judging efficiency of agricultural markets systems.

#### Unit-4-

**Agricultural Credit:** Importance of credit, Need for Government intervention, agricultural credit system in India.

**Agricultural Price Policy:** Need, Objectives, and instruments of agricultural price policy; Agricultural price policy in India, Recommendations of Swaminathan Report.

**SUGGESTED READINGS: (Latest Edition of books will be followed)**

#### Textbook:

Soni, R. N. Leading Issues in Agricultural Economics (Sohan Lal Nagin Chand Co. Jalandhar, 2006)

1. Dantawala, M. L. (ed.) Indian Agricultural Developments since Independence.
2. Lekhi R. K. & Singh Joginder, Agricultural Economics, Kalyani Publishers, New Delhi.
3. Government of India: National Agricultural Policy, Ministry of Agriculture, Government of India, New Delhi.
4. Hyami, Y and Rattan, V. M. Agricultural Development: An International Perspective
5. Government of India: Five year Plan (latest), Planning Commission, Government of India, New Delhi



CourseCode20UECO-208	CourseName	L-T-P
DSEC-4	IntroductiontoEconometrics	5-1-0

**Note:** The question papers shall be divided into two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions (2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

**Course Objective:** Demonstrate the conceptual knowledge on data set for meaningful Research. Carry out the Regression analysis on Quantitative as well as on Qualitative variable.

#### Unit-1-

**Introduction:** Definition, Scope, and Methodology of econometrics; Nature and sources of data for econometric analysis; Specification of an econometric model.

**Regression Models:** Simple and Multiple Regression, Estimators (OLS), Assumptions and their properties; Statistical inference; Tests of significance and tests of restrictions.

#### Unit-2-

**Relaxation of Assumptions of OLS:** Nature, consequences, detection and remedial measures of the problems of multicollinearity, heteroscedasticity and autocorrelation.

#### Unit-3-

**Dummy Variables:** Specification of Regression Variables, Error of Measurements, Dummy Variables: Use of Dummy Variables, Slope Dummy Variable, The Chow Test

#### Unit-4-

**Simultaneous Equation Model:** Simultaneous Dependence of Variables & Consequences, Simultaneous Bias, Problem of Identification, Rules of identification: Order and Rank Conditions

#### SUGGESTED READINGS: (Latest Edition of books will be followed)

**Textbook:** Gujarati, Damodar (2002): Introduction to Econometrics (4th Edition), McGraw Hill.

1. Koutsoyiannis, A. (1978): Theory of Econometrics, Macmillan Publishers.
2. Wooldridge, J.M. (2013). Introductory econometrics: A modern approach, Nelson Education, 5<sup>th</sup> ed
3. Maddala, G.S. (1997): Econometrics, McGraw Hill, New York.
4. Mills, T. (1990): Time Series Techniques for Economists, New York: Cambridge University Press.
5. Pesaran, M.H. & Peter Schmidt (Ed.) (1999): Handbook of Applied Econometrics, Vols. I & II, Oxford University Press.
6. Pindyck, R.S. and Rubinfeld, D.L. (1998): Econometric Models and Economic Forecasts (4th Edn.), McGraw Hill.
7. Christopher Dougherty, Introduction to Econometrics, Oxford University Publication, IV Edition

Course Code 20UECO-209	Course Name	L-T-P
DSEC-5	Development Economics (with special reference to India)	5-1-0

**Note:** The question papers shall be divided into two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions (2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

**Course Objective:** Understanding the concept of economic growth and sustainable development. Try to understand the implications of some very critical growth models in economic development so far.

#### Unit-1-

**Introduction to Economic Development:** Features of Under Developed Countries, Economic Growth and Development; Determinants, Measurement and obstacles of Economic Development, Rostow's theory.

#### Unit-2-

**Human Capital:** Role of learning, education and research; Accumulation of Human Capital, Concepts and Measurements of HDI, Solow Model and Endogenous Growth Theory.

#### Unit-3-

**Analysis of Growth Theories:** Balanced and Unbalanced Growth Theories, Lewis' Model and Leibenstein's Critical minimum effort thesis.

#### Unit-4-

**Economic Development in India:** Recent Economic Policy in India, Post Reform Policy, Economic reforms & LPG Policy, NITI Aayog and its Functions.

#### SUGGESTED READINGS: (Latest Edition of books will be followed)

##### Textbook

Todaro, M.P. and S.C. Smith (2013), (11th Edition), Economic Development, Pearson Education, Delhi.

1. G. Meir and James E. Rauch (2000), "Leading Issues in Economic Development," Oxford University Press, New York.
2. Goodstein, E.S. (2002), "Economics and the Environment, 3rd edition, Prentice Hall. Sinha
3. S.K. Mishra and V.K. Puri, "Indian Economy", Himalaya Publishing House, New Delhi.
4. Ray, Debraj (2004), "Development Economics," Oxford University Press, New Delhi.
5. Ghatak, Subrata (2003), Introduction to Development Economics, Routledge, London, New York.

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CourseCode20UECO-210	CourseName	L-T-P
DSEC-6	InternationalEconomics	5-1-0

**Note:** The question papers shall be divided into two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions (2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All question will carry equal marks.

**Course Objective:** Explain how international trade can result from Economies of scale. Demonstrate the basic understanding about BOP on international transactions.

**Unit-1 Theories of International Trade:** Free Trade vs Protection, Inter-regional and International Trade, Absolute Advantage Theory, Comparative Cost Theory; Heckscher-Ohlin Theory, Leontief Paradox.

#### Unit-2-

**The Balance of Payment and Adjustment Process:** Purchasing Power Parity Theory, BOP Theory; Fixed and Flexible Exchange Rate, Tariff & Quota; Theory of interventions (Tariffs, quotas and Non-Tariff)

#### Unit-3-

**Structure of Foreign Trade:** Change in Value, Volume, Composition and direction of Foreign Trade in India since 1991; Concept of terms of trade, their uses and limitations, Crisis of Globalisation

#### Unit-4-

**The International Monetary System & Regionalism:** Objectives, Functions and advantages for India of International Monetary Fund and World Trade Organization

### SUGGESTED READINGS: (Latest Edition of books will be followed)

#### Textbook

Salvatore, D. (latest edition): International Economics, Prentice Hall, New York.

1. Kenen, P.B. (1994): The International Economy.
2. Carbaugh, Robert, J, Global Economics, Cengage Publication, 13th Edition
3. Kindleberger, C.P. (1991): International Economics, India Traveller Books. Sellers, New Delhi.
4. Paul, R. Krugman & Maurice Obstfeld (2000): International Economics Theory and Policy, Addison-Wesley Series in Economics.
5. Sodersten, B.O. (3<sup>rd</sup> ed.) (1999): International Economics, The Macmillan Press Ltd., London.
6. The World Bank (2002): Globalization, Growth and Poverty: Building an Inclusive World Economy, World Bank Policy Research Paper, Oxford University Press, New York.
- 7.

Course Code 20UECO-211	Course Name	L-T-P
DSEC-7:	Gender Economics	5-1-0

**Note:** The question papers shall be divided into two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

**Course Objective:** To introduce the problems of gender discrimination and its relation with the three sectors of Indian economy.

#### Unit-1-

**Introduction to Gender Economics:** Defining Gender; Debate on Women and Development (1970s and 1980s) Theory of gender development theory—women in development (WID), Women and Development (WAD) and Gender and Development (GAD); Critique of WID; Gender in Economic Development.

**Unit-2-Gender and Agrarian Structure:** Gender—Segregated role and responsibilities in agriculture sector; Gender—Segregated agriculture labor-market; new farm technology and its gendered implications with special reference to India displacement of labor, Workforce Participation rate in Agrarian sector.

**Unit-3-Gender and Industrial Structure:** Formal and informal manufacturing—Orientation of industrial production and generation of employment; Gender differentiated impact of economic liberalization and trade oriented growth, Workforce Participation rate in Industry

#### Unit-4-

**Gender and Economic Policy:** Poverty, Unemployment and Development; Feminization of urban labor market—concepts, debate and evidence from India; Committee on Status of Women in India; Gender Wage Gap, National Commission on Self Employed Women and Women in the Informal Sector.

**SUGGESTED READINGS: (Latest Edition of books will be followed)**

#### Textbook

Krishnaraj, M., R.M. Sudarshan and A. Shariff (1999), Gender, Population and Development, Oxford University Press, New Delhi.

1. Boserup E. (1970), Women's Role in Economic Development, George Allen and Unwin, London.
2. Desai, N. and M.K. Raj (Eds.) (1979), Women and Society in India, Research Center for Women Studies, SNDT University, Bombay
3. Government of India (1974), Towards Equality—Report of the Committee on the Status of Women in India, Department of Social Welfare, Ministry of Education and Social Welfare, New Delhi.



4. Krishnaraj, M., R. M. Sudarshan and A. Shariff (1999), Gender, Population and Development, Oxford University Press, New Delhi.

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Course Code 20UECO-212	Course Name	L-T-P
DSEC-8:	History of Economic Thought	5-1-0

**Note:** The question papers shall be divided into two sections. Section 'A' shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section 'B' shall comprise of 8 questions (2 questions from each unit). The Students will be required to attempt four questions selecting one question from each unit. All question will carry equal marks.

**Course Objective:** To introduce the students of economic to various ideologies including classic, Indian economists.

#### Unit 1—Classical Theories of Value, Growth and Distribution

Smith and Ricardo on the Theory of Value—Later Subjectivist Theories of Value—Classical Theory of Growth and Development—Classical Theories of Income Distribution—Classical Monetary Theory—Role of the Government

#### Unit 2—Marxist Economics: Classical or Not?

Marx and the Labor Theory of Value—Marx's Theory of Money—Marx's Theory on Distribution—Marx's Theory of Capital Accumulation and Crises

#### Unit 3—Marginalist and Late Neoclassical Economics

Alfred Marshall: Principles of Economics—Leon Walras: Elements of Pure Economics—Wicksell and Fisher: Purchasing Power, Interest Rates, Crises

#### Unit 4—Keynes Theory of Money, Investment, and Business Cycles

Keynes vs. Say's Law: Employment and Output Determination—Keynes Analysis of the Labour Market—Quantity Theory of Money—Keynes on Depression and Business Cycle

#### SUGGESTED READINGS: (Latest Edition of books will be followed)

**Textbook**-R.R. Paul: History of Economic Thought, Kalyani Publication

1. Dasgupta, AK (1986): Epoch of Economic Theory, Oxford University Press, New Delhi
2. Foley, D. (1986). Understanding Capital: Marx's Economic Theory, Harvard University Press
3. Keynes, J.M. (2005). General Theory of Employment, Interest and Money, Prometheus Books
4. Collander, DC (Ed.): Neo-Classical Economists
5. Mandel, E (1971): Marxist Economic Theory, Upra & Co
6. Schumpeter, JA (1954): History of Economic Thought, Oxford University Press
7. Samuel Hollander (1987): Classical Economics
8. Tom Bottomore (1980): Dictionary of Marxist Thought, Basic Blackwell Publishers, England
9. O'Brien, DP (1975): Classical Economists, Oxford, Clarendon Press.
10. Dobb, Maurice (1973): Theories of Value and Distributions since Adam Smith.
11. Sweezy, Paul M (1945): The Theory of Capitalist Development
12. Blaug, M (1961): Economic Theory in Retrospect

**Skill Enhancement Course  
Syllabi of B.A. under CBCS  
3<sup>rd</sup> Semester  
(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20USECCS301	Basics of Computer-I (IT Level-I)	Skill Enhancement	2	2	40+10=50
20USECCS302	Basics of Computer Lab (Based on 20USECCS301)		1	2	40+10=50

**20USECCS301  
Basics of Computer-I (IT Level-I)**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To get the basic concepts of Computers.
2. To get the functional knowledge about PC hardware, operations and concepts.
3. To understand the functional units of a standard PC and it's working.

**Unit-I**

**Computer:** Definition, Block Diagram along with its components, characteristics & classification of computers, Limitations of Computers, Human-Being Vs Computer, Applications of computers in various fields.

**Operating System:** Operating System, Types of Operating System, Function of Operating System, Features of Window OS, Types of Software, Proprietary and Open Source Software.

**Unit-II**

**Basics of Windows.** Basic components of windows, icons, types of icons, taskbar, activating windows, title bar, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance, Using windows accessories.

**Unit-III**

Input devices, Output devices, Printers, Memory: Concept of primary & secondary memory, RAM, ROM, types of ROM, Secondary storage devices.

Computer Virus: Definition, types of viruses, Characteristics of viruses, anti-virus software

*Handwritten signatures*

## Unit-IV

**Overview of Networking:** An introduction to computer networking, Types of Network, Network topologies, Modes of data transmission, Transmission media.

**Introduction to internet and its uses,** Applications of internet, Hardware and Software requirements for internet, Intranet, Applications of intranet, World Wide Web; Web Browser, Search Engines; Understanding URL; Domain name.

**Course Outcome:** After completion of course, the students will be able to:

1. Learn the fundamental concepts of Computers.
2. Study Operating Systems, programming languages, peripheral devices, networking, multimedia and internet.

**Suggested Readings:**

**a) Text Books:**

1. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.

**b) Reference Books:**

1. Balagurusamy E, Computing Fundamentals and C Programming, Tata McGraw Hill.
2. Norton, Peter, Introduction to Computer, McGraw-Hill
3. Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World
4. Rajaraman, V., Fundamentals of Computers, PHI





**Skill Enhancement Course**  
**Syllabi of B.A. under CBCS**  
**3<sup>rd</sup> Semester**  
**(w.e.f. 2021-22)**

20USECCS302

Basics of Computer Lab-I (IT Level-I) (Based on 20USECCS301)

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Note:** - Every student will maintain practical record of programs done during practical lab in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on the list of practicals as given under. An examinee will be asked to write the programs and run on computer. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

Practical Examination will be conducted externally as per the following distribution of marks:

Writing solutions of problems and executing on the Computer:	20 marks.
Presentation & Viva voce:	10 marks.
Practical record:	10 marks.
Internal Assessment: marks)	10 marks (Attendance=5 marks, Assignment=5

**List of Practical:**

1. Create a folder on desktop and manage that folder.
2. Change date and time settings.
3. Change desktop wallpaper and also apply a screen saver.
4. Create a document and apply formatting on it.
5. Write a program to create a folder on desktop and manage files & folder into existing folder.
6. change date and time setting into desktop/PC?
7. change the desktop icon setting using Windows?
8. setup sleep mode in Windows?
9. create your personal E-mail account?

*SK*

*SK*

**Skill Enhancement Course  
Syllabi of B.A. under CBCS  
4<sup>th</sup> Semester  
(w.e.f. 2021-22)**

Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	Contact Hours (Theory/ Practical)	Marks (External + Internal)
20USECCS406	Basics of Computer-I (IT Level-II)	Skill Enhancement	2	2	40+10=50
20USECCS407	Basics of Computer Lab (Based on 20USECCS406)		1	2	40+10=50

**20USECCS406  
Basics of Computer-II (IT Level-II)**

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

*Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.*

**Objectives:**

1. To get the basic concepts of Email and E-Governance.
2. To get the functional knowledge about MS Office.
3. To get the practical knowledge of Word Processor, Spreadsheet and Presentation.

**Unit-I**

**Basics of E-Mail:** Introduction, Objective, Open Email account, Mailbox: Inbox, Outbox, Creating and sending a new mail, Reply, Forward Email, CC, BCC.  
Introduction to E-Governance, Social Networking, E-Learning, E-Business.

**Unit-II**

**Understanding Word Processing:** Word Processing Basics; Opening and Closing of documents; Saving a document, Menu Bar, Ribbon, Page setup, Formatting Text, Editing, Printing, drawing table, manipulating table, working with graphics, Mail merge, Inserting equation, Word Art, Smart Art, Header and Footer, Track Changes, Macros.

**Unit-III**

**Using Spread Sheet:** Basics of Spreadsheet; Elements of spreadsheet, Manipulation of cells, saving workbook, entering data, editing data, formatting worksheet, Formula and Function, Working with Charts and Graphics, Data Validation, Conditional Formatting, Sorting, Filtering, Advance Filter, Page Layout, What-if analysis.

## Unit-IV

**Working with Presentation:** Basics of presentation software; Opening, Saving, creating a Presentation; Preparation and Presentation of Slides; entering and editing text, Insert and delete slides, adding clip art picture, Inserting objects, Inserting Graphics, views in PowerPoint presentation, Transition, Slideshow, Rehearse Timing, Slide master.

**Course Outcome:** After completion of course, the students will be able to:

1. Learn the fundamental concepts of Electronic Email.
2. Learn to work with a Word Processor
3. Analyse the data in a Spreadsheet
4. Create a powerful PowerPoint Presentation.

### **Suggested Readings:**

#### **a) Text Books:**

1. Microsoft Office – Complete Reference – BPB Publication
2. Gill, Nasib S.: Essentials of Computer and Network Technology, Khanna Book Publishing Co., New Delhi.

#### **b) Reference Books:**

1. Daniel Minoli & Emma Minoli, "Web Commerce Technology Handbook", Tata McGraw Hill – 1999.
2. K. Bajaj & D Nag, "E-Commerce", Tata McGraw Hill – 1999.
3. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
4. Balagurusamy E, Computing Fundamentals and C Programming, Tata McGraw Hill
5. Norton, Peter, Introduction to Computer, McGraw-Hill
6. Chhillar, Rajender S.: Application of IT in Business, Ramesh Publishers, Jaipur.
7. Web enabled commercial applications development using Html, DHTML, Javascript, Perl, CGI by Ivan Bayross 3rd revised Ed-BPB
8. Thomas Powell- HTML & CSS: The complete Reference, Fifth Edition, 2017



**Skill Enhancement Course**  
**Syllabi of B.A. under CBCS**  
**4<sup>th</sup> Semester**  
**(w.e.f. 2021-22)**

20USECCS407

Basics of Computer Lab-II (IT Level-II) (Based on 20USECCS406)

Maximum Marks-50  
External Examination-40  
Internal Assessment-10  
Max. Time- 3 hrs.

**Note:** - Every student will maintain practical record of programs done during practical lab in a file. Examination will be conducted through a question paper set jointly by the external and internal examiners. The question paper will consist of questions based on the list of practicals as given under. An examinee will be asked to write the programs and run on computer. Evaluation will be made on the basis of the examinee's performance in written solutions and presentation with viva-voce and practical record.

Practical Examination will be conducted externally as per the following distribution of marks:

Writing solutions of problems and executing on the Computer:	20 marks.
Presentation & Viva voce:	10 marks.
Practical record:	10 marks.
Internal Assessment: (marks)	10 marks (Attendance=5 marks, Assignment=5 marks)

**Practical's List:**

1. Write a program to create a folder on desktop and manage files & folder into existing folder.
2. How do you change date and time setting into desktop/PC?
3. How do you change the desktop icon setting using Windows?
4. How do you setup sleep mode in Windows?
5. How do you create your personal E-mail account?
6. Write a program to set the background color of different elements.
7. Create a document in MS Word and save it with student name.
8. Create a letter in MS Word and with help of Mail merge feature send it to 10 people.
9. Draw a student detail table in Ms Word and insert rows and column in this.
10. Create a MS Excel worksheet and create a table in it and save it with any name.
11. Apply cell formatting in that table.
12. Create a table of student's data with marks and calculate total marks of all students, percentage of marks of all subjects of any student.
13. Create a worksheet and move data from one place to another in same worksheet and in different worksheet.
14. Create a power point presentation and apply transition of different slide.
15. Create a E-Mail account with your name and send a E-Mail to your friend.



## B.A. HISTORY

(Semester-I)

Paper Code-20UHIS 101-History of India from Earliest Times upto 300 A.D.

Max.Marks : 100

Theory : 80

Internal Assessment : 20

Time : 3 Hrs.

**Note:** The paper setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q. No. 9) containing eight short answer type questions of two marks each covering the entire syllabus. The candidate shall attempt five questions in all selecting one question from each unit and the compulsory question. All questions shall carry equal marks.

### UNIT-I

Sources & Interpretation

A broad survey of Palaeolithic, Mesolithic and Neolithic Cultures.

Harappan Civilization: Origin, Extent, dominant features & decline, Chalcolithic age.

The Vedic Period: Polity, Society, Economy and Religion, Iron age with reference to PGW & Megaliths.

### UNIT-II

Territorial States and the rise of Magadha, Conditions for the rise of Mahajanpadas and the Causes of Magadha's success,

Iranian and Macedonian Invasions, Alexander's Invasion and impact

Jainism and Buddhism: Causes, Doctrines, Spread, Decline and Contributions.

### UNIT-III

Emergence and Growth of Mauryan Empire, State, Administration, Economy, Ashoka's Dhamma, Art & Architecture.

The Satvahana Phase: Aspects of Political History, Material Culture, and Administration & Religion.

The Sangam Age: Sangam Literature, The three Early Kingdoms, Society & the Tamil language.

The age of Shakas, Parthians & Kushanas:-Aspects of Polity, Society, Religion, Arts & Crafts, Coins, Commerce and Towns.

### UNIT-IV

1 Important sites of Harappan Civilization

2 Extents of Ashoka's Empires and Pillars Edicts

3 Extents of Kushanas Empires

4 Important of Trades routes and ports of Ancient India

8-hh2



**B.A.HISTORY**  
**(Semester-II)**

**Paper Code-20UHIS 201-History of India from. 300 A.D. to1206 A.D.**

**Max.Marks : 100**  
**Theory : 80**  
**Internal Assessment : 20**  
**Time : 3 Hrs.**

**Note:** The paper setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q.No. 9) containing eight short answer type questions of two marks each covering the entire syllabus. The candidate shall attempt five questions in all selecting one question from each unit and the compulsory question. All questions shall carry equal marks.

**UNIT-I**

The Rise & Growth of the Guptas: Administration, Society, Economy, Religion, Art, Literature, and Science & Technology.

Harsha & His Times: Harsha's Kingdom, Administration, Buddhism & Nalanda

South India: Polity, Society, and Economy & Culture

**UNIT-II**

Towards the Early Medieval: Changes in Society, Polity Economy and Culture with reference to the Pallavas, Chalukayas and Vardhanas.

Evolution of Political structures of Rashtakutas, Pala & Pratiharas.

**UNIT-III**

Emergence of Rajput States in Northern India: Polity, Economy & Society.

Arabs in Sindh: Polity, Religion & Society.

Struggle for power in Northern India & establishment of Sultanate.

**UNIT-IV**

1 Extents of Harsha Empires

2 Urban Centres in Ancient India

3 Extent of Samunderguptas Empires

4 Extents of Chandergutas-II Empires

S. K. L.

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# SYLLABUS

B.A. PART-II (M.D.U.)

IIIrd Semester

Paper—III : History of India (C. 1707-1947 A.D.)

Max. Marks	:	100
Theory	:	80
Internal Assessment	:	20
Time	:	3 Hrs.

Note : The paper-setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q. No. 9), containing eight short answer type questions of two marks each, covering the entire syllabus. The candidate shall attempt five questions in all, selecting one question from each unit and the compulsory question. All questions shall carry equal marks.

## UNIT—I

1. Disintegration of central authority
  - (a) Decline of Mughal Empire and rise of successor states
  - (b) British Conquest of India : its nature : a brief survey- Eastern India-Bengal ; Southern India-Mysore and Marathas ; North and Western India-Awadh, Sind and Punjab.
2. Consolidation of British rule and resistance
  - (a) Administration and Foreign policy
  - (b) Early resistance and Revolt of 1857.

## UNIT—II

3. Society of India
  - (a) Social condition in 18th century
  - (b) Indian cultural renaissance
  - (c) Social impact of British rule.
4. Economy of India
  - (a) Economic condition in 18th century
  - (b) British land revenue policy
  - (c) Rise of Modern Industry
  - (d) Economic impact of British rule.

## UNIT—III

5. Emergence of Nationalism
  - (a) Causes of the emergence of National Movement
  - (b) Indian National Congress and National Freedom Movement (1885-1947)
  - (c) Revolutionaries
6. Towards Freedom
  - (a) Constitutional Development : 1909 to 1935
  - (b) Emergence of Communal and separatist politics
  - (c) Negotiations for independence and transfer of power.

## UNIT—IV

### Maps

1. India during 1764.
2. Important places of 1857 Revolt.
3. Centres of socio-religious movements.
4. Important places of Revolutionary Movements.
5. Places associated with significant sessions of Indian National Congress.





**B.A. HISTORY**  
**(Semester IV)**

**Paper Code-20UHIS 501, Option-I- History of Haryana**

**Max.Marks : 100**

**Theory : 80**

**Internal Assessment : 20**

**Time : 3 Hrs.**

**Note:** The paper setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q.No. 9) containing eight short answer type questions of two marks each covering the entire syllabus. The candidate shall attempt five questions in all selecting one question from each unit and the compulsory question. All questions shall carry equal marks.

**Unit-I**

Sources (Literary and Archaeological), Stone Age culture, Harappan civilization in Haryana.

Vedic Culture and Epic Age (Mahabharata),

Republic States: Yaudheyas, & Agras

Pusyabhutis & Tomars

**Unit-II**

Chamanas: Battles of Tarain and their Impact.

Battles of Panipat (I,II,III) and their Impact

Revolt of Satnami, Sikh influences in Haryana with special references of Banda Bahadur.

Art and Architecture during Medieval period (Sultanate & Mughal)

**Unit-III**

George Thomas and East India Company.

First war of Independence and Haryana (1857).

Religious movements: Arya Samaj and Sanatan Dharam

Unionist Party: Educational and Agricultural Reforms.

National Movement 1885-1947.

Parja Mandal Movement

*S-h-h-l. M*



**B.A. HISTORY**  
**(Semester-V)** ✓  
**Paper Code-20UHS 501, Option-II-Ancient and Medieval World**

**Max.Marks : 100**

**Theory : 80**

**Internal Assessment : 20**

**Time : 3 Hrs.**

**Note:** The paper setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q.No. 9) containing eight short answer type questions of two marks each covering the entire syllabus. The candidate shall attempt five questions in all selecting one question n from each unit and the Compulsory question. All questions shall carry equal marks.

**Unit - I**

Pre-Historic Cultures (a) Hunting stage (Paleolithic) (b) Hunting – gathering stage (Mesolithic) (c) Food producing stage (Neolithic)

Bronze Age Civilizations (a) Sumerian Civilization : Socio-economic structure (b) Egyptian Civilization : Socio-economic structure (c) Indus Civilization : Socio-economic structure

**Unit - II**

Iron age civilizations (a) Greek civilization : Polity, Society and Economy (b) Roman civilization : Polity, Society and Economy (c) Indian civilization : P.G.W. Culture

Feudalism in Medieval Europe (a) Feudalism : Definition, Rise, Features and Decline (b) Role of Church in Medieval Europe

**Unit - III**

Islamic World (a) Rise of Islam : Socio-Political background of Pre-Islamic Arabia, Evolution of Islamic State under Prophet Muhammad, Pious Caliphs (b) State under Umayyads and Abbasids; Intellectual and cultural contribution of the Arab civilization

Transition of Europe from Medieval to Modern Period : (a) Renaissance : Rise and it's impact (b) Reformation : Rise and it's impact

**Unit IV**

**Map Work**

- a. Indus valley civilization
- b. Main centers of Greek-Roman civilization
- c. Formation of empire under Abbasids
- d. Trade routs and towns during Medieval Europe

*S.h.k.L.*

*[Signature]*

**B.A. HISTORY**  
**(Semester-VI)**

**Paper Code-20UHS 601, Option-I Modern World**

**Max.Marks : 100**  
**Theory : 80**  
**Internal Assessment : 20**  
**Time : 3 Hrs.**

**Note:** The paper setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q.No. 9) containing eight short answer type questions of two marks each covering the entire syllabus. The candidate shall attempt five questions in all selecting one question n from each unit and the compulsory question. All questions shall carry equal marks.

**Unit - I**

**Economic Development - I**

(a) Mercantilism (b) Agricultural Revolution (c) Technological Revolution

**Economic Development - II**

(a) Capitalism - Its stages and development (b) Imperialism - Its theories and development

**Unit - II**

**Political Development - I**

(a) French Revolution (b) Liberalism in Britain (c) Nationalism in Germany & Italy

**Political Development - II**

(a) Russian Revolution (b) Fascism in Italy (c) Nazism in Germany

**Unit - III**

**Colonialism**

(a) Stages of Colonialism in India (b) China and the West (c) Japan and the West

**World in the Crisis**

(a) First World War and peace settlements (b) Second World War

**Non-Alignment Movement**

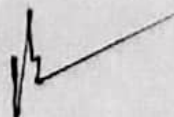
(a) Origin (b) Development

**Unit IV**

**Maps**

- i. Area of Agriculture Revolution
- ii. Europe on the eve of French Revolution
- iii. Unification of Italy
- iv. Unification of Germany

S-hk





# Annexure - B

## CH. BANSI LAL UNIVERSITY, BHIWANI

(A State University established by Govt. of Haryana Act No. 25 of 2014)

### Scheme of Examination for Bachelor of Arts with Political Science

Semester- I to VI

Credit-36

Total Marks= 600

Course/ Paper Code	Paper Name		Contact Hours Per Week			Credit			Examination Scheme		Total
			Theory	Tutorial	Total	Theory	Tutorial	Total	Theory	Internal Assessment	
20 UPOL101 Semester 1	Indian Government & Politics	C.C.	5	1	6	5	1	6	80	20	100
20 UPOL 201 Semester 2	Introduction to Political Theory	C.C.	5	1	6	5	1	6	80	20	100
20 UPOL 301 Semester 3	Comparative Government & Politics	C.C.	5	1	6	5	1	6	80	20	100
20 UPOL 401 Semester 4	Introduction to International Relations	C.C.	5	1	6	5	1	6	80	20	100
20 UPOL 501 Semester 5	Public Policy & Governance 501	DSE	5	1	6	5	1	6	80	20	100
	Indian Political Thought 502										
20 UPOL 601 Semester 6	International Organizations 601	DSE	5	1	6	5	1	6	80	20	100
	Indian Foreign Policy 602										
Total			30	6	36	30	6	36	480	120	600
20 UPOL 701 O.E.	Human Rights	O.E.	5	1	6	5	1		80	20	100
20 UPOL 702 O.E.	Gender Studies	O.E.									

C.C. = Core Course

DSE= Disciplinary Specific Elective

OE= Open Elective

*(Signature)*  
Bharat Maurya  
13.07.2020

# B.A. Political Science

Semester-1

Paper Name: Indian Government and Politics  
Paper Code: 20UPOL 101

Total: 100 Marks  
M. Marks: 80 Marks  
Internal Assessment: 20 Marks  
Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

## Unit-1

Indian Constitution: Basic Features, Preamble, Fundamental Rights and Directive Principles; Federalism and Centre-State Relations.

## Unit-2

Institutional Structure and Functioning: President, Prime Minister, Governor and Parliament; Supreme Court - Judicial Review and Judicial Activism.

## Unit-3

Role of Caste, Class, Regions and Religion;  
Electoral Politics in India, Parties and Party System in India.

## Unit-4

Social Movements in India: Peasants', Workers', Women's and Environmental.



Bharat Maurya  
13.07.2020



### Suggested Readings:

- A. Kohli (ed.), 1988. *India's Democracy: An Analysis of Changing State-Society Relations*, Princeton NJ, Princeton University Press.
- A. Kumar & Nafe Singh, 2018, *Bhartiya Samaj Mein Mahilayon Ki Bhoomika*, New Delhi, Shaad Publication.
- A.Kaushik, 1994. *Democratic Concerns: The Indian Experience*, Jaipur, Alekh.
- A.Kohli, (Ed), 2001. *The Success of India's Democracy*, Cambridge University Press.
- A.P. Singh & K. Murari, 2019, *Political Process in Contemporary India*, New Delhi, Pearson.
- B. Ghosh, 2020, *Social Movements*, New Delhi, Sage Publication.
- D.D.Basu, 1994. *An Introduction to the Constitution of India*, New Delhi, Prentice Hall.
- G. Austin, 1966. *The Indian Constitution: Corner Stone of a Nation*, Oxford, Oxford University Press.
- G. Tripathi & Lakshmi Yadav, 2018. *Paryavarniye Mudde, Bahuaayami Paripeksh*, New Delhi, Adhyyan Publication & Distributors.
- H. Abbas, 2012. *Indian Government and Politics*, New Delhi, Pearson.
- J.N. Pandey, 2019. *Bharat Ka Samvidhan*, New Delhi, Central Law Agency.
- K.R. Bombwall, 1967. *The Foundations of Indian Federalism*, Bombay, Asia Publishing House.
- Khosla. Madhav. 2018. *Bharat Ka Samvidhan*, New Delhi, OUP Hindi.
- M.V. Pylee, 1998. *An Introduction to the Constitution of India*, New Delhi, Vikas.
- N. Chandhoke, 1999. *Beyond Secularism: The Rights of Religious Minorities*, Delhi, Oxford University Press.
- N. Chandoke, 2012. *Contemporary India*, New Delhi, Pearson.
- P. Bardhan, 1984. *The Political Economy of Development in India*, London, Oxford, Blackwell.
- P. Kumar Jha, 2012. *Indian Politics in Comparative Perspective*, New Delhi, Pearson.
- P. Kumar Jha, 2012. *Tulnatamak Paripekshay Mein Bhartiya Rajniti*, New Delhi, Pearson.
- P.R. Brass, 1994. *Politics of India Since Independence*, 2nd ed, Cambridge University Press.
- R.B. Roy & M.C. Sharma, 2019, *Hamara Samvidhan : Ek Punaravalokan*, New Delhi, Prabhat.
- R. Kothari, 1970. *Politics in India*, New Delhi, Orient Longman.
- R. Kothari, 1970. *Caste and Politics in India*, New Delhi, Orient Longman.
- S. Aiyar, 2017, *Unnat Bharat*, New Delhi, Prabhat.
- S. Kaviraj. 1998. *Politics in India, Delhi*, Oxford University Press.
- W.H. Morris Jones, 1974. *Government and Politics in India*, Delhi, B.I. Publications.

Semester- 2

**Paper Name: Introduction to Political Theory**  
**Paper Code: 20 UPOL 201**

Total: 100 Marks  
M. Marks: 80 Marks  
Internal Assessment: 20 Marks  
Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

**Unit-1**

Politics: Meaning and Dimensions;  
What is Political Theory: Meaning, Nature, Scope and its Relevance.  
Decline and Resurgence of Political Theory.

**Unit-2**


State: Definitions, Elements, its relations with other organisations.  
Theories of the State: Socialist, Liberal and Neo-Liberal.

**Unit-3**

Liberty: Meaning, Types and Civil and Political Liberty.  
Equality: Meaning, Types and its relationship with Liberty.

**Unit-4**

Democracy: Meaning and Models of Democracy;  
Citizenship, Civil Society, Rights and Gender.

  
Shobhit Maurya  
13.07.2020

### Suggested Readings

- A. Heywood, 1997. *Political Theory*, London, Palgrave Macmillan.
- A. Heywood, 1999. *Politics*, London, Palgrave Macmillan.
- A. Acharya & R. Bhargava, 2011. *Rajnitik Sidhanth: Ek Parichay*, New Delhi, Pearson Publication.
- D. Easton, 1997. The Future of the Post Behavioural Phase in Political Science, in *Contemporary Empirical Political Theory*, K. R. Monroe (ed.), Berkeley, University of California Press.
- D. Held, 1991. *Political Theory Today*, Cambridge, Polity Press.
- G.H. Sabine, 1939. What is Political Theory? *Journal of Politics*.
- L. Hutcheon, 1989. *The Politics of Postmodernism*, London and New York, Routledge. LXVIII, pp. 321-337.
- O.P. Gauba, 2014. *Rajneetik Sidhanta: Ek Parichaya*, New Delhi, Mayur Publication.
- R. Bhargava & Ashok Acharya, 2013. *Introduction to Political Theory*, New Delhi, Pearson.
- R. E. Goodin and H.D. Klingemann (eds.), 1996. *A New Handbook of Political Science*, Oxford, Oxford University Press.
- R. Grant, *Oakeshott*, 1990. London, Claridge Press.
- R. J. Bernstein (ed.), 1985. *Habermas and Modernity*, Cambridge, Polity Press.
- R. Plant, 1991. *Modern Political Thought*, Oxford, Blackwell.
- S. K. White, 1991. *Political Theory and Postmodernism*, Cambridge, Cambridge University Press.
- S. Mulhall and A. Swift, 1992. *Liberals and Communitarians*, Oxford, Basil Blackwell.
- W. Kymlicka, 1990. *Contemporary Political Philosophy: An Introduction*, Oxford University Press.
- W. Kymlicka, 2016. *Samkaleen Rajneeti Darshan: Ek Parichaya*, New Delhi, Pearson.



**Semester- 3**

**Paper Name: Comparative Government and Politics**  
**Paper Code: 20 UPOL 301**

Total: 100 Marks  
M. Marks: 80 Marks  
Internal Assessment: 20 Marks  
Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

**Unit-1**

Comparative Political Analysis: Meaning, Nature, Scope and Methods;  
Comparing Regimes: Authoritarian and Democratic.

**Unit-2**

Classification of Political Systems: Parliamentary and Presidential: UK and USA,  
Federal and Unitary: Canada and China.

**Unit-3**

Electoral Systems: First Past the Post, Proportional Representation and Mixed Systems.  
Party Systems: One Party, Two Party and Multi Party Systems.

**Unit-4**

Contemporary Debates on the Nature of State: From State Centric to Human Centric Security.  
Changing Nature of Nation State in the Context of Globalization.



Bharet Maurya  
13.07.2020.



### Suggested Readings

- A. Bebler and J. Seroka (eds.), 1990. *Contemporary Political Systems: Classifications and Typologies*, Boulder Colorado, Lynne Rienner Publishers.
- D. Apter, 1965. *The Politics of Modernization*, Chicago, University of Chicago Press.
- G. Almond and J.S. Coleman, 1960. *The Politics of the Developing Areas*, Princeton NJ, Princeton University Press.
- G. Almond, 2000. *Comparative Politics Today: A World View*, 7th ed., London, Harper Collins.
- G. Almond, and S. Verba, 1963. *The Civic Culture: Political Attitudes and Democracy in Five Nations*, Princeton NJ, Princeton University Press.
- H. Finer, 1969. *Theory and Practice of Modern Government*, London, Methuen.
- H.J. Wiarda (ed.), 1986. *New Developments in Comparative Politics*, Boulder Colorado, Westview Press.
- J. Manor (ed.), 1968. *Rethinking Third World Politics*, London, Longman.
- J.C. Johari, 1987. *Comparative Political Theory: New Dimensions, Basic Concepts and Major Trends*, New Delhi, Sterling.
- K. Kumar, 1971. *Revolution: The Theory and Practice of a European Idea*, London, Weidenfeld and Nicolson.
- L. Cantori and A.H. Zeigler (ed.), 1988. *Comparative Politics in the Post-Behaviouralist Era*, London, Lynne Rienner Publisher.
- L.W. Pey (ed.), 1963. *Communication and Political Development*, Princeton NJ, Princeton University Press.
- O. Dunleavy and B.O' Leary, 1987. *Theories of Liberal Democratic State*, London, Macmillan.
- O.P. Gauba, 2018, *Tulnatmak Rajniti Ki Rooprekha* New Delhi, Mayur paperbacks.
- P. De, 2012. *Comparative Politics*, New Delhi, Pearson.
- P. Singh & C. Sharma, 2019, *Comparative Government and Politics*, New Delhi, Sage Publication.
- R. Hauge and M. Harrop, 2001. *Comparative Government and Politics. An Introduction*, 5<sup>th</sup> edn. New York, Palgrave.
- R.C. Macridis and R.E. Ward, 1968. *Modern Political Systems: Europe, and Asia*, 2nd edn. Englewood Cliffs NJ, Prentice Hall.
- R.C. Macridis, 1955. *The Study of Comparative Government*, New York, Doubleday.
- R.C. Macridis, 1968. *Modern European Governments: Cases in Comparative Policy Making*, Englewood Cliffs NJ, Prentice Hall.
- R.I. Rotberg (ed.), 2001. *Politics and Political Change: A Journal of Inter-Disciplinary History Reader*, Massachusetts, MIT Press.
- T. Biswal, 2016, *Tulnaatmak Rajniti: Sansthaayen aur Prakriyayen* (In Hindi), Hyderabad, Orient Black Swan.

**Semester-4**

**Paper Name: Introduction to International Relations**  
**Paper Code: 20 UPOL 401**

Total: 100 Marks  
M. Marks: 80 Marks  
Internal Assessment: 20 Marks  
Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

**Unit-1**

International Relations: Meaning, Nature, Scope and its Evolution as a Discipline;  
Approaches to International Relations: Liberalism, Classical Realism and Neo-Realism.

**Unit-2**

Cold War and Post-Cold War Era: Origin and Phases of Cold War, Détente, End of Cold War and Collapse of the Soviet Union;  
Post-Cold War Era and Emerging Centers of Power (European Union, China, Russia and Japan).

**Unit-3**

India's Foreign Policy: Basic Determinants (Historical, Geopolitical, Economic, Domestic and Strategic); India's Policy of Non Alignment; India: An Emerging Power.

**Unit-4**

Emerging Challenges in International Relations: Terrorism, Climate Change and Global Warming; Globalization and its Challenges.



Bharat Maurya  
13.07.2020

### Suggested Readings

- A.A. Couloumbis and J.H. Wolf, 1989. *Introduction to International Relations: Power and Justice*, New York, Praegar.
- A.J.R. Groom and M. Lights (eds.), 1993. *Contemporary International Relations: A Guide to Theory*, London, Printer.
- Ajay Kumar, 2012. *Antarrashtriya Sambandhon Ke Siddhant* (In Hindi), New Delhi, Pearson,
- B.S. Chimni, et al, 2012. *International Relations*, New Delhi, Pearson.
- D.G. Brennan (ed.), 1961. *Arms Control, Disarmament and National Security*, New York, George Braziller.
- F. Halliday, 1994. *Rethinking International Relations*, Basingstoke, Macmillan.
- F. Halliday, 1999. *Revolution and World Politics: The Rise and Fall of the Sixth Great Power*, Basingstoke, Macmillan.
- H.J. Morgenthau, 1985. *Politics Among Nations*, 6th Edition, revised by K.W. Thompson, New York, Alfred Knopf.
- I. Claude, 1962. *Power and International Relations*, New York, Random House.
- J. Baylis and Steve Smith, 1997. *Globalization of World Politics*, London, Oxford.
- K.W. Deutsch, 1989. *The Analysis of International Relations*, New Delhi, Prentice Hall.
- M.P. Sullivan, 2001. *Theories of International Politics: Enduring Paradigm in a Changing World*, Hampshire, Macmillan.
- M.S. Rajan, 1994. *Non-Alignment and the Non-Alignment Movement in the Present World Order*, Delhi, Konark.
- P. Gilbert, 1995. *Terrorism Security and Nationality*, London and New York, Routledge.
- P.Allan and K. Goldman (eds.), 1992. *The End of the Cold War*, Dordrecht, Martinus Nijhoff.
- R. Basu, 2019. *Antarrashtriya Rajneeti: Awdharnaye, Sidhanth aur Mudde*, New Delhi, Sage Publication.
- R.O. Keohane (ed.), 1986. *Neo-Realism and Its Critics*, New York, Columbia University Press.
- S. Burchill et. al., 2001. *Theories of International Relations*, Hampshire, Macmillan.
- S.P. Verma, 1988. *International System and the Third World*, New Delhi, Vikas.
- T. Biswal, 2016. *Antarrashtriya Sambandh* (In Hindi), Hyderabad, Orient Black Swan.
- W. Epstein, 1976. *The Last Chance: Nuclear Proliferation and Arms Control*, New York, The Free Press.



**Semester -5 (Option- 1)**

**Paper Name: Public Policy and Governance**

**Paper Code: 20 UPOL 501**

Total: 100 Marks

M. Marks: 80 Marks

Internal Assessment: 20 Marks

Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

**Unit-1**

Public Policy: Meaning, Types & Significance; Models of Public –Policy;  
Institutions of Policy Formation and Implementation: NITI-Aayog and Major Parliamentary Committees.

**Unit-2**

Governance: Meaning, Good-Governance (World Bank) and E-Governance;  
Right to Education, National Health Mission, Right to Food Security and MNREGA.

**Unit-3**

Decentralization in India: Evolution of Local-Governments in India. 73<sup>rd</sup> and 74<sup>th</sup> Constitutional Amendments in India, Impacts of Decentralisation in India. Challenges of Decentralization in India.

**Unit-4**

Accountability & Transparency: Ombudsman, Lokpal and Lokayukta; Citizen's Charter and Right to Information Act. Recommendations of 1<sup>st</sup> & 2<sup>nd</sup> Administration Reforms Commission.



*Barat Maurya  
15.07.2020*



**Suggested Readings:**

- A. Avasthi & S.R. Maheshwari, 2017. *Public Administration*, Agra, Lakshmi Narayan Agarwal,
- B.L. Meena, 2017. *Innovations in Administration*, New Delhi, Prabhat.
- F. J. Goodnow, 2008. *Politics and Administration: A Study in Governments*, New Delhi, Transaction Publishers.
- H. Nicolas, 2015 *Public Administration and Public Affairs*, London, Routledge.
- K. Mathur, 2013. *Panchayati Raj*, New Delhi, Oxford India Short Introductions.
- K. Mathur, 2013. *Public Policy and Politics in India: How Institutions Matter*, New Delhi, Oxford University Press.
- K. Mathur, 2008. *From Government to Governance: A Brief Survey of the Indian Experience*, New Delhi, NBT.
- K. Sanyal, and R. Chakrabarti, 2017. *Public Policy in India*, New Delhi, Oxford India Short Introductions.
- M. Bhattacharya, 2013. *New Horizons of Public Administration*, New Delhi, Jawahar Publishers.
- M. Sinha (ed.), 2010. *Prashasan evam Lok Niti* (In Hindi), Hyderabad, Orient Longman.
- N.B. Rao, 2016. *Sushasan*, New Delhi, Sage Publication.
- P. K. Mohanty, 2018. *Nagar aur Lok Niti*, New Delhi, Sage Publication.
- P.R. Dubhashi, 1995. *Recent Trends in Public Administration*, Delhi, Kaveri Books.
- R. Boesche, 2002. *The First Great Political Realist: Kautilya and His Arthashastra*, Lexington Books.
- S. Naib, 2013. *The Right to Information in India*, New Delhi, Oxford University Press.
- S. R. Maheshwari, 1994. *Administrative Theories*, New Delhi, Allied.
- V. Sahasrabuddhe, 2019. *Vikas Ki Rajneeti*, New Delhi, Prabhat.



**Semester -5 (Option- 2)**

**Paper Name: -Indian Political Thought**  
**Paper Code: 20 UPOL 502**

Total: 100 Marks  
M. Marks: 80 Marks  
Internal Assessment: 20 Marks  
Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

**Unit-1**

Ancient Indian Political Thought: Sources and Characteristics,  
Political Thoughts: Shanti Parva, Dharma-Shastra and Arthashastra Traditions.

**Unit-2**

Political Thoughts of Raja Ram Mohan Roy and Vivekananda.

**Unit-3**

Political Thoughts of Dr. B.R. Ambedkar and Mahatma Gandhi.

**Unit-4**

Political Thoughts of Deen Dayal Upadhyaya and Jai Prakash Narayan.



Bhanat Maurya  
13.07.2020

### Suggested Readings

- A. Appadorai, 1992. *Indian Political Thinking through the Ages*, Delhi, Khanna Publishers.
- A. Pradhan, 2018. *Dalit Chintan*, New Delhi, Prabhat.
- B. Chakrabarty & R.K. Pandey, 2015. *Aadhunik Bhartiya Rajnitik Chintan: Vichar Avam Sandarbh*, New Delhi, Sage Publication.
- G. Tripathi & M. Sharma, 2019. *Gandhi Vaichariki*, New Delhi, Akhand Publishing House.
- J. Bandhopahdyaya, 1969. *Social and Political Thought of Gandhi*, Bombay, Allied.
- K.K. Mehendiratta, 2019. *Gandhian World Order*, Kurukshetra, Nirmal.
- K.N. Kadam (ed.), 1992. *Dr. B.R. Ambedkar*, New Delhi, Sage.
- K.P. Karunakaran, 1975. *Indian Politics from Dababhai Naoroji to Gandhi: A Study of Political Ideas of Modern India*, New Delhi, Gitanjali.
- M. Gandhi, 2020. *Hind Swaraj*, New Delhi, Prabhat.
- O.P. Gauba, 2019. *Bhartiya Rajniti Vicharak*, New Delhi, Mayur paperbacks.
- P. Jain, 2019. *Pratinidhi Bhartiya Rajnitik Vicharak*, Agra, Sahitya Bhawan Publications.
- R. Iyer, 1973. *The Moral and Political Thought of Mahatma Gandhi*, Delhi, Oxford
- R.M. Lohia, 1953. *Marx, Gandhi and Socialism*, Hyderabad, Nav Hind.
- S. Ghose, 1984. *Modern Indian Political Thought*, Delhi, Allied.
- S. Ghose, Socialism, 1973. *Democracy and Nationalism in India*, Bombay, Allied University Press.
- V.P. Verma, 1974. *Modern Indian Political Thought*, Agra, Lakshmi Narain aggarwal.
- V.R.Mehta, 1992. *Foundations of Indian Political Thought*, New Delhi, Manohar.
- V.S. Narvane, 1978. *Modern Indian Thought*, New Delhi, Orient Longman.

**Semester- 6 (option- 1)**

**Paper Name: International Organisations**

**Paper Code: 20 UPOL 601**

Total: 100 Marks

M. Marks: 80 Marks

Internal Assessment: 20 Marks

Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

**Unit-1**

Meaning, Nature, Scope and Evolution of International Organisations.

Meaning, Types, Evolution and Role of Regional Organisations.

**Unit-2**

United Nations Organisation: Objectives and Principles. Structure and Functions of Principal Organs.

**Unit-3**

India & Regional Organisations: SAARC, ASEAN & BIMSTEC.

**Unit-4**

International Non-Governmental Organization: International Commission of Jurists (ICJ), Amnesty International (AI), Human Rights Watch and Greenpeace.



Bhavraj Malhotra  
13.07.2020



### Suggested Readings

- A. Bhaseen, 2018. *Antarrashtriya Sangathan* (In Hindi), New Delhi, Prabhat.
- A. L. Bennett, 1977. *International Organisations: Principles and Issues*, Englewood Cliffs NJ, Prentice Hall.
- C.S.R. Murthy, 2020, *India in the United Nations*, New Delhi, Pearson.
- D. Sinha, 2019, *Shakti Ki Manyata*, New Delhi, Prabhat.
- E. Laurd, 1989. *A History of the United Nations*, London, Macmillan.
- H.G. Nicholas, 1975. *The UN as a Political Institution*, Oxford, Oxford University Press.
- I. Claude, 1967. *Changing United Nations*, New York, Random House.
- I. Claude, 1971. *Swords into Ploughshares: The Problems and Progress of International Organisations*, New York, Random House.
- K.K. Mehendiratta, 2019. *Gandhian World Order*, Kurukshetra, Nirmal.
- K. P. Saxena, 1993. *Reforming the United Nations: The Challenge and Relevance*, New Delhi, Sage.
- P. Baehr and L. Gordenker, 1992. *The United Nations in the 1990s*, London, Oxford
- R. Meltzer, 1978. "Restructuring the UN System, Institutional Reform, Efforts in the Context of North-South Relations," *International Organization*, vol. 32, No. 4.
- R. C. Angell, 1979. *The Quest for World Order*, Ann Arbor, University of Michigan Press.
- R. K. Ashley, 1983. "The Eye of Power: The Politics of World Modelling," *International Organization*, Vol. 37, No. 3.
- R. Yalem, 1979-1980. "Conflicting Approaches to World Order," *Alternatives*, Vol.5.
- S. J.R. Bilgrami, 1971. *International Organisation*, New Delhi, Vikas University Press.
- W. H. Lewis (ed.), 1991. *The Security Role of the United Nations*, New York, Praegar.



**Semester- 6 (Option-2)**

**Paper Name: Indian Foreign Policy**

**Paper Code: 20 UPOL 602**

Total: 100 Marks

Marks: 80 Marks

Internal Assessment: 20 Marks

Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

**Unit-I**

Meaning of Foreign Policy: History, Principles, and Objectives; Legacies of the Freedom Struggle.  
Indian Foreign Policy in Making: Domestic Background and International Environment.

**Unit-II**

Policy of Non-Alignment: Meaning, Features and Bases. Role of India in the Non-Aligned Movement;  
India and the Third World.

**Unit-III**

Indian Foreign Policy: Achievements since Independence and Contemporary Challenges.  
Indian Ocean: Regional Co-operation and Zone of Peace.

**Unit-IV**

India's Security and Indian Foreign Policy - Domestic, Regional and International Environment;  
India and the United Nation (UN).



Bharat Maurya  
15.07.2020

### Suggested Readings

- A. Gupta & A. Wadhwa, 2020, *India's Foreign Policy: Surviving in a Turbulent World*, New Delhi, Sage Publication.
- A. Nautiyal, ed., 2006. *Challenges to India's Foreign Policy in the New Era*, New Delhi, Gyan Publishing House.
- A. Pande, 2017. *From Chanakya to Modi*, New Delhi, Harper Collins India.
- A. Sinha & M. Mahota, eds., 2007. *Indian Foreign Policy: Challenges and Opportunities*, New Delhi, Academic.
- A. Ghosh, 2012. *India's Foreign Policy*, New Delhi, Pearson.
- C. Raja Mohan, 2003. *Crossing The Rubicon: The Shaping of India's New Foreign Policy*, New Delhi, Viking.
- D. H. Mohite and A. Dholakia, Eds, 2001. *India and The Emerging World Order*, New Delhi, Kalinga.
- H. Kapur, 1994. *India's Foreign Policy: 1947-1993*, New Delhi, Sage.
- H.V. Pant, 2018. *Bharatiya Suraksha Evam Videsh Niti*, New Delhi, Prabhat.
- J. Bandhopahdyaya, 1979. *The Making of India's Foreign Policy*, Calcutta, Allied.
- J. K. Roy, 2011. *India's Foreign Relations, 1947-2007*, New Delhi, Routledge.
- J.N. Dixit & R. Singh, 2018. *Bhartiya Videsh Niti* (In Hindi), New Delhi, Prabhat.
- J.N. Dixit, 1999. *Across Border: Fifty Years of India's Foreign Policy*, New Delhi, Picks Books.
- N. Jetley, 1985. *India's Foreign Policy: Challenges and Prospects*, New Delhi, Janaki Prakashan.
- N.K. Jha (ed.). 2000. *India's Foreign Policy in a Changing World*, New Delhi, South Asian Publishers.
- N.S. Sisodia & C. U. Bhaskar, eds., 2007. *Emerging India: Security and Foreign Policy Perspective*, New Delhi, Promilla.
- R. Harshe & K.M. Seethi, eds., 2005. *Engaging with the World: Critical Reflections on India's Foreign Policy*, New Delhi, Orient Longman.
- R. Sikri, *Chunauti aur Ranniti* (In Hindi), New Delhi, Sage Publication.
- R. Thakur, 1993. *Politics and Economics of India's Foreign Policy*, Delhi, Oxford University Press.
- R.S. Yadav & S. Dhanda, 2009. eds., *India's Foreign Policy: Contemporary Trends*, New Delhi, Shipra.
- R.S. Yadav (ed.), 1993. *India's Foreign Policy Towards 2000 A.D.*, New Delhi, Deep & Deep.
- R.S. Yadav, 2012. *Bharat Ki Videsh Niti* (in Hindi), New Delhi, Pearson.
- S. Ganguly (ed.), 2018. *Bharat Ki Videsh Niti*, New Delhi, Oxford University Press.
- S. Mansingh (ed.), 1999. *India's Foreign Policy in the 21st Century*, New Delhi, Foreign Policy Institute.
- V.P. Dutt, 1999. *India's Foreign Policy in a Changing World*, New Delhi, Vikas.
- V. Shastri & Y. Bhatt, 2018. *Dynamic Diplomacy & Foreign Policy*, New Delhi, Prabhat.

(Generic Elective) Paper I

Paper Name: Human Rights  
Paper Code: 20 UPOL 701 O.E.

Total: 100 Marks  
M. Marks: 80 Marks  
Internal Assessment: 20 Marks  
Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

Unit-I

Human Rights: Meaning, Human Rights and Citizen's Rights.  
Indian Concepts: Danda Neeti, Nyaya and Dharma.  
Different Generations of Human Rights.

Unit-II:

International Covenant on Civil and Political Rights (ICCPR).  
International Covenant on Economic, Social and Cultural Rights (ICESCR).

Unit-III:

The Protection of Human Rights Act, 1993, National Human Rights Commission.;  
Human Rights Movements in India: (People's Union for Civil Liberties (PUCL) and People's  
Union for Democratic Rights (PUDR).

Unit-IV

Universal Declaration of Human Rights (1948), UN: Human Rights Council and  
UN High Commissioner for Human Rights.



Bharat Maurya  
13.07.2020



### Suggested Readings

- A. Bhascen, 2018, *Janiye Manav Adhikaron Ko*, New Delhi, Prabhat.
- A. Phillip (ed.), 1992. *The United Nations and Human Rights: A Critical Appraisal*, Oxford: Clarendon Press.
- E.S. Venkataramiah (ed), 1988. *Human Rights in a Changing World*, New Delhi, International Law Association.
- F. G. Jacobs & R.C.A. White, 1996. *The European Convention of Human Rights*, Oxford, Clarendon University Press.
- G. Hargopal, 1999. *Political Economy of Human Rights*, Hyderabad, Himalaya.
- G.S. Bajwa, 1995. *Human Rights in India: Implementation and Violations*, Delhi, Anmol Publications.
- J. Donnelly, 1989 *Universal Human Right in Theory and Practice*, Ithaca, Cornell University Press.
- K.G. Kannabiran, 2003. *The wages of Impunity: Power, Justice and Human Rights*, New Delhi, Orient Longman.
- M. Mehrotra, 2017, *Mahila Adhikar Aur Manav Adhikar*, New Delhi, Prabhat.
- M. P. Dube, and Neeta Bora, (ed.), 2000. *Perspective on Human Rights*, New Delhi, Anamika Publishers.
- M. Freeman, 2003. *Human Rights: An Interdisciplinary Approach*, Cambridge, Polity Press.
- P. R. Bachr, 1999. *Human Rights: Universality in Practice*, New York, Palgrave.
- P.L. Mehta 2002. *Human Rights under the Indian Constitution*, New Delhi, Deep and Deep Publications,
- P.N. Bhagwati, 1987. *Dimensions of Human Rights*, Madurai, Society for Community Organization Trust.
- R.C. Hingorani, 1985. *Human Rights in India*, Oxford University of Michigan.
- S. Davidson, 1993. *Human Rights*. Buckingham, Open University Press.
- S. Mishra, 2015. *Manavadhikar Ka Manveeya Chehara*, New Delhi, Prabhat.
- S. Sen.2009. *Human Rights in a Developing Society*, New Delhi, Sage Publication.
- S. Kothari, and Harsh Sethi (ed.), 1991. *Rethinking Human Rights: Challenge for Theory and Action*, New Delhi, Lokayan
- U. Baxi, 2002. *The Future of Human Rights*, New Delhi, Oxford University Press.

(Generic Elective) Paper II

Paper Name: GENDER STUDIES  
Paper Code: 20UPOL 702 O.E.

Total: 100 Marks  
M. Marks: 80 Marks  
Internal Assessment: 20 Marks  
Time: 3 Hrs

*Note: The Paper setter shall set Nine Questions in all, taking two questions from Each Unit and one compulsory question (Q. No. 9) containing Eight Short Answer Type Questions of Two Marks each covering the entire Syllabus. The Candidate shall attempt five questions in all selecting one question from each Unit and the compulsory question. All questions shall carry equal marks. Paper will be set in Hindi and English Medium.*

Unit-1

Meaning, Nature, Scope and Evolution of Gender Studies; Patriarchy, Sex and Gender;  
Need for Gender Sensitization.

Unit-2

National and State Commissions for Women; National Committees for Welfare of Women;  
Indian Feminism

Unit-3

Women's Education- Gender Diversities and Disparities in Education, Profession and  
Gender; Committees & Commissions for Women's Education in India. Vocational Education  
and Skill Development for Women.

Unit-4

Gender Mainstreaming, Gender Budgeting, Gender Planning and Gender Analysis.



Bharat Maurya  
13.07.2020

Suggested Readings:

- A. Basu, 1995. *The challenge of Local Feminism: Women's Movement in Global Perspective*, Boulder Co, West View Press.
- A. Joan, 2006. *Class Questions: Feminist Answers*, Maryland, Rowman and Littlefield.
- A. Brooke, 2000. *Political Theory and Feminist Social Criticism*, London, Cambridge University Press.
- B. Smith, 2000. *Global Feminisms since 1945: Rewriting Histories*, London, Routledge.
- B. Ackerly, 2000. *Political theory and Feminist Social Criticism*, London, Cambridge University Press.
- C. R. McCann & S. K. Kim, 2003. *Feminist Theory Reader: Local and Global Perspectives*, London, Routledge.
- G. Anzaldúa, (ed.) 1990. *Making Face, Making Soul, Haciendo Caras: Creative and Critical Perspectives by Women of Color*, San Francisco, Aunt Lunte Foundation Books.
- J. Ghosh, 2009. *Never Done and Poorly Paid: Women's Work in Globalizing India*, New Delhi, Women Unlimited.
- L. Nicholson (ed.), 1997. *The Second Wave: A Reader in Feminist Theory*, New York, Routledge.
- M. Schneir, 1972. *The Vintage Book of Historical Feminism*, London, Vintage.
- N. Kabeer, 1995. *Reversed Realities*, London, Verso.
- N. Menon, (ed.), 1999. *Gender and Politics in India*, New Delhi, Oxford University Press.
- P. Clough, 1994. *Feminist Thought*, Oxford, Blackwell.
- P. H. Collins, 2000. *Black Feminist Thought*, London, Routledge.
- S. Rai, 2002. *Gender and the Political Economy of Development*, UK, Polity Press.
- U. Narayan, 1997. *Dislocating Cultures: Identities, Traditions and Third World Feminism*. London, Routledge.
- V. Bhagwat, 2004. *Feminist Social Thought*, New Delhi, Rawat Publications.



# Chaudhary Bansi Lal University, Bhiwani

(A State University established by Govt. of Haryana Act No. 25 of 2014)

## Scheme of Examination for Bachelor of Arts with Psychology

Semester-I to VI

Credits= 36

Total Marks = 600

Course/ Paper Code	Subjects	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Theory	Practical/ Tutorial	Total	Theory	Practical	Total	Theory	Internal Assessment	Practical	
20 UPSY 101 <b>Semester-I</b>	Foundations of Psychology	C.C.	04	04	08	04	02	06	60	15	25	100
20 UPSY 201 <b>Semester-II</b>	Social Psychology	C.C.	04	04	08	04	02	06	60	15	25	100
20 UPSY 301 <b>Semester-III</b>	Psychological Disorders	C.C.	04	04	08	04	02	06	60	15	25	100
20 UPSY 401 <b>Semester-IV</b>	Statistical Methods & Psychological Research	C.C.	04	04	08	04	02	06	60	15	25	100
20 UPSY 501 <b>Semester-V</b>	Psychological Intervention	D.S.E	04	04	08	04	02	06	60	15	25	100
20 UPSY 502 <b>Semester-V</b>	Bio-Psychology											
20 UPSY 503 <b>Semester-V</b>	Developmental Psychology											
20 UPSY 601 <b>Semester-VI</b>	Counselling Psychology	D.S.E	04	04	08	04	02	06	60	15	25	100
20 UPSY 602 <b>Semester-VI</b>	Health and Wellbeing											
20 UPSY 603 <b>Semester-VI</b>	Industrial and Organizational Psychology											
<b>Total</b>			<b>24</b>	<b>24</b>	<b>48</b>	<b>24</b>	<b>12</b>	<b>36</b>	<b>240</b>	<b>90</b>	<b>150</b>	<b>600</b>
20 UPSY701 O.E	Psychology and Life	O.E	05	01 Tutorial	06	05	01 Tutorial	06	80	20		100

C.C. = Core Course

O.E.= Open Elective

D.S.E = Discipline Specific Collective

*5.5.14*



**B.A Psychology**  
**Semester-1**  
**Paper Name: Foundations of Psychology (CC)**  
**Paper Code: 20UPSY101**

Theory: 60  
Internal Assessment: 15  
Time: 3 Hours

**Note - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.**

**(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.**

**(iii) Each question carries 12 marks.**

**Unit 1**

Introduction:

Psychology: A Science and a Perspective, Origin and Development of Psychology, Historical Perspective of Psychology in India, Methods: Experimental, Observation

**Unit 2**

Cognitive Processes:

Sensory Processes- Sensation: Meaning and Characteristics

Perception: Nature of Perception, Laws of Perceptual Organization, Learning: Classical Conditioning, Operant Conditioning, Observational Learning, Memory Processes: Information Processing Model.

**Unit 3**

Motivation and Emotion:

Motives: Biogenic and Sociogenic

Emotions: Aspects of Emotions, Theories of Emotion: James-Lange, Cannon-Bard

**Unit 4**

Personality and Intelligence:

Personality: nature, theories: Cattle, Allport

Intelligence: nature, Theories: Spearman, Thurston

**Suggested Readings:**

1. Singh, A.K. (2009) Uchattar Samanaya Manovigyan. Delhi: Moti Lal Banarsidas.
2. Singh, A. And Singh,U. (1984). Prayogatamak Manovigyan. Bhiwani: Vedic Prakashan.
3. Singh, R. And Shyam,R. (2008). Adhunik Sangyanatmak Manovigyan. Panchkula: Haryana Sahitya Akadami.
4. Singh, A.K. (2013). Cognitive Psychology. MotiLal Banarsidas, New Delhi
5. Verma, P.and Srivastava, D.N. (2012). Adhunik Prayogatamak Manovigyan. Delhi:AggarwalPublications
6. Galotti, K.M. (2014).Cognitive Psychology: In and Out of the Laboratory. New Delhi: Sage

3. Singh

**B.A. (Semester-1) PRACTICAL**

**M.Marks:25**  
**Time: 3 Hours**

1. EPQ/EPI
2. Study of Emotions.
3. Verbal Test of Intelligence.
4. Performance Test of Intelligence/RPM.
5. Muller Lyer Illusion
6. Test of Motivation.
7. Maze Learning
8. STM
9. LTM

Note: Students are to conduct and report at least five (5) practicals.

The examiner will allot one practical at the time of examination.

**Open Elective**  
**Paper Name: Psychology and Life**  
**Paper Code: 20UPSY701OE**

**Unit -1**

Introduction to Psychology: Meaning, Branches of Psychology  
Methods: Observation, Experimental and Survey

**Unit -2**

Social interaction and Influence: Interpersonal attraction, Pro-Social Behaviour, Aggression, Social Influence  
Psychological Well-Being, Mindfulness, Happiness Positive Evaluation , Optimism , Hope, Self Efficacy

**Unit -3**

Personality: Perspectives on personality: Psychodynamic, Phenomenological- Humanistic and Social Cognitive.  
Intelligence: Nature, Theories: Spearman, Thurstone, Heredity, Environment and Intelligence  
Emotional Intelligence

**Unit 4**

Health risk behavior (use of Tobacco, Alcohol, Drugs), Causes, Consequences and Rehabilitation  
Health Promotion and Management: Life style Exercise, nutrition, Indian Healing Techniques (Ayurveda, Traditional Healing), Stress and Coping

**Suggested Readings:**

1. Atkinson, R.L., Atkinson, R.L, et al. (1985) Introduction to Psychology. N. Y.: HBJ Publishers.
2. Baron, R. and Misra.G. (2013).Psychology. New Delhi: Pearson.
3. Carr, A. (2011): Positive psychology. Routledge.
4. Hussain A. & Ilyas Khan, M. (2006). Recent Trends in Human Stress Management., Global Vision Publishing House
5. Singh, R. & Shyam, R. (2008) Adhunik Sangyanatmak Manovigyan. Panchkula: Haryana Sahitya Akadami.
6. Taylor, S.E. (2006) Health Psychology (6th ed.) Delhi: Tata McGraw Hill.
7. Snyder C.R.& Shane J.Lopez (2002)Handbook of Positive Psychology Oxford University Press – 2002
8. Verma, R.S., Singh, S., & Sharma, D. (1982). Vayavaharik Manovigyan. Agra: Vinod Pustak
9. Seligman, E ( 2002). Authentic Happiness, Atria Bookks

5.57 h

**B.A. (Semester-1) PRACTICAL**

**M.Marks:25**  
**Time: 3 Hours**

1. EPQ/EPI
2. Study of Emotions.
3. Verbal Test of Intelligence.
4. Performance Test of Intelligence/RPM.
5. Muller Lyer Illusion
6. Test of Motivation.
7. Maze Learning
8. STM
9. LTM

Note: Students are to conduct and report at least five (5) practicals.  
The examiner will allot one practical at the time of examination.

3.57/2



**B.A Psychology**  
**Semester-1**  
**Paper Name: Foundations of Psychology (CC)**  
**Paper Code: 20UPSY101**

Theory: 60  
Internal Assessment: 15  
Time: 3 Hours

Note: - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.  
(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.  
(iii) Each question carries 12 marks.

**Unit 1**

Introduction:

Psychology: A Science and a Perspective, Origin and Development of Psychology,  
Historical Perspective of Psychology in India, Methods: Experimental, Observation

**Unit 2**

Cognitive Processes:

Sensory Processes- Sensation: Meaning and Characteristics  
Perception: Nature of Perception, Laws of Perceptual Organization, Learning: Classical  
Conditioning, Operant Conditioning, Observational Learning, Memory Processes: Information  
Processing Model.

**Unit 3**

Motivation and Emotion:

Motives: Biogenic and Sociogenic  
Emotions: Aspects of Emotions, Theories of Emotion: James-Lange, Cannon-Bard

**Unit 4**

Personality and Intelligence:

Personality: nature, theories: Cattle, Allport  
Intelligence: nature, Theories: Spearman, Thurston

**Suggested Readings:**

1. Singh, A.K. (2009) Uchattar Samanaya Manovigyan. Delhi: Moti Lal Banarsidas.
2. Singh, A. And Singh, U. (1984). Prayogatamak Manovigyan. Bhiwani: Vedic Prakashan.
3. Singh, R. And Shyam, R. (2008). Adhunik Sangyanatmak Manovigyan. Panchkula:  
Haryana Sahitya Akadami.
4. Singh, A.K. (2013). Cognitive Psychology. MotiLal Banarsidas, New Delhi
5. Verma, P. and Srivastava, D.N. (2012). Adhunik Prayogatamak Manovigyan.  
Delhi: Aggarwal Publications
6. Galotti, K.M. (2014). Cognitive Psychology: In and Out of the Laboratory. New Delhi: Sage

S. Singh

**B.A.(Semester-2)**

**PRACTICAL**

**M.Marks:25**  
**Time: 3 Hours.**

1. Sociometry
2. Measurement of Attitude
3. Altruism Scale
4. Stereotypes
5. Aggression Scale
6. Prejudice Scale
7. Leadership Styles
8. Social Facilitation
9. Observation

Note: Students are to conduct and report atleast five(5) practicals.  
The examiner will allot one practical at the time of examination.

3.24h

**B.A Psychology**  
**Semester-2**  
**Paper Name: Social Psychology (CC)**  
**Paper Code: 20UPSY201**

Theory: 60  
Internal Assessment: 15  
Time: 3 Hours

- Note: - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.**
- (ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.**
- (iii) Each question carries 12 marks.**

**Unit- 1**

Introduction:

Brief history of Social Psychology (special emphasis on India), Scope of social Psychology, Levels of Social Behaviour, Approaches towards understanding Social Behaviour

**Unit -2**

Individual Level Processes:

Socialization: Meaning, Agencies

Person Perception: Attribution-theories, Biases and Errors

Attitude: Formation, Change and Resistance to Change

**Unit- 3**

Interpersonal Processes:

Interpersonal Attraction, Prosocial Behaviour, Aggression: Nature, Type and Associated factors

**Unit -4**

Group dynamics:

Groups: Key Aspects, Cooperation and Conflict, Group Decision Making.

Leadership- Meaning, Need and Types, Characteristics of a Leader.

**Suggested Readings:**

1. Baron, R.A. and Byrne, D. (2008). Samajik Manovigyan (Hindi Sanskaran) Delhi: Pearson.
2. Chadha, NK. (2012). Social Psychology MacMillan
3. Chaube S.P.(1985). Social Psychology. Agra: Educational Publishers.
4. Myer, D.G, Sahajpal and Behera (2011). Social Psychology. (10<sup>th</sup> Edt) Mc Graw Hill Education.
5. Perlman, D. and Cozby, P.C.(1983). Social Psychology. New York: CBS College Publishing.
6. Rai, B.C.(1989) Social Psychology. Delhi: Sultan Pub.
7. Singh, A.K. (2009). Samaj Manovigyan ki Rooprekha. Delhi: Moti Lal Banarsidas.

S. Singh

**B.A. (Semester-3) PRACTICAL**

**M.Marks : 25**  
**Time: 3 Hours.**

1. Clinical Interview
2. CAQ
3. TAT
4. WAT
5. Depression Inventory
6. Anxiety Scale
7. WAIS
8. PGI Memory Scale
9. Field Visit/ Case History

Note: Students are to conduct and report atleast five (5) practicals.

The examiner will allot one practical at the time of examination.

S. 24



**B.A Psychology**  
**Semester-3**  
**Paper Name: Psychological Disorders (CC)**  
**Paper Code: 20UPSY301**

Theory: 60  
Internal Assessment: 15  
Time: 3 Hours

**Note: - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.**

**(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.**

**(iii) Each question carries 12 marks.**

**Unit -1**

Basic Concepts: Definition and Criteria of Abnormality, Classification: Meaning, Purpose, DSM-IV (TR): Key Features, Diathesis Stress Model.

**Unit -2**

Approaches to Psychopathology: Biological, Psychodynamic, Behavioural, Cognitive and Cultural  
Clinical states: Anxiety Spectrum Disorders: Generalized Anxiety Disorder, Obsessive Compulsive Disorder,

**Unit -3**

Mood Disorders-Unipolar, Bipolar; Schizophrenia: Disorganized, Paranoid and Catatonic, Learning Disabilities:- Dyscalculia, Dysgraphia & Dyslexia.

**Unit -4**

Treatment of disorders:

- a) Biological treatment: Pharmacotherapy and Electroconvulsive Therapy
- b) Psychological treatment: Psychoanalytic Therapy, Behaviour Therapy and Cognitive-Behaviour Therapy

**Suggested Readings:**

1. Anand, V. and Srivastva, R. (2003). Manovikriti Vigyan, Delhi: Moti Lal Banarsi Das.
2. Carson, R.C.; Butcher, J.N., et al. (2007). Abnormal Psychology. (13th Ed.) New Delhi: Pearson Education.
3. Davison, G.C. and Neale, J.M. (1998). Abnormal Psychology (7th Ed. & 11th Ed.) New York: Wiley.
4. Sarason, I.G. and Sarason, B.R. (2005). Abnormal Psychology: The Problem of Maladaptive Behaviour (10th Ed.) New Delhi: Pearson Education Inc.
5. Singh, A.K. (2006). Adhunik Asamanya Manovigyan, Delhi: Moti Lal Banarasi Das.
6. Srivastava, D.N. (1991) Adhunik Asamanya Manovigyan (6th Ed.) Agra: Sahitya.
7. Butcher, J.N., Hooley, D., Vivedi and Mineka. (2013). Abnormal Psychology. (16th Ed.) New Delhi: Pearson Education.
8. Donald, W., Black, M.D., John, E. and Grant, M.D. (2017). DSM-V Guide Book The Essential Companion To The Diagnostic And Statistical Manual Of Mental Disorders, CBS Publications & Distributos Pvt Ltd

S. S. S.

**B.A. (Semester-4) PRACTICAL**

**M.Marks : 25**

**Time: 3 Hours.**

1. Data Entry by (Excel/SPSS)
2. Computation of Central Tendencies by (Excel/SPSS)
3. SPM/RPM
4. Observation Method
5. GHQ
6. Variability
7. Reliability
8. Calculation of Correlation by (Excel/SPSS)
9. Survey Method

S. S. H.

**B.A Psychology  
Semester-4**

**Paper Name: Statistical Methods and Psychological Research (CC)  
Paper Code: 20UPSY401**

**Theory: 60  
Internal Assessment: 15  
Time: 3 Hours**

- Note:** - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.  
(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.  
(iii) Each question carries 12 marks.

**Unit 1**

Introduction: Scales of Measurement, Frequency Distribution, Graphical Representation of Data.

**Unit 2**

Data analysis: Measures of Central Tendency: Mean, Median, Mode (properties and computation). Standard Deviation: Properties and Computation.  
Correlation: Pearson Method

**Unit 3**

Psychological Testing: Introduction to Psychological Testing, Characteristics of test, Reliability, Validity, Properties of Normal Probability Curve (NPC).

**Unit 4**

Norms, Standardization, Types of Tests,  
Qualitative Methods: Interview, Observation, Case Study

**Suggested Readings:**

1. Singh, A.K. (2006). Tests Measurements and Research Methods in Behavioural Sciences. New Delhi: Bharati Bhawan.
2. Garrett, H.E. and Woodworth, R.S. (1967). Statistics in Psychology and Education. Bombay: Vakils, Feffer and Simons Pvt. Ltd.
3. Mangal, S.K. and Mangal, S. (2013). Research Methodology in Behavioural Science. PHI Learning Pvt. Ltd.
4. Aiken, L.R., & Groth-Marnat, G. (2009). Psychological Testing and Assessment. New Delhi: Pearson Education.

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**B.A. (Semester-5)**

**PRACTICAL**

**M.Marks:25**

**Time: 3Hours**

1. Scale of Suicide Ideation
2. Hopelessness Scale
3. Cognitive Therapy Scale
4. Y-BOCS-( YALE-BROWN OBSESSIVE COMPULSIVE SCALE )
5. Depression Scale
6. Anxiety
7. History Taking
8. Helplessness Scale
9. Copying Style

3 24<sup>h</sup> -



**B.A Psychology**  
**Semester-5**  
**Paper Name: Psychological Intervention (D.S.E)**  
**Paper Code: 20UPSY501**

Theory: 60  
Internal Assessment: 15  
Time: 3 Hours

**Note:** - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.

(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.

(iii) Each question carries 12 marks.

**Unit-1**

Psychological Intervention: Nature, Types: Individual vs Groups  
Ethical, legal, Social and Practical Issues, uses of Psychological Intervention

**Unit-2**

Process of psychotherapy: Initial Phase, Middle Phase and Termination Phase  
Need of Psychotherapeutic: Management Indication for Contraindication

**Unit-3**

Behaviour Therapy: Nature, Principles of Behaviour Techniques- Flooding, Systematic Desensitization, Shaping and Modelling

**Unit-4**

Cognitive Psychotherapies: Nature, Cognitive Schema  
Assessment, Changes in Cognitive Schema, Assertive Training, Time Out, Token Economy, Contingency Management, Activity Scheduling in Child Behaviour Modification

**Suggested Readings:**

1. Freeman et al (1990). Clinical Application of Cognitive Therapy. Plenum Press, New York
2. Welberg, L (1967). The Technique of Psychotherapy, 2 Vol, Grune & Stratton. Inc, 381, Park Avenue South New York
3. Beck, J.S. (2011). Cognitive Behavior Therapy, Second Edition: Basics and Beyond. The Guilford Press: New York

3. 579

**B.A. (Semester-5) PRACTICAL**

**M.Marks : 25**  
**Time: 3 Hours.**

1. Bender Gestalt Test
2. P.G.I. Battery for Brain Dysfunctions
3. Letter Cancellation Test
4. Naher Benson Test
5. Finger Tapping Test
6. Aphasia Screening Test
7. Mini Mental Status Examination
8. Boston Dementia Scale/ Inventory
9. BBMG

Note: Students are to conduct and report atleast five (5) practicals.

The examiner will allot one practical at the time of examination

S. Singh

**B.A Psychology**  
**Semester-5**  
**Paper Name: Bio-Psychology (D.S.E)**

**Paper Code: 20UPSY502**

**Theory: 60**  
**Internal Assessment: 15**  
**Time: 3 Hours**

**Note:** - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.  
(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.  
(iii) Each question carries 12 marks.

**Unit 1**

Bio-Psychology: Meaning, Nature and Scope, Methods of Biopsychology.  
Ethics in Biopsychology and Divisions of Biopsychology.

**Unit 2**

Human Brain: Structure, Function of Neurons: Synapse and Postsynaptic Potentials.  
Structure & functions of muscles: Smooth, Cardiac Striated.

**Unit 3**

Nervous System: Classification, Anatomy & Division.  
Functions of Major Parts of Brain: Cerebral Cortex, Corpus Striatum, Thalamus, Hypothalamus and Hippocampus.

**Unit 4**

Structure, functions and abnormalities of major glands: Thyroid, Adrenal and Pituitary.  
Hemisphere: Division, functions and abnormalities.

**Suggested Readings:**

1. Leukel Francis (1985). Introduction to Physiological Psychology, 3<sup>rd</sup> ed. CBS, Publishers & Distributors: New Delhi.
2. Pinel, P.J. (2009). Biopsychology. (International edition). New Delhi: Pearson Edu
3. Kalat, J.N. (2016). Biological Psychology. Boston, USA: Cengage Learning.

S. Singh

**B.A. (Semester-5) PRACTICAL**

**M.Marks : 25**  
**Time: 3 Hours.**

1. Cognitive Development
2. Emotional Maturity Scale
3. Parent-Child Relationship
4. Self Concept
5. Youth Problem Inventory
6. Self Esteem Inventory
7. Study of values
8. Family Environment Inventory
- 9.

Note: Students are to conduct and report atleast five(5) practicals.  
The examiner will allot one practical at the time of examination.

S. Singh



**B.A Psychology**  
**Semester-5**  
**Paper Name: Developmental Psychology (D.S.E)**

**Paper Code: 20UPSY503**

Theory: 60  
Internal Assessment: 15  
Time: 3 Hours

Note: - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.

(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.

(iii) Each question carries 12 marks.

**UNIT-1**

Human Development; Concept and Principles

Factors in Human Development; Biological, Social and Cultural

**UNIT-2**

Prenatal Development, Determinants and Stages.

Infancy: Characteristics, Hazards and Adjustment

**UNIT-3**

Childhood: Characteristics, Perceptual, Motor, Emotional, Cognitive Development.

Adoloscents: Characteristics and Problems of Adolescents and Adjustment

**UNIT-4**

Adulthood: Early Adulthood, Aging: Physical Conditions, Personal Relationships, Financial and

Emotional Problems, Death Anxiety

**Suggested Readings:**

1. Berk, L.E. (2004). Development Through the Life Span. Delhi: Pearson Education.
2. Hurlock, E.B. (2001) Developmental Psychology: A life-span approach. New Delhi: Tata McGraw Hill.
3. Lal, J.N., & Srivasstava, A. (2001) Modern Developmental Psychology. Agra: Vinod Pustak Bhandar.
4. Sheffer, D.R. and Katherine, K. (2007). Developmental Psychology: Childhood And Adolescence NewYork: Thomson Wadsworth.
5. Singh, R. & Shyam, R. (2008) Comprehensive Statistics for Behavioural Sciences (in Hindi). Sanjay Prakashan, Delhi.

5-546

**B.A. (Semester- 6)**

**PRACTICAL**

**M. Marks : 25**  
**Time: 3 Hours.**

1. Counselling Need Scale
2. Interest Inventory
3. Adjustment
4. Family Environment
5. Case History
6. 16 PF/NEO-FFI
7. GHQ
8. Report Writing
9. Aptitude Test

Note: Students are to conduct and report atleast five(5) practicals.  
The examiner will allot one practical at the time of examination.

5. Singh

**B.A Psychology**  
**Semester-6**  
**Paper Name: Counselling Psychology (D.S.E)**

**Paper Code: 20UPSY601**

Theory: 60  
Internal Assessment: 15  
Time: 3 Hours

**Note: - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.**

**(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.**

**(iii) Each question carries 12 marks.**

**Unit -1**

Introduction: Meaning and goals; Counselling process and relationship; Counsellor Effectiveness, Counselling in the Indian context

**Unit-2**

Approaches: Overview of approaches to counselling: Psychodynamic, Behavioural, Person-Centered and Cognitive-behavioural

**Unit-3**

Techniques: Play, Art, Drama, Music, Dance; Yoga and Meditation

**Unit-4**

Applications: Family Counselling; School and Career Counselling, Personal Counselling.

**Suggested Readings:**

1. Gibson, R. L. & Mitchell, M. H. (2012). Introduction to Counselling and Guidance (7thEd.) New Delhi: Pearson
2. Gladding, S. T. (2012). Counselling: A Comprehensive Profession. (7th Ed) New Delhi. Pearson
3. Rao, S.N. and Sahajpal, P. (2013) Counselling and Guidance. New Delhi: Tata McGraw Hill.
4. Seligman, L. and Reichenberg, L.W. (2010). Theories of Counseling and Psychotherapy: Systems, Strategies, and Skills. 3rd Ed. Indian reprint: Pearson.
5. Udupa, K. N. (1985). Stress and its Management by Yoga. Delhi: Motilal Banarsidas.
6. Hackney, H.L. (2012). The Professional Counselor: A process guide to helping. Pearson.
7. Friedlander, M.L. & Diamond, G.M. (2012). Couple and Family Therapy. In E. M. Altmaier and J.C. Hansen (Eds.) The Oxford Handbook of Counselling Psychology. New York: Oxford University Press.

3. 24/4

**B.A. (Semester-6)**

**PRACTICAL**

**M.Marks:25**

**Time: 3 Hours**

1. Self Perceived Health
2. Stress Scale
3. General Well-being
4. Life Satisfaction
5. Coping Scale
6. Life Style Schedule
7. Healthiness Scale
8. Problem Behaviour
9. Happiness

Note: Students are to conduct and report atleast five(5) practicals.  
The examiner will allot one practical at the time of examination.

3. 5m<sup>h</sup> -



**B.A Psychology**  
**Semester-6**  
**Paper Name: Health and Wellbeing (D.S.E)**

**Paper Code: 20UPSY602**

Theory: 60  
Internal Assessment: 15  
Time: 3 Hours

**Note: - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.**

**(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.**

**(iii) Each question carries 12 marks.**

**UNIT 1**

Introduction to Health Psychology: Components of Health, Relationship between Health and Psychology, Mind and Body relationship, Goals of Health Psychology

**UNIT 2**

Well-Being: Components of Well-being: Life Satisfaction, Affect

**UNIT 3**

Stress, Illness and Pain: Causes, Consequences and Coping with Stress, Pain and Illness.

**UNIT 4**

Health enhancing behaviours: Implications for Well-being: Psychological factors: Resilience, Hope, Optimism; Exercise, Safety, Nutrition.

**Suggested Readings:**

1. Carr, A. (2004). Positive Psychology: The Science of Happiness and Human Strength. UK:Routledge.
2. DiMatteo, M.R. & Martin, L.R.(2002). Health Psychology. New Delhi: Pearson.
3. Forshaw,M. (2003). Advanced Psychology: Health Psychology. London: Hodder and Stoughton.
4. Misra,G. (1999).Stress and Health. New Delhi: Concept.
5. Sarafino, E.P. (2002). Health psychology: Bio Psychosocial Interactions ( 4th Ed.).NY: Wiley.
6. Snyder, C.R., &Lopez, S.J.(2007). Positive Psychology: The scientific and Practical Explorations of Human Strengths. Thousand Oaks, CA: Sage.
7. Taylor, S.E. (2006). Health Psychology, 6th Edition. New Delhi: Tata McGraw Hill.

**B.A. (Semester-6)**

**PRACTICAL**

**M.Marks:25**

**Time: 3Hours**

1. Occupational stress
2. Job Satisfaction
3. Organization Climate Inventory
4. Work Performance Schedule
5. Work Performance
6. Job Value Questionnaire
7. Work Motivation Questionnaire
8. EQ
9. Optimism

Note: Students are to conduct and report at least five (5) practicals.  
The examiner will allot one practical at the time of examination.

S. Singh

**B.A Psychology**  
**Semester-6**  
**Paper Name: Industrial and Organizational Psychology (D.S.E)**

**Paper Code: 20UPSY603**

Theory: 60  
Internal Assessment: 15  
Time: 3 Hours

**Note: - (i) The question paper will comprise of nine questions. First question will be of short answer type not exceeding 30 words consisting of six parts (2 marks each) to be set from the whole syllabus. This question would be compulsory.**

**(ii) Remaining eight questions (essay type) would be set unit-wise, two questions from each unit. The candidate has to attempt four questions, selecting at least one from each unit.**

**(iii) Each question carries 12 marks.**

**Unit-1**

Industrial Psychology: History, Areas of Industrial Psychology, Goals

Organizational Behaviour: Definition, Scientific Management and Human Relations Movement

**Unit-2**

Motivation: Meaning – Primary, Secondary and General Motives;

Theories of work motivation- Maslow's Need Hierarchy, Herzberg's Two Factor Theory

**Unit-3**

Employee Attitudes: Job Satisfaction, Organizational Commitment

Performance Appraisal: Methods of Appraising Performance, Error and Bias in Performance Appraisal

**Unit -4**

Leadership: Nature, Basic approaches: Trait theories, Behavioural theories

Positive Organizational Behaviour: Optimism, Emotional Intelligence

**Suggested Readings:**

1. John W Newstrom (2015). Organizational Behaviour-Human Behaviour at Work. 14<sup>th</sup> Edition Tata McGraw-Hill Publishing Company Limited. New Delhi
2. Ronald, E.R and Lyman, W.P (2013). Introduction to Industrial/ Organization Behaviour. Pearson
3. Girishbala Mohanty (2010). Industrial Psychology and Organisational Behaviour, Kalyani Publishers, Ludhiana
4. Suleman, M. and Chaudhary, V. (2006). Industrial Psychology and Organisational Behaviour, Moti Lal Banarsi Das

J. S. S. S.

**Open Elective**  
**Paper Name: Psychology and Life**  
**Paper Code: 20UPSY701OE**

**Unit -1**

Introduction to Psychology: Meaning, Branches of Psychology  
Methods: Observation, Experimental and Survey

**Unit -2**

Social interaction and Influence: Interpersonal attraction, Pro-Social Behaviour, Aggression, Social Influence  
Psychological Well-Being, Mindfulness, Happiness Positive Evaluation , Optimism , Hope, Self Efficacy

**Unit -3**

Personality: Perspectives on personality: Psychodynamic, Phenomenological- Humanistic and Social Cognitive.  
Intelligence: Nature, Theories: Spearman, Thurstone, Heredity, Environment and Intelligence  
Emotional Intelligence

**Unit 4**

Health risk behavior (use of Tobacco, Alcohol, Drugs), Causes, Consequences and Rehabilitation  
Health Promotion and Management: Life style Exercise, nutrition, Indian Healing Techniques (Ayurveda, Traditional Healing), Stress and Coping

**Suggested Readings:**

1. Atkinson, R.L., Atkinson, R.L, et al. (1985) Introduction to Psychology. N. Y.: HBJ Publishers.
2. Baron, R. and Misra.G. (2013). Psychology. New Delhi: Pearson.
3. Carr, A. (2011): Positive psychology. Routledge.
4. Hussain A. & Ilyas Khan, M. (2006). Recent Trends in Human Stress Management., Global Vision Publishing House
5. Singh, R. & Shyam, R. (2008) Adhunik Sangyanatmak Manovigyan. Panchkula: Haryana Sahitya Akadami.
6. Taylor, S.E. (2006) Health Psychology (6th ed.) Delhi: Tata McGraw Hill.
7. Snyder C.R.& Shane J.Lopez (2002) Handbook of Positive Psychology Oxford University Press – 2002
8. Verma, R.S., Singh, S., & Sharma, D. (1982). Vayavaharik Manovigyan. Agra: Vinod Pustak
9. Seligman, E ( 2002). Authentic Happiness, Atria Bookks

3.545-



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**Common Ordinance for all Under Graduate Three Years (Six semesters) courses**

{Unless otherwise specified in any other relevant Ordinance, this Ordinance will be applicable to all Under Graduate Three Year (Six semesters) courses}

1. The duration of the course shall be three academic years, divided into six semesters. The examination for the first, third and fifth semesters shall ordinarily be held in the months of December/January and for the second, fourth and sixth semesters, in the month of May/June on such dates as may be notified by the Controller of Examinations.

A supplementary examination for 1st, 2nd, 3rd and 4th semesters shall be held along with their regular 1st, 2nd, 3rd and 4th semester examinations. However, the supplementary examination for 5<sup>th</sup> and 6<sup>th</sup> semesters shall be held simultaneously after every six months.

2. The examination schedule containing the dates of receipt of examination forms with and without late fee shall be notified by the Controller of Examinations from time to time.

3. A person who has passed the Senior Secondary Examination (10+2) from Board of School Education Haryana, Bhiwani or any other equivalent examination thereto shall be eligible for admission. The detailed eligibility conditions e.g. percentage of marks in the qualifying examination subject(s) combination etc. etc. shall be notified in the Admission Brochure as approved by the Academic Council from time to time. However, lateral entry in BBA-3<sup>rd</sup> semester is allowed to those candidates who have passed Diploma in Business Management or an equivalent examination approved by the State Board of Technical Education, Haryana with at least 45% marks in aggregate.

4. Every candidate shall be examined in the subject(s) as laid down in the syllabus and scheme of examination prescribed by the Academic Council from time to time. The fail/re-appear candidates will also appear in the exam as per syllabus applicable to regular students of that semester.

Note:

(i) A candidate coming from Non-Hindi speaking area shall if, he/she did not offer Hindi/Punjabi/Sanskrit/Urdu in the qualifying examination for admission, offer in lieu of Compulsory Hindi/Punjabi/Sanskrit/Urdu, the subject of Additional English which shall carry the same marks as for Hindi/Punjabi/Sanskrit/Urdu.

(i) The students offering restructured vocational/Career/Job-Oriented courses as per UGC scheme shall be required to take up the combination of traditional and compulsory subjects and will be entitled to additional Diploma/Advanced Diploma/Certificate as per Scheme of Examination. The minimum marks to pass the Diploma examination and for the award of division are given in clause-9 and 14 respectively.

5. 20% marks in each written paper (excluding viva-voce), shall be assigned for internal assessment.

5.5/4

The Head of the Department/Principal shall forward the internal assessment marks awarded by the concerned teacher on the basis of class test, written assignment and attendance in the class etc. to the Controller of Examinations as per the following schedule:

(i) The Internal Assessment/Sessional marks shall be supplied by the Heads of the Departments/Institutions/Principals of the Colleges of the invariably within 20 days after commencement of the examination.

(i) Thereafter, a late fee @ Rs.25/- per candidate per subject shall be charged from the Department/College/Institute concerned.

(ii) Non Internal Assessment/Sessional marks shall be entertained if the same are received by the University after 30 days of the declaration of results. However, the Vice-Chancellor may condone the delay with late fee after taking into consideration the merit of each case.

6. The Head of the Department/Principal will preserve the records on the basis of which the internal assessment awards have been prepared for inspection, if needed by the University up to three months from the date of declaration of the semester examination results.

7. The candidate will be allowed to appear in the examination if he meets the following requirements: -

a) bears a good character

b) Has been on the rolls of the Department/College/institution during the semester.

c) Has attended not less than 65% of lectures delivered in theory as well as practical in aggregate. Relaxation in shortage of lectures up to 20% will be allowed by the Head of the Department/Principal of the College/Institute on the following grounds:

(i) Self illness;

(ii) illness/death of parents, brother, sister or any other close family member;

(iii) Any other reasons beyond the control of the student to the satisfaction of the Head of the Institution/Department.

8. The medium of instruction shall be Hindi/English/Language concerned.

(i) The question papers will be set in:

(a) Hindi in case of Sanskrit;

(b) The language concerned in the case of other languages;

(c) In both Hindi and English in the case of other subjects;

(d) In BBA/BCA and other professional courses, the question paper shall be set in English only.

(ii) The candidates shall write their answer in:

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(a) The language concerned in the case of English and Modern Indian and Oriental Language, except Sanskrit in which the answer may be written in Hindi;

(b) Hindi or English in the case of other subjects.

9.1. The minimum percentage of marks to pass the examination in each semester shall be:

(i) 40% in each theory paper

(ii) 40% in each practical examination or viva-voce/Project/Training Report/Dissertation wherever prescribed.

(iii) 40% in the aggregate of each theory paper and internal assessment (and practical where Practical is a component of theory paper).

9.2. The student shall be required to obtain a minimum pass marks in the Theory papers/Practicals/Seminar/Self-study/Dissertation/Field work/Project/Training separately and their corresponding Internal assessment marks (if any) taken together subject to the condition that the students must at least have secured minimum 30% marks in external/end semester Theory papers/Practicals/Seminar/Self-study/Dissertation/Field work/Project/ Training. The Internal Assessment awards of a candidate who fails in any semester examination shall be carried forward to the next examination.

10.1. Total 20% marks in each paper/practical shall be reserved for Internal Assessment. The following parameters (with weightage of each) forming the basis of award of Internal Assessment shall be adopted in the relevant scheme of examination: -

**I. For Theory Papers: (for 100 marks paper)**

(i) One class test/Minor/Sessional examination: 50% marks of the internal marks set for each paper (10 marks in case of 20 as total internal marks)

(ii) One assignment/presentation: 25% marks of the total internal marks for each paper

(iii) Attendance: 25% marks of the total internal marks for each paper

**Distribution of 50 marks paper is as under:**

Minor test	05 marks
Assignment/presentation	02 marks
Attendance	03 marks**

**Marks for Attendance (100 marks paper) will be given as under:**

- (1) 80% onwards: 5 Marks
- (2) 75% to less than 80%: 4 Marks
- (3) 70% to less than 75%: 3 Marks\*

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(4) 65% to less than 70%: 2 Mark\*

\*For students engaged in co-curricular activities of the Departments/colleges only/authenticated medical grounds/under circumstances beyond the control of student subjected to the satisfaction of concerned Chairperson/In-Charge/ Principal on valid documentary proof.

**\*\*Marks for Attendance (50 marks paper) will be given as under:**

(1) 75% onwards: 3 Marks

(2) 70% to less than 75%: 2 Marks#

(3) 65% to less than 70%: 1 Mark#

#For students engaged in co-curricular activities of the Departments/colleges only/authenticated medical grounds/under circumstances beyond the control of student subjected to the satisfaction of concerned Chairperson/In-Charge/ Principal on valid documentary proof.

**II. For Subjects with Practical, apart from the theory paper of 100 marks for which distribution remains the same as mentioned above, the distribution of practical Marks = (A + B)**

The Practical marks shall include

**A. 20% marks of Practical marks are the internal marks** (10 marks in case of 50) for which the assessment is made by the faculty who takes that practical paper.

(i). Practical Test/ Assignment & practical file maintenance: 60% of marks of the total internal marks of practical are for one practical test conducted. (6 marks out of 10)

(ii). Attendance: 40% marks of the total internal marks of practical are for attendance in the practical classes (4 out of 10 marks)

**B. 80% marks of Practical marks are the external marks** (40 marks in case of 50) for which the assessment is made by external examiner nominated by the Head of the department and/or appointed by university.

(i). Practical Test: 50% of marks of the total internal marks of practical are for one practical Exam conducted. (20 marks out of 40 marks)

(ii). Viva- Voce: 20% marks of the total external marks of practical are for Viva-Voce on practical subject. (20 marks out of 40 marks)

**\*Marks for Attendance (50 marks paper) will be given as under:**

(1) 75% onwards: 3 Marks

(2) 70% to less than 75%: 2 Marks

(3) 65% to less than 70%: 1 Mark

\*For students engaged in co-curricular activities of the Departments/colleges only/authenticated medical grounds/under circumstances beyond the control of student

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subjected to the satisfaction of concerned Chairperson/In-Charge/ Principal on valid documentary proof.

Internal assessment for practical and their distribution could be decided by the Department duly approved by BOS and Academic council in case of the above mentioned distribution is not found suitable as per requirement of the syllabus.

10.2. If a candidate remains absent in minor / sessional examinations, he/she will have to apply within 10 days from the date of conduct of the test to the Chairperson/In-Charge/Head of the Department of the concerned Department and if found genuine, the Chairperson/In-Charge/Head of the Department will allow the candidate to appear in the minor / sessional examination. However, the candidate will then be required to deposit an examination fee prescribed by the examination branch.

10.3. The student who have failed in Internal Assessment (i.e. Minor/sessional examination, Attendance, and Assignment/Presentation scores taken together) in aggregate will have the option to improve their score only in the respective Minor/sessional examination by giving the special chance to the student before the end semester examinations of that semester only. However, the candidate will then be required to deposit an examination fee prescribed by the examination branch. A student who have already secure pass marks in Internal Assessment based on Minor/sessional examination, attendance and Assignment/Presentation will not be allowed to improve his/her score of internal assessment.

11. The examination fee to be paid by the candidate for each semester shall be prescribed by the University from time to time.

12. (i) A candidate who fails to pass or having been eligible, fails to appear in any semester examination will be allowed to clear the re-appear(s) and also for improvement of result after passing a semester examination within a period of six years. While re-appearing to pass a semester examination, the candidate will be exempted from re-appearing in the papers /practical's in which he/she has secured 40% pass marks.

(ii) For promotion to 3rd semester, a student must have passed at least 50% papers of 1st semester and for promotion to 5th semester, a student must have passed al papers of 1st semester. Students to the other semesters will be promoted automatically. However, this clause is subject to fulfilment of clause 7 of this Ordinance.

Note: For the purpose of promotion, each theory and practical in any subject shall be considered as separate paper.

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13. The internal assessment awards as well as viva-voce awards of a candidate who fails in any semester examination shall be carried forward to the next examination.
14. Soon after the termination of the examination, the Controller of Examinations shall declare the result as early as possible.
15. The list of successful candidates of Fourth Semester Examination shall be arranged, as under, on the basis of the aggregate marks obtained in the First, Second, Third and Fourth Semester Examinations taken together, and the division obtained by the candidate will be stated in the Degree.

Marks (%)	Letter Grade	Grade Point
95 to 100	O	10
90 to less than 95	A+	09
80 to less than 90	A	08
70 to less than 80	B+	07
60 to less than 70	B	06
50 to less than 60	C+	05
40 to less than 50	P	04

Note: A candidate securing 90% and above marks will be awarded A+ grade with **"Distinction"**

16. (i) A candidate who has passed B.A. three years' degree course of this University may appear in additional subject(s) prescribed for the course in the subsequent examination except in the subject(s) with which he/she has already passed the course.
- (ii) A candidate who has passed B.Sc./B.Com./BBA/BCA may also appear in additional subject(s) of B.A. (Pas course) in the subsequent examination.
17. After passing each semester examination, a candidate will be allowed to appear for improvement of result in one or more theory papers only once within the period prescribed in Clause-1 (i). Only improved marks (higher score) will be taken into account. The candidate will have to appear according to the current syllabus.
18. The grace marks will be allowed as per University rules.
19. The Training Report/Field Report/Project Report etc. wherever prescribed in the syllabus/scheme of examination and required to be submitted to the University must reach in the concerned office within 20 days after the commencement of the theory examinations.

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# Chaudhary Bansi Lal University, Bhiwani

(A State University established by Govt. of Haryana Act No. 25 of 2014)

Implemented w.e.f. Session: 2021-22 & onwards

## Scheme of Examination for Bachelor of Arts English Core Course

Semester-I to IV

Credits= 16

Total Marks = 400

Course/ Paper Code	Subjects	Type Of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Theory	Practical	Total	Theory	Practical	Total	Theory	Internal Assessment	Practical	
20UENG01 Semester -I	English Core Course IA	C.C.	04	00	04	04	00	04	80	20	00	100
20UENG02 Semester-II	English Core Course IB	C.C.	04	00	04	04	00	04	80	20	00	100
20UENG03 Semester-III	English Core Course IC	C.C.	04	00	04	04	00	04	80	20	00	100
20UENG04 Semester-IV	English Core Course ID	C.C.	04	00	04	04	00	04	80	20	00	100
<b>Total</b>			<b>16</b>	<b>00</b>	<b>16</b>	<b>16</b>	<b>00</b>	<b>16</b>	<b>320</b>	<b>80</b>	<b>00</b>	<b>400</b>

C.C. = Core Course (Compulsory)

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# Chaudhary Bansi Lal University, Bhiwani

(A State University established by Govt. of Haryana Act No. 25 of 2014)

Implemented w.e.f. Session: 2021-22 & onwards

## Scheme of Examination for Bachelor of Arts Generic Elective Course in English

Semester-V & VI

Credits= 12

Total Marks = 200

Course/ Paper Code	Subjects	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Lecture	Tutorial	Total	Theory	Practical	Total	Theory	Internal Assessment	Practical	
20UENG51 Semester-V	Academic Writing and Composition	G.E.C. I A	05	01	06	06	00	06	80	20	00	100
20UENG52 Semester-V	English for Competitive Examinations	G.E.C. I B										
20UENG61 Semester VI	Partition Literature	G.E.C. II A	05	01	06	06	00	06	80	20	00	100
20UENG62 Semester VI	Women's Writing and Women's Empowerment	G.E.C. II B										
<b>Total</b>			<b>12</b>	<b>00</b>	<b>12</b>	<b>12</b>	<b>00</b>	<b>12</b>	<b>160</b>	<b>40</b>	<b>00</b>	<b>200</b>

G.E.C.: Generic Elective Course

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# Chaudhary Bansi Lal University, Bhiwani

(A State University established by Govt. of Haryana Act No. 25 of 2014)

Implemented w.e.f. Session: 2021-22 & onwards

## Scheme of Examination for Bachelor of Arts

Ability Enhancement Compulsory Course(AECC) Skill Enhancement Course(SEC) Non CGPA Compulsory Course (NCCC)

Semester I, II & V

Credits: 8

Total Marks:400

Course Code	Nomenclature	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			
			Theory	Practical	Total	Theory	Practical	Total	Theory	Internal Assessment	Practical	Total
ENG1001	Communicative English	A.E.C.C.I A.E.C.C.II	2	-	2	2	-	2	80	20	-	100
ENG1002	Creative Writing	N.C.C.C I	2	-	2	2	-	2	80	20	-	100
ENG2001	Translation Studies	N.C.C.C II	2	-	2	2	-	2	80	20	-	100
ENG5001	Communication Skills	S.E.C III	2	-	2	2	-	2	80	20	-	100
Total			8		8	8		8	320	80		400

AECC: Ability Enhancement Compulsory Course

SEC: Skill Enhancement Course

NCCC: Non CGPA Compulsory Course

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# Chaudhary Bansi Lal University, Bhiwani

(A State University established by Govt. of Haryana Act No. 25 of 2014)

Implemented w.e.f. Session: 2021-22 & onwards

## Scheme of Examination for Bachelor of Arts with English

Semester-I to VI

Credits= 36

Total Marks = 600

Course/ Paper Code	Subjects	Type Of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Lecture	Tutorial	Total	Theory	Practical	Total	Theory	Internal Assessment	Practical	
20UENG101 Semester -I	The Individual and Society	CC (Core Optional)	05	01	06	06	00	06	80	20	00	100
20UENG201 Semester-II	Cultural Diversity	CC (Core Optional)	05	01	06	06	00	06	80	20	00	100
20UENG301 Semester-III	Indian Literature	CC (Core Optional)	05	01	06	06	00	06	80	20	00	100
20UENG401 Semester-IV	English Literature	CC (Core Optional)	05	01	06	06	00	06	80	20	00	100
20UENG501 Semester-V	Introduction to Literature & Literary Devices	D.S.E.C.	05	01								
20UENG502 Semester-V	Modern Indian Literature I	D.S.E.C.			06	06	00	06	80	20	00	100
20UENG601 Semester VI	Modern English Literature	D.S.E.C.	05	01								
20UENG602 Semester VI	Modern Indian Literature II	D.S.E.C.			06	06	00	06	80	20	00	100
<b>Total</b>			<b>36</b>	<b>00</b>	<b>36</b>	<b>36</b>	<b>00</b>	<b>36</b>	<b>480</b>	<b>120</b>	<b>00</b>	<b>600</b>

D.S.E.C.: Disciplinary Specific Elective Course

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**B.A.**  
**Core Course I A English**  
**SEMESTER I**

**Credits: 4**  
**Maximum Marks:100**  
**Theory:80**  
**Internal Assessment:20**

**Paper Code: 20UENG01**

**Nomenclature of the Paper: Language and Literature-I**

**Objective:**

To initiate the students into the world of literature through value based writings of Indian and English authors. To enhance the grammatical and writing skills of the students.

**Unit-I**

The following Prose writings from the prescribed text book:

Rabindranath Tagore	“The Homecoming”
M.K. Gandhi	“Playing the English Gentleman”
Dr B.R. Ambedkar	“Prospects of Democracy in India”
(A Short Biography by Board of Editors)	“Indra Nooyi: A Corporate Giant”

**Unit—II**

The following Poems from the prescribed text book:

Oliver Goldsmith	“The Village Schoolmaster”
Rudyard Kipling	“If”
Kamala Das	“My Grandmother’s House”

**Unit—III**

Basic grammatical concepts:

Tenses, Voices, Modals, Prepositions, Articles, Relative Clause, Question Tag

**Unit—IV**

**Vocabulary and Composition:**

Synonyms and Antonyms

Homonyms and Homophones

One-word substitution

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Paragraph Writing

Letter /Email Writing (Formal)

**Prescribed Books:**

- I. *Prelude*, (Dr Shriram G. Gahane), Orient BlackSwan
- II. *Intermediate Grammar*, Usage and Composition (M.L. Tickoo, A.E. Subramanian, P.R. Subramaniam), Orient BlackSwan.

**Instructions to the Paper-setter:**

- Q. 1. Comprehension Questions: The students will be asked to answer comprehension questions based on a passage from Unit I. There will be internal choice. 5
- Q. 2. Explanation with reference to the context: Two passages will be set from Unit I. Students will have to attempt one passage. 5
- Q. 3. Short-answer questions: There will be six short answer type questions based on Unit I. The students will be asked to attempt any four questions and give answers in about 30 words each. 2x4=8
- Q. 4. Essay-type Question: The students will be asked to attempt one essay type question from Unit I in about 100-120 words. There will be internal choice. 8
- Q. 5. Comprehension Questions: The students will be asked to answer comprehension questions based on a stanza from Unit II. There will be internal choice. 5
- Q. 6. Explanation with reference to the context: The students will be asked to attempt one stanza/extract out of the given two from Unit II. 5
- Q. 7. Short-answer questions: There will be six short answer type questions based on Unit II. The students will be asked to attempt any four questions and give answers in about 30 words each. 2x4=8
- Q. 8. The students will be asked to attempt grammar based questions from Unit III in the form of fill in the blanks and error correction. There will be sufficient internal choice. 16
- Q.9. The students will be asked to give meanings and frame sentences on the topics of vocabulary from Unit IV. 6
- Q. 10. The students will be offered topics of general nature for paragraph writing in about 150 words. 7
- Q. 11. The students will be asked to write a letter/Email on any one of the two topics. 7

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**B.A.**  
**English Core Course I B**  
**SEMESTER-II**

**Credits: 4**  
**Maximum Marks:100**  
**Theory:80**  
**Internal Assessment:20**

**Paper Code: 20UENG02**

**Nomenclature of the Paper: Language and Literature-II**

**Objective:**

To initiate the students into the world of literature through value based writings of Indian and English authors. To enhance the grammatical and writing skills of the students.

(The following topics from *Prelude: A textbook for college students*, Board of Editors, Orient BlackSwan)

**Unit-I**

“The Three Questions”	Leo Tolstoy
“The Chicago Speech”	Swami Vivekananda
“Work Brings Solace”	A.P.J. Abdul Kalam
“Why is the Sea Blue”	G. Venkataraman

**Unit—II**

“Where the Mind is Without Fear”	Rabindranath Tagore
“Money Madness”	D.H. Lawrence
“Leisure”	W.H. Davies

**Unit—III**

The following basic Grammatical Concepts from *A Remedial English Grammar* by F.T. Wood:

Chapter 2: Agreement of Verb and Subject

Chapter 7: Confusion of Adjective and Adverb

Chapter 10: Difficulties with Comparatives and Superlatives

Chapter 19: Introductory There

Chapter 20: The Infinitive

Chapter 21: Anticipatory It with Noun Clauses and Adjective Clauses

Chapter 22: The Position of Adverbs

Chapter 28: The Use of Correlatives

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## Unit—IV

Facing an Interview, Presentation Skills, C.V./Resume Writing

Prescribed Books:

- I. *Prelude*, (Dr Shriram G. Gahane), Orient BlackSwan
- II. *A Course in Communication Skills*, P Kiranmai Dutt, Geetha Rajeevan, CLN Prakash (Recommended for Unit IV)
- III. *A Remedial English Grammar* by F.T. Wood

### Instructions to the Paper-setter:

- Q. 1. Comprehension Questions: The students will be asked to answer comprehension questions based on a passage from Unit I. There will be internal choice. 5
- Q. 2. Explanation with reference to the context: Two passages will be set from Unit I. Students will have to attempt one passage. 5
- Q. 3. Short-answer questions: There will be six short answer type questions based on Unit I. The students will be asked to attempt any four questions and give answers in about 30 words each. 8
- Q. 4. Essay-type Question: The students will be asked to attempt one essay type question from Unit I in about 100 words. There will be internal choice. 8
- Q. 5. Comprehension Questions: The students will be asked to answer comprehension questions based on a stanza from Unit II. There will be internal choice. 5
- Q. 6. Explanation with reference to the context: The students will be asked to attempt one stanza/extract out of the given two from Unit II. 5
- Q. 7. Short-answer questions: There will be six short answer type questions based on Unit II. The students will be asked to attempt any four questions and give answers in about 30 words each. 8
- Q. 8. The students will be asked to attempt grammar based questions from Unit III in the form of fill in the blanks and error correction. There will be sufficient internal choice. 20
- Q.9. The students will be offered two topics for C.V. writing in about 150 words. They will have to attempt any one of them. 8
- Q. 10. The students will be asked questions in the form of short notes based on Unit IV. 8

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**B.A.**  
**English Core Course I C**  
**Semester III**

**Credits: 4**  
**Maximum Marks:100**  
**Theory:80**  
**Internal Assessment:20**

**Paper Code: 20UENG03**

**Nomenclature of the Paper: Language and Literature-III**

**Objectives: To enhance the linguistic and literary skills of the students by making them familiar with the important literary works in different genres like modern prose, poetry and grammatical rules.**

**Unit I**

(The following topics from *Short Stories of Yesterday and Today*, Edited by Shiv K. Kumar, Oxford, 2015)

Oscar Wilde	“The Model Millionaire”
Katherine Mansfield	“A Cup of Tea”
Somerset Maugham	“The Mother”
O’ Henry	“The Gift of Magi”

**Unit II**

William Shakespeare	“All the World’s a Stage”
Robert Frost	“Mending Wall”
John Keats	“La Bella Dame Sans Merci”
Chinua Achebe	“Refugee Mother & Child”

**Unit III**

Grammar and Vocabulary

Editing of passages, filling of the blanks, correction of selected sections, arrangements of jumbled words, phrases and sentences.

Vocabulary: Antonyms and Synonyms

**Unit IV**

“Important Poetic Forms and Devices” From *Fragrances: A Textbook of Poetry and Language Skills* edited by Dinesh Kumar, et. al. Orient Black Swan, 2015.

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**Instructions to the Paper-setter:**

- Q. 1. Comprehension Questions: The students will be asked to answer comprehension questions based on a passage from Unit I. There will be internal choice. 5
- Q. 2. Explanation with reference to the context: Two passages will be set from Unit I. Students will have to attempt one passage. 5
- Q. 3. Short-answer questions: There will be six short answer type questions based on Unit I. The students will be asked to attempt any four questions and give answers in about 30 words each. 8
- Q. 4. Essay-type Question: The students will be asked to attempt one essay type question from Unit I in about 100 words. There will be internal choice. 8
- Q. 5. Comprehension Questions: The students will be asked to answer comprehension questions based on a stanza from Unit II. There will be internal choice. 5
- Q. 6. Explanation with reference to the context: The students will be asked to attempt one stanza/extract out of the given two from Unit II. 5
- Q. 7. Short-answer questions: There will be six short answer type questions based on Unit II. The students will be asked to attempt any four questions and give answers in about 30 words each. 8
- Q. 8. The students will be asked to attempt grammar based questions from Unit III in the form of fill in the blanks and error correction. There will be sufficient internal choice. 16
- Q.9. The students will be asked to give meaning and frame sentences on the topics of vocabulary from Unit IV. 4
- Q. 10. The students will be offered two paragraphs of about 10 sentences. They will have to attempt any one of them. 8
- Q. 11. The students will be asked to attempt any four out of the eight literary terms from Unit IV. 8

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**B.A.**  
**English Core Course I D**  
**Semester IV**

**Credits:4**  
**Maximum Marks:100**  
**Theory:80**  
**Internal Assessment:20**

**Paper Code: 20UENG04**

**Nomenclature of the Paper: Language and Literature-IV**

**Objectives: To enhance the linguistic and literary skills of the students by making them familiar with the important literary works in different genres like modern prose, poetry, basic rules of Phonetics and Writing skills.**

**Unit I**

(The following selections from *Short Stories of Yesterday and Today*, Edited by Shiv K. Kumar)

Mulk Raj Anand	“The Gold Watch”
Raja Rao	“A Client”
Khushwant Singh	“Karma”
Manohar Malgonkar	“Upper Division Love”

**Unit II**

The following selections from *Fragrances: A Textbook of Poetry and Language Skills*

William Shakespeare	“Sonnet XVIII”
Alexander Pope	“Know Then Thyself”
William Wordsworth	“The World is Too Much with Us”
Sarojini Naidu	“The Bangle Sellers”

**Unit III**

**Basic Phonetics:** Familiarity with English sounds and their phonemic symbols.

Transcription of words given in vocabulary section of *Fragrances*

**Unit IV**

Composition

1. Precis
2. Unseen Passage for Comprehension
3. Translation

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**Instructions to the Paper-setter:**

- Q. 1. Comprehension Questions: The students will be asked to answer comprehension questions based on a passage from Unit I. There will be internal choice. 5
- Q. 2. Explanation with reference to the context: Two passages will be set from Unit I. Students will have to attempt one passage. 5
- Q. 3. Short-answer questions: There will be six short answer type questions based on Unit I. The students will be asked to attempt any four questions and give answers in about 30 words each. 8
- Q. 4. Essay-type Question: The students will be asked to attempt one essay type question from Unit I in about 100-120 words. There will be internal choice. 8
- Q. 5. Comprehension Questions: The students will be asked to answer comprehension questions based on a stanza from Unit II. There will be internal choice. 5
- Q. 6. Explanation with reference to the context: The students will be asked to attempt one stanza/extract out of the given two from Unit II. 5
- Q. 7. Short-answer questions: There will be six short answer type questions based on Unit II. The students will be asked to attempt any four questions and give answers in about 30 words each. 8
- Q. 8. The students will be asked to give phonemic transcription of words from vocabulary section of *Fragrances*. There will be sufficient internal choice. 10
- Q.9. The students will be offered two unseen paragraphs for comprehension. They will have to attempt any one of them. 8
- Q. 10. The students will be asked to write a precis of the given passage. There will be internal choice. 8
- Q. 11. The students will be required to translate a given passage from English into Hindi. There will be internal choice. 10

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**B.A. English  
Semester V  
Generic Elective Course A (i)**

**Credit: 6  
Maximum Marks:100  
Theory: 80  
Internal Assessment:20**

**Paper code:20UENG51**

**Nomenclature: Academic Writing and Composition**

**Objective: To make student learn to develop the skill of intelligent argument and accomplish it successfully by understanding proper format and technical use that can be used to write effectively.**

**Instructions to the Paper setters and Students:**

There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit (These questions may contain sub-sections). Students will have to attempt one question from each unit. All questions shall carry equal marks.

**Unit-I**

The Writing Process: Introduction to the Writing Process and the conventions and Approaches of Academic Writing, Exercises.

**Unit-II**

Writing in one's own words: Summarizing, Paraphrasing, Writing a Paragraph.

**Unit-III**

Critical Thinking and Writing: Syntheses, Analyses & Evaluation. Structuring and Argument: Introduction, Interjection, and Conclusion, Writing a Short Research Paper.

**Unit-IV**

Working with Words, Citing Resources, Editing, Book & Media Review

**Suggested Reading:**

McCarthy, Michael and O'Dell Felicity. *Academic Vocabulary in Use*. Cambridge, 2016.

Gupta, Renu. *A Course in Academic Writing*. 2<sup>nd</sup> ed. Orient Blackswan, 2019.

Liz Hamp-Lyons & Ben Heasley, *Study Writing: A Course in Writing Skills for Academic Purposes*. OUP, 2006.

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**B.A. English**  
**Semester-V**  
**Generic Elective Specific Course A (ii)**

**Credit:6**  
**Max. Marks:100**  
**Theory: 80**  
**Internal Assessment:20**

**Paper Code: 20UG52**

**Nomenclature: English for Competitive Examinations**

**Objective: To enhance the grammatical and writing skills of students and prepare them for the competitive exams at different levels and in different fields.**

**Instructions to the Paper setters and Students:**

There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit (These questions may contain sub-sections). Students will have to attempt one question from each unit. All questions shall carry equal marks.

**Unit-I**

Building Blocks

Rules of English Grammar, Troublesome Pronouns, Troublesome Verb & Troublesome Adjectives and Adverbs, Troublesome Prepositions, Spotting Errors.

**Unit-II**

Introduction to Vocabulary

Synonyms, Antonyms, One Word Substitution, Idioms and Phrases Idiomatic Use of Verbs, dealing with Homonyms, Test of Spellings

**Unit-III**

Logic-based English Language

Rearrangement of Jumbled words in Sentences, Jumbled Sentences in Paragraphs, Word Pairs, Sentence Completion.

**Unit-IV**

Comprehension

How to Read Passages for Comprehension: Types of Reading, Format of Reading Comprehension Section, Tactics to Tackle Questions, Time Saving Tactics, Cloze test.

**Suggested Reading:**

Prasad, Hari Mohan. *Objective English*. Pearson, 2017.

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**B.A. English  
Semester VI  
Generic Elective Course B (i)**

**Credit:6  
Maximum Marks:100  
Theory:80  
Internal Assessment:20**

**Paper Code: 20UENG61  
Nomenclature: Partition Literature**

**Instructions to the Paper setters and Students:**

There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit (These questions may contain sub-sections). Students will have to attempt one question from each unit. All questions shall carry equal marks.

Saadat Hassan Manto:	<b>Unit-I</b> "Toba Tek Singh" (English Translation by Muhammad Umar Menon from <i>My Name is Radha</i> , Penguin, 2016)
Bhisham Sahani:	<b>Unit-II</b> <i>Tamas</i>
Kamleshwar:	<b>Unit-III</b> "Kitne Pakistan" (Story from <i>Translating Partition: Studies in Culture and Translation</i> edited by Ravikant and Tarun Saint)
Mohan Rakesh:	<b>Unit-IV</b> Malbe ka Malik (Translated by Jai Ratan as "Lord of the Rubble" in <i>Anthology of Hindi Short Stories</i> )

**Suggested Readings:**

Didur, Jill. *Unsettling Partition: Literature, Gender, Memory*, University of Toronto Press, 1965.

Hasan, Mushirul. *India's Partition: Process, Strategy and Mobilization*, OUP, 1997.

S. H. L.

Murphy, Anne and Churnjeet Mahn, editors. *Partition and the Practice of Memory*, Palgrave Macmilln, 2017.

Ravikant, and Tarun Saint, editors. *Translating Partition: Studies in Culture and Translation*, Katha, 2001.

Zamindar, Vazira. *The Long Partition and the Making of Modern South Asia*. CUP, 2010.

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**B.A. English**  
**Semester VI**  
**Generic Elective Course B (ii)**

**Credit: 6**  
**Max. Marks: 100**  
**Theory: 80**  
**Internal Assessment: 20**

**Paper Code: 20UENG62**

**Nomenclature: Women's Writing and Women's Empowerment**

**Objective: To develop, promote & disseminate knowledge about women's struggle and their role in society and make students understand how women voice their issues through writing.**

**Instructions to the Paper setters and Students:**

There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit (These questions may contain sub-sections). Students will have to attempt one question from each unit. All questions shall carry equal marks.

**Unit-I**

Mahasweta Devi: "Bayen" (From *Translating Caste* ed. by Tapan Basu)

**Unit-II**

Amartya Sen: "Seven Types of Gender Inequality"

**Unit-III**

Rassundari Devi: "Amar Jiban" translated by  
Enakshi Chatterjee, writers workshop

**Unit IV**

Rokeya Sekhawat Hussain: "Sultana's Dream"

**Suggested Reading:**

Bhattacharya, Rinki. *Janani: Mothers, Daughters, Motherhood*. Sage Classics, 2013.

Woolf, Virginia. *A Room of One's Own*. Penguin Modern Classics, 2019.

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**B.A. English**  
**Semester I/II**  
**Ability Enhancement Compulsory Course I/II**

**Credit:2**  
**Maximum Marks:100**  
**Theory: 80**  
**Internal Assessment: 20**

**Paper Code: 21ENG1000**  
**Nomenclature: Communicative English**

**Total Credits: 2**  
Maximum Marks-100  
Theory- 80 marks  
Internal Assessment- 20 marks  
Time: 3 hrs

**Note:** There shall be nine questions in all. Question no. I shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. All questions shall carry equal marks.

**Course Objectives:**

1. To familiarize the students with the nature and importance of communication.
2. To orient the students towards theory and practice of Communication Skills.
3. To impart knowledge of common courtesies and conversational practices.
4. To acquaint students with positive attributes of personality.

**Course Outcomes:**

1. Students should be able to understand the nature and importance of Communication Skills.
2. Students would gain knowledge of common courtesies and conversational practices in various situations.
3. Students would be acquainted with the knowledge of skills necessary for Personality Development.
4. Students would be able to demonstrate the skills and knowledge of effective communication.

**Unit I**

**Parts of Speech:** Noun, Pronoun, Adjective, Verb, Adverb, Conjunction, Interjection, Identifying parts of speech, 20 commonly used verb patterns, Common errors

**Unit II**

**Listening & Speaking:** Hearing and Listening, Barriers to Listening, Academic Listening

**Conversational English:** Greeting and Introducing, Making Requests, Asking for and Giving Permission, Offering Help, Giving Instructions and Directions, Arts of Small Talk

**Speech and Oration:** Making a Short Formal Speech, Describing People, Places, Events and Things

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### Unit III

**Conversational Practices in Various Situations:** Meeting, parting, at railway station, buying at shops, asking about buses, travelling by bus, Using expressions of time, talking about money, identifying people, at the bank, at the grocery store, immediate family and relatives, hiring a taxi, talking about weather/weather conditions, ordering food, dinner conversations, at the doctor's clinic, quitting and finding jobs, office conversations, conversations about school/ college/university, the English class

(Students shall develop dialogue-based conversations on the above-mentioned situations)

### Unit IV

**Public speaking:** The Art of Public Speaking, Welcome and introductory speech, Vote of thanks speech, Farewell speech, Audience analysis. Popular Speeches by great Orators

**Suggestive Readings:**

Dutt, P. Kiranmai and GeethaRajeevan et. Al. A Course in Communication Skills. Foundation Books, CUP, 2016

Hornby, A. S. A Guide to Patterns and Usage in English. OUP (latest edition),

Raymond Murphy. Intermediate English Grammar CUP (latest edition),

Tickoo, M. L. and Subramanian et. Al. Intermediate grammar usage and composition. Orient BlackSwan (latest edition),

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**B.A. English**  
**Semester-I**  
**Non CGPA Credit Courses Compulsory Specified Course-I**

**Credits:2**  
**Maximum Marks:100**  
**Theory:80**  
**International Assessment:20**

**Paper Code: 20UENG1002**

**Nomenclature of the Paper: Creative Writing**

**Objectives: To enhance the creativity of students with language and imagination so as to enable them to communicate effectively in writing and conduct themselves graciously in different spheres of life.**

**Instructions to the Paper setters and Students:**

There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit (These questions may contain sub-sections). Students will have to attempt one question from each unit. All questions shall carry equal marks.

**Unit-I**

Forms of Writing:

Descriptive: Use & Application, Expository: Use & Application, Persuasive: Use & Application, Narrative: Use & application Practice.

**Unit-II**

Literary Devices:

Alliteration, Imagery, Metaphor, Simile, Personification, Oxymoron, Irony, Pun, Rhetoric.

**Unit-III**

Composing Poetry:

Understanding Poetry, Selection of Diction, Theme, Rhyme Scheme & Structure. Application of Literary Devices. Practice

**Unit-IV**

Writing Stories:

Understanding a story, know Your Target Audience, Attractive title, Structure (Genre) of the story, (Plot, Setting, Character, Climax, Conclusion) Practice.

**Suggested Readings:**

Anjana Neira Dev et al, *Creative Writing: A Beginner's Manual*. New Delhi: Pearson, 2009.

David Morley and Philip Nielsen. eds. *The Cambridge Companion to Creative Writing*. CUP. 2012.

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**B.A. English  
Semester V  
Skill Enhancement Course III**

**Credits:2  
Maximum Marks:100  
Theory:80  
Internal Assessment: 20**

**Paper Code: 20UENG5001**

**Nomenclature of the Paper: Communication Skills**

**Objective: To introduce the theory and practice of communicative skills so as to enable the students to communicate effectively and conduct themselves graciously in the business of life.**

**Instructions to the Paper setters and Students:**

There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit (These questions may contain sub-sections). Students will have to attempt one question from each unit. All questions shall carry equal marks.

**Unit I**

**Grammar:** Articles, Prepositions, Tenses, Active & Passive Voice, Vocabulary building, Concord, Relative clauses, Common errors.

**Unit II**

**Reading:** Purpose & Strategies of Reading, Identifying & Scanning, Improving Reading Skills, Stress & Intonation, Reading Comprehension.

**Unit III**

**Writing:** Features of Good Writing, Types of Writing, Paragraph Writing, Choosing the Right Words, Using Linkers, Editing & Proofreading Writing Introduction, and Conclusion.

**Unit IV**

**Group Discussion:** Types, Leadership & Problem- Solving Skills, Group dynamics, Etiquette, body-language & time management.

**Interview:** Preparing Resume, Purpose of Interview, FAQs.

Workplace Awareness: Workplace Etiquette, Values, Ethics & Culture, Gender, Equality.

**Suggested Readings:**

Kumar, Suresh E. et al. *English for Success*. Foundation Books, 2016

Kumar, Sanjay and Pushp Lata. *English for Effective Communication*, OUP, 2016.

*S. K. K.*



**B.A. English**  
**Semester II**  
**Non CGPA Credit Courses Compulsory Specified Course II**

**Credits:2**  
**Maximum Marks:100**  
**Theory:80**  
**Internal Assessment:20**

**Paper Code: 20UENG2001**

**Nomenclature of the Paper: Translation Studies**

**Objective:** To enable the students to understand the theory and practice in translation, and focus on precision and beauty of words and their interconnection in the creative texts to create a wholesome meaning. To fine-tune the student's imagination in trans creating a short text from Hindi to English and vice-versa.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering Unit I & II of the syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. All questions shall carry equal marks.

Note: Paper Specific Note regarding Unit I & II:

1. Question no. 1 will be compulsory and it will consist of 8 short notes based on unit I & II.
2. Question no. 2 to 5 will be essay type questions. The candidate will be required to select one question from each unit.

Paper Specific Note regarding Unit III & IV:

1. Question no. 6 to 9 will be based on Unit III & IV. The candidates will be required to translate the given passages and stanzas (2 out of the given 4 passages and 2 out of the given 4 stanzas carrying 8 marks each).
2. Free translations are not ruled out.
3. All questions will be based on unseen literary passages.

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### Unit-I

Concept of translation in the West and in the Indian tradition; types of translation – intra-lingual and inter-semiotic; ‘word for word’ or ‘sense for sense’; decoding and recoding Equivalence – linguistic and cultural; formal and dynamic; Equivalence Effect Language and Culture. Translation of cultural items. Translation of different registers of language ‘Translator’s Invisibility’- ‘Domestication’ and ‘Foreignization;’

### Unit-II

Introducing basic concepts and terms used in Translation Studies through relevant tasks, Equivalence, Language variety, Dialect, Idiolect, Register, Style, Mode, Code mixing/Switching.

Defining the process of translation (analysis, transference, restructuring) through critical examination of standard translated literary/non-literary texts and critiquing subtitles of English and Hindi films.

### Unit-III

Translation as Rewriting, Self-translation (Auto Translation), ‘Transcreation’  
Translation of short stories

### Unit-IV

Translation of poems  
Translation of passages from novels/plays

#### **Suggested Reading:**

Bassnett, Susan. *Translation Studies*. Routledge, 2002.

Das, Bijoy Kumar. *A Handbook of Translation Studies*. Atlantic Publishers and Distributors Pvt. Ltd. 2019.

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**B.A. with English**  
**Semester I**  
**Discipline Specific Elective Course**

**Paper Code: 20UENG101**

**Nomenclature: The Individual and Society**

**Credit: 6**  
**Maximum Marks:100**  
**Theory: 80**  
**Internal Assessment: 20**

**Objective:** To acquaint the students with various identities attached to an individual through the study of literature based on various perspectives.

**Note:** There will be five questions in all carrying equal marks. Question No. 1, consisting of eight short notes from the entire syllabus, will be compulsory. Two long answer questions will be asked from each unit. The students will be required to attempt one question from each unit.

**The Individual and Society.** The following selections from *The Individual and Society: Essays, Stories and Poems* edited by Vinod Sood, et. al., (Delhi: Pearson, 2005)

**Unit-I**

**Caste/Class**

Premchand	“Deliverance”
Ismat Chughtai	“Kallu”
Hira Bansode	“Bosom Friend”

**Unit II**

**Gender**

Ambai	“Yellow Fish”
Margaret Atwood	“Reincarnation of Captain Cook”
A.K. Ramanujan	“Highway Stripper”

**Unit III**

**Race**

Wole Soyinka	“Telephone Conversations”
Langston Hughes	“Harlem”
Nadine Gordimer	“Jump”

**Unit-IV**

*S. K. S.*

### Violence and War

Wilfred Owen

“Dulce et Decorum Est”

Bertolt Brecht

“General, Your Tank is a Powerful Vehicle”

Sa'adat Hasan Manto

“The Dog of Tetwal”

### Suggested Reading:

Valmiki, Omprakash. *Joothan : A Dalit's Life*. Columbia University Press, 2008.

Premchand, Munshi. *The World of Premchand: Selected Short Stories*. Translated by David Rubin. Oxford University Press, 2001.

Mehrotra, Arvind Krishna. *The Oxford Anthology of Twelve Modern Indian Poets*. Oxford India Paperbacks, 1997.

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**B.A. with English**  
**Semester II**  
**Discipline Specific Elective Course**

**Paper Code: 20UENG201**  
**Nomenclature: Cultural Diversity**

**Credit: 6**  
**Maximum Marks:100**  
**Theory: 80**  
**Internal Assessment: 20**

**Objective:** To develop the students' sensibility to humanitarian perspectives through the study of literature from various cultural backgrounds.

**Note:** There will be five questions in all carrying equal marks. Question No. 1, consisting of eight short notes from the entire syllabus, will be compulsory. Two long answer questions will be asked from each unit. The students will be required to attempt one question from each unit.

**Unit-I**

Rabindranath Tagore:	The Postmaster
Pratibha Ray:	Salvation
Ved Rahi:	Bal, Kak and Nono
Kartar Singh Duggal:	Taxi Driver

**Unit-II**

Guy de Maupassant:	The Necklace
Edgar Allen Poe:	The Black Cat
Anton Chekhov:	The Bet
D.H. Lawrence:	The Rocking Horse

**Unit-III**

Harper Lee:	<i>To Kill A Mocking Bird</i>
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**Unit IV**

**Literary Terms:** Short Story, Fable, Fiction, Allegory, Antithesis, Paradox, Point of View.

**Suggested Reading:**

Abrams, M.H. *A Glossary of Literary Terms*. 11<sup>th</sup> Ed. Cengage Learning India Pvt. Ltd., 2015.

Hudson, W.H. *An Introduction to the Study of Literature*. Rupa Publications India, 2015.

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**B.A. with English**  
**Semester III**  
**Discipline Specific Elective Course**

**Paper Code: 20UENG301**

**Nomenclature: Indian Literature**

**Credit: 6**  
**Maximum Marks:100**  
**Theory: 80**  
**Internal Assessment: 20**

**Objective:** To acquaint the students with the representative works of Indian writers.

**Note:** There will be five questions in all carrying equal marks. Question No. 1, consisting of eight short notes from the entire syllabus, will be compulsory. Two long answer questions will be asked from each unit. The students will be required to attempt one question from each unit.

**Unit-I**

Premchand:	The Shroud
R.K Narayan:	Under the Banyan Tree
Chandradhar Sharma Guleri:	For your Sake
Rajender Singh Bedi:	Lajwanti

**Unit-II**

A.K. Ramanujan:	The Last of the Princes
Nissim Ezekiel:	The Professor
Dilip Chitre:	Father Returning Home

**Unit III**

Girish Karnad:	<i>Tale Danda</i>
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**Unit IV**

R.K. Narayan	<i>The Bachelor of Arts</i>
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**Suggested Reading:**

King, Bruce. *Modern Indian Poetry in English*. Oxford India Paperback, 2005.

Iyengar, K.R.S. *Indian Writing in English*. Sterling Publishers Pvt. Ltd., 2012.

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**B.A. with English**  
**Semester IV**  
**Discipline Specific Elective Course**

**Paper Code: 20UENG401**

**Nomenclature: English Literature**

**Credit:6**  
**Maximum Marks:100**  
**Theory:80**  
**Internal Assessment:20**

**Objective:** To introduce the students to the great works of English writers of various genres.

**Note:** There will be five questions in all carrying equal marks. Question No. 1, consisting of eight short notes from the entire syllabus, will be compulsory. Two long answer questions will be asked from each unit. The students will be required to attempt one question from each unit.

**Unit I**

Alfred Lord Tennyson:	The Charge of the Light Brigade
Maya Angelou:	Caged Bird
Walter de la Mare:	The Listeners
Seamus Heaney:	Digging

**Unit II**

Bertrand Russell:	Functions of a Teacher
J. B. Priestley:	Making Writing Simple
Virginia Woolf:	Shakespeare's Sister

**Unit III**

George Orwell:	<i>Animal Farm</i>
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**Unit IV**

William Shakespeare:	<i>The Merchant of Venice</i>
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**Suggested Reading:**

Hudson, W.H. *An Outline History of English Literature*. Maple Press, 2012.

Woolf, Virginia. *A Room of One's Own*. Fingerprint! Publishing, 2016.

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**B.A. with English**  
**Semester V**  
**Discipline Specific Elective Course II A**

**Paper code: 20UENG501**

**Nomenclature: Introduction to Literature & Literary Devices**

**Credit: 6**  
**Maximum Marks:100**  
**Theory: 80**  
**Internal Assessment: 20**

**Objective:** To enable the students to critically appreciate the works of various genres with proper knowledge of figures of speech.

**Note:** There will be five questions in all carrying equal marks. Question No. 1, consisting of eight short notes from the entire syllabus, will be compulsory. Two long answer questions will be asked from each unit. The students will be required to attempt one question from each unit.

**Unit-I**

John Donne	“Death be not Proud”
John Milton	“On His Blindness”
P.B. Shelley	“Ozymandias”
S.T. Coleridge	“Youth and Age”
Matthew Arnold	“Dover Beach”

**Unit-II**

Anton Chekhov	<i>A Proposal</i>	G.
Priestley	<i>Mother's Day</i>	

**Unit-III**

(The following topics from the Spectrum of life: An Anthology of Modern Prose, edited by Manmohan K. Bhatnagar, Trinity Press, 2016.)

Dale Carnegie:	“If You Are Wrong Admit It”
J.B. S. Haldane:	“The Scientific Point of View”
Bertrand Russell:	“An Outline of Intellectual Rubbish”
A.G. Gardiner:	“The Rule of the Road”
Nirad C. Chaudhuri:	“Public Transport in London and Delhi”

**Unit-IV**

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Sonnet, Elegy, Lyric, Simile, Metaphor, Personification, Alliteration, onomatopoeia, Hyperbole, pun, Comedy, Tragedy, Tragi-comedy, Rhyme, Rhythm, The Ode

**Suggested Reading:**

Eagleton, Terry. *How to Read a Poem*. Wiley Blackwell, 2006.

Abrams, M.H. *A Glossary of Literary Terms*. 11<sup>th</sup> Ed. Cengage Learning India Pvt. Ltd., 2015.

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**B.A. with English**  
**Semester VI**  
**Discipline Specific Elective Course II B**

**Paper Code: 20UENG601**

**Nomenclature: Modern English Literature**

**Credit: 6**  
**Maximum Marks: 100**  
**Theory: 80**  
**Internal Assessment: 20**

**Objective:** To help the students appreciate the modern works of literature.

**Note:** There will be five questions in all carrying equal marks. Question No. 1, consisting of eight short notes from the entire syllabus, will be compulsory. Two long answer questions will be asked from each unit. The students will be required to attempt one question from each unit.

**Unit-I**

Nissim Ezekiel	“The Patriot”
T.S. Eliot	“Journey of the Magi”
W.H. Auden	“The Unknown Citizen”
W.B. Yeats	“Lapis Lazuli”
Ted Hughes	“The Thought Fox”
Sarojini Naidu	“To Buddha Seated on A Lotus”

**Unit-II**

Khushwant Singh	“Posthumous”
Rabindranath Tagore	“Subha”
Ruskin Bond	“The Night Train at Deoli”
Jawaharlal Nehru	“Last Will and Testament”

**Unit-III**

Kritz Karinthy	“Refund”
W.W. Jacobs	“Monkey’s Paw”

**Unit-IV**

Ernest Hemingway	<i>Old Man and the Sea</i>
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**Suggested Reading:**

*English Literature* by William J. Long. Atlantic Publishers and Distributors Pvt. Ltd. 2020.

Bloom, Harold. *The Art of Reading Poetry*. Harper Perennial, 2005.

*S. K. K.*