

Syllabus only for B.A-I, B.Sc-I according to NEP

HINDI DEPARTMENT

Chaudhary Bansi Lal University, Bhiwani
(A State University established under Haryana Act No. 75 of 2014)



Scheme of Examinations & Syllabi
of
Bachelor of Arts (Hindi)
(w.e.f. 2024-25)
in
Undergraduate Programme
as per NEP 2020

With effect from the session 2024-25 (in phased manner)

DEPARTMENT OF HINDI
Chaudhary Bansi Lal University, Bhiwani
HARYANA, INDIA

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Department of Hindi
Chaudhary Bansi Lal University, Bhiwani
(Established by the State Legislature Act 25 of 2014) - ABC

Scheme of Examination for Undergraduate Programme Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance with NEP-2020 w.e.f. 2024-25 (in phased manner), Subject: Hindi (VACs, SECs, VOCs and AECs)

SEMESTER-I									
Semester	Course Type	Course Code	Nomenclature of Course	Credits	Cont. Hours/Week	Internal marks	External Marks	Total Marks	Exam Duration
I	AEC-1	24UN-HND-AEC101	हिन्दी भाषा और व्याकरण	2	2	15	35	50	2 hrs.
II	AEC-2	24UN-HND-AEC201	हिन्दी भाषा एवं सम्प्रेषण : मौखिक सम्प्रेषण	2	2	15	35	50	2 hrs.
III	AEC-3	24UN-HND-AEC301	हिन्दी भाषा एवं सम्प्रेषण : लेखन सम्प्रेषण	2	2	15	35	50	2 hrs.
IV	AEC-4	24UN-HND-AEC401	हिन्दी भाषा एवं सम्प्रेषण : व्यक्तित्व विकास	2	2	15	35	50	2 hrs.
II	SEC-2	24UN-HND-SEC201	Public Speaking in Hindi Language & Leadership	3	2	20	50	70	3 hrs.
II	SEC-2	24UN-HND-SEC202	सृजनात्मक लेखन	3	3	20	50	70	3 hrs.
III	SEC-2	24UN-HND-SEC301	अनुवाद कला	3	3	20	50	70	3 hrs.
III	VAC-3	24UN-HND-VAC301	हरियाणवी संस्कृति : विविध आयाम	2	4	15	35	50	2 hrs.
III	VAC-3	24UN-HND-VAC302	संस्कृति एवं संचार	2	4	15	35	50	2 hrs.
III	VOC-3	24UN-HND-VOC301	Typing Shorthand in Hindi	4	4	30	70	100	3 hrs.





Chaudhary Bansi Lal University, Bhiwani Annexure-II

(A State University established by Govt. of Haryana Act No. 25 of 2014) Session: 2021-22

Scheme of Examination for Bachelor of Arts Hindi Compulsory

Semester - I

Paper as per Main Scheme of UG	Paper Code	Paper Name	Type of Course	Contact Hours Per Week			Credit			Examination Scheme		Total
				Theory	Tutorial /Prac	Total	Theory	Tutorial /Prac	Total	Theory	Internal Assessment	
CC II A Hindi	UHIND-101 ✓	हिन्दी साहित्य का इतिहास	CC (Core Course)	4	---	4	4	---	4	80	20	100
AECC-I	UHIND-102	हिन्दी भाषा और रचयन	AECC	2	---	2	2	---	2	80	20	100
NCCC-I	UHIND-103 ✓	सुखमालक लेखन के विविध शैली	NCCC	2	---	2	2	---	2	80	20	100
Total				08	---	08	08	---	08	240	60	300

Semester - II

CC II B Hindi	UHIND-201 ✓	भारतीय हिन्दी कविता	CC (Core Course)	4	---	4	4	---	4	80	20	100
AECC-II	UHIND-202	हिन्दी भाषा और रचयन	AECC	2	---	2	2	---	2	80	20	100
NCCC-II	UHIND-203 ✓	अनुवाद	NCCC	2	---	2	2	---	2	80	20	100
Total				08	---	08	08	---	08	240	60	300

Semester - III

CC II C Hindi	UHIND-301 ✓	आधुनिक हिन्दी कविता	CC (Core Course)	4	---	4	4	---	4	80	20	100
Total				04	---	04	04	---	04	80	20	100

Semester - IV

CC II D Hindi	UHIND-401 ✓	हिन्दी गद्य साहित्य	CC (Core Course)	4	---	4	4	---	4	80	20	100
Total				04	---	04	04	---	04	80	20	100

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Syllabus only for B.A I, B.A II, B.A III / M.A I According to NEP
History Department

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Chaudhary Bansi Lal University,
Prem Nagar, Bhiwani
(A State University established under Haryana Act No. 25 of 2014)



Scheme of Examination

for

History Subject

in

Undergraduate Programmes

as per NEP 2020

Curriculum and Credit Framework for Undergraduate Programmes
(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF)

With effect from the session 2024-25 (in phased manner)

DEPARTMENT OF HISTORY

Chaudhary Bansi Lal University, Prem Nagar,
Bhiwani
HARYANA, INDIA

CBLU-Syllabi-History-UG-NEP2020

For Two Year MA. Programme

CH. BANSI LAL UNIVERSITY, BHIWANI
Scheme of Examination for M.A.-HISTORY
Semester: I Credits: 20 Marks: 500

Sr. No.	Paper Code	Subjects	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
				Theory	Practical/ Tutorial	Total	Theory	Practical /Seminar	Total	Theory	Internal Assessment	Practical /Seminar	
✓1	25HIS-101	Ancient Civilizations	CC-1	4	--	4	4	--	4	70	30	--	100
✓2	25HIS-102	Medieval Civilizations	CC-2	4	--	4	4	--	4	70	30	--	100
✓3	25HIS-103	Modern World	CC-3	4	--	4	4	--	4	70	30	--	100
✓4	25HIS-104	History of Haryana (Earliest Times to 1526 CE)	CC-4	4	--	4	4	--	4	70	30	--	100
5	25HIS-105	States in India	DEC-1	4	--	4	4	--	4	70	30	--	100
	✓25HIS-106	History and Its Nuances											
	25HIS-107	History of USA (1820-1973)											
Total				20		20	20		20	350	150		500

CC:- Core Course, DEC:- Discipline Elective Course

*The Discipline Elective Course (DEC) papers can be offered depending upon the availability of the resources and faculties. Students may select one out of three papers mentioned against these papers code such as 25HIS-105, 25HIS-106 and 25HIS-107.

Chakraborty

Chakraborty

Chakraborty

Department of History

FIRST YEAR: SEMESTER- I (Session-2024-25)

Remarks on Scheme	Course Type & Total Credits	Course Code	Course Nomenclature	Credits			Hours/week	Internal Assessment	End Term Marks	Maximum Marks	Exam Duration (hrs)
				Lecture	Tutorial	Total					
A, B & C	CC-1 MCC-1	24UN-HIS-101	History of Ancient India	3	1	4	4	30	70	100	3 Hrs
C	MCC2	24UN-HIS-102	Idea of Bharat	3	1	4	4	30	70	100	3 Hrs
A,B & D	*CC-M1	24UN-HIS-103	Elements of Ancient Indian Art	2	-	2	2	15	35	50	3 Hrs
C	CC-M1	From Available CC-1/-MCC-1 of 4 credits as per NEP from the subjects other than major									
A, B & C	MDC-1	From Available pool of Multidisciplinary Course from a Subject of Different discipline as per NEP									
A, B & C	AEC-1	From Available AEC-1 of 2 credits as per NEP									
	SEC-1	From Available SEC-1 of 3 credits as per NEP									
	VAC-1	From Available VAC-1 of 2 credits as per NEP									

*For Students who opt History as a Minor Subject

CC: Core Course
MDC: Multidisciplinary Course
SEC: Skill Enchantment Course

CC-M: Minor
AEC: Ability Enchantment Course
VAC: Value Added Course

- ❖ Minor subject in History can be chosen within same discipline by those who have not selected History as CC.
- ❖ MDC will be chosen by different discipline (B.A., B.Com., etc.).

FIRST YEAR: SEMESTER 2ND

Remarks on Scheme	Course Type & Total Credits	Course Code	Course Nomenclature	Credits			Hours/week	Internal Assessment	End Term Marks	Maximum Marks	Exam Duration (hrs)
				Lecture	Tutorial	Total					
A, B & C	CC-2 MCC-3	24UN-HIS-201	History of Medieval India	3	1	4	4	30	70	100	3 Hrs
C	DSEC-1	24UN-HIS-202	History of South India	3	1	4	4	30	70	100	3 Hrs
A, B & D	*CC-M2	24UN-HIS-203	Elements of Ancient Indian Architecture	2	-	2	2	15	35	50	3 Hrs
C	CC-M2	From Available CC-2/-MCC-3 of 4 credits as per NEP from the subjects other than major									
A, B & C	MDC-2	From Available pool of Multidisciplinary Course from a Subject of Different discipline as per NEP									
A, B & C	AEC-2	From Available AEC-2 of 2 credits as per NEP									
A, B & C	SEC-2	From Available SEC-2 of 3 credits as per NEP									
A, B & C	VAC-2	From Available VAC-2 of 2 credits as per NEP									

*For Students who opt History as a Minor Subject

CC: Core Course, CC-M: Minor, DSEC: Discipline Skill Enhancement Course, SEC: Skill Enchantment Course

MDC: Multidisciplinary Course, AEC: Ability Enchantment Course, VAC: Value Added Course

- ❖ Minor subject in History can be chosen within same discipline by those who have not selected History as CC.
- ❖ MDC will be chosen by different discipline (B.A., B.Com., etc.).

Exit Option: Any student opting for exit option after 1st year will get UG Certificate in 'Discipline' According to scheme A and B, and UG Diploma in 'Major Subject' According to scheme C.

A student will be allowed an exit option after passing first academic year of the UG Programme with requisite 52 credits (including the 4 credits of internship) according to Scheme A & B and 48 credits (including the 4 credits of internship) according to scheme C.

**B.A. HISTORY
(Semester-V)**

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

Unit-IV

Maps:

- 1 Main centers of Harappan Civilization in Haryana
- 2 Haryana at the times of Harashavardhan
- 3 Urban Centers During Medieval Period
- 4 Major Centers of 1857 Revolt in Haryana

CHAUDHARY BANSI LAL UNIVERSITY, BHIWANI
Scheme of Examination for M.A. English

Semester-III

Credits-27

Marks-625

Sr. No.	Paper Code	Subject	Type of Course	Contact Hours Per Week			Credits			Examination Scheme			
				Theory	Practical	Total	Theory	Practical	Total	Theory	Internal Assessment	Practical	Total
1	23ENG301	English Poetry-III	C.C.	4	-	4	4	-	4	80	20	-	100
2	23ENG302	English Drama-II	C.C.	4	-	4	4	-	4	80	20	-	100
3	23ENG303	English Fiction-II	C.C.	4	-	4	4	-	4	80	20	-	100
4	23ENG304	Literary Theory & Criticism-II	C.C.	4	-	4	4	-	4	80	20	-	100
5		Elective-IV	D.S.E.C.	4	-	4	4	-	4	80	20	-	100
	23ENG305(A)	Literature & Diaspora											
	23ENG305(B)	Postcolonial Literature											
	23ENG305(C)	Partition Literature											
6		Elective-V	D.S.E.C.	4	-	4	4	-	4	80	20	-	100
	23ENG306(A)	American Literature											
	23ENG306(B)	European Literature											
	23ENG306(C)	Afro-American Literature											
7	23ENG307	Seminar	S.E.C.	-	2	2	-	1	1	-	25	-	25
8		Hobby Club*	S.E.C./ V.A.C. (non- CGPA)		1	1	-	1	1	As per Hobby Club Ordinance			
Total				24	3	27	24	2	26	480	145		62

*for details go through the ordinance available on the University Website.

C.C. = Core Course D.S.E.C. = Discipline Specific Elective Course S. E. C. = Skill Enhancement Course V.A.C. = Value Added Course

#The students will have to select one option from the list of Elective papers for 23ENG305 and 23ENG306

The Discipline Elective Courses can be offered depending upon the availability of the resources and faculty members.

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English



CHAUDHARY BANSI LAL UNIVERSITY, BHIWANI

(A State University established under Haryana Act No. 25 of 2014)
Undergraduate Programme as per NEP-2020

Subject: English
(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF)
w.e.f. the Session 2025-26 (in a phased manner)

Semester I

Course Nomenclature: Short Story

Course Code: 25UN-ENG-101

Course Type: CC-1/MCC-1

Credits (L+T+P): 4 (3+1+0)

External Theory Marks: 70
Internal Assessment Marks: 30
Time Allowed: 3 Hrs.

Course Outcomes (CO)

At the end of the course, the students will be able to:

- Explore different human emotions and experiences through stories.
- Understand how stories reflect culture, society, and values
- Develop an interest in reading fiction
- Understand the basic features and structure of short stories.
- Improve their vocabulary and comprehension by reading literary texts.
- Learn to write answers and express views clearly and logically.

Note for Paper Setter:

The students will be required to attempt 5 questions in all selecting 1 question out of 2 from each unit. Question no 1 shall be compulsory, consisting of seven short answers type questions covering the entire syllabus. All questions carry equal marks.

Unit-I

Somerset Maugham

“The Luncheon”

“The Ant and the Grasshopper”

“The Verger”

Oscar Wilde

“The Model Millionaire”



CHAUDHARY BANSI LAL UNIVERSITY, BHIWANI

(A State University established under Haryana Act No. 25 of 2014)
Undergraduate Programme as per NEP-2020
Subject: English
(Multiple Entry-Exit, Internships and Choice Based Credit System (LOCF)
w.e.f. the Session 2025-26 (in a phased manner))

Semester I

Course Nomenclature: Literature for Children

Course Code: 25UN-ENG-103

Course Type: MIC-1

Credits (L+T+P): 2 (2+0+0)

External Theory Marks: 35
Internal Assessment Marks: 15
Time Allowed: 2 Hrs.

Course Outcomes (CO)

At the end of the course, the students will be able to:

- Understand the meaning and features of literature for children
- Read and enjoy simple and moral-based stories written for children.
- Learn life lessons and human values from folk tales and fables.
- Get familiar with Indian mythological and cultural stories.
- Understand the creative use of imagination in storytelling.

Note for Paper Setter:

1. The students will be required to attempt 5 questions in all. All questions carry equal marks.
2. Question no. 1 will be based on shorts notes covering the entire syllabus. The students will be required to attempt 7 questions out of 10 carrying 1 mark each.
3. Q. no. 2-9 will be long answer type questions carrying 7 marks each. The students will be required to attempt two questions from each unit.

Unit-I (Short Stories)

Ruskin bond

"The Blue Umbrella"

"The Angry River"

Sudha Murthy

"The Serpent's Revenge"

"The Ring of Memory" (From *The Serpent's*

Revenge: Unusual Tales from the

Mahabharata)



CHAUDHARY BANSI LAL UNIVERSITY, BHIWANI

(A State University established under Haryana Act No. 25 of 2014)
Undergraduate Programme as per NEP-2020

Subject: English
(Multiple Entry-Exit, Internships and Choice Based Credit System (LOCF)
w.e.f. the Session 2025-26 (in a phased manner)

Semester I

Course Nomenclature: Communication Skills in English

Course Code: 24-UN-ENG-AEC101

Course Type: AEC-1

Credits (L+T+P): 2 (2+0+0)

External Theory Marks: 35
Internal Assessment Marks: 15
Time Allowed: 2 Hrs.

Course Outcomes:

- Improve listening skills and overcome barriers.
- Develop effective verbal and non-verbal communication.
- Enhance pronunciation and speech accent.
- Master conversational English for various situations.
- Deliver short formal speeches effectively.

Note for Paper Setter:

1. The students will be required to attempt 5 questions in all. All questions carry equal marks.
2. Question no. 1 will be based on shorts notes covering the entire syllabus. The students will be required to attempt 7 questions out of 10 carrying 1 mark each.
3. Q. no.2 -9 will be long answer type questions carrying 7 marks each. The students will be required to attempt two questions from each unit.

Unit I

Listening: Barriers to Listening, Effective Listening, Academic Listening

Speaking: Verbal & Non-Verbal Communication, Types, Paralinguistic Features, Commonly Mispronounced Words, Stress, Tone, Intonation— Statements, Questions, Directions, Orders, 'Wh' Questions, Polite Questions; Choice of Right Words and Expressions, Words used as Verbs and Nouns, Affixes, Common Courtesy



CHAUDHARY BANSI LAL UNIVERSITY BHIWANI

(A State University established under Haryana Act No. 25 of 2014)
Undergraduate Programme as per NEP-2020

Subject: English

(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF)
w.e.f. the Session 2025-26 (in a phased manner)

Semester III

Course Nomenclature: Selected English Poetry

Course Code: 25UN-ENG-301

Course Type: CC-3/MCC-4

Credits (L+T+P): 4 (3+1+0)

External Theory Marks: 70
Internal Assessment Marks: 30
Time Allowed: 3 Hrs.

Course Outcomes (CO)

At the end of the course, the students will be able to:

- Understand the basic forms and devices used in English poetry.
- Read and enjoy famous English poems from different centuries.
- Compare different styles of classical and modern poetry.
- Appreciate Indian English poetry and its cultural richness.
- Develop the ability to critically read and enjoy poetry in daily life.

Note for Paper Setter:

1. The paper-setter will set 9 questions in all. All questions carry equal marks.
2. Question No. 1 will consist of 6 short notes based on unit 1 out of which the students will be required to attempt any four. Each short note will carry 4 marks (4x4=16).
3. Question No. 2 will consist of 10 short questions based on unit 2, 3, & 4 out of which the students will be required to attempt any seven, selecting at least one short question from each unit. Each question from this section will carry 2 marks (7x2=14).
4. Question No 3 with 4 parts will be based on explanation with reference to the context based on Unit 2, 3 & 4. Students will be required to attempt any two (2x6=12).
5. Question No 4 with internal choice will be essay type questions based on Unit 2, 3 & 4 carrying 08 marks each.
6. Question No 5 will be based on Phonemic Transcription and Vocabulary from Unit 2, 3 & 4 consisting of 15 items. The students will be required to attempt any 10 items.



CHAUDHARY BANSI LAL UNIVERSITY BHIWANI

(A State University established under Haryana Act No. 25 of 2014)
Undergraduate Programme as per NEP-2020

Subject: English

(Multiple Entry-Exit, Internships and Choice Based Credit System (LOCE)
w.e.f. the Session 2025-26 (in a phased manner))

Semester III

Course Nomenclature: English Grammar and Usage

Course Code: 25-UN-ENG-AEC301

Course Type: AEC-3

Credits (L+T+P): 2 (2+0+0)

External Theory Marks: 35

Internal Assessment Marks: 15

Time Allowed: 2 Hrs.

Course Outcomes:

Note for Paper Setter:

1. The students will be required to attempt 5 questions in all. All questions carry equal marks.
2. Question no. 1 will be based on shorts notes covering the entire syllabus. The students will be required to attempt 7 questions out of 10 carrying 1 mark each.
3. Q no 2-9 will be long answer type questions carrying 7 marks each. The students will be required to attempt two questions from each unit.

Unit I

Articles, Nouns: Definition and types, Pronouns - Definition and types, Adjectives : Definition and types, Adverbs : Definition and types, Prepositions, Conjunctions, Verbs : Definition and types, Tenses - Definition and types, Modals and its uses.

Unit-II

Non-finite verbs: The Infinitive, The Gerund, The Participles, Infinitive and Gerund/ Present Participle Constructions, Commands/ Requests/ Advice, The Subjunctive, Passive Voice, Reported Speech.



CHAUDHARY BANSI LAL UNIVERSITY BHIWANI

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

Undergraduate Programme as per NEP-2020

Subject: English

(Multiple Entry-Exit, Internships and Choice Based Credit System (CBCS)
w.e.f. the Session 2025-26 (in a phased manner))

Semester III

Course Nomenclature: English at the Workplace

Course Code: 25UN-ENG-SEC301

Course Type: SEC3

Credits (L+T+Pr): 3 (2+1+0)

External Theory Marks: 50

Internal Assessment Marks: 20

Time Allowed: 3 Hrs.

Course Outcomes: At the end of the course, the students will be able to

- Learn how to create a strong professional profile, respond to job ads, and prepare job-related documents.
- Develop confidence in facing interviews and using body language and communication skills professionally
- Acquire workplace skills such as proper etiquette, cultural sensitivity, and ethical behavior.
- Gain practical skills in making presentations and writing effective business letters and emails.

Unit I

Exploring the Job Market, Profiling Oneself for the Job, Searching for a Job, Responding to Job Advertisements, Preparing for the Job

Unit II

Using Body Language Effectively, Portfolio Making, Writing Your Curriculum Vitae (CV)

Preparing to Face an Interview

Unit III

Skills for the Workplace, Etiquette, Cultural Awareness and Gender Perceptions, Work Ethics

Making Presentations, Writing Business Letters and emails

B. A. English
Semester V

Credits:2
Maximum Marks:100
Theory:80
Internal Assessment: 20

Paper Code: 201 ENG5001

Nomenclature of the Paper: Skill Enhancement Course III

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 subsections). 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 I. et al. *English for Success*, Foundation Books, 2016.

Kumar, Sanjay and Pushp Jata. *English for Effective Communication*, OUP, 2016.

B.A. English
Semester-A
Generic Elective Specific Course A (ii)

Credit:6
Max. Marks:100
Theory: 80
Internal Assessment:20

Paper Code: 201 G52

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.

Physical - Education. ✓ 22

1st Semester Subject: Health & Physical Education
(According to NEP2020 implemented from Session 2023 - 24)

Core Course – 1 & Major Core Course – 1

Part A - Introduction

Subject	Health & Physical Education		
Semester	1 st Semester		
Name of the Course	History and Foundation of Physical Education		
Course Code	24UN-PED-101		
Course Type:	Core Course - 1 Major Core Course - 1		
Level of the Course	100 - 199		
Pre-requisite (if any)	12 th pass from any streams (Arts/Science/ Commerce) preferable with Sports Background. It is open for all.		
Course Learning Outcomes (CLOs):	After completing this course, the learner will be able to 1. Describe the Aims, Objectives and scope of Physical Education. 2. Explain the historical development of Physical Education in India. 3. Illustrate the basic knowledge of biological aspects of Physical Education. 4. Tell the various Career opportunities in Physical Education and Sports. 5. Know the basic specifications of court/ground, general rules and demonstrate the basic skills of Kho Kho and Badminton.		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3 hours per week	2 hours per week	5
	(Size of practical group = 20 students)		
Max. Marks: 100 Part I - Theory = 70 (Internal Assessment - 20 Marks + End Term Exam - 50 Marks) Part II - Practical = 30 (Internal Assessment - 10 Marks + End Term Exam - 20 Marks)			Time: 3 Hours For End Term Exam

Part B- Content of the Course

Instructions for Paper- Setter:

The question paper will consist of Five Units I, II, III, IV and V. Units I, II, III & IV will have two questions from their respective Units of the Syllabus and will carry 10 marks each. Unit Vth will consist of 5 short answer type questions which will cover the entire syllabus and will carry 2 marks for each question.

Unit	Topics	Contact Hours
1	Introduction of Physical Education: • Meaning and definition of Physical Education • Relationship of Physical Education with Health and General Education • Aim and Objectives Physical Education • Scope of Physical Education. • Need of Physical Education in modern society. • Misconceptions regarding Physical Education. • Physical Education as Arts or Science	12

Signature

	<p>History of Physical Education in India:</p> <ul style="list-style-type: none"> Physical Education during Indus Valley Civilization (3250 BC - 2500 BC) Physical Education during Vedic period (2500 BC - 600 BC) Physical Education during Early Hindu Period (600 BC - 320 A.D) Physical Education during Later Hindu Period (320 A.D - 1000 A.D) Physical Education during Medieval Period (1000 A.D - 1757 A.D) Physical Education during British Period (Till 1947) Physical Education during After Independence 	12
III	<p>Biological Basis of Physical Education:</p> <ul style="list-style-type: none"> Meaning of Growth and Development Meaning of Chronological Age, Anatomical age, Physiological age and Mental age Principles of Growth and development Difference between Growth and development Factor affecting Growth and development Growth and Development at various Levels of Childhood: Pre - Adolescence - Adolescence - Adulthood. 	11
IV	<p>Career opportunities in Physical Education and Sports:</p> <ul style="list-style-type: none"> Qualifications and responsibilities of Physical Education and Sports professionals at various levels of educational institutions. Qualifications and responsibilities as Coach, Fitness Trainers, Yoga Instructors and others Qualifications and responsibilities as sports Event Managers, Technical Officials, Researcher and others Qualifications and responsibilities in Health Clubs and Fitness Centers, Aerobics, Dance & Recreation Clubs in Corporate Sectors and others. Qualifications and responsibilities Sports Journalists, Commentators, Sports Photographers and Video Analysts Career opportunities in various Central Govt, State Govt., Private Organizations and others Career opportunities in Manufacturing and Marketing sectors. Entrepreneurs opportunities in Physical Education and Sports. 	11

Suggested Evaluation Methods:

Maximum Marks: 70 (Internal Assessment - 20 Marks + End Term Exam - 50 Marks)

<p>Internal Assessment: 20 Marks</p> <p>Continuous Comprehensive Evaluation (CCE): 20 Marks</p> <p>Class presentation = 5</p> <p>Seminar/ Assignment/Quiz/class test, etc. = 5</p> <p>Mid Term Test = 10</p>	<p>End Term Exam: 50 Marks Time = 3 hrs.</p> <p>One question of 10 marks from each Units I to IV = 40 Marks.</p> <p>Five Questions short answer from entire syllabus = 5 x 2 Marks = 10 Marks.</p>
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Part II - Practical
(Internal Assessment - 10 Marks + External - 20 Marks)

Unit	Topics	Marks distribution	Contact Hours
I	Kho - Kho: Court specifications, general rules and basic skills	15 Marks	15
II	Badminton: Court specifications, general rules and basic skills	15 Marks	15

Signature

Internal Assessment: 10 Marks
 Evaluation through Skill Test/ Assignments/
 Quiz/ Viva Voce/ Practical Record File
 (5 Marks for Each Game)

End Term Exam: 20 Marks
 Evaluation through performance in Skill
 Demonstration/ Viva Voce/ Practical Record
 (10 Marks for Each Game)

Part C-Learning Resources

- Suggested Readings:
- Baljit Singh (2009). Principles of Physical Education. New Delhi: Sports Publication
- Bevinson Perinbaraj. S (2002). History of Physical Education. Karaikudi: Vinsi Publications
- Bucher A.
- Charles. (1983). Foundations of Physical Education. St. Louis: Mosbyco.
- Charles A. Bucher. (1982). Foundations of Physical Education. USA: The C.V. Mosby company
- Charles C. Cowell & William L. France. (1963). Philosophy and Principles of Physical Education
 New Jersey: Prentice-Hall.
- Singh Ajmer et.al. Modern Text Book of Physical Education, Health and Sports,
 Kalyani Publishers, Ludhiana, (2010).
- Sharma, V.K, Health & Physical Education, Saraswati House Pvt. Ltd., Daryaganj, New
 Delhi, (2013).
- Singh Ajmer et. al. Olympic Movement, Kalyani Publishers, Ludhiana, (2000)
- Kamlesh & Sangral, Principles & History of Physical Education, Parkash Brothers,
 Ludhiana.(2000).
- Bucher, C. A. (n.d.) Foundation of physical education. St. Louis: The C.V. Mosby Co
- Deshpande, S. H. (2014).
- Mohan, V. M. Principles of physical education. Delhi: Metropolitan Book Dep. Nixon,
 E. E. & Cozen, F.W. (1969). An introduction to physical education. Philadelphia: W.B
 Saunders Co.
- Pinto John and Roshan Kumar Shetty (2021) Introduction to Physical Education, Lotus
 Publications, Mangalore.
- Amit Arjun Budhe, (2015) Career aspects and Management in Physical Education
 Sports Publication, New Delhi
- Anand, R.L (1987) Play Field Manual, Patiala: NIS Publication.

Books list

2nd Semester Subject: Health & Physical Education
(According to NEP2020 implemented from Session 2023 - 24) 25
Core Course – 2 & Major Core Course - 3

Part A - Introduction

Subject:	Health & Physical Education		
Semester	2 nd Semester		
Name of the Course	Basic Anatomy and Physiology		
Course Code	24UN- PED -201		
Course Type:	Core Course - 2 Major Core Course - 3		
Level of the Course	100 - 199		
Pre-requisite (if any)	Student who has opted Core Course – 1 in 1 st Semester		
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to 1. Describe the Anatomy, Physiology and structure of Cells. 2. Explain the structure of Joints and Muscular System 3. Illustrate the basic knowledge about Anatomy, Physiology of Circulatory and Digestive Systems of human body 4. Explain the Anatomy, Physiology of Respiratory and Excretory Systems of human body 5. Identify name and locations of bones, muscles and organs of various systems of human body.		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3 hours per week	2 hours per week (Size of practical group = 20 students)	5

Max. Marks: 100

Part I - Theory = 70

(Internal Assessment - 20 Marks + End Term Exam – 50 Marks)

Part II - Practical = 30

(Internal Assessment - 10 Marks + End Term Exam – 20 Marks)

Time: 3 Hours

For End Term Exam

Part B- Content of the Course

Instructions for Paper- Setter:

The question paper will consist of five Units I, II, III, IV and V. Units I, II, III & IV will have two questions from their respective Units of the Syllabus and will carry 10 marks each. Unit Vth will consist of 5 short answer type questions, which will cover the entire syllabus and will carry 2 marks for each question.

Unit	Topics	Contact Hours
I	Introduction of Anatomy and Physiology <ul style="list-style-type: none"> • Meaning and Definition of Anatomy and Physiology. • Importance of Anatomy and Physiology in Physical Education and sports • Cell: Structure, Properties and functions • Meaning of Cell, Tissues, Organs and System. • Bone: Meaning and types • Skeletal System: Structure and functions of Skeletal System. • Axial and Appendicular Skelton 	12

BDK/24/1

UNIT I: Skeletal and Muscular System

- Meaning of Joints, Types of Joints
- Types of Synovial Joints present in human body
- Meaning of Muscle, Types of muscles present in human body
- Gross Structure of Skeletal Muscle,
- Structural Classification of Skeletal muscles.

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III	<p>Circulatory System and Digestive System</p> <ul style="list-style-type: none"> • Constituents of blood and Function of blood • Structure of the heart • Types of Blood Circulation: Systemic, Pulmonary and Coronary, • Organs of Digestive System • Structure and functions of the digestive system, • Process of Food absorption, Name and functions of various digestive juices and enzymes 	12
IV	<p>Respiratory System and Excretory System</p> <ul style="list-style-type: none"> • Organs of Respiratory system and their functions. • Structure of Respiratory system • Exchange of gases in the lungs and tissues, • Organs of Excretory System kidneys and skin • Parts and Functions of the urinary system • Structure and functions of Skin. 	11

Suggested Evaluation Methods:

Maximum Marks: 70 (Internal Assessment - 20 Marks + End Term Exam – 50 Marks)

<p>Internal Assessment: 20 Marks Continuous Comprehensive Evaluation (CCE): 20 Marks Class presentation = 5 Seminar/ Assignment/Quiz/class test, etc. = 5 Mid Term Test = 10</p>	<p>End Term Exam: 50 Marks Time = 3 hrs One question of 10 marks from each Units I to IV = 40 Marks. Five Questions short answer from entire syllabus = 5 × 2 Marks = 10 Marks.</p>
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Part II – Practical
(Internal Assessment - 10 Marks + External – 20 Marks)

Unit	Topics	Marks distribution	Contact Hours
I	Identification of Name and location of Human Bones on Skelton and Chart	10 Marks	10
II	Identification of Name and location of Major Muscles of Human Body on Model and Chart	10 Marks	10
III	Identification of Name and Location of organs of various systems: Circulatory, Digestive, Respiratory and Excretory on Models and Charts	10 Marks	10
<p>Internal Assessment: 10 Marks Evaluation through Assignments/ Quiz/ Viva Voce/ Practical Record File</p>		<p>University Exam (UE): 20 Marks Evaluation through Viva Voce/ Practical Record File:</p>	

Signature

27 ✓
Learning Resources

- Singh Ajmer et.al. "Modern Text Book of Physical Education, Health and Sports", Kalyani Publishers, Ludhiana, (2010).
- Gupta, A. P. (2010). Anatomy and physiology. Agra: Sumit Prakashan.
- Gupta, M. and Gupta, M. C. (1980). Body and anatomical science. Delhi: Swaran Printing Press.
- Guyton, A.C. (1996). Textbook of Medical Physiology, 9th edition. Philadelphia: W.B. Saunders.
- Karpovich, P. V. (n.d.). Philosophy of muscular activity. London: W.B. Saunders Co.
- Lamb, G. S. (1982). Essentials of exercise physiology. Delhi: Surjeet Publication.
- Moorthy, A. M. (2014). Anatomy physiology and health education. Karaikudi: Madalayam Publications.
- Morehouse, L. E. & Miller, J. (1967). Physiology of exercise. St. Louis: The C.V. Mosb Co.
- Pearce, E. C. (1962). Anatomy and physiology for nurses. London: Faber & Faber Ltd
- Sharma, R. D. (1979). Health and physical education, Gupta Prakashan.
- Singh, S. (1979). Anatomy of physiology and health education. Ropar: Jeet Publications

Booster!

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5

3rd Semester Subject: Health & Physical Education
 According to NEP2020 implemented from Session 2024 - 25 (IHS from session 2023-24)

Core Course - 3 & Major Core Course - 4

Part A - Introduction			
Subject:	Health & Physical Education		
Semester	3 rd Semester		
Name of the Course	Exercise Physiology		
Course Code	24UN-PED-301		
Course Type:	Core Course - 3 Major Core Course - 4		
Level of the Course	100 - 199		
Pre-requisite (if any)	Candidate who has opted Physical Education as Major		
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: <ol style="list-style-type: none"> 1. Describe the Exercise Physiology, Body Composition and types of muscle contractions 2. Explain the effect of exercise on the various aspects of Skelton muscles 3. Illustrate the effects of various aspects of circulatory system 4. Tell the various Effects of exercise on the various capacities and volumes of lung. 5. Know the basic specifications of court/ground, general rules and demonstrate the basic skills of Football and Boxing/Wrestling/Jud 		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3 hours per week	2 hours per week (Size of practical group = 20 students)	5
Max. Marks: 100		Time: 3 Hours	
Part I - Theory = 70		For End Term Exam	
(Internal Assessment - 20 Marks + End Term Exam - 50 Marks)			
Part II - Practical = 30			
(Internal Assessment - 10 Marks + End Term Exam - 20 Marks)			

Part B- Content of the Course

Instructions for Paper- Setter:

The question paper will consist of five Units I, II, III, IV and V. Units I, II, III & IV will have 4 questions from their respective Units of the Syllabus and will carry 10 marks each. Unit Vth will consist of 5 short answer type questions, which will cover the entire syllabus and will carry 2 marks for each question.

Unit	Topics	Contact Hours
1	Introduction of Exercise Physiology <ul style="list-style-type: none"> • Meaning of Exercise Physiology, Anabolism, Catabolism and Metabolism • Importance of Exercise Physiology in Physical Education • Types of muscular Contractions: Isometric, Isotonic and Isokinetic. • Meaning of Body Composition, Components of Body Composition • Effect of Exercises on the body composition. 	11

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II	Muscular System and Exercise <ul style="list-style-type: none"> Gross Structure of the Skeletal Muscle Functions of Muscular system Properties of slow-twitch and fast-twitch muscle fibers Meaning of Aerobic Activity, Anaerobic Activity, Muscle Tone, Muscle Hypertrophy and Atrophy Effect of exercises and training on the muscular system 	12
III	Cardiovascular System and Exercise <ul style="list-style-type: none"> Meaning and functions of Cardiovascular System Meaning of Stroke Volume, Cardiac Output, Heart Rate, Blood pressure and Cardiac Hypertrophy Conduction System of the Heart Blood circulation in the Heart, Blood Supply to the Heart Effect of exercises and training on the Cardio vascular system. 	11
IV	Respiratory System and Exercise: <ul style="list-style-type: none"> Meaning of Lung Volumes: Inspiratory Reserve Volume, Expiratory reserve volume, Tidal Volume and Residual Volume Meaning of Lung capacities: Total Lung Capacity, Inspiratory Capacity, Vital Capacity and Functional Residual Capacity. Mechanism of Breathing Diffusion of Gases: Exchange of Gases in the Lungs and Exchange of Gases in the Tissues Effect of exercises and training on the respiratory system. 	11

Suggested Evaluation Methods:

Maximum Marks: 70 (Internal Assessment - 20 Marks + End Term Exam – 50 Marks)

Internal Assessment: Continuous Comprehensive Evaluation (CCE): 20 Marks Class presentation = 5 Seminar/ Assignment/Quiz/class test, etc. = 5 Mid Term Test = 10	End Term Exam: 50 Marks Time = 3 hrs. One question of 10 marks from each Units I to IV = 40 Marks. Five Questions short answer from entire syllabus = 5 × 2 Marks = 10 Marks.
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Part II – Practical (Internal Assessment - 10 Marks + External – 20 Marks)

Unit	Topics	Marks distribution	Contact Hour
I	Football: Court specifications, general rules and basic skills	15 Marks	15
II	Wrestling/Judo/Boxing: Ring/Mat specifications, general rules and basic skills	15 Marks	15
	Internal Assessment: 10 Marks Evaluation through Skill Test/ Assignments/ Quiz/ Viva Voce/ Practical Record File (5 Marks for Each Sports/Game)	University Exam (UE): 20 Marks Evaluation through performance in Skill Test/ Demonstration/ Viva Voce/ Practical Record File (10 Marks for Each Sports/Game)*	

Part C-Learning Resources

- Clarke, D.H. (1975). Exercise Physiology. New Jersey: Prentice Hall Inc., Englewood Cliffs.
- David, L Costill. (2004). Physiology of Sports and Exercise. Human Kinetics.
- SandhyaT waji. (1999). Exercise Physiology. Sports Publishers.
- Fox, E.L., and Mathews, D.K. (1981). The Physiological Basis of Physical Education and Athletics

BDK/20/20/20

4th Semester Subject: Health & Physical Education
 (According to NEP2020 implemented from Session 2024 – 25 (IHS from session 2023-2)
Core Course – 4 & Major Core Course - 6

Part A - Introduction			
Subject:	Health & Physical Education		
Semester	4 th Semester		
Name of the Course	Basics of Sports Fitness		
Course Code	24UN-PED-401		
Course Type:	Core Course – 4 Major Core Course - 6		
Level of the Course	100 – 199		
Pre-requisite (if any)	Candidate have taken Physical Education as Major Course		
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: <ol style="list-style-type: none"> Describe meaning, importance and norms of Physical Fitness. Illustrate meaning, principles and methods of warming up. Explain meaning, principles and methods of cooling down. Describe the health related and skill related components of fitness. Demonstrate the techniques of measuring strength, flexibility, agility and hand eye coordination. 		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3 hours per week	2 hours per week (Size of practical group = 20 students)	5
Max. Marks: 100 Part I - Theory = 70 (Internal Assessment - 20 Marks + End Term Exam – 50 Marks) Part II - Practical = 30 (Internal Assessment - 10 Marks + End Term Exam – 20 Marks)			Time: 3 Hours For End Term Exam

Part B- Content of the Course

Instructions for Paper- Setter:

The question paper will consist of Five Units I, II, III, IV & V. Unit I, II, III & IV will have two questions from their respective Units of the Syllabus and will carry 10 marks each. Unit V will consist of 5 short answer type questions, which will cover the entire syllabus and will carry 2 marks for each question.

Unit	Topics	Contact Hours
I	Introduction of Physical Fitness <ul style="list-style-type: none"> Meaning and Definition of Physical Fitness Benefits of Physical Fitness in Sports and daily life Meaning and Types of Aerobic and Anaerobic activities Exercises and Heart rate Zones for intensities of aerobic and anaerobic activities WHO guidelines and recommendations of Physical Activities for children under 5 years of age, Children and adolescents aged 5-17 years and Adults aged 18-64 years. 	11
II	Warming Up <ul style="list-style-type: none"> Meaning and definition of Warming up Principles of Warming up Physiological and Psychological benefits of Warming up Types of warming up Methods of Warming up 	11

Signature

III	Cooling Down <ul style="list-style-type: none"> • Meaning and definition of Cooling Down • Principles of Cooling Down • Physiological and Psychological Benefits of Cooling Down • Procedure for Cooling Down • Types of Cooling Down
IV	Components of Physical Fitness: <ul style="list-style-type: none"> • Meaning of Health-related components of Physical fitness: (i) Cardiovascular Fitness, (ii) Muscular Strength, (iii) Muscular Endurance (iv) Body Composition (v) Flexibility. • Meaning of Skill Related Fitness Components: (i) Agility, (ii) Balance, (iii) Neuro Muscular Adaptations and Coordinative abilities, (iv) Speed, (v) Strength (vi) Reaction Time.

Suggested Evaluation Methods:
Maximum Marks: 70 (Internal Assessment - 20 Marks + End Term Exam – 50 Marks)

Internal Assessment: 20 Continuous Comprehensive Evaluation (CCE): 20 Marks Class presentation = 5 Seminar/ Assignment/Quiz/class test, etc. = 5 Mid Term Test = 10	End Term Exam: 50 Marks Time = 3 hrs One question of 10 marks from each Units I to IV = 40 Marks. Five Questions short answer from entire syllabus = 5 × 2 Marks = 10 Marks.
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Part II – Practical
Maximum Marks: 30 (Internal Assessment - 10 Marks + End Term Exam – 20 Marks)

Unit	Topics	Marks distribution	Contact Hours
I	i) Measuring Hand Grip and Leg & Back Strength by Dynamometer ii) Measuring Flexibility by Sit and Reach Test	(5+5) 10 Marks	10
II	i) Hand eye Coordination Test	10 Marks	10
III	Measuring Agility by LUS Agility Obstacle Course	10 Marks	10
	Internal Assessment: 10 Marks Evaluation through Assignments/ Quiz/ Viva Voce/ Practical Record File/ score of test	End Term Exam: 20 Marks Evaluation through Demonstration of technique/ Viva Voce/ Practical Record File/ score of test	

Part C-Learning Resources

- Difiore, J.(1998). Complete guide to postnatal fitness. London: A & C Black,.
- Giam, C.K & The, K.C. (1994). Sport medicine exercise and fitness. Singapore: P.G. Medical Book.
- McGlynn, G., (1993). Dynamics of fitness. Madison: W.C.B Brown.
- Sharkey, B. J.(1990). Physiology of fitness, Human Kinetics Book.
- David K. Miller & T. Earl Allen(1989), Fitness, A life time commitment, Surjeet Publication Delhi.
- Dificore Judy, the complete guide to the postnatal fitness, A & C Black Publishers Ltd' Bedford row, London 1998
- Uppal A.K (1992), Physical Fitness, Friends Publications (India),
- Warner W.K Oeger & Sharon A. Hoeger(1990) Fitness and Wellness, Morton Publishing Company
- Elizabeth & Ken day (1986), Sports fitness for women, B T Batsford Ltd, London
- Hardayal Singh (2005). Sports Training - General Theory and Methods. Patiala: NSNIS
- <https://www.who.int/news-room/fact-sheets/detail/physical-activity>

Signature

B.A. Health & Physical Education**5th Semester (OPTION-II)****Paper Name – Yoga Science (D.S.E)****Paper Code: 21UPHY502**

Time: 3 hours

Theory: 60 marks

Internal assessment: 15 Marks

Important Instructions for Paper Setter and students:

1. The question paper will consist of 09 questions in all and will carry 12 marks each. The first question will be compulsory and comprise of 06 short answer types questions (2 marks each) and this question will be set from the whole syllabus.
2. Remaining 08 questions would be set unit wise, two questions from each unit. The candidate has to attempt four questions selecting at least one from each unit.

Unit-1 Introduction of yoga:

1. Brief history of Yoga in India. ①
2. Meaning, definition and types of Yoga. ②
3. Astang Yoga and its steps. ③
4. Aim, objectives and Importance of Yoga. ④

Unit-2 Asanas:

1. Meaning, definition and types of Asanas.
2. Methods and benefits of Asanas: Sukhasana, Padmasana, Siddhasana and Vajrasana.
3. Sarvangasana, Halasana, Paschimottanasana, Bhujangasana, Dhanurasana and sirsasana.
4. Surya Namaskar, chakrasana and Mayurasana.

Unit-3 Shat Karams/ ShudhiKriyas process and effects:

1. Neti: SutraNeti and Jalneti.
2. Dhauti: JalDhauti, VastraDhauti, DandDhauti.
3. Basti: SusakBasti, Wet Basti.
4. KapalBhati and Taratak.

Unit-4 Yoga Breathing (Pranayama):

1. Introduction, meaning, definition of Pranayama.
2. Benefits of Pranayama.

B.A. IIIrd / 2023-2024 ✓

3. **Methods of Comfortable Pranayama** (Sukhpurvak), Bhastrika, Anlom-Vilom, Ujjayi, Sitali, Sitkari.
4. **Hints and Cautions for the practice of Pranayama.**

Suggested Readings:

1. Iyengar, B.K.S. (2006) Light on Yoga. Thorsons.
2. Hewitt, J. (1977) Yoga and Vitality. Barrie & Jenkins.
3. Sharma, J.P. (2006) Yoga Shiksha. Friends publications.
4. Maguire, I. (2008) Yoga for a healthy body.
5. Sharma, P.D. (1984) Yoga yogasana and Pranayama for health. Navneet publications pvt. Ltd.
6. Sharma, Lalita, (1999) All you wanted to know about yoga. Sterling publishers.
7. Bhole, M.V. (1988) Physiological benefits through yoga. Yoga Mimamsa.
8. Sharma, V.K. (2015) Yoga Shiksha. Saraswati House Pvt. Ltd. New Delhi.

5th Semester

Practical : Paper Code: 21UPHY502-A

Time ; 3;00 Hours

Practical syllabus

Total 25 marks

1. **Physical fitness:** Shuttle Run, 800m race, push-ups, sit-ups.....05 marks
2. **Athletics:** Hammer, Steeple chase, Pole Vault,.....05 marks
3. **Game (Any two):** Kho-Kho, table-tennis, Baseball.....05 marks
4. **Record Work:** File for above listed activities.....05 marks
5. **Viva-Voce:**.....05 marks

120
35
✓

B.A. Health & Physical Education

6th Semester (OPTION-I)

Paper Name – Organization and Administration of Physical Education. (D.S.E)

Paper Code: 21UPHY601

Time: 3 hours

Theory: 60 marks

Internal assessment: 15 Marks

Important Instructions for Paper Setter and students:

1. The question paper will consist of 09 questions in all and will carry 12 marks each. The first question will be compulsory and comprise of 06 short answer types questions (2 marks each) and this question will be set from the whole syllabus.
2. Remaining 08 questions would be set unit wise, two questions from each unit. The candidate has to attempt four questions selecting at least one from each unit.

Unit-1

1. Meaning of organization and administration in physical education
2. Need of organization and administration in physical education
3. importance of organization and administration in physical education
4. objectives and guiding principles of organization and administration

Unit-2

1. Purchase of equipment's.
2. Care and maintenance of sports equipment's.
3. Care and maintenance of play fields.
4. Facilities of gymnasium hall and swimming pool.

Unit-3

1. Meaning and purpose of budget.
2. Meaning of record and registers and their importance.
3. Types of records and registers.
4. Qualities of a good administrator.

Unit-4

1. Meaning and types of tournaments
2. Merits and demerits of knockout and league tournaments.
3. Preparation of fixtures for
4. knockout tournaments.
5. Preparation of fixtures for league tournaments

Suggested readings: -

1. Kamlesh, M.L. (2006) Methods in physical education. Friends publication.
2. Two experienced professors. (2004) Organization, administration and recreation in physical education, Prakash Brothers.
3. Wakharkar, D.G. (2018) Handbook of physical education. Friends Publications
4. Clyde, G.K. (1953) Teaching methods for physical education. McGraw-Hill.
5. Malik, R. (2018) Teaching methods of physical education. Friends publication
6. William, J.F. (2019) The organization and administration of physical education. Creative media partners.

6th Semester

Practical : **Paper Code: 21UPHY601-A**

Time : 3;00 Hours

Total 25 marks

1. **Physical fitness:** Shuttle Run, 800m race, push-ups, sit-ups 05 marks
2. **Athletics:** Hitch Kick, Fosbury Flop, Parry O'Brien Techniques 05 marks
3. **Game (Any two):** Volleyball, Gymnastics, Shooting 05 marks
4. **Record Work:** File for above listed activities 05 marks
5. **Viva-Voce:** 05 marks

B.A.

Semester -vi

Session : 2023-24

Paper : Health & Exercise

Marks 100

Theory Examination :80

Internal Assessment :20

Max. Time : 3 hrs

Roll - 2101654

Note: There shall be nine questions in all. Question no. 1 consisting of eight short answer type questions covering the entire syllabus shall be compulsory. Two questions will be asked from each unit. Student will have to attempt one question from each unit. All questions shall carry equal marks.

Unit-I

- ✓ Concept of Health, fitness & wellness
- Need and importance of fitness & wellness
- Basic Physical fitness components
- Factors influencing fitness (Age, Sex, Climate, Diet, Exercise & Training)

Unit-II

- Major Health Problem in India
- Measurement of Health Related Physical fitness
- Body mass Index (BMI) or Quetelet index formula & calculations
- Health Organizations:- World Health Organization (WHO), Red Cross, Government Health agencies

Unit-III

- Meaning, Definition & Importance of Exercise therapy
- Role of Exercise/Physical activities in maintaining health
- Types of Exercises:- Aerobic exercise, an aerobic exercise, stretching exercise, strengthening exercises

Unit IV

- Basics of Exercise regime
- FITT formula (frequency, Intensity, Time & type of exercises for fitness)
- Warm up exercise
- Cool down exercise

Pranav

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SB-100

Swachh Bharat
(Open Elective)

Credits-2

Contact hours per week - 2hrs.

Maximum Marks - 100

External Examination - 60

Practical + Internal Assessment - 40

Max. 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. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Unit - I

- Explain Swachhata,
- Ways of awareness for Swachhata
- Personal Hygiene

Unit - II

- Health and Health Education
- Balance diet and Sanitation practices

Unit - III

- Solid waste management, Segregation Disposal
- Non-Biodegradable and Biodegradable waste

Unit - IV

- Compost pits, Biogas plants
- ways of campaigning
- Role of Gram panchayat in Swachhata

Shikha Kaur

Yoga & Health (Open Elective)

MPE-100

Credits-2

Contact hours per week - 2hrs.

Maximum Marks - 100

External Examination - 60

Practical + Internal Assessment - 40

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

- Meaning definition dimension and determinants of health
- Role of Physical activities in maintaining health
- Health problem in India, effect of alcohol, tobacco on health
- Preventive strategies for obesity, hypertension, coronary heart disease, diabetes in relation to physical activities and lifelong wellness

Unit - II

- Meaning & definition of food & nutrition
- Basic nutrition guideline and role of nutrition in daily life
- Concept of balanced diet caloric values of food
- Role of diet in weight management

Unit - III

- Introduction of Yoga : Meaning & definition
- Astanga Yoga, Yama, Niyama, Asana, Pranayama, Prathyahara, Dharama, Dhyana, and Samadhi;
- Yogic Practice: Place, Time, Clothes, Bathing, Diet before and after Yoga
- Surya Namaskar: methods and Benefits

Unit - IV

- Meaning of Asana, its types and principles
- Meaning of Pranayama, its types and principles
- Meaning of Kriyas, its types and principles
- Meaning of Bandhas, its types and principles

PRACTICAL ASANA

1. Shirsh Asana
2. Vipratarani
3. Hal Asana

Unit Health

DEPARTMENT OF BOTANY, CHAUDHARY BANSI LAL UNIVERSITY, BHIWANI

Scheme of Examination for Under-Graduate

Programme

Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2024-25(in phased manner)

Subject: Botany

SEMESTER-I

Remarks	Course	Paper(s)	Nomenclature of Paper	Credits	Hours/Week	Internal marks	External Marks	Total Marks	Exam Duration
Scheme A & C	CC-I MCC-I 4 credit	24UN- BOT-101	Diversity of Microbes, Algae, Fungi and Archegoniates	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.

SEMESTER-2

Remarks	Course	Paper(s)	Nomenclature of Paper	Credits	Hours/Week	Internal marks	External Marks	Total Marks	Exam Duration
Scheme A & C	CC-2 MCC-3 4 credit	24UN- BOT-201	Cell biology & Genetics	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.

SEMESTER-3

Remarks	Course	Paper(s)	Nomenclature of Paper	Credits	Hours/Week	Internal marks	External Marks	Total Marks	Exam Duration
Scheme A, B & C	CC-3 MCC-4 4 credit	24UN- BOT-301	Gymnosperms & Plant Systematics	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.

SEMESTER-4

Remarks	Course	Paper (s)	Nomenclature of Paper	Credits	Hours/Week	Internal marks	External Marks	Total Marks	Exam Duration
Scheme A, B & C	CC-4 MCC-6 4 credit	24UN- BOT- 401	Plant Anatomy & Embryology	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.

Course Type Total Credits	SEM	Course Code	Nomenclature of the Course	Credits	Contact hours per week	Internal Assessment Marks	End term Examination Marks	Total Marks	Examination Hrs.
MDC-1 03 Credits	I	24UN-BOT- MDC101	Fundamentals of Botany	02	02	15	35	50	03
			Practical	01	02	05	15	20	03
MDC-2 03 Credits	II	24UN-BOT- MDC201	Economic Botany	02	02	15	35	50	03
			Practical	01	02	05	15	20	03
MDC-3 03 Credits	III	24UN-BOT- MDC301	Ornamental Plants and Propagation	02	02	15	35	50	03
			Practical	01	02	05	15	20	03
VAC-1	I/II	24UN-BOT- VAC101	Environmental Studies	02	02	15	35	50	03

B.Sc. (PASS COURSE) BOTANY Semester V-VI

Semester V

Paper No.	Paper Code	Name of Paper	Credit	Contact hours per week	Max marks	Internal Assessment	Total
Paper I	20UBOTDSE5A	DSE I	2	2	40	10	50
Paper II	20UBOTDSE5B	DSE II	2	2	40	10	50
Paper III	20UBOTDSE5P	Botany Lab V	2	4	50	---	50
			6	8	130	20	150

Semester VI

Paper No.	Paper Code	Name of Paper	Credit	Contact hours per week	Max marks	Internal Assessment	Total
Paper I	20UBOTDSE6A	DSE I	2	2	40	10	50
Paper II	20UBOTDSE6B	DSE II	2	2	40	10	50
Paper III	20UBOTDSE6P	Botany Lab VI	2	4	50	---	50
			6	8	130	20	150

INTERNAL ASSESSMENT: - Internal Assessment for Practical Paper comprises of

- (i) Attendance 05
- (ii) Seminar/Presentation/Report 05
- Total 10

Discipline Specific Elective Course Offered by Department of Botany

<u>semester</u>	<u>6th semester</u>
<u>choose any one group of papers from given three)</u>	<u>(choose any one group of papers from given three)</u>
UBOT501A Economic Botany & Biotechnology -I	20UBOT601A Cell & Molecular Biology -I
UBOT501B Economic Botany & Biotechnology -II	
UBOT502A Analytical techniques in Plant Science -I	20UBOT602A Environmental Biology -I
UBOT502B Analytical techniques in Plant Science -II	20UBOT602B Environmental Biology -II
UBOT503A Genetics & Plant Breeding -I	20UBOT603A Biodiversity & Human Welfare -I
UBOT503B Genetics & Plant Breeding -II	
	20UBOT603B Biodiversity & Human Welfare -II

B.A (ECONOMICS)

Chaudhary Bansi Lal University, Prem Nagar, Bhiwani

Scheme of Examination of Bachelor of Economics

Curriculum and Credit Framework for Undergraduate Programmes as per NEP 2020

(Multiple Entry-Multiple Exit, Internships and Choice Based Credit System LOCF) with effect from the session 2024-25
(in phased manner)

Semester-1

Course Type	Applicable Scheme	Course Code	Nomenclature of the Course	Credits	Internal Assessment Marks	End term Examination Marks	Total Marks	Examination hours
CC-I, MCC-1	A, B & C	24UN-ECO-101	Micro Economics-I	4	30	70	100	3
MCC-2	C	24UN-ECO-102	Public Economics	4	30	70	100	3
CC-M1	A & B	24UN-ECO-103	Principles of Economics	2	15	35	50	3
CC-M1	C	24UN-ECO-104	Fundamental of Economics	4	30	70	100	3
MDC-I	A, B & C	From Available pool of Multidisciplinary Courses from a subject of different discipline as per NEP						
AEC-I	A, B & C	From Available pool of Ability Enhancement Courses as per NEP						
SEC-I	A, B & C	From Available pool of Skill Enhancement Courses as per NEP						
VAC-I	A, B & C	From Available pool of Value-Added Courses as per NEP						

Semester-2

Course Type	Applicable Scheme	Course Code	Nomenclature of the Course	Credits	Internal Assessment Marks	End term Examination Marks	Total Marks	Examination hours
CC-2, MCC-3	A, B & C	24UN-ECO-201	Macro Economics-I	4	30	70	100	3
DSEC-1	C	24UN-ECO-202	Economic Survey Techniques	4	30	70	100	3
CC-M2	A & B	24UN-ECO-203	Economy of Haryana	2	15	35	50	3
CC-M2	C	24UN-ECO-204	Socio-Economic Development of Haryana	4	30	70	100	3
MDC-2	A, B & C	From Available pool of Multidisciplinary Courses from a subject of different discipline as per NEP						
AEC-2	A, B & C	From Available pool of Ability Enhancement Courses as per NEP						
SEC-2	A, B & C	From Available pool of Skill Enhancement Courses as per NEP						
VAC-2	A, B & C	24UN-ECO-204	Internship of credit of 4-6 weeks duration after 2 nd Semester (Mandatory in case of exit)					

- Note:** 1. Students exiting the programme after second semester and securing 52 credits including 4 credits of summer internship will be awarded UG Certificate in Economics under Scheme A & B.
2. Students exiting the programme after second semester and securing 48 credits including 4 credits of summer internship will be awarded UG Certificate in Economics under Scheme C.

Semester-3

Course Type	Applicable Scheme	Course Code	Nomenclature of the Course	Credits	Internal Assessment Marks	End term Examination Marks	Total Marks	Examination hours
CC-3, MCC-4	A, B & C	24UN-ECO-301	Micro Economics -II	4	30	70	100	3
MCC-5	B & C	24UN-ECO-302	Economic History of India	4	30	70	100	3
MCC-2	B	24UN-ECO-102	Public Economics	4	30	70	100	3
CC-M3	A & C	24UN-ECO-303	Welfare Economics	4	30	70	100	3
CC-M3(V)	B	From Available pool of Minor (Vocational) Courses VOC-1						
MDC-3	A, B & C	From Available pool of Multidisciplinary Courses from a subject of different discipline as per NEP						
AEC-3	A, B & C	From Available pool of Ability Enhancement Courses as per NEP						
SEC-3	A, B & C	From Available pool of Skill Enhancement Courses as per NEP						
VAC-3	C	From Available pool of Value-Added Courses as per NEP						

Semester-4

Course Type	Applicable Scheme	Course Code	Nomenclature of the Course	Credits	Internal Assessment Marks	End term Examination Marks	Total Marks	Examination hours
CC-4, MCC-6	A, B & C	24UN-ECO-401	Macro Economics-II	4	30	70	100	3
MCC-7	B & C	24UN-ECO-402	Labour Economics	4	30	70	100	3
MCC-8	B & C	24UN-ECO-403	Indian Financial System	4	30	70	100	3
DSE-1	B & C	24UN-ECO-404	Environment Economics	4	30	70	100	3
CC-M4(V)	A, B & C	From Available pool of Minor (Vocational) Courses VOC-2						
AEC-4	A, B & C	From Available pool of Ability Enhancement Courses as per NEP						
VAC-4	A, B & C	From Available pool of Value-Added Courses as per NEP						
Internship	A, B & C	24UN-ECO-406	Internship of 4 Credits of 4-6 weeks duration after 4th Semester (Mandatory in case of exit if not done after 2 nd Semester)					

- Note:**
1. Students exiting the programme after fourth semester and securing 96 credits including 4 credits of summer internship will be awarded UG Diploma with major in Economics under Scheme A.
 2. Students exiting the programme after fourth semester and securing 100 credits including 4 credits of summer internship will be awarded UG Diploma with major in Economics under Scheme B.
 3. Students exiting the programme after fourth semester and securing 94 credits including 4 credits of summer internship will be awarded UG Diploma with major in Economics under Scheme C.

Semester-5	DSEC-1: Indian Economy	D.S.E	5	1	6	80	20	-	100
	DSEC-2: Economy of Haryana								
	DSEC-3: Agricultural Economics								
	DSEC-4: Introduction to Econometrics								
Semester-6	DSEC-5: Development Economics	D.S.E	5	1	6	80	20	-	100
	DSEC-6: International Economics								
	DSEC-7: Gender Economics								
	DSEC-8: History of Economic Thought								
Total			30	6	36	480	120	0	600

Vishy Kumar
2/1/2020

M.A (ECONOMICS)

Chaudhary Bansi Lal University

Scheme of Examination for Postgraduate Programme in Economics (M.A)

as per NEP 2020 Curriculum and Credit Framework for Postgraduate Pro

grammes (CBCS LOCF) with effect from the session 2025-26

Semester	Course Type	Course Code	Nomenclature of course	Theory (T)/ Practical (P)	Credits		Contact hours/ week				Internal Assessment Marks		End Term Examination Marks		Total Marks	Examination hours
					Total	L	T	P	Total	T	P	T	P			
1	CC-1	ECO-101	Micro-Economic Analysis-I	T	4		4	0	0	4	30		70		100	3
	CC-2	ECO-102	Macro-Economic Analysis-I	T	4		4	0	0	4	30		70		100	3
	CC-3	ECO-103	Statistics for Economics	T+P	3+1		3	0	2	5	T 20	P 10	T 50	P 20	100	3
	CC-4	ECO-104	Economics of Growth and Development-I	T	4	(22)	4	0	0	4	30		70		100	3
	DEC-1 (Any One)	ECO-105	Data Analytics-I	T+P	3+1		3	0	2	5	T 20	P 10	T 50	P 20	100	3
		ECO-106	Methodology of Economics	T	4		4	0	0	4	30		70		100	3
		ECO-107	Indian Economic Thought-I ✓	T	4		4	0	0	4	30		70		100	3
	SEMI NAR	ECO-108	Minor Project with Seminar		2		0	0	0	2	0		50		50 (Viva)	

1. Note- For theory class(L), 1 credit=1hr. for practical class(P), 1 credit=2hr.

2. Note – For practical classes (lab work, it skills in economics), the student shall be divided in to groups with maximum 30 students in one group

3. Note – Topic of minor project with seminar is related to current topic (economy) and viva in external.

Semester	Course Type	Course Code	Nomenclature of course	Theory (T)/ Practical (P)	Credits		Contact hours/ week				Internal Assessment Marks		End Term Examination Marks		Total Marks	Examination hours
					Total		L	T	P	Total						
2	CC-5	ECO-201	Micro-Economic Analysis-II	T	4	22	4	0	0	4	30	70	100	3		
	CC-6	ECO-202	Macro-Economic Analysis-II	T	4		4	0	0	4	30	70	100	3		
	CC-7	ECO-203	Mathematics of Economics	T	4		4	0	0	4	30	70	100	3		
	CC-8	ECO-204	Economics of Growth and Development-II	T	4		4	0	0	4	30	30	100	3		
	DEC-2 (Any One)	ECO-205	Data Analytics-II	T	3+1		3	0	2	5	T	P	T	P	100	3
		ECO-206	Computer Applications in Economics	T	4		0	0	0	4	30	70	100	3		
		ECO-207	Indian Economic Thought-II	T	4		0	0	0	4	30	70	100	3		
	CHM	CHM-208	Constitutional, Human and Moral Values, and IPR	T	2		2	0	0	2	15	35	50	3		
Internship	INT-200	An internship course of 4 Credits of 4-6 weeks duration during summer vacation after II nd semester is to be completed by every student. Internship can be either for enhancing the employability or for developing the research aptitude.									50	50	100			

PROGRAMME STRUCTURE AND SCHEME OF EXAMINATION
M.A. ECONOMICS
w.e.f/2023-24

(In accordance with NEP, 2020)

(2024-25)

Proposed
'X'

Semester: III

Total Credits: 30

Total Marks: 775

Sr. No.	Course Code	Type of Course	Nomenclature of the course	Credits			Examination Scheme			Total
				L	P	Total	Theory	Internal Assessment	Practical/Viva-voce examination	
I	23ECO301	CC	Public Finance ✓	4	-	4	80	20	-	100
II	23ECO302	CC	International Economics I ✓	4	-	4	80	20	-	100
III	23ECO303	CC	Indian Economy I ✓	4	-	4	80	20	-	100
IV	23ECO304	VEC	Issues of Contemporary Relevance	2	-	2	-	10	40	50
V	23ECO305	SEC	Term Paper	4	-	4	-	20	80	100
VI	23ECO306	AEC	Seminar	1	-	1	-	-	25	25
<p>The students are required to choose any two courses from the pool of DCECs. The students who opt for Econometrics-I and/or Advanced Data Analytics-I, in the third semester shall study Econometrics-II and/or Advanced Data Analytics-II in the fourth semester.</p>										
VII	23ECO307	DCEC	Econometrics-I	4	-	4	80	20	-	100
VIII	23ECO308	DCEC	Environmental Economics ✓	4	-	4	80	20	-	100
IX	23ECO309	DCEC	Regional Economics	4	-	4	80	20	-	100
X	23ECO310	DCEC	Advanced Data Analytics-I	3	1	4	40	10	50	100
XI	23ECO311	DCEC	Economics of Entrepreneurship	4	-	4	80	20	-	100
XII	23ECO312	DCEC	Agricultural Economics ✓	4	-	4	80	20	-	100
XIII	23ECO313	DCEC	Monetary Economics	4	-	4	80	20	-	100
XIV	23ECO314	DCEC	Research Methodology (Only for those students, who opt for writing dissertation in fourth semester)	4	-	4	80	20	-	100
<p>• Open Elective Course</p>										
		VAC	Open Elective Course to be opted from other disciplines offered by the other Departments of the University. ✓	2	-	2	80	20	-	100
		SEC (Non- CGPA)	Hobby Club (SB/ro Swatch Bharat)	1x2	-	2	As per University Policy framed for Hobby Club			
Total Marks										775

Note-1: L- Lecture, P- Practical, CC- Core Course, DCEC- Discipline Centric Elective Course, SEC- Skill Enhancement Course, AEC- Ability Enhancement Course, Vocational Education Course (VEC), value Added Course (VAC).

Note-2: For theory class (L), one credit = one hour and for practical class (P), one credit = 2 hours

Note-3: For practical classes (Advanced Data Analytics, term paper), the students shall be divided into groups with maximum of 30 students in one group.

Hobby Club

Periods / Credits
31 31 / 30

hobby club. 1+1=2

Amador

(2024-25)

Semester: IV

Sr. No.	Course Code	Type of Course	Nomenclature of the course	Total Credits: 24			Total Marks: 575			
				Credits			Examination Scheme			Total
				L	P	Total	Theory	Internal Assessment	Practical/ Viva-voce examination	
I	23ECO401	CC	Public Policy Analysis ✓							
II	23ECO402	CC	International Economics II ✓ <i>Ne</i>	4	-	4	80	20	-	100
III	23ECO403	CC ✓	Indian Economy II ✓ <i>R</i>	4	-	4	80	20	-	100
IV	23ECO404	VEC ✓	Issues of Contemporary Relevance <i>R</i>	2	2	4	80	20	-	100
V	23ECO405	AEC ✓	Seminar <i>D</i>	1	1	2	-	10	40	50
The students are required to choose any two courses from the pool of DCECs. Those who opt for PG. Dissertation are required to study one DCEC				1	-	1	-	-	25	25
VI	23ECO406	DCEC	Econometrics-II	4	-	4	80	20	-	100
VII	23ECO407	DCEC	Health Economics	4	-	4	80	20	-	100
VIII	23ECO408	DCEC	Economy of Haryana ✓ <i>S</i>	4	-	4	80	20	-	100
IX	23ECO409	DCEC	Advanced Data Analytics- II	3	1	4	40	10	50	100
X	23ECO410	DCEC	Micro Finance Operations	4	-	4	80	20	-	100
XI	23ECO411	DCEC	Labour Economics ✓	4	-	4	80	20	-	100
XII	23ECO412	DCEC	Financial Institutions and Markets ✓ <i>Ne</i>	4	-	4	80	20	-	100
XIII	23ECO413	DCEC	PG Dissertation	6	-	6	60	40	-	100
	-	SEC ✓ (Non-CGPA)	Hobby Club	-	1	1	20	20	-	40
Total Credits/Marks				24			575			

Note-1: L- Lecture, P- Practical, CC- Core Course, DCEC- Discipline Centric Elective Course, SEC- Skill Enhancement Course, AEC- Ability Enhancement Course, Vocational Education Course (VEC).

Note-2: For theory class (L), one credit = one hour and for practical class (P), one credit = 2 hours

Note-3: For practical classes (Advanced Data Analytics), the students shall be divided into groups with maximum of 30 students in one group.

24
25
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Amulya

Chemistry Department

2024-2025

UG + PG

Syllabi, Department of Chemistry, CBLU

w.e.f. session 2019-20

Semester-III

Credits=30

Marks= 600

Paper Code	Subjects	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Theory/Group discussion	Practical	Total	Theory/Group Discussion	Practical	Total	Exam	Internal Assessment	Practical	
19CHE-301	Spectroscopy-II	C.C.	04	--	04	04	--	04	80	20	--	100
19CHE-302	Inorganic Chemistry Special-I	D.S.E.	04	--	04	04	--	04	80	20	--	100
19CHE-303	Physical Chemistry Special - I											
19CHE-304	Organic Chemistry Special - I											
19CHE-305	Inorganic Chemistry Special - II	D.S.E.	04	--	04	04	--	04	80	20	--	100
19CHE-306	Physical Chemistry Special - II											
19CHE-307	Organic Chemistry Special - II											
19CHE-308	Inorganic Chemistry Special - III	D.S.E.	04	--	04	04	--	04	80	20	--	100
19CHE-309	Physical Chemistry Special - III											
19CHE-310	Organic Chemistry Special - III											
Open Elective - II	Open Elective - II	O.E.C.	02	--	02	02	--	02	40	10	--	50
	Practical VII	S.E.C.	--	02x04	08	--	04	04	--	--	50	50
19CHE-311	Inorganic Chemistry Special											
19CHE-312	Physical Chemistry Special											
19CHE-313	Organic Chemistry Special											
	Practical VIII	S.E.C.	--	02x04	08	--	04	04	--	--	50	50
19CHE-314	Inorganic Chemistry Special											
19CHE-315	Physical Chemistry Special											
19CHE-316	Organic Chemistry Special											
	Practical IX	S.E.C.	--	02x04	08	--	04	04	--	--	50	50
19CHE-317	Inorganic Chemistry Special											
19CHE-318	Physical Chemistry Special											
19CHE-319	Organic Chemistry Special											
Total			18	24	42	18	12	30	400	100	150	600

C.C. = Core Course

D.S.E. = Discipline Specific Elective Course

O.E.C. = Open Elective Course

S.E.C. = Skill Enhancement Course

Note: 1. For Open Elective Course, students will have to choose a course out of list of open electives offered by other UTD

2. Practicals VII, VIII and IX are based on theory papers.

3. Special paper will be allotted on the basis of merit of 1st semester result and choice.

M.Sc. Chemistry Syllabus w.e.f. 2025-26 in , Chaudhary Bansi Lal University, Bhiwani

Chaudhary Bansi Lal University
 Scheme of Examination for Postgraduate Programme M.Sc. Chemistry
 as per NEP 2020 Curriculum and Credit Framework for Postgraduate Programmes
 (CBCS LOCF) with effect from the session 2025-26
 Semester I

Course Code	Course Type	Nomenclature of the Course	Course Level	Theory (T)/ Practical (P)	Credits	Total Credits	Contact Hours per Week				Examination Scheme			Examination Hours for Internal Examinations	Examination Hours for End Term Examinations	
							L	T	P	Total	Internal Assessment Marks (170)	End Term Marks (410)	Total Marks (580)			
25PN-CHE-101	CC	Inorganic Chemistry-I	500-599	Th	4	24	4	0	0	4	30	70	100	1.5	3	
25PN-CHE-102	CC	Physical Chemistry-I	500-599	Th	4		4	0	0	4	30	70	100	1.5	3	
25PN-CHE-103	CC	Organic Chemistry-I	500-599	Th	4		4	0	0	4	30	70	100	1.5	3	
25PN-CHE-104	DEC	Industrial Chemistry	500-599	Th	3		3	0	0	0	3	20	50	70	1.5	3
25PN-CHE-105		or Analytical Chemistry	500-599													
25PN-CHE-106		or Chemistry in Everyday Life	500-599													
25PN-CHE-107	PC	Practical-I Inorganic Chemistry	500-599	P	3		0	0	6	6	20	50	70	3	6	

M.Sc. Chemistry Syllabus w.e.f. 2025-26 in , Chaudhary Bansi Lal University, Bhowani

25PN-CHE-108	PC	Practical-II Physical Chemistry Practical	500-599	P	3	0	0	6	6	20	50	70	3	6
25PN-CHE-109	PC	Practical-III Organic Chemistry Practical	500-599	P	3	0	0	6	6	20	50	70	3	6

Note(s) and Abbreviations: CC = Core Course, DEC = Discipline Elective Course, PC = Skill Enhancement Course; For discipline elective course, the student has to opt one course in the department/institute. All the PC course(s) are based on the theory papers.

Ch. Bansi Lal University, Prem Nagar, Bhiwani

Scheme of Examination for Chemistry Subject in Under Graduate Programmes
as per NEP 2020 Curriculum and Credit Framework for Undergraduate Programmes

(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) with effect from session 2024-25 (in a phased manner)

Semester-I

Course Type Total Credits	Applicable Scheme	Course Code	Nomenclature of the Course	Credits	Contact hours per week	Internal Assessment Marks	End term Examination Marks	Total Marks	Examination Hrs.
CC-1 MCC-1 04 Credits	Scheme A, B & C	24UN-CHE-101	Chemistry-I	03	03	20	50	70	05
			Practical	01	02	10	20	30	05
MCC-2 04 Credits	Scheme C Only	24UN-CHE-102	Physical Chemistry - I	03	03	20	50	70	05
			Practical	01	02	10	20	30	05
*CC-M1 02 Credits	Scheme A, B & D	24UN-CHE-103	Minor Chemistry - I	02	02	15	35	50	05
CC-M1 04 Credits	Scheme C	From Available CC-1/MCC-1 of 4 credits as per NEP							
MDC-1 03 Credits	Scheme A,B & C	From Available pool of Multidisciplinary Courses from a subject of different discipline as per NEP.							
AEC-1 02 Credits	A, B & C	From Available pool of Ability Enhancement Courses as per NEP							
SEC-1 03 Credits	A,B & C	From Available pool of Skill Enhancement Courses as per NEP							
VAC-1 02 Credits	A,B & C	From Available pool of Value Added Courses as per NEP							

*For students who opt Chemistry as a minor subject.

Handwritten signatures and initials:
 Dr. Pardeep, Pardeep, W, MR

Semester-III

Course Type Total Credits	Applicable Scheme	Course Code	Nomenclature of the Course	Credits	Contact hours per week	Internal Assessment Marks	End term Examination Marks	Total Marks	Examination Hrs.
CC-3 MCC-4 04 Credits	Scheme A, B,C & D	24UN-CHE-301	Chemistry - III	03	03	20	50	70	03
Practical			01	02	10	20	30	03	
MCC-5 04 Credits	Scheme B & C	24UN-CHE-302	Inorganic Chemistry - I	03	03	20	50	70	03
Practical			01	02	10	20	30	03	
MCC-2 04 Credits	Scheme B only	24UN-CHE-102	Physical Chemistry - I	03	03	20	50	70	03
Practical			01	02	10	20	30	03	
CC-M3 04 Credits	Scheme A, C & D	From Available CC-3/MCC-4 of 4 credits as per NEP							
CC-M3 (V) 04 Credits	Scheme B only	From Available pool of Minor (Vocational) Courses VOC-1							
MDC-3 03 Credits	Scheme A, B, C & D	From Available pool of Multidisciplinary Courses from a subject of different discipline as per NEP.							
AEC-3 02 Credits	Scheme A, B,C & D	From Available pool of Ability Enhancement Courses as per NEP							
SEC-3 03 Credits	Scheme A, B, C & D	From Available pool of Skill Enhancement Courses as per NEP							
VAC-3 02 Credits	Scheme C only	From Available pool of Value Added Courses as per NEP							

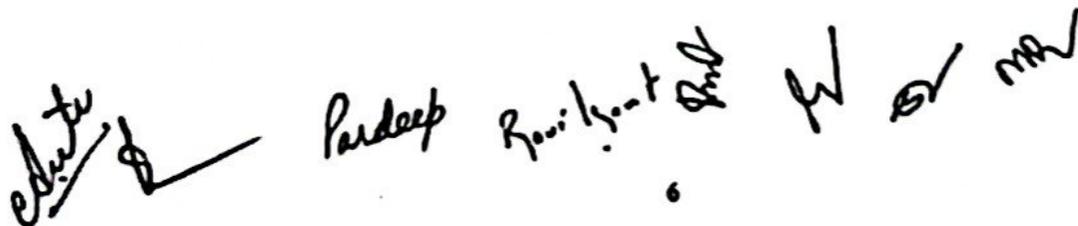
SEMESTER-V					
Paper Code	Paper Name	Type of Course	Credits (Theory/ Practical)	(Lectures/ Practical Classes)	Marks (External + Internal)
20UCHE501	Select any one a. ORGANOMETALLICS & BIODORGANIC b. CHEMISTRY OF HETEROCYCLIC COMPOUNDS	Discipline Specific Elective	2	2	40+10=50
20UCHE502	Select any one a. ORGANIC SPECTROSCOPY-I b. CHEMISTRY OF POLYMERS	Discipline Specific Elective	2	2	40+10=50
20UCHE503	PRACTICAL-V		2	2	40+10=50
SEMESTER-VI					
20UCHE601	Select any one a. ORGANIC SPECTROSCOPY-II b. INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE	Discipline Specific Elective	2	2	40+10=50
20UCHE602	Select any one a. QUANTUM MECHANICS MOLECULAR SPECTROSCOPY b. CHEMISTRY OF COSMETICS & PERFUMES	Discipline Specific Elective	2	2	40+10=50
20UCHE603	PRACTICAL-VI		2	2	40+10=50

Note: Skill Enhancement Courses are listed as follows to be offered in Semester IV, V & VI.

Semester-II

Course Type Total Credits	Applicable Scheme	Course Code	Nomenclature of the Course	Credits	Contact hours per week	Internal Assessment Marks	End term Examination Marks	Total Marks	Examination Hrs.
CC-2 MCC-3 04 Credits	Scheme A,B & C	24UN-CHE-201	Chemistry - II	03	03	20	50	70	03
			Practical	01	02	10	20	30	03
DSEC-1 04 Credits	Scheme C Only	24UN-CHE-202	Physical Chemistry Skill - I	03	03	20	50	70	03
			Practical	01	02	10	20	30	03
*CC-M2 02 Credits	Scheme A, B & D	24UN-CHE-203	Minor Chemistry - II	02	02	15	35	50	03
CC-M2 04 Credits	Scheme C Only	From Available CC-2/MCC-3 of 4 credits as per NEP							
MDC-2 03 Credits	Scheme A, B, C & D	From Available pool of Multidisciplinary Courses from a subject of different discipline as per NEP.							
AEC-2 02 Credits	Scheme A,B & C	From Available pool of Ability Enhancement Courses as per NEP							
SEC-2 03 Credits	Scheme A, B, C & D	From Available pool of Skill Enhancement Courses as per NEP							
VAC-2 02 Credits	Scheme A & C	From Available pool of Value Added Courses as per NEP							
Internship 04 Credits	Scheme A & C	Internship of 04 Credits of 4-6 weeks duration after 2 nd Semester							

*For students who opt Chemistry as a minor subject.



 Aditya, Pardeep, Ravishant, W, S, MV

Semester-IV

Credits = 29

Marks = 625

Paper Code	Subjects	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Theory/Group discussion	Practical	Total	Theory/Group Discussion	Practical	Total	Theory	Internal	Practical	
22CHE- 401 22CHE-402 22CHE-403	Inorganic Chemistry Special IV Physical Chemistry Special IV Organic Chemistry Special IV	D.S.E.	04	-	04	04	-	04	80	20	-	100
22CHE- 404 22CHE-405 22CHE-406	Inorganic Chemistry Special V Physical Chemistry Special V Organic Chemistry Special V	D.S.E.	04	-	04	04	-	04	80	20	-	100
22CHE- 407 22CHE-408 22CHE-409	Inorganic Chemistry Special VI Physical Chemistry Special VI Organic Chemistry Special VI	D.S.E.	04	-	04	04	-	04	80	20	-	100
21ENG-100	Communication Skills	A.E.C.C.	02	-	02	02	-	02	80	20	-	100
22CHE- 410 22CHE-411 22CHE-412	Practical X Inorganic Chemistry Special Physical Chemistry Special Organic Chemistry Special	S.E.C.	-	02×04	08	-	04	04	-	-	50	50
22CHE- 413 22CHE-414 22CHE-415	Practical XI Inorganic Chemistry Special Physical Chemistry Special Organic Chemistry Special	S.E.C.	-	02×04	08	-	04	04	-	-	50	50
22CHE- 416 22CHE-417 22CHE-418	Practical XII Inorganic Chemistry Special Physical Chemistry Special Organic Chemistry Special	S.E.C.	-	02×04	08	-	04	04	-	-	50	50
22CHE-419	Seminar/Journal club	A.E.C.C.	02	-	02	02	-	02	-	50	-	50
	Hobby Club				02			01		25		25
Total			16	24	42	16	12	29	320	155	150	625

D.S.E. = Discipline Specific Elective Course A.E.C.C. = Ability Enhancement Compulsory Course S.E.C. = Skill Enhancement Course

Note: 1. Practicals X, XI, XII are based on theory papers.

Semester-VI

Course Type Total Credits	Applicable Scheme	Course Code	Nomenclature of the Course	Credits	Contact hours per week	Internal Assessm ent Marks	End term Examinat ion Marks	Total Mar ks	Examination Fee		
CC-6 MCC-11 04 Credits	Scheme A, B & C	24UN-CHE- 601	Chemistry - VI	03	03	20	50	70			
			Practical	01	02	10	20	30			
MCC-12 04 Credits	Scheme B & C	24UN-CHE- 502	Organic Chemistry - II	03	03	20	50	70	05		
			Practical	01	02	10	20	30	05		
DSE-4 04 Credits Select one option	Scheme B & C	24UN-CHE- 603	Elective Chemistry- X	03	03	20	50	70	05		
			Practical	01	02	10	20	30	05		
		OR									
		24UN-CHE- 604	Elective Chemistry- XI	03	03	20	50	70	05		
			Practical	01	02	10	20	30	05		
		OR									
		24UN-CHE- 605	Elective Chemistry- XII	03	03	20	50	70	05		
			Practical	01	02	10	20	30	05		
		DSF-5 04 Credits Select one option	Scheme B & C	24UN-CHE- 606	Elective Chemistry- XIII	03	03	20	50	70	05
					Practical	01	02	10	20	30	05
OR											
24UN-CHE- 607	Elective Chemistry- XIV			03	03	20	50	70	05		
	Practical			01	02	10	20	30	05		
OR											
24UN-CHE- 608	Elective Chemistry- XV			03	03	20	50	70	05		
	Practical			01	02	10	20	30	05		
CC-M6	Scheme A only	From Available CC-6/MCC-11 of 4 credits as per NEP (Only for Minor subject as Chemistry)									


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04 Credits		
CC-M5 (V)	Scheme B only	From Available pool of Minor (Vocational) Courses VOC-3
CC-M6 (V)	Scheme C only	
CC-M7 (V)	Scheme A only	
SEC-4	Scheme C only	From Available pool of Skill Enhancement Courses As Per NEP


 chaitu Pardeep Sanjayant Singh for MA

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Chaudhary Bansi Lal University, Prem Nagar, Bhiwani
Scheme of Examination for the Zoology Subject in Under-Graduate Programme
Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020
w.e.f. 2024-25 (In a phased manner)

SEMESTER-1									
Applicable Scheme	Course Type	Course Code	Name of the Course	Credit	Contact Hours/Week	Internal Assessment marks	End Term Marks	Max. Marks	Exam Duration
Scheme A & C	CC-1 MCC-1 4 credit	24UN-ZOO-101	Animal Diversity of Non-Chordates	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
Scheme C only	MCC-2 4 credit	24UN-ZOO-102	Type study of Non-chordates	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
Scheme A	CC-M1 2 credit	24UN-ZOO-103	Introduction of Non-Chordates	1	1	10	20	30	3 hrs.
			Practical	1	2	5	15	20	4 hrs.
Scheme A & C	MDC-1 3 credit	24UN-ZOO-MDC104	Basics of Zoology-I	2	2	15	35	50	3 hrs.
			Practical	1	2	5	15	20	4 hrs.

SEMESTER-2									
Applicable Scheme	Course Type	Course Code	Name of the Course	Credit	Contact Hours/Week	Internal Assessment marks	End Term Marks	Max. Marks	Exam Duration
Scheme A & C	CC-2 MCC-3 4 credit	24UN-ZOO-201	Animal Diversity of Chordates	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
Scheme C only	SEC-1 4 credit	24UN-ZOO-SEC202	Applied Zoology	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
Scheme A only	CC-M2 2 credit	24UN-ZOO-203	Introduction of Chordates	1	1	10	20	30	3 hrs.
			Practical	1	2	5	15	20	4 hrs.
Scheme A & C	MDC-2 3 credit	24UN-ZOO-MDC204	Basics of Zoology-II	2	2	15	35	50	3 hrs.
			Practical	1	2	5	15	20	4 hrs.

SEC- Skill Enhancement Course Offered by the Department of Zoology

Fourth Semester

Sr. No.	Papers Name	Paper Code	Type of Courses	Credits	Contact Hours	External Marks	Internal Marks	Total Marks
1.	MEDICAL DIAGNOSTICS	20USECZ404	Theory(SEC)	3	3	80	20	100

Fifth Semester

Sr. No.	Papers Name	Paper Code	Type of Courses	Credits	Contact Hours	External Marks	Internal Marks	Total Marks
1.	PUBLIC HEALTH AND HYGIENE	20USECZ507	Theory(SEC)	3	3	80	20	100

Sixth Semester

Sr. No.	Papers Name	Paper Code	Type of Courses	Credits	Contact Hours	External Marks	Internal Marks	Total Marks
1.	APICULTURE & POULTRY FARMING	20USECZ607	Theory (SEC)	3	3	80	20	100

SEC- Skill Enhancement Course

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5th Sem

	BIOTECHNOLOGY							
4	AQUACULTURE	20UZOO504	Theory(DSE IB)	2	2	40	10	50
5	ECONOMIC ZOOLOGY	20UZOO505	Theory(DSE IB)	2	2	40	10	50
6	AQUACULTURE AND ECONOMIC ZOOLOGY	20UZOO506	Practical*(DSE IB)	2	4	50	-	50

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Sixth Semester

Sr. No.	Papers Name	Paper Code	Type of Courses	Credits	Contact Hours	External Marks	Internal Marks	Total Marks
1	APPLIED ZOOLOGY	20UZOO601	Theory(DSE IIA)	2	2	40	10	50
2	INSECT, VECTORS AND DISEASES	20UZOO602	Theory(DSE IIA)	2	2	40	10	50

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3	APPLIED ZOOLOGY, INSECT, VECTORS AND DISEASES	20UZOO603	Practical*(DSE IIA)	2	4	50	-	50
4	ECOLOGY AND EVOLUTION	20UZOO604	Theory(DSE IIB)	2	2	40	10	50
5	WILD LIFE CONSERVATION	20UZOO605	Theory(DSE IIB)	2	2	40	10	50
6	ECOLOGY AND EVOLUTION, WILD LIFE CONSERVATION	20UZOO606	Practical*(DSE IIB)	2	4	50	-	50

CC- Core Course

DSE- Discipline Specific Electives

*Practical will be conducted according to Theory Paper

** One DSE course to be selected by students from DSE IA and DSE IB; DSE IIA and DSE IIB courses in fifth and sixth semesters, respectively

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SEMESTER-3									
Applicable Scheme	Course Type	Course Code	Name of the Course	Credit	Contact Hours/Week	Internal Assessment marks	End Term Marks	Max. Marks	Exam Duration
Scheme A, B & C	CC-3 MCC-4 4 credit	24UN-ZOO-301	Cell Biology and Animal Genetics	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
Scheme B & C	MCC-5 4 credit	24UN-ZOO-302	Type study of Chordates	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
Scheme A, B & C	MDC-3 3 credit	24UN-ZOO-MDC303	Basics of Zoology-III	2	2	15	35	50	3 hrs.
			Practical	1	2	5	15	20	4 hrs.
SEMESTER-4									
Applicable Scheme	Course Type	Course Code	Name of the Course	Credit	Contact Hours/Week	Internal Assessment marks	End Term Marks	Max. Marks	Exam Duration
Scheme A, B & C	CC-4 MCC-6 4 credit	24UN-ZOO-401	Biomolecules and Mammalian Physiology	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
Scheme B & C	MCC-7 4 credit	24UN-ZOO-402	Aquaculture	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
Scheme B & C	MCC-8 4 credit	24UN-ZOO-403	Pest Management	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
Scheme B & C	DSE-1 4 credit Select one option	24UN-ZOO-404	Biodiversity and Wildlife Management	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.
		24UN-ZOO-405	Cytogenetics	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	4 hrs.

Home Science (MDC)

Session: 2024-25			
Part A - Introduction			
Subject	Bachelor of Home science		
Semester	III		
Name of the Course	Basics of Home Science III		
Course Code	24UN-HOM- MDC301		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/VA C)	MDC-3		
Level of the course (As per Annexure-I)	100-199		
Pre-requisite for the course (if any)	Senior Secondary(10+2)		
Course Learning Outcomes(CLO):	<p>After completing this course, the learner will be able to:</p> <ol style="list-style-type: none"> 1.To obtain knowledge about dietary management of diseases and modifications of normal diet for therapeutic purposes and preservation. 2.To impart knowledge about traditional embroideries of India and stain removal 3.To inculcate the skills of effective guidance & counseling 4.To impart knowledge about traditional embroideries of India and stain removal <hr style="width: 20%; margin-left: 0;"/> <p>5*.To impart practical training on various aspects of home science</p>		
Credits	Theory	Practical	Total
	2	1	3
Contact Hours	2	2	4

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Max. Marks: 70

Internal Assessment Marks: 15(T)+5(P)=20

End Term Exam Marks: 35(T)+15(P)=50

Time: 3hrs (T)
4hrs (P)

Part B- Contents of the Course

Instructions for Paper- Setter: The examiner will set nine questions in all, Selecting four questions from each unit and one compulsory objective type question.

Instructions for the candidate: The candidates will attempt five questions in all, selecting atleast one question from each unit as well as compulsory questions. Each question shall carry 07 Marks.

Unit	Topics	Contact Hours
I	<ul style="list-style-type: none">➤ Meal Planning: Its Meaning & Principles➤ Planning Diet for School Going Children & Adolescents; Food Preservation➤ Principles and Home Scale Methods	8
II	<ul style="list-style-type: none">➤ Traditional Embroideries of India: Chikankari, Phulkari, Kantha, Chamba And Kasuti.➤ Soaps and Detergents, Starches, Blues And Bleaches➤ Stain Removal-Classification of Stains, Methods of Removing Different Types of Stain	7
III	<ul style="list-style-type: none">➤ Physical Changes, Health Problems and Adjustments in Old Age➤ Guidance: Meaning and Its Types➤ Skills and Characteristics of Effective Counseling	9
IV	<ul style="list-style-type: none">➤ Various Color Schemes and its Application. Table Etiquettes and Table Setting – Formal and Informal➤ Communication- Meaning, Importance and Types➤ Major Nutritional Problems in India; PEM, IDD, Anemia	8
V*	<ul style="list-style-type: none">➤ Prepare a Counseling Aid for Children➤ Preparation of Chocolate Cake & Pineapple Cake➤ Make Rangoli/Alpana on Floor➤ Prepare Samples of Embroidery Stitches / Tie & Dye	30

Suggested Evaluation Methods

MU

Internal Assessment:**> Theory**

- Class Participation: 04
- Seminar/presentation/assignment/quiz/class test etc.:04
- Mid-Term Exam: 07

> Practical

- Class Participation:
- Seminar/Demonstration/Viva-voce/Lab records etc.:05
- Mid-Term Exam:

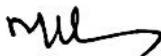
End Term Examination:
35

15

Part C-Learning Resources**Recommended Books/e-resources/LMS:**

- Srilakshmi, B. (2001) Food Science (2nd edition). New Age International Pvt. Ltd. Publishers: New Delhi.
- Mudambi, S.R. and Rao S. Fundamentals of Food & Nutrition. (2nd ed.) Wiley Eastern Ltd.: New Delhi.
- Bamiji, M.S.; Rao, N.P. and Reddy, V. (Editors) (1999). Textbook of Human Nutrition. New Delhi: Oxford and IBH Publishing Co. Pvt. Ltd.
- Saraswathi, T.S. & Kaur, B. (1993): The development of Children, New York: Scientific American Books.
- Srivastava S., Rani K.S. (2014): Textbook of Human Development, S.Chand publication, New Delhi.
- Tara L. Kuther (2022). Lifespan Development: Lives in Context. A Topical Approach, Second Edition. Western Connecticut State University, USA.
- Bela Bhargava (2005). Family Resource Management and Interior decoration. Apple Printer and V.R. Printers, Jaipur.
- Premalatha Mullick (2011). Textbook of Home Science, Kalyani Publishers, New Delhi.
- Sushma Gupta, Neeru Garg and Amita Aggarwal (1993). Home Management, Hygiene and Physiology. Kalyani Publishers, Ludhiana.
- Sushma Gupta, Neeru Garg and Renu Saini, 2013. Text book of clothing, textiles and laundry Kalyani Pub.
- Ray, G.L. (2004). Extension education and Management. Kalyani Publisher, New Delhi.
- Reddy, A.A.(2001). Extension Education. Bapatla : Sri Lakshmi Press.

*Applicable for courses having practical component.



Psychology Session
2025-26

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DEPARTMENT OF PSYCHOLOGY
CHAUDHARY BANSILAL UNIVERSITY, BHIWANI

Established by the State ACT 25 of 2014

Scheme of Examination for Undergraduate Programme in the Subject of Psychology as per NEP 2020 (Multiple Entry-Exit, Internships and Choice Based Credit System- Learning Outcome Based) w.e.f. 2024-25 in phased manner.

Semester	Course Type	Applicable Scheme	Course Code	Nomenclature of paper	Credits	Credits		Contact hours	Internal Assessment marks		End term Exam. Marks		Max. Marks	Duration of End Term exam (Hrs T/P)	
						Theory (T)	Practical (P)		T+P	T	P	T			P
1	✓ CC-1	A,B,C	24UN-PSY-101	Foundations of Psychology	4	3	1	5	20	10	50	20	100	3/3	
	MCC-1														
	MCC-2	C	24UN-PSY-102	Basic Statistics in Psychology	4	3	1	5	20	10	50	20	100	3/3	
	✓ CC-M1	A,B,D	24UN-PSY-103	Youth Psychology	2	2	NA	2	15	-	35	00	50	3	
	CC-M1*	C	From the available CC-1/MCC-1 of 4 Credits from subject other than Major.												
	✓ MDC-1	A,B,C,D	24UN-PSY-MDC101	Introduction to Psychology	3	2	1	4	15	05	35	15	70	3/3	
	✓ VAC-1	A,B,C,D	24UN-PSY-VAC101	Human Values And Ethics	2	2	NA	2	15	-	35	00	50	3	
	AEG-1	From Available pool of Ability Enhancement Courses as per NEP (2Credit)													
	SEC-1	From Available pool of Skill Enhancement Courses as per NEP(3Credit)													

*For Students who opt Psychology as a major subject.

Semester	Course Type	Course Code	Applicable Scheme	Nomenclature of paper	Credits	Credits		Contact hours T+P	Internal Assessment marks		End term Exam. Marks		Max. Marks	Duration of End Term exam (Hrs T/P)
						Theory (T)	Practical (P)		T	P	T	P		
						2	✓ CC-2		24UN-PSY-201	A,B,C	Social Psychology	4		
	MCC-3													
	DSEC-1	24UN-PSY-202	C	Counselling Psychology	4	3	1	5	20	10	50	20	100	3/3
	✓ CC-M2	24UN-PSY-203	A,B,D	Understanding and Managing Stress	2	2	NA	2	15	---	35	---	50	3
	CC-M2*		C	From the available CC-2\MCC-3 of 4 Credits from subject other than Major.										
	✓ MDC-2	24UN-PSY-MDC201	A,B,C,D	Understanding of Abnormal Behavior	3	2	1	4	15	5	35	20	75	3/3
	VAC-2	24UN-PSY-VAC201	A,B,C,D	Emotional Intelligence	2	2	NA	2	15	---	35	--	50	3/3
	VAC-2	From Available pool of Ability Enhancement Courses as per NEP (2Credit)												
	SIC-2	From Available pool of Skill Enhancement Courses as per NEP (3Credit)												
	Internship	Internship of 4 Credits of 4-6 weeks duration after 2nd Semester (Mandatory in case of exit)												
Exit Option		Under Graduate Certificate in Discipline with 52 credits												

***For Students who opt Psychology as a major subject.**

Note:

1. CC of concerned semester will be CC-M (4 credits) for non-psychology students.
2. AEC/SEC/VAC/VOC course(s) will be chosen from the pool of courses.
3. Discrepancy, if any, in the scheme will be dealt as per ordinance for UG programs prepared by Chaudhary Bansi Lal University, Bhiwani.
4. The scheme will be implemented in phased manner with effect from the session 2024-25.

Sem ester	Course Type	Course Code	Applicable Scheme	Nomenclature of paper	Credits	Credits		Contact hours T+P	Internal Assessment marks		End term Exam. Marks		Max. Marks	Duration of End Term exam.(Hrs) T/P
						Theory(T)	Practical(P)		T	P	T	P		
3	MCC-3MCC-4	24UN-PSY-301	A,B,C	Experimental Psychology	4	3	1	5	20	10	50	20	100	3/3
	MCC-5	24UN-PSY-302	B,C	Personality	4	3	1	5	20	10	50	20	100	3/3
	MDC-3	24UN-PSY-MDC301	A,B,C,D	Health and Wellbeing	3	2	1	4	15	05	35	15	70	3/3
	VAC-3	24UN-PSY-VAC301	C	Emotional Intelligence	2	2	NA	2	15	00	35	00	50	3
	SEC-3	From Available pool of Skill Enhancement Courses as per NEP												
	AEC-3	From Available pool of Value Added Courses as per NEP												

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Seme Ster	Course Type	CourseCode	Applicable Scheme	Nomenclature of paper	Credits	Credits		Contact hours T+P	Internal Assessment marks		End term Exam. Marks		Max. Marks	Duration of End Term exam.(Hrs T/P)
						Theory (T)	Practical (P)		T	P	T	P		
4		24UN-PSY-401	A,B,C	Developmental Psychology	4	3	1	5	20	10	50	20	100	3/3
		24UN-PSY-402	B,C	Intelligence	4	3	1	5	20	10	50	20	100	3/3
		24UN-PSY-403	B,C	Cognitive Psychology	4	3	1	5	20	10	50	20	100	3/3
		24UN-PSY-404	B,C	Health Psychology	4	3	1	5	20	10	50	20	100	3/3
Or														
		24UN-PSY-405	B,C	Industrial and Organizational Psychology	4	3	1	5	20	10	50	20	100	3/3
		24UN-PSY-VAC401	A,B,C,D	Art of Happiness	2	2	NA	2	15	00	35	00	50	3/3
				Internship of 4 Credits of 4-6 weeks duration after 4th Semester (Mandatory in case of exit), if not done after 2 nd semester.										

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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 Semester-I	Foundations of Psychology	C.C.	04	04	08	04	02	06	60	15	25	100
20 Upsy 201 Semester-II	Social Psychology	C.C.	04	04	08	04	02	06	60	15	25	100
20 Upsy 301 Semester-III	Psychological Disorders	C.C.	04	04	08	04	02	06	60	15	25	100
20 Upsy 401 Semester-IV	Statistical Methods & Psychological Research	C.C.	04	04	08	04	02	06	60	15	25	100
20 Upsy 501 Semester-V	Psychological Intervention	D.S.E.	04	04	08	04	02	06	60	15	25	100
20 Upsy 502 Semester-V	Bio-Psychology											
20 Upsy 503 Semester-V	Developmental Psychology											
20 Upsy 601 Semester-VI	Counselling Psychology	D.S.E.	04	04	08	04	02	06	60	15	25	100
20 Upsy 602 Semester-VI	Health and Wellbeing											
20 Upsy 603 Semester-VI	Industrial and Organizational Psychology											
Total			24	24	48	24	12	36	240	90	150	600
20 Upsy 701 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

3 344

Foundation of Psychology

Ist sem

2025-26

Ist sem

Chaudhary Bansi Lal University, Bhiwani

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

Undergraduate Programs (Psychology) Syllabus , Semester-I

Session:2024-25			
Part A-Introduction			
Subject	Psychology		
Semester	I		
Name of the Course	Foundations of Psychology		
Course Code	24UN-PSY-101		
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC)	CCI/MCCI		
Course Learning Outcomes(CLO):	After completing this course, the learner will be able to: 1. Demonstrate an understanding of foundational concepts of psychology and human behaviour. 2. Understand the structure and function of sensory processes. 3. Comprehend theoretical concepts of emotion and motivation. 4. Understand various theories and factors affecting personality and intelligence. 5. Conduct experiments and tests related to Foundations of Psychology		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3Per week	2per week/Per Group	5per week /per Group
Max.Marks:100 Internal Assessment Marks:30 End Term Exam Marks: 70		Time:3 Hours (Each theory & practical)	

Part B-Contents of the Course

Instructions for Paper- Setter: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 5(2mark each) short answer questions uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 10 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.

Unit	Topics	Contact Hours
I	Introduction: Nature and Scope of Psychology; Psychology as a Science and Present Status. Methods to Study Behaviour: Interview, Case study and Experimental.	11
II	Pre -Scientific Psychology: Eastern and Western Thoughts. Schools of Psychology: Associationism, Structuralism, Functionalism, Gestalt (Subject Matter, Methods and Contribution)	11
III	Sensation: Nature, Characteristics and Types Structure and Functions of Visual and Auditory sensation. Attention: Nature and Characteristics.	11
IV	Personality: Nature, Factors Affecting and Theories: Allport, Cattell and Eysenck. Intelligence: Nature, Factors Affecting and Theories: Spearman, Thurstone ,and Cattell.	12
	<p style="text-align: center;">Practical</p> <ol style="list-style-type: none"> 1. NEO-FFI/Personality Test 2. Retinal Colour Zones/Colour Blindness 3. Simple Reaction Time 4. Verbal Test of Intelligence. 5. Performance Test of Intelligence/RPM. 6. 16PFQuestionnaire 7. GMAT <p>Note: Students will perform at least five practical. The examiner will allot one practical at the time of end term examination for evaluation.</p>	30

Part B-Contents of the Course		
<p>Instructions for Paper- Setter: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 5(2mark each) short answer questions uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units .Each question will carry 10 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.</p>		
Unit	Topics	Contact Hours
I	Introduction: Meaning, History, Scope and Relationship of Social Psychology with Anthropology and Sociology. Determinants of Social Behaviour. Method: Observation, Sociometry and Survey.	11
II	Socialization: Nature, Agencies and Factors Affecting Socialization. Person perception: Nature and Determinants. Attitude: Nature, Formation, Change and Resistance to Change.	11
III	Interpersonal Attraction: Nature and Determinants. Pro-social behaviour: Meaning, Stages and Determinants. Aggression: Nature, Causes and Control.	11
IV	Group Behaviour: Meaning, Formation, Types and Functions of Group. Leadership: Nature, Characteristics and Types .Collective Behaviour: Crowd and Mob.	12
	<p style="text-align: center;">Practical</p> <ol style="list-style-type: none"> 1. Sociometry 2. Measurement of Attitude 3. Altruism Scale 4. Stereotype Scale 5. Aggression Scale 6. Prejudice Scale 7. Leadership Styles <p>Note: Students will perform at least five practical. The examiner will allot one practical at the time of end term examination for evaluation.</p>	30

Experimental Psychology

3rd sem

2025-26

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Part B-Contents of the Course

Instructions for Paper- Setter: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 5 short answer questions uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 10 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.

Unit	Topics	ContactHours
I	Experimental Psychology:Nature and Historical Development.Experimental Method. Psychophysics: Nature, Concept of Continuum, and Problems.Methods of Classical Psychophysics.	11
II	Attention: Nature; Selective Attention and Divided Attention Perception:Nature and Characteristics.Perception of Form,Depth and Movement.	11
III	Learning:Definition,Factors Affecting.Theories of Learning:Trial and Error,Insight and Classical Conditioning. Verbal Learning:Nature, Material,Method and Organizational Processes	11
IV	Memory:Process and Types, Methods to Study Memory. Thinking:Nature-and Types.	12
	<p>Practical</p> <ol style="list-style-type: none">1. Absolute Limen byMethod ofConstantStimuli2. Differential Limen by Method of limits.3. Muller-Lyre Illusion4. Bilateral Transfer of Training5. Maze Learning6. Experiment on STM/LTM7. Span of Attention <p>Note:Students will perform at least five practical.The examiner will allot one practical at the time of end term examination for evaluation.</p>	30

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Developmental Psychology

4th sem

2025-26

76

Part B- Contents of the Course

Instructions for Paper- Setter: The question paper will consist of **NINE** questions out of which the candidate would be required to attempt **FIVE** questions. The first question will be compulsory and will have 5 short answer questions uniformly spread over entire syllabus. The remaining **EIGHT** questions will be set taking **TWO** questions from each of the four units. Each question will carry 10 marks. The candidate would be required to attempt **ONE** question from each unit in addition to compulsory question.

Unit	Topics	Contact Hours
I	Human Development: Concept, Principles and Determinants. Major Perspectives: Psychodynamic, Behavioural and Contextual.	11
II	Earliest Development: Basic of Genetics, Transmission of Genetics information . Prenatal Development: Fertilization, Stages and Threats to Development.	11
III	Infancy and Childhood: Physical, Cognitive and Social Development. Adolescence: Physical and Sexual Maturation, Crisis in Adolescence	11
IV	Aging: Concept, Factors: Biological, Psychological and Sociocultural.	12
	<p>Practical</p> <ol style="list-style-type: none">1. Family Environment Scale2. Emotional Maturity Scale3. Youth Problem Inventory4. Aggression Questionnaire5. Vineland Social Maturity Scale6. Impulsiveness scale7. Case study. <p>Note: Students will perform at least five practical. The examiner will allot one practical at the time of end term examination for evaluation.</p>	30

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Developmental Psychology
5th sem
2025-26

71

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.

Adolescents: 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 New York: Thomson Wadsworth.
5. Singh, R. & Shyam, R. (2008) Comprehensive Statistics for Behavioural Sciences (in Hindi). Sanjay Prakashan, Delhi.

S-546

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

Note: Students are to conduct and report atleast five(5) practicals.
The examiner will allot one practical at the time of examination.

S. Singh

Counselling Psychology

6th sem

2025-26

6200

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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 (7th Ed.) 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. 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.

S. Singh

Youth Psychology
1st sem - Minor
2025-26

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Part B-Contents of the Course

Instructions for Paper- Setter: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 7(1 mark each) short answer questions uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 07 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.

Unit	Topics	Contact Hours
I	Introduction: Defining youth; Youth across cultures; Formulation of youth identity; Concerns of youth in Indian context.	7
II	Youth development and Relationships: Relationship with family members and friends; Romantic relationships;	7
III	Today's Youth: Issues and challenges: Youth and risk behaviours; Employment and education	7
IV	Developing Youth: Positive youth development; Building resources: Hope, Optimism and Resilience	7

Suggested Evaluation Methods

Internal Assessment:	End Term Examination:
<ul style="list-style-type: none"> > Theory • Class Participation: 04Marks • Seminar/presentation/assignment/quiz/classstestetc.: 04Marks • Mid-Term Exam: 07Marks 	<p>35Marks</p>

Part C-Learning Resources

Recommended Books/e-resources/LMS:

- Agochia, D. (2010). Life competencies for Adolescents: Training Manual for Facilitators, Teachers and Parents. New Delhi: Sage Publication. Baron, R.A., Byrne, D. & Bhardwaj, G (2010).
Social Psychology (12th Ed). New Delhi: Pearson Berk, L. E. (2010). Child Development (9th Ed.). New Delhi: Prentice Hall.
Brown, B. B., R. Larson, & T. S. Saraswathi. (2002). The world's youth: Adolescence in eight regions of the globe. New York: Cambridge University Press. (Chapters 1 & 2).
Carr, A. (2004), Positive Psychology: The Science of Happiness and Human Strength, Brunner Routledge Connidis,
I. A. (2010). Family ties and aging. Sage. (Chapters 8 & 10)

Understanding & Managing stress

2nd sem - Minor

82

2025-26

Part B-Contents of the Course

Instructions for Paper- Setter: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 7 short answer questions (1 mark each) uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 7 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.

Unit	Topics	Contact Hours
I	Stress: Nature, Symptoms and Sources of Stress.	7
II	Stress and Health: Effect of Stress on Cardio-Vascular System, Endocrine System and Immune System.	7
III	Managing Stress: Methods- Yoga, Meditation, Relaxation Training and Biofeedback	7
IV	Coping with Stress: Use of Distraction, Imagery and resilience	7

Suggested Evaluation Methods

<p style="text-align: center;">Internal Assessment:</p> <ul style="list-style-type: none"> ➤ Theory(15Marks) • Class Participation:04Marks • Seminar/presentation/assignment/quiz/class test etc.:04 Marks • Mid-Term Exam: 07Marks 	<p>End Term Examination:</p> <p>35 Marks</p>
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Part C-Learning Resources

Recommended Books/e-resources/LMS:

Carr A. (2004). Positive Psychology: The science of happiness and human strength. UK: Routledge.

Di Matteo, M.R. & Martin, L.R. (2002). Health Psychology, New Delhi: Pearson.

Neiten, W. & Lloyd, M.A. (2007). Psychology applied to Modern life. Thomson Detmar Learning

Taylor, S.E. (2006). Health Psychology, 6th Edition, New Delhi: Tata McGraw Hill.

Personality
3rd sem - Minor

2025-26

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Part B-Contents of the Course

Instructions for Paper- Setter: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 5 short answer questions uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 10 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.

Unit	Topics	Contact Hours
I	Introduction: Nature, Conceptual History; Nomothetic and Ideographic approaches Determinants of personality: Genetic and environmental.	11
II	Personality theory: Nature, components, criteria for theory. Psychoanalytic Theories: Sigmund Freud, Carl Jung.	11
III	Trait Theories: Cattell, Allport, Eysenck and Five Factor Model.	11
IV	Personality Assessment: Self-report inventories, Projective techniques, Phenomenological Perspective: Carl Rogers, Abraham Maslow's Humanism	12
	<p>Practical</p> <ol style="list-style-type: none"> 1. NEO Personality 2. Eysenck personality questionnaire EPQ/EPI 3. Word Association Test (WAT) 4. Sentence Completion test 5. 16 PF 6. TAT <p>Note: Students will perform at least five practical. The examiner will allot one practical at the time of end term examination for evaluation.</p>	30

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Introduction to Psychology

MDC- 1st sem

2025-26.

85

Part B-Contents of the Course

Instructions for Paper- Setter: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 7 short answer questions (1 mark each) uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 7 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.

Unit	Topics	Contact Hours
I	Psychology: Nature, Historical background and Fields of Psychology, Emergence of Psychology as a Science.	7
II	Methods: Experimental, Interview, Observation and Case Study.	7
III	Learning: Nature and Factors Affecting. Classical and Instrumental Conditioning.	7
IV	Memory: Nature, Study Methods, Factors Affecting Memory. Types of Memory.	7
	Practical 1. Sound Localization. 2. Experiment on STM 3. Experiment on LTM 4. Study of Primacy and Regency Effect 5. Simple Reaction time. 6. Observation. 7. Transfer of Training. Note: Students will perform at least five practical. The examiner will allot one practical at the time of end term examination for evaluation.	32

Suggested Evaluation Methods

Internal Assessment:	End Term Examination:
<ul style="list-style-type: none"> ➤ Theory (15Marks) • Class Participation: 04Marks • Seminar/presentation/assignment/quiz/classstestetc.: 04Marks ➤ Mid-Term Exam: 07Marks ➤ Practical (5Marks) • Class Participation: Nil • Seminar/Demonstration/Viva-voce/Labrecordsetc.: 05Marks • Mid-Term Exam: Nil 	35Marks 15Marks

Part C-Learning Resources

Understanding Abnormal Behaviour

86

MDC - 2nd sem

2025-26

Part B-Contents of the Course

Instructions for Paper- Setter: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 7 short answer questions (1 mark each) uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 7 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.

Unit	Topics	Contact Hours
I	Abnormal Behaviour: Meaning, Criteria and Characteristics. Causes of Abnormal Behaviour.	7
II	Models of Abnormality :Biological, Psychological and Socio-cultural.	7
III	Anxiety Based Disorders: Obsessive Compulsive Disorder, Phobia, Panic Attack: Etiology and Management.	7
IV	Psychotherapies: Psychoanalysis, Behaviour Therapy and Cognitive Behaviour Therapy.	7
	Practical 1. Obsessive-compulsion Checklist 2. Depression Inventory 3. Adjustment Inventory 4. Mental Health Questionnaire 5. Anxiety Inventory 6. PGI-Memory Scale 7. Defence Mechanism Inventory Note: Students will perform atleast five practical. The examiner will allot one practical at the time of end term examination for evaluation.	32

Suggested Evaluation Methods

Internal Assessment:	End Term Examination:
<ul style="list-style-type: none"> ✓ Theory(15 Marks) • Class Participation:04 Marks • Seminar/presentation/assignment/quiz/classstestetc.:04 Marks • Mid-Term Exam: 07 Marks 	35 Marks
<ul style="list-style-type: none"> ✓ Practical (5Marks) • Class Participation: Nil • Seminar/Demonstration/Viva-voce/Labrecordsetc.:5Marks • Mid-Term Exam: Nil 	15 Marks

Part C-Learning Resources

Human Values & Ethics

Ist - sem
2025-26.

Part B-Contents of the Course

Instructions for Paper- Setter: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 7 (1 mark each) short answer questions uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 7 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.

Unit	Topics	Contact Hours
I	Human Values and Ethics: Meaning and nature of human values.	07
II	Significance of human values in life; Relation between values and ethics.	07
III	Relevance of Human values: Integrity Empathy, Loksangrah, Brahmvihara.	07
IV	The of Naya (Jainism), Deontology, Virtue Ethics, Utilitarianism ory .	07

Suggested Evaluation Methods

<p style="text-align: center;">Internal Assessment:</p> <ul style="list-style-type: none"> > Theory(15Marks) • Class Participation:04Marks • Seminar/presentation/assignment/quiz/classstetetc.:04Marks • Mid-Term Exam: 07Marks 	<p>End Term Examination:</p> <p>35Marks</p>
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Part C-Learning Resources

Recommended Books/e-resources/LMS:

Sandel, M. J. (2010). Justice: What's the right thing to do? Farrar, Straus and Giroux.

Singer, P. (2011). Practical ethics (3rd ed.). Cambridge University Press.

Vaughn, L. (2016). Bioethics: Principles, issues, and cases (3rd ed.). Oxford University Press.

Ferrell, O. C., Fraedrich, J., & Ferrell, L. (2020). Business ethics: Ethical decision making & cases (12th ed.). Cengage Learning.

Pojman, L. P., & Vaughn, L. (Eds.). (2014). Moral philosophy: A reader (5th ed.). Oxford University Press.

Rachels, J., & Rachels, S. (2018). The elements of moral philosophy (9th ed.). McGraw-Hill Education.

MacKinnon, B., & Fiala, A. (2018). Ethics: Theory and contemporary issues (9th ed.). Cengage Learning.

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

Choose One: 20UCS501	Choose One: Database Management Systems	Discipline Specific Elective	3	3	40+10=50
20UCS502	Discrete Structures				
20UCS503	Internet Technologies				
20UCS504	Artificial Intelligence				
Choose One: 20UCS505	Choose One: Software Engineering	Discipline Specific Elective	3	3	40+10=50
20UCS506	Computer Networks				
20UCS507	Computer Architecture & Organization				

SEMESTER -VI

Choose One: 20UCS601	Choose One: Data Mining	Discipline	3	3	40+10=50
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20UCS602	Mobile Computing and Applications	Specific Elective			
20UCS603	E-Commerce Technologies				
20UCS604	Object Oriented Programming using C++				
Choose One:	Choose One:	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					
Choose One:	Choose One:	Skill Enhancement	3	3	40+10-50
20USECCS401	Office Automation Tools				
20USECCS402	HTML Programming				
20USECCS403	MySQL				
20USECCS404	Multimedia and Applications				
SEMESTER-V					
Choose One:	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					
Choose One:	Choose One:	Skill Enhancement	3	3	40+10-50
20USECCS601	Software Testing Concepts				
20USECCS602	Android Programming				
20USECCS603	XML Programming				
20USECCS604	R Programming				

Operating system

Semester-3

Course Type	Applicable Scheme	Course Code	Nomenclature of the Course	Credits			Contact hours: L: Lecture P: Practical T: Tutorial			Internal Assessment Marks		End term Examination Marks		Total Marks	Examination hours	
				Total	Theory (T)	Practical (P)	L	P	Total	T	P	T	P		T	P
CC-3 MCC-4	A,B&C	24UN-ICT-301	Operating Systems	4	3	1	3	2	5	20	10	50	20	100	3	3
MCC-5	B&C	24UN-ICT-302	Quantitative Foundations of Computer Science	4	3	1	3	2	5	20	10	50	20	100	3	3
MDC3	A,B&C	24UN-ICT-303	Programming with C	3	2	1	2	2	5	15	5	35	15	70	3	3
CC-M3	A&C	From Available CC-3/MCC-4 of 4 credits as per NEP														
CC-M3(V)	B	From Available pool of Minor (Vocational) Courses VOC-1														
MCC-2	B	From Available pool of Multidisciplinary Courses from a subject of different discipline as per NEP														
AEC-3	A,B&C	From Available pool of Ability Enhancement Courses as per NEP														
SEC-3	A,B&C	From Available pool of Skill Enhancement Courses as per NEP														
VAC-3	C only	From Available pool of Value Added Courses as per NEP														

Session: 2023-24			
Part A - Introduction			
Subject	COMPUTER SCIENCE		
Semester	III		
Name of the Course	Advance IT Skills		
Course Code	24UN-ICT-SEC301		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/ VAC)	SEC		
Level of the course (As per Annexure-I)			
Pre-requisite for the course (if any)			
Course Learning Outcomes(CLO):	<p>After completing this course, the learner will be able to:</p> <ol style="list-style-type: none"> 1. Use e-Governance applications; and use computer to improve existing skills and learn new skills 2. Using internet for Digital Financial services 3. understand the concept of Cyber security and issues and challenges associated with it 4. Develop knowledge about Future Skills <p>5*. to understand the various concepts in the syllabi practically.</p>		
Credits	Theory	Practical	Total
	2	1	3
Contact Hours	2	2	4
Max. Marks:70(50(T)+20(P)) Internal Assessment Marks:20(15(T)+5(P)) End Term Exam Marks: 55(35(T)+15(P))	Time: 3 Hrs.(T), 3Hrs.(P)		
Part B- Contents of the Course			
<u>Instructions for Paper- Setter</u>			
<p>Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory. Practicum will be evaluated by an external and an internal examiner. Examination will be of</p>			

Semester-1

Session: 2024-25

Part A - Introduction

Subject	COMPUTER SCIENCE		
Semester	I		
Name of the Course	Problem Solving through C		
Course Code	24UN-ICT-101		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/ VAC)	CC		
Level of the course (As per Annexure-I)	100-199		
Pre-requisite for the course (if any)			
Course Learning Outcomes(CLO):	After completing this course, the learner will be able to: 1. learn the basics of C program, data types and input/output statements. 2. understand different types of operators, their hierarchies and also control statements of C. 3. implement programs using arrays and strings. 4. get familiar with advanced concepts like structures, union etc. in C language. 5*. to implement the programs based on various concepts of C.		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3	2	5
Max. Marks:100(70(T)+30(P)) Internal Assessment Marks:30(20(T)+10(P)) End Term Exam Marks: 70(50(T)+20(P))	Time: 3 Hrs.(T), 3Hrs.(P)		

Part B- Contents of the Course

Instructions for Paper- Setter

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.

Session: 2023-24

Part A - Introduction

Subject	COMPUTER SCIENCE		
Semester	I		
Name of the Course	Office and spreadsheet Tools Learning		
Course Code	24UN-ICT-SEC101		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/ VAC)	SEC		
Level of the course (As per Annexure-I)			
Pre-requisite for the course (if any)			
Course Learning Outcomes(CLO):	After completing this course, the learner will be able to: 1. understand the basic concepts of operating systems 2. do the basic editing and formatting in a document 3. create basic spread-sheets for different purposes 4. create basic presentations for different applications 5*. to understand the working of operating system and various office tools practically.		
Credits	Theory	Practical	Total
	2	1	3
Contact Hours	2	2	4
Max. Marks:70(50(T)+20(P)) Internal Assessment Marks:20(15(T)+5(P)) End Term Exam Marks: 55(35(T)+15(P))	Time: 3 Hrs.(T), 3Hrs.(P)		

Part B-Contents of the Course

Instructions for Paper- Setter

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory. Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

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**Scheme of Examination for Under-Graduate Programme in Subject Home
Science as per NEP 2020**
Under multiple Entry-Exit, Internship & CBCS-LOCF-CCF in accordance to
w.e.f. 2024-25 (in phased manner)

Home Science
SEMESTER-1

Course	Paper(s)	Nomenclature of Paper	Credits	Hours / Week	Internal marks	External Marks	Total Marks	Exam Duration
CC-1 4 credit	24UN-HOM-101	Home and Interior Decor'	3	3	20	50	70	3 hrs.
		Practical	1	2	10	20	30	4 hrs.
CC-M1 2 credit	24UN-HOM-102	Elementary Home Science I	1	1	10	20	30	3hrs.
		Practical	1	2	5	15	20	4hrs.
MDC-1 3 credits	24UN-HOM-MDC101	Basics of Home Science I	2	2	15	35	50	3 hrs.
		Practical	1	2	5	15	20	4 hrs.
AEC-1 2 credit	From available AEC-1 pool list of two credit as per NEP							
SEC-1 3 credit	From Available SEC-1 pool list of two credit as per NEP							
VAC-1 2 credit	From Available VAC-1 pool list of two credit as per NEP							

SEMESTER-2

Course	Paper(s)	Nomenclature of Paper	Credits	Hrs/ Week	Internal marks	External Marks	Total Marks	Exam Duration
CC-2 4 credit	24UN-HOM-201	Nutrition Science	3	3	20	50	70	3 hrs.
		Practical	1	2	10	20	30	4 hrs.
CC-M2 2 credit	24UN-HOM-202	Elementary Home Science II	1	1	10	20	30	3hrs.
		Practical	1	2	5	15	20	4hrs.
MDC-2 3 credits	24UN-HOM-MDC201	Basics in Home Science II	2	2	15	35	50	3 hrs.
		Practical	1	2	5	15	20	4 hrs.
AEC-2 2 credit	From Available AEC-2 pool list of two credit as per NEP							
SEC-2 3 credit	From Available SEC-2 pool list of three credit as per NEP							
VAC-2 2 credit	From Available VAC-2 pool list of two credit as per NEP							

❖ Internship of 4 credits of 4-6 weeks duration after 2nd Semester.

ml

SEMESTER-3 ✓

Course	Paper(s)	Nomenclature of Paper	Credits	Hours/Week	Internal marks	External Marks	Total Marks	Exam Duration
CC-3 4 credit	24UN-HOM-301	Basics of Clothing Construction & Apparel Designing	3	3	20	50	70	3 hrs.
		Practical	1	2	10	20	30	4 hrs.
MDC-3 3 credits	24UN-HOM-MDC301	Basics in Home Science- III	2	2	15	35	50	3 hrs.
		Practical	1	2	5	15	20	4 hrs.
AEC-3 2 credit	From Available AEC-3 pool list of three credit as per NEP							
SEC-3 3 credit	From Available SEC-3 pool list of three credit as per NEP							

SEMESTER-4 ✓

Course	Paper(s)	Nomenclature of Paper	Credits	Hours/Week	Internal marks	External Marks	Total Marks	Exam Duration
CC-4 4 credit	24UN-HOM-401	Advanced Apparel & Textile Designing	3	3	20	50	70	3 hrs.
		Practical	1	2	10	20	30	4 hrs.
CC-M4(V) 4 credit	From Available CC-M4(V) pool list of four credit as per NEP							
AEC-4 2 credit	From Available AEC-4 pool list of three credit as per NEP							
VAC-3 2 credit	From Available VAC-4 pool list of two credit as per NEP							

❖ Internship of 4 credits of 4-6 weeks duration after 4th semester (If not done in 2nd Semester).

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Chaudhary Bansi Lal University, Bhiwani

(A State University established by Govt. of Haryana Act No. 25 of 2014)
From Session: 2021-22

Scheme of Examination for Bachelor of Arts (B.A) with Home Science

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	Total	Theory	Practical	Total	Theory	Internal Assessment	Practical	
21 UHS 101 Semester I	Family Resource Management	C.C.	03		09	03		06	40	10		100
21 UHS 101(P) Semester I	Practical	C.C.		06			03					
21 UHS 201 Semester II	Promotive Health and Hygiene	C.C.	03		09	03		06	40	10		100
21 UHS 201(P) Semester II	Practical	C.C.		06			03					
21 UHS 302 Semester III	Basic Clothing and Textile	C.C.	03		09	03		06	40	10		100
21 UHS 302(P) Semester III	Practical	C.C.		06			03					
21 UHS 402 Semester IV	Basic Food and Nutrition	C.C.	03		09	03		06	40	10		100
21 UHS 402(P) Semester IV	Practical	C.C.		06			03					
21 UHS 503 Semester V	Home Science Extension Education	D.S.E.	03		09	03		06	40	10		100
21 UHS 503- (P) Semester V	Practical OR			06			03					
21 UHS 503 A Semester V	Food Preservation	D.S.E.	03		09	03		06	40	10		100
21 UHS 503(P)-A Semester V	Practical OR			06			03					

21 UHS 603 Semester VI	Human Development	D.S.E.	03		09	03		06	40	10		100
21 UHS 603(P)- Semester VI	Practical OR			06			03				50	
21 UHS 603A Semester VI	Apparel Designing	D.S.E.	03	06	09	03		06	40	10		100
21 UHS 603(P)-A Semester VI	Practical						03				50	
Total			18	36	54	18	18	36	240	60	300	600

C.C. = Core Course

Elective

D.S.E = Discipline Specific

B. A.1st (HOME SCIENCE)

SEMESTER - I X

Paper Name: Family Resource Management (C.C)

Paper Code: 21UHS101

Credits: 3+3/week

MM: 100

Theory: 40

Internal Assessment: 10

Practical: 50

Duration of Exam: 3 hrs.

Note:

- 1) The question paper will consist of nine questions. The candidate will attempt five questions in all. The first question will be of short answer type consisting of eight parts (1 Mark each) to be set from the whole syllabus. This question will be compulsory.
- 2) 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.
- 3) Each question carries 8 marks.

UNIT I

1. Concept and scope of Home Science including job opportunities.
2. Housing - selection of site for an ideal house- Soil, Locality, Orientation and Functions of home.
3. Kitchen Garden-Meaning and Utility, Planning and Types of Manures.

Session: 2024-25			
Part A - Introduction			
Subject	Bachelor of Home Science		
Semester	I		
Name of the Course	Home and Interior Décor'		
Course Code	24UN-HOM- 101		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/VA C)	CC-1 (Core Course)		
Level of the course (As per Annexure-I)	100-199		
Pre-requisite for the course (if any)	Senior Secondary (10+2)		
Course Learning Outcomes(CLO):	<p>After completing this course, the learner will be able to:</p> <ol style="list-style-type: none"> 1.To encourage experimentation with traditional and contemporary materials, technical processes and methods 2. To impart knowledge and skills for making different floor plans for different income groups. 3.To develop skills, abilities & knowledge that enable artistic production & creative problem solving skills. 4. To develop and apply concepts of art & design to create aesthetically pleasing interiors. <p>5*.To acquire professional and entrepreneurial skills like interior decoration, use of waste material and decorative pieces for economic empowerment.</p>		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours .	3	2	5

MW

Max. Marks:100

Internal Assessment Marks:20(T)+10(P)=30

End Term Exam Marks: 50(T)+20(P)=70

Time:3hrs (T)

4hrs(P)

Part B- Contents of the Course

Instructions for Paper- Setter: The examiner will set nine questions in all, Selecting four questions from each unit and one compulsory objective type question.

Instructions for the candidate: The candidates will attempt five questions in all, selecting one question from each unit as well as compulsory questions. Each Question shall carry 10 Marks.

Unit	Topics	Contact Hours
I	<ul style="list-style-type: none"> ➤ Interior decoration: Objectives, importance of elements of art in interior decoration. ➤ Types of design: Structural and decorative and its Application. ➤ Elements of art: Line, Form, Texture, Light, Pattern, Colour, Space and its Application in Interior Decoration 	10
II	<ul style="list-style-type: none"> ➤ Principles of design: Rhythm, Balance, Proportion, Emphasis, Harmony and its Application in Interior Decoration ➤ Colour: Properties of Colour, Psychological Effect of Colour, Color Schemes and its Application in the Interior of a House. ➤ Lighting: <ul style="list-style-type: none"> a) Types and requirement for various activities b) Lighting fixtures in the home 	10
III	<ul style="list-style-type: none"> ➤ Table setting and table manners: Informal and Formal Table Settings (Buffet Style, Indian Style Restaurant Style, Cafe Style) ➤ Furniture: Types of Furniture, Furniture Arrangement for Different Areas (Bedroom, Drawing Room, Dining Room, Kitchen And its Types) Factors Affecting the Selection and Purchase of Furniture, Care and Maintenance of Furniture. 	10

ml

<p>V*</p>	<p>➤ Flower arrangement: a) Different types of Flower Arrangement b) Accessories used and points to be considered for Flower Arrangement c) Flower Decoration for different Occasions</p> <p>➤ Furnishings: a) Soft Furnishing (curtains, cushions, pillow and material for upholstered furniture) b) Wall Treatment and its types c) Window Treatment and Decoration d) Types of Floor Coverings</p>	<p>10</p>
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<p>V*</p>	<p>➤ Preparation of house plans for different income groups (manual/computer aided). ➤ Floor decoration: Alpana and Rangoli. ➤ Pottery Painting and Decoration. ➤ Creating various art pieces/accessories using various types of materials and techniques like Paper cutting, Collage, Candle making, , Stone painting, Gift wrapping, Greeting cards with Decorative envelopes , Shopping bags/Decorative pouches, Accessories for Fashion Designing including Jewellery making (any 5). ➤ Table setting and Napkin folding. ➤ Flower arrangement for different Rooms and Occasions. ➤ Planning color Schemes for different Rooms manual/computer aided).</p>	<p>30</p>
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Suggested Evaluation Methods

<p>Internal Assessment:</p> <p>➤ Theory</p> <ul style="list-style-type: none"> ● Class Participation: 05 ● Seminar/presentation/assignment/quiz/class test etc.:05 ● Mid-Term Exam: 10 <p>➤ Practical</p> <ul style="list-style-type: none"> ● Class Participation: ● Seminar/Demonstration/Viva-voce/Lab records etc.:10 ● Mid-Term Exam: 	<p>End Term Examination:</p> <p>50</p> <p>20</p>
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Part C-Learning Resources

MU

Session: 2024-25

Part A - Introduction

Subject	Bachelor of Home Science		
Semester	II		
Name of the Course	Nutrition Science		
Course Code	24UN-HOM-201		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/VA C)	CC-2(Core Course)		
Level of the course (As per Annexure-I)	100-199		
Pre-requisite for the course (if any)	Senior Secondary(10+2)		
Course Learning Outcomes(CLO):	<p>After completing this course, the learner will be able to:</p> <ol style="list-style-type: none"> 1. To understand basic concepts of nutrition & importance of water & carbohydrates. 2. To understand the functions, sources, requirements and effects of excess and deficiency of different nutrients. 3. The students will be able to know the functions, sources, requirements and effects of excess and deficiency of different vitamins. 4. To understand the functions, sources, requirements and effects of excess and deficiency of different minerals.. <p>5*.To impart practical knowledge about preparation of nutrient rich and some other recipes</p>		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3	2	5
Max. Marks:100 Internal Assessment Marks:20(T)+10(P)=30 End Term Exam Marks: 50(T)+20(P)=70	Time:3hrs (T) 4hrs(P)		

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Part B- Contents of the Course

Instructions for Paper-Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.

Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well. Each question shall carry 10 Marks.

Unit	Topics	Contact Hours
I	<ul style="list-style-type: none"> ➤ Definition of Nutrition, nutrients, recommended dietary allowance, balanced diet, health., reference man & reference woman and BMR-Definition and factors affecting BMR ➤ Water: Functions and sources of water for human body ➤ Carbohydrates: Classification, functions, sources & requirement, effects of deficiency and excess (in brief) ➤ Fibre: Types, functions, sources & requirement and health problems associated with excess and deficiency of fiber 	10
II	<ul style="list-style-type: none"> ➤ Protein: Classification. functions, sources & requirement ➤ Fats/ Lipids: Classification, functions, sources and requirements and health problems associated with excess and deficiency of lipids. ➤ Vitamins: Definition and classification of vitamins, difference between fat soluble & water soluble vitamins ➤ Fat soluble Vitamins: Functions, sources, recommended dietary allowances, effects of excess & deficiency (in brief) of: Vitamin A, D, E & K 	11
III	<ul style="list-style-type: none"> ➤ Functions, sources, recommended dietary allowances, effects of excess & deficiency (in brief) of various water soluble vitamins : Vitamin C, Vitamin B1 (Thiamine), Vitamin B2, (Riboflavin), Vitamin B6 (Pyridoxine), Vitamin B12 (Cyanocobalamin), Niacin and Folic acid. 	11

ml

IV	<ul style="list-style-type: none"> ➤ Definition and Classification of Minerals ➤ Macro minerals: Functions, Sources, RDA, Effect of Excess and low intake of Calcium, Phosphorus, Magnesium, Sodium and Potassium ➤ Micro Minerals: Functions, sources and RDA, Effect of Excess and low intake of Iron, Iodine Fluorine & Zinc 	10
V*	<ul style="list-style-type: none"> ➤ Controlling Techniques: Weights and Measures, Standard and household measures for raw and cooked foods ➤ Classify foods on the basis of nutrients:-Protein, Iron, Calcium, Vitamin A, Vitamin C ➤ Planning, Calculation of nutritive value and Preparation of the following: <ol style="list-style-type: none"> 1. Paranthas / Poories – (simple & stuffed) 2. Sandwiches 3. Soups 4. Desserts 5. Sponge Cake 6. Main Course Dishes (any 2) ➤ Planning and preparing nutrient rich dishes: Protein, calcium, iron & vitamin A 	28
Suggested Evaluation Methods		
Internal Assessment: <ul style="list-style-type: none"> ➤ Theory <ul style="list-style-type: none"> ● Class Participation: 05 ● Seminar/presentation/assignment/quiz/class test etc.:05 ● Mid-Term Exam: 10 ➤ Practical <ul style="list-style-type: none"> ● Class Participation: ● Seminar/Demonstration/Viva-voce/Lab records etc.:10 ● Mid-Term Exam: 		End Term Examination: 50 20
Part C-Learning Resources		

MU

Session: 2024-25			
Part A - Introduction			
Subject	Bachelor of Home Science		
Semester	III		
Name of the Course	Basics of Clothing Construction and Apparel Designing		
Course Code	24UN-HOM- 301		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/VA C)	CC-3(Core Course)		
Level of the course (As per Annexure-I)	100-199		
Pre-requisite for the course (if any)	Senior secondary (10+2)		
Course Learning Outcomes(CLO):	<p>After completing this course, the learner will be able to:</p> <ol style="list-style-type: none"> 1. Acquire the knowledge of application of elements of arts and principles of design in clothing construction and techniques of dress designing. 2. Students get aware about the fabric construction techniques and Non woven fabrics. 3. Gains information about the methods of developing design. 4. Students understand the concept of fashion, figure types and fitting. 5* Students gain practical knowledge of drafting, cutting and stitching of basic children's garments. 		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3	2	5
Max. Marks: Internal Assessment Marks: 20(T)+10(P)=30 End Term Exam Marks: 50(T) +20(P) =70		Time: 3hrs (T) 4hrs (P)	

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Part B- Contents of the Course

Instructions for Paper-Setter: The examiner will set nine questions in all, selecting four questions from each unit and one compulsory objective type question.

Instructions for the candidate: The candidates will attempt five questions in all, selecting at least one question from each unit and the compulsory question as well. Each question shall carry 10 Marks.

Unit	Topics	Contact Hours
I	<ul style="list-style-type: none"> ➤ Importance of Apparel Designing & its Role in Personality Development. ➤ Application of Elements of Arts and Principles of Designs in Clothing Construction ➤ Types of Designs: Structural & Decorative ➤ Wardrobe Planning: Principles, Steps involved and Importance. 	10
II	<ul style="list-style-type: none"> ➤ Fabric construction : <ul style="list-style-type: none"> ● Weaving : Parts and function of loom ● Types of weaves (plain, twill and their variation, satin and sateen weave.) ➤ Knitting : Types, characteristics, stitches used in knitting ➤ Non wovens fabrics: Felting, bonding, netting, braiding, laces 	10
III	<ul style="list-style-type: none"> ➤ Anthropometry: Definition, Importance and Equipment required <ul style="list-style-type: none"> ● Types of Anthropometric Measurements (vertical, horizontal, girth/round measurement) ● Care to be taken while taking Body Measurement ➤ Methods of developing Design/ Pattern: <ul style="list-style-type: none"> ● Drafting: Drafting Tools, Techniques, Advantages and Disadvantages of Drafting. ● Paper Pattern: Types, Principles, Advantages and Disadvantages of Paper Pattern. ● Draping: Techniques of Draping and Advantages And Disadvantages Of Draping. ➤ Preparation of Fabric: Preshrinking, Straightening The Grain, Pressing, Identify Face And Back, Square Up, Marking, Pinning, Types of Markings, ➤ Methods And Precautions For Cutting, Sewing & Finishing 	11

ml

IV	<ul style="list-style-type: none"> ➤ Fashion: Concept , Importance and Terminology { Fad ,Style, Classic ,Silhouette Vogue ,Haute Couture, Niche ,Brand} ➤ Fashion Cycle and Fashion Favoring and Retarding Factors ➤ Figure Analysis and Fitting: Figure Types, Common Fitting Problems, Reason for Poor Fitting and their Remedies . 	9
V*	<ul style="list-style-type: none"> ➤ Prepare Samples of Different Types Of Weaves. ➤ Prepare a Sample of Knitting (Any Two). ➤ Prepare a Sample Consisting of Ten Basic Embroidery Stitches : Stem Stitch, Chain Stitch, Feather Stitch, Herringbone, Stitch, Satin Stitch, Lazy Daisy Stitch, French Knots, Bullions Stitch, Cross Stitch, Long And Short Stitch. ➤ Drafting of Child's Bodice Block.& Sleeves Block. ➤ Cutting and Stitching of Napkins, Bib, Jhabla. 	30
Suggested Evaluation Methods		
Internal Assessment: <ul style="list-style-type: none"> ➤ Theory <ul style="list-style-type: none"> ● Class Participation:05 ● Seminar/presentation/assignment/quiz/class test etc.: 05 ● Mid-Term Exam:10 ➤ Practical <ul style="list-style-type: none"> ● Class Participation: ● Seminar/Demonstration/Viva-voce/Lab records etc.:10 ● Mid-Term Exam: 		End Term Examination 50 20
Part C-Learning Resources		

MU

Session: 2024-25

Part A - Introduction

Subject	Bachelor of Home Science		
Semester	IV		
Name of the Course	Advance Apparel and Textile Designing		
Course Code	24UN-HOM-401		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/VAC)	CC-4(Core Course)		
Level of the course (As per Annexure-I)	100-199		
Pre-requisite for the course (if any)	Senior secondary(10+2)		
Course Learning Outcomes(CLO):	<p>After completing this course, the learner will be able to:</p> <ol style="list-style-type: none"> 1. Gain knowledge about different types of finishes given to fabrics. 2. Get acquainted with different types of dyes and methods of dyeing. 3. Acquire the technique of different types of printing. 4. Equipped with the knowledge of laundry process, soap Making, stiffening and bluing agents. <hr/> <p>5* Students become able to do the drafting of various sleeves, collars and implement the technique of tie\dyead printing on fabric ,and acquire knowledge of the process of stain removal.</p>		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3	2	5

MW

Max. Marks:

Internal Assessment Marks: 20(T)+10(P)=30
End Term Exam Marks: 50(T) +20(P) =70

Time: 3hrs (T)
4hrs(P)

Part B- Contents of the Course

Instructions for Paper-Setter: The examiner will set nine questions in all, selecting four questions from each unit and one compulsory objective type question.

Instructions for the candidate: The candidates will attempt five questions in all, selecting at least one question from each unit and the compulsory question as well. Each question shall carry 10 Marks.

Unit	Topics	Contact Hours
I	<ul style="list-style-type: none"> ➤ Fabric finishes: Definition and Objectives ➤ Classification of Finishes: <ul style="list-style-type: none"> • Physical: Singeing, Napping, Brushing, Shearing, sizing, Tentering, and Calendaring • Chemical: Mercerising, Durable finishes, • Special-purpose finishes: Wrinkle resistant , Water Resistant, Soil repellent, and Flame repellent ➤ Bleaching & its Types. 	10
II	<ul style="list-style-type: none"> ➤ Dyeing: Definition Classification of Dyes: (in Brief): ➤ On the Basis of Source of Dye: <ul style="list-style-type: none"> • Natural: Vegetable, Animal & Mineral • Synthetic Dye: Basic, Acidic & Neutral Dye ➤ On the Basis of Method of Dyeing: Sulphur Dyes, Direct Dyes, Vat Dyes, Mordant Dyes & Developed Dyes ➤ On the Basis of Stages of Dyeing: Raw Stock Dyeing, Skein Dyeing, Cloth Dyeing ➤ Simple Dyeing: Principles and Methods of Dyeing, Faults in Dyeing and Remedies ➤ Resist Dyeing: Tie and Dye, Batik and Screen 	11

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III	<ul style="list-style-type: none"> ➤ Printing: Definition, Classification ➤ Methods of Printing: <ul style="list-style-type: none"> • Hand Printing: Block, Stencil, Screen • Machine Printing: Roller, Screen, Discharge, Resist and Duplex Printing. ➤ Care (Darning, Mending & Renovation) and Storage of Fabrics ➤ Dry Cleaning: Principle, Process (In Brief) and Advantages 	10
IV	<ul style="list-style-type: none"> ➤ Laundry: Process of Laundry, Laundry Equipment and their Uses. ➤ Stain Removal: <ul style="list-style-type: none"> • Types of Stains & Methods of Removing Stains(Solvent, Absorbent & Chemical Methods) • Removal Of Different Stains(Tea, Coffee, Fruits, Blood, Oil/ Ghee, Turmeric, Colour, Egg, Ink, Iron Rust, Lipstick, Nail Paint, Sweat, Perfume & Stain of Hot Iron) ➤ Soaps and Detergents: Types and Manufacture of Soap and Detergents. ➤ Stiffening Agent and Blueing Agent. 	9
V*	<ul style="list-style-type: none"> ➤ Drafting Of Sleeves: Puff, Umbrella, Raglan, Ruffle, Kimono. ➤ Drafting Of Collars: Baby Collar, Flat Peter Pan, Raised Peter- Pan, Chinese Band And Sailor's Collar. ➤ Drafting And Construction Of Children's Garment Frock (Any One) : A Line / Gathered / Party Wear. ➤ Prepare Samples And One Article Of Tie & Dye. ➤ Prepare A Sample of Batik. ➤ Prepare Samples of Block, Stencil And Screen Printing. ➤ Prepare Samples of Darning, Mending (Patching) and Renovation. ➤ Removal of Different Types of Stains : Tea, Coffee, Oil/ Ghee, Curry, Blood, Ink, Iron Rust, Lipstick, Nail Paint. 	30
Suggested Evaluation Methods		

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B.A. 2nd(Home Science)
Semester-IV

Basic Food and Nutrition (Practical) (C.C)

Paper Code: 21UHS402(P)

M. Marks: 50
Time : 3
hrs.

1. Standard and household measures for raw and cooked foods.
2. Preparation of minimum two dishes by using different methods of cooking.
3. Preparation of any two products that can be preserved.
4. Preparation of minimum two dishes using microwave cooking.
5. Preparation of food items by fermentation and germination.

B. A. 3rd (HOME SCIENCE)

SEMESTER - V

Paper Name: Home Science Extension Education(D.S.E)

Paper Code: 21 U HS 503

Credits:3+3/ week

MM: 100
Theory: 40
Internal Assessment: 10
Practical: 50
Duration of Exam: 3 hrs.

Note:

1. The question paper will consist of nine questions. The candidate will attempt five questions in all. The first question will be of short answer type consisting of eight parts (1 Mark each) to be set from the whole syllabus. This question will be compulsory.
2. 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.
3. Each question carries 8 mark

UNIT I

1. Home Science Extension Education- meanings, definition, scope, objectives and importance.
2. Philosophy, history and principles of extension education.

UNIT II

3. Extension approaches and methods; classification, characteristics and selection and factors affecting.
4. Diffusion of innovation and adoption.

UNIT III

5. Communications; definitions, elements, scope and barrier of communication.
6. Extension Programme Planning-
 - a. Concept, definition, principles and importance of programme planning.
 - b. Programme cycle and its components.

UNIT IV

7. National Development Programme in India-
 - a. Pre-independent- Gurgaon Experiment and Firka Development Programme.
 - b. Post- Independent -Nilokheri-Experiment, Etawah Pilot Project, Indian Village Services (IVS).

Suggested Reading:

- i. O.P. Dhama (2019). Extension and Communication for Development, Oxford and IBH Publishing.
- ii. Rathore, O.S. (1999). Handbook of Extension Education, Agrotech Publishing Academy.
- iii. Dale R. (2004). Evaluating Development Program and Projects Practical New Delhi: Sage Publication.
- iv. Kumar and Hansra (1997): Extension Education for Human Resource Development, New Delhi Concept Publication.
- v. Henton, S and Larissa H. (2013). Understanding Social Media, Sage Publication India.
- vi. Chopra, K., Kaukodi, G.K and Murthy (1990). Participatory Development, Sagar Publication.
- vii. Zhu, O., Yuanhong J.D., Chengxiang, L., and Editors, M. (2015). Rain Water Harvesting for Agriculture and Water Supply Science, Press Beijing (Springer).
- viii. Sharma, J.S. (1996). Water Harvesting and Recycling: Indian experiences, Sage Publications.
- ix. Mikkelsen, B. (2002). Methods for Development Programs Work and Research, New Delhi: Sage Publications.

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**B.A 3rd(Home Science)
Semester-V**

Home Science Extension Education (Practical) (D.S.E)

Paper Code: 21UHS503(P)

M. Marks: 50

Time : 3 hrs

- 1. A survey report on any rural institution- Gram Panchayat, Block Samiti and preparation of report on welfare programs run by Government.**
- 2. A visit to any of the following -Anganwadi centre, govt. school and preparation of analytical report on any one developmental programme for women and children in Haryana.**
- 3. To prepare audio visual aids: posters, charts, puppets, flashcards and folders.**
- 4. Showcasing of social issues through puppets.**

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**B.A.3rd (Home Science)
Semester-VI**

Paper Name : Human Development (D.S.E.)
Paper code: 21UHS603
Credits:3+3/ week

MM:100
Theory:40
Internal assessment:10
Practical:50
Duration of exam:3 hrs.

Note:

1. The question paper will consist of nine questions. The candidate will attempt five questions in all. The first question will be of short answer type consisting of eight parts (1 Mark each) to be set from the whole syllabus. This question will be compulsory.
2. 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.
3. Each question carries 8 marks.

UNIT I

1. Human Development- concept, definition, importance and scope.
2. Principles and domains of development.
3. Current Trends and Issues in Human Development.

UNIT II

4. Growth and Development during prenatal stage-
 - a. Female Reproductive System.
 - b. Pregnancy- conception, signs, symptoms, discomfort, care and influences factors.

UNIT III

5. Stages of Development and their Characteristics; infancy, childhood, late childhood and adolescent.
6. Early Childhood Care and Education- objectives, importance, need, scope and principles.

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UNIT 1V

7. **A. Children with special needs- meaning, causes, classification, and characteristics-**

- a) **Gifted**
- b) **Mentally Retarded**
- c) **Orthopedically Handicapped**
- d) **Speech Disorders**
- e) **Deaf & visual Impairments.**

B. Need for identification, screening and early intervention.

10. **Guidance and Counseling- introduction, definition, characteristics, importance and scope.**

Suggested Readings:

1. **Hurlock, Elizabeth B. (1987) Development Psychology, A life span approach 5th edition. Tata McGraw Hill Publishing Company Ltd. New Delhi**
2. **Hurlock, Elizabeth B. (1987) Child Development 6th edition. Tata McGraw Hill Publishing Company Ltd. New Delhi**
3. **Gordon, L.J. (1975) Human Development New York : Harper & Row**
4. **Berk, Laura E (1999) Child Development Prentice Hall of India, Private Ltd. New Delhi**
5. **Ambron S.R. (1975) Child Development Rinchart Prep, San Francisco**

**Semester VI
(Home Science)**

Human Development (Practical) (D.S.E)

Paper Code: 21UHS603(P)

M. Marks: 50

Time : 3 hrs.

1. Preparation of resource file on the basis of a play way method / approach for preschoolers.
2. Preparation of teaching material-
 - a. Story booklet and their techniques.
 - b. Rhymes booklet.
 - c. Reading games and material.
3. Planning and executing activities in ECCE or primary school.

SEMESTER – VI

Paper Name:

Apparel Designing (D.S.E)

Paper Code: 21UHS603-A

SCredits: 3+3/week

MM: 100

Theory: 40

Internal Assessment: 10

Practical: 50

Duration of Exam: 3 hrs.

Note:

1. The question paper will consist of nine questions. The candidate will attempt five questions in all. The first question will be of short answer type consisting of eight parts (1 Mark each) to be set from the whole syllabus. This question will be compulsory.
2. 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.
3. Each question carries 8 marks.

Semester-I

Course Type	Applicable Scheme	Course Code	Nomenclature of paper	Credits	Contact hours	Internal marks	End term Marks	Total Marks	Duration of exam (Hrs.) T-P
CC-1/MEC-1	A,B&C	24UN-PHY-01	Mechanics	3	4	30	50	80	3
			Practicum	1	2	0	20	20	1
MCC-2	C	24UN-PHY-02	Mathematical Physics	2	3	20	5	25	1
			Practicum	1	2	0	20	20	1
CC-3E	A,B & C	24UN-PHY-03	Lectures/ Modules	1	1	30	20	50	1
			Practicum	1	2	5	17	22	1
MED-1	A, B,C&D	24UN-PHY-04	Physics Fundamentals-I	2	2	0	40	40	1
			Practicum	1	2	0	10	10	1
AEC-1	A,B&C	From Available pool of Ability Enhancement Courses as per NEP							
SEC-1	A,B&C	From Available pool of Skill Enhancement Courses as per NEP							
VAC-	A,B&C	From Available pool of Value Added Courses as per NEP							

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Semester-II

Course Type	Applicable Scheme	Course Code	Nomenclature of paper	Credits	Contact hours	Internal marks	End term Marks	Total Marks	Duration of exam (Hrs.) T-P
CC-2/MEC-2	A,B&C	24UN-PHY-201	Electricity and Magnetism & EM Theory	3	3	20	50	70	3
			Practicum	1	2	10	20	30	1
CC-3E	A,B & C	24UN-PHY-202	Elementary Electricity, Magnetism & EM Theory	1	1	10	30	40	1
			Practicum	1	2	5	5	10	1
DSEC-1	B & C	24UN-PHY-203	Computational Physics	3	3	20	0	20	1
			Practicum	1	2	10	0	10	1
MED-2	A, B,C&D	24UN-PHY-204	Physics Fundamentals-II	2	2	20	30	50	1
			Practicum	1	2	0	0	20	1
AEC-2	A,B&C	From Available pool of Ability Enhancement Courses as per NEP							
SEC-2	A,B&C	From Available pool of Skill Enhancement Courses as per NEP							
VAC-2	A, B&C	From Available pool of Value Added Courses as per NEP							
Internship	A,B&C	24UN-PHY-204	Internship of 4 Credits of 4-6 weeks duration after 2 nd Semester (Mandatory in case of exit)						

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Scheme of Examination for SET

Semester	Course Type	Applicable Scheme	Course Code	Nomenclature of paper	Credits	Contact hours	Internal marks	End term Marks	Total Marks	Duration of exam (Hrs.) T-P
1	SET-1	A, B,C&D	24UN-PHY-SET-101	Electromagnetic Radiation Physics	2	2	15	15	30	1
				Practicum	1	1	10	10	20	1
2	SET-2	A, B,C	24UN-PHY-SET-201	High Energy Radiation and Matter	2	2	15	15	30	1
				Practicum	1	1	10	10	20	1

(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) with effect from the session 2024-25 (in a phased manner)

Semester-III

Course Type	Applicable Scheme	Course Code	Nomenclature of paper	Credits	Contact hours	Internal marks	End term Marks	Total Marks	Duration of exam (Hrs.) T-P
CC-3/ MCC-4	A,B&C	24UN-PHY-301	Thermodynamics & Statistical Physics	3	3	20	50	70	3
			Practicum	1	2	10	20	30	3
MCC-2	B	24UN-PHY-102	Mathematical Physics	3	3	20	50	70	3
			Practicum	1	2	10	20	30	3
MCC-5	B & C	24UN-PHY-302	Classical Mechanics	3	3	20	50	70	3
			Practicum	1	2	10	20	30	3
MDC3	A,B & C	From Available pool of Multidisciplinary Courses as per NEP							
CC-M3	A & C	From Available CC-3/MCC-4 of 4 credits as per NEP							
CC-M3 (V)	B	From Available pool of Minor (Vocational) Courses VOC-3							
AEC-3	A,B&C	From Available pool of Ability Enhancement Courses as per NEP							
SEC-3	A,B&C	From Available pool of Skill Enhancement Courses as per NEP							
VAC-3	C	From Available pool of Value Added Courses as per NEP							

Scheme of Examination for SEC

Semester	Course Type	Course Code	Nomenclature of paper	Credits T+P	Contact hours T+P	Internal marks	End term Marks	Total Marks	Duration of exam (Hrs) T + P
3	SEC-3	24UN-PHY-SEC301	Radiation Safety	2+1	2+2	20	50	70	3

Chaudhary Bansi Lal University Bhiwani

Scheme of Examination for the Physics Subject in Under Graduate Program
as per NEP 2020 Curriculum and Credit Framework for Undergraduate Program
(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) with effect from the session
(in a phased manner)

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Applicable Scheme	Course Code	Nomenclature of paper	Credits	Contact hours	Internal marks	En Ma
A, B & C	24UN-PHY-401	Waves and Optics	3	3	20	50
		Practicum	1	2	10	20
B & C	24UN-PHY-402	Introductory Quantum Mechanics	3	3	20	50
		Practicum	1	2	10	20
B & C	24UN-PHY-403	Atomic spectroscopy	3	3	20	50
		Practicum	1	2	10	20
B & C	24UN-PHY-404	Laser Physics & Fiber Optics	3	3	20	50
		Practicum	1	2	10	20
	OR					
	24UN-PHY-405	Physics of Nano Materials	3	3	20	50
		Practicum	1	2	10	20
) A, B & C	From Available pool of Minor (Vocational) C					
A, B & C	From Available pool of Ability Enhancement Co					

B.Sc. (PASS COURSE) PHYSICS Semester V – VI w.e.f. 2020-21

Semester V

Paper No.	Paper Code	Name of the paper	Credit	Contact hours per week	Max mark	Internal Assessment	Total
Paper I	20UPHY-501	Discipline Specific Elective Group I	2	2	40	10	50
Paper II	20UPHY-502	Discipline Specific Elective Group II	2	2	40	10	50
Paper III	20UPHY-503	Physics Lab V	2	4	40	10	50
Total			6	8	120	30	150

Semester VI

Paper No.	Paper Code	Name of the paper	Credit	Contact hours per week	Max mark	Internal Assessment	Total
Paper I	20UPHY-601	Discipline Specific Elective Group III	2	2	40	10	50
Paper II	20UPHY-602	Discipline Specific Elective Group IV	2	2	40	10	50
Paper III	20UPHY-603	Physics Lab VI	2	4	40	10	50
Total			6	8	120	30	150

INTERNAL ASSESSMENT: - The Internal Assessment for practical papers comprises of

- (i) Attendance- 05
 (ii) Seminar/presentation/report 05
Total 10

Odd Semester: (Choose any one from each group)

Discipline Specific Elective Group-I
 20UPHY 501A Solid State Physics
 20UPHY 501B Medical Physics

Discipline Specific Elective Group-II
 20UPHY 502A Statistical Physics
 20UPHY 502B Digital Electronics and microcontrollers

Even Semester: (Choose any one from each group)

Discipline Specific Elective Group-III
 20UPHY 601A Nuclear Physics
 20UPHY 601B Nano Materials and Applications

Discipline Specific Elective Group-IV
 20UPHY 602A Atomic & Molecular Spectroscopy
 20UPHY 602B Computational Physics

Skill Enhancement Course (any four) (Credit: 03 each; Max Marks 40, IA 10, Total = 50)- SEC 1 to SEC 4

- 20USECP 701 Physics Workshop Skills
 20USECP 702 Electrical circuits and Network Skills
 20USECP 703 Basic Instrumentation Skills
 20USECP 704 Renewable Energy and Energy harvesting
 20USECP 705 Radiation Safety

Note: i. Two contact hours per week = Three periods of duration 40/45 minutes in affiliated colleges as per existing DHE norms.

ii. Discipline Specific Elective (DSE) and Skill Enhancement Course (SEC) will be run with minimum 20 students.

Chaudhary Bansi Lal University Bhiwani Undergraduate Programs
Course: CC-1/MCC-1

Session: 2024-25			
Part A-Introduction			
Subject	Physics		
Semester	1 st		
Name of the Course	Mechanics		
Course Code	24UN-PHY-101		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/ VAC)	CC/MCC		
Level of the course	100-199		
Pre-requisite for the course (if any)	Physics as main subject at level 4 (i.e. 10+2 or equivalent)		
Course Learning Outcomes (CLO):	<p>After completing this course, the learner will be able to:</p> <ol style="list-style-type: none"> 1. Understand the dynamics of system of particles, conservation of energy and momentum application of both translational and rotational dynamics motions simultaneously in analyzing rolling with slipping. 2. Differentiate between elastic and plastic body. Elastic constants, determination and their physical significance. Torque and its significance. 3. Familiar about the special theory of relativity and its applications. Michelson's Morley experiments and its finding. 4. Analyze the two body Central Force problem and its applications 5. Learn to present observations, results, analysis and different concepts related to experiments of Mechanics. 		
Credits	Theory	Practicum	Total
	3	1	4
Contact Hours	3	2	5

Max. Marks:100
 Internal Assessment Marks:30
 End Term Exam Marks: 70

Time:3hrs

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Part B-Contents of the Course

Instructions for Paper-Setter

1. Nine questions will be set in total.
2. Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No.
3. Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.
4. 20% numerical problems are to be set.
5. Use of scientific (non-programmable) calculator is allowed.

Unit	Topics	Contact Hours
I	Fundamentals of Dynamics: Rigid body, Moment of Inertia, Radius of Gyration, Theorems of perpendicular and parallel axis (with proof), Moment of Inertia of ring, Disc, Angular Disc, Solid cylinder, Solid sphere, Hollow sphere, Rectangular plate, Square plate, Solid cone, Triangular plate, Torque, Rotational Kinetic Energy, Angular momentum, Law of conservation of angular momentum, Rolling motion, condition for pure rolling, acceleration of body rolling down an inclined plane, Fly wheel, Moment of Inertia of an irregular body.	11
II	Elasticity: Deforming force, Elastic limit, stress, strain and their types, Hooke's law, Modulus of rigidity, Relation between shear angle and angle of twist, elastic energy stored/volume in an elastic body, Elongation produced in heavy rod due to its own weight and elastic potential energy stored in it, Tension in rotating rod, Poisson's ratio and its limiting value, Elastic Constants and their relations, Torque required for twisting cylinder, Hollow shaft is stiffer than solid one, Bending of beam, bending moment and its magnitude, Flexural rigidity, Geometrical moment of inertia for beam of rectangular cross-section and circular cross-section, Bending of cantilever (loaded by a weight W at its free end), weight of cantilever uniformly distributed over its entire length, Dispersion of a centrally loaded beam supported at its ends, determination of elastic constants for material of wire by Searle's method.	12

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III	Special Theory of Relativity: Michelson's Morley experiment and its outcomes, Postulates of special theory of relativity, Lorentz Transformations, Simultaneity and order of events, Lorentz contraction, Time dilation, Relativistic transformation of velocity, relativistic addition of velocities, variation of mass-energy equivalence, relativistic Doppler effect, relativistic kinematics, transformation of energy and momentum, transformation of force, Problems of relativistic dynamics.	11
IV	Gravitation and central force motion: Law of gravitation, Potential and field due to spherical shell and solid sphere, Motion of a particle under central force field, Two body problem and its reduction to one body problem and its solution, compound pendulum or physical pendulum in form of elliptical lamina and expression of time period, determination of g by means of bar pendulum, Normal coordinates and normal modes, Normal modes of vibration for given spring mass system, possible angular frequencies of oscillation of two identical simple pendulums of length (l) and small bob of mass (m) joined together with spring of spring constant (k)	11
	Practicum 1. Measurement of length (or diameter) using Vernier Caliper, screw gauge and travelling microscope. 2. To study the random error in observations. 3. To determine the area of window using a sextant. 4. Moment of Inertia of a Fly Wheel 5. Moment of Inertia of irregular body using a Torsion Pendulum. 6. Young's Modulus by Bending of Beam. 7. Modulus of rigidity of material of wire by Maxwell's Needle 8. Elastic constants by Searle's method. 9. To determine the value of 'g' by using Bar pendulum. 10. To find the Poisson ratio of rubber by Rubber tube method. 11. To compare Moment of Inertia of a solid Sphere, Hollow Sphere and solid Disc, of same mass with the help of Torsion Pendulum. 12. To determine the bending moment of a cantilever beam with uniformly distributed load, uniformly varying load and point load	30

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Unit	Topics	Contact Hours
I	Introduction: What is computational physics? Why do we need it? Computer hardware: basic computer architecture, hierarchical memory, RAM, ROM, cache, latency and bandwidth.	06
II	Machine representation, precision and errors Representation on a computer: Integer representation; floating-point representation; Machine precision; Errors: round-off; approximation errors; random errors; errors of the third kind;	07
III	Algorithms and Flowcharts: Algorithm: Definition, properties and development. Flowchart: Concept of flowchart, symbols, guidelines, types. Examples: Roots of Quadratic Equation, Sum of two matrices, Sum and Product of a finite series, calculation of $\sin(x)$ as a series, algorithm for plotting (1) trajectory of a projectile thrown at an angle with the horizontal.	10
IV	Scientific Programming: Some fundamental Linux Commands (Internal and External commands). Development of FORTRAN. Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Operators: Arithmetic, Relational, Logical and Assignment Operators.	07

<p>Practicum</p> <ol style="list-style-type: none"> Computer Introduction: Hands-on sessions with computer would allow students to understand their operation and practice using them. Hardware: Hands-on sessions with computer hardware would allow students to understand their operation. Flow Chart: Students would make flow charts, gaining proficiency in making flow charts. Algorithm: Students would make algorithm, gaining proficiency in making flow charts. Programming: To write program to open a file and generate data for problem solving in editor. Problem Solving: To find the roots of a quadratic equation. <p>Note: Student will perform at least 06 experiments out of above practical topics. The examiner will allot one Practicum at the time of end term examination.</p>	30
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Chaudhary Bansi Lal University
Bhiwani Undergraduate Programs
Course: CC-2/MCC-3

Session:2024-25			
Part A-Introduction			
Subject	Physics		
Semester	2 nd		
Name of the Course	Electricity, Magnetism and EM Theory		
Course Code	24UN-PHY-201		
Course Type: (CC/MCC/MDC/CC-M/DSEC /VOC/DSE/PC/AEC/VAC)	CC/MCC		
Level of the course	100-199		
Pre-requisite for the course (if any)	Appeared or passed the 1 st sem(B.Sc. Physical Science/ equivalent)		
Course Learning Out comes(CLO):	<p>After completing this course, the learner will be able to:</p> <ol style="list-style-type: none"> 1. Explain and differentiate the vector and scalar formalisms of electrostatics. Also be able to apply Gauss's Divergence & Stokes theorem to solve various problems in electrostatics 2. Describe the magnetic materials & important properties of magnetic field. Understand the properties and theories of dia-, para- & ferromagnetic materials. 3. Derive Maxwell equations and their physical significance and familiar about the propagation of electromagnetic waves i.e. boundary conditions at the interface between different media. The students will also be able to have basic idea about the propagation of electromagnetic waves in free space and in medium. 4. Understand D.C. and A.C. circuits, able to apply and analyses using networks. Analyze DC/AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor. 5. Learn to present observations, results, analysis and different concepts related to experiments of Electricity and Magnetism. 		
Credits	Theory	Practicum	Total

Part B-Contents of the Course

Instructions for Paper-Setter

1. Nine questions will be set in total
 2. Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No
 3. Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.
 4. 20% numerical problems are to be set.
1. Use of scientific (non-programmable) calculator is allowed

Unit	Topics	Contact Hours
I	Vector Background and Electric Field Gradient of a scalar and its physical significance, Line, Surface and Volume integrals of a vector and their physical significance, Flux of a vector field, Divergence and curl of a vector and their physical significance, Gauss's divergence theorem, Stoke's theorem, Conservative nature of Electrostatic Field, Electrostatic Potential, Potential as line integral of field, potential difference Derivation of electric field E from potential as gradient Derivation of Laplace and Poisson equations. Electric flux, Gauss's Law, Differential form of Gauss's law and applications of Gauss' law, Mechanical force of charged surface, Energy per unit volume.	11
II	Magnetic Field: Biot-Savart law and its simple applications: straight wire and circular loop, Current Loop as a Magnetic Dipole and its Dipole Moment, Ampere's Circuital Law and its applications to (1) Solenoid and (2) Toroid, properties of B: curl and divergence, Magnetic Properties of Matter: Force on a dipole in an external field, Electric currents in Atoms, Electron spin and Magnetic moment, types of magnetic materials, Magnetization vector (M), Magnetic Intensity (H), Magnetic Susceptibility and permeability, Relation between B, H and M, Electronic theory of dia and para magnetism, Domain theory of ferromagnetism (Langevin's theory), Cycle of Magnetization- B-H curve and hysteresis loop, Energy dissipation, Hysteresis loss and importance of Hysteresis Curve	12
III	Time varying electromagnetic fields: Electromagnetic induction,	11

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	Faraday's laws of induction and Lenz's Law, Self-inductance, Mutual inductance, Energy stored in a Magnetic field, Derivation of Maxwell's equations, Displacement current, Maxwell's equations in differential and integral form and their physical significance. Electromagnetic Waves: Electromagnetic waves, Transverse nature of electromagnetic wave, energy transported by electromagnetic waves, Poynting vector, Poynting's theorem, Propagation of Plane electromagnetic waves in free space & Dielectrics	
IV	DC current Circuits: Electric current and current density, Electrical conductivity and Ohm's law (Review), Kirchhoff's laws for D.C. networks, Network theorems: Thevenin's theorem, Norton theorem, Superposition theorem Alternating Current Circuits: A resonance circuit, Phasor, Complex Reactance and Impedance, Analysis for RL, RC and LC Circuits, Series LCR Circuit (1) Resonance, (2) Power Dissipation (3) Quality Factor and (4) Band Width, Parallel LCR Circuit.	11
	Practicum 1. Use of Multimeter for measuring Resistance, A.C. and D.C. Voltage and Current, checking of electrical fuses. 2. Low resistance by Carey Foster's bridge with calibration. 3. Determination of Impedance of an A.C. circuit and its verification. 4. Frequency of A.C. mains using an electromagnet. 5. Frequency of A.C. mains Electrical vibrator. 6. High resistance by substitution method. 7. To compare capacitances using De'Sauty bridge. 8. To study the Characteristics of a Series RC Circuit. 9. To study a series LCR circuit and determine its (a) Resonant frequency, (b) Quality factor. 10. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor. 11. To verify the Thevenin and Norton theorems. 12. To verify the Superposition and Maximum Power Transfer Theorems. 13. Self-inductance by Anderson's bridge. 14. Verification of laws of electromagnetic induction. 15. Study of B-H curves of various materials using C.R.O. and determination of various parameters. Note: Student will perform at least 08 experiments. The examiner will allot one Practicum at the time of end term examination.	30
Suggested Evaluation Methods		

Max. Marks:100

Internal Assessment Marks:30

End Term Exam Marks: 70

Time:3hrs

Part B-Contents of the Course

Instructions for Paper-Setter

1. Nine questions will be set in total.
2. Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No.
3. Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.
4. 20% numerical problems are to be set.
5. Use of scientific (non-programmable) calculator is allowed.

Unit	Topics	Contact Hours
I	<p>Thermodynamics-I</p> <p>Thermodynamic-systems, variables and equation of state, thermal equilibrium, Zeroth law of thermodynamics; Concept of heat and work, First law of thermodynamics- its significance and limitations, internal energy as a state function, different types of process-isochoric process, isobaric process, adiabatic process, isothermal process, cyclic process, Reversible and irreversible process, First law and cyclic process; Second law of thermodynamics and its significance, Carnot theorem; Joule's free expansion, Joule Thomson effect, Joule-Thomson (Porous plug) experiment : conclusions and explanation, Entropy, calculations of entropy of reversible and irreversible process, T-S diagram, entropy of a perfect gas, Nernst heat law (third law of thermodynamics); Liquefaction of gases (qualitative idea).</p>	11
II	<p>Thermodynamics-II</p> <p>Derivation of Clausius-Clapeyron and Clausius latent heat equations and their significance, phase diagram and triple point of a substance, development of Maxwell thermo dynamical relations, Thermodynamical functions: Internal energy (U), Helmholtz function (F), Enthalpy (H), Gibbs function (G) and the relations between them, derivation of Maxwell thermodynamical relations from thermodynamical functions, Application of Maxwell relations: relations between two specific heats of gas, derivation of Stefan's law, adiabatic compression and expansion of gas & deduction of theory of Joule Thomson effect.</p>	10
III	<p>Statistical Physics-I</p>	12

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	Distribution of N (for N= 2, 3, 4) distinguishable and indistinguishable particles in two boxes of equal size, microstates and macrostates, thermodynamical probability, constraints and accessible states, statistical fluctuations, general distribution of distinguishable particles in compartments of different sizes, β -parameter, entropy and probability; Concept of phase space, division of phase space into cells, postulates of statistical mechanics; Classical and quantum statistics, basic approach to these statistics, Maxwell-Boltzmann statistics applied to an ideal gas in equilibrium-energy distribution law, Maxwell's distribution of speed & velocity (derivation required), most probable speed, average and r.m.s. speed, mean energy for Maxwellian distribution.	
IV	Statistical Physics-II Dulong and Petit Law, derivation of Dulong and Petit law from classical physics; Need of Quantum statistics- classical versus quantum statistics, Bose-Einstein energy distribution Law, Application of B. E. Statistics to Planck's radiation law, degeneracy and B. E. condensation; Fermi-Dirac energy distribution Law, F.D. gas and degeneracy, Fermi energy and Fermi temperature; F. D. energy distribution Law for electron gas in metals, zero point energy, average speed (at 0 K) of electron gas	11
	Practicum <ol style="list-style-type: none"> 1. To determine Mechanical Equivalent of Heat, by Callender and Barne's constant flow method. 2. Measurement of Planck's constant using black body radiation. 3. To determine Stefan's Constant. 4. To determine the coefficient of thermal conductivity of copper by Searle's Apparatus. 5. To determine the Coefficient of Thermal Conductivity of Cuby Angstrom's Method. 6. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method. 7. To determine the temperature co-efficient of resistance by Platinum resistance thermometer. 8. To study the variation of thermo emf across two junctions of a thermocouple with temperature. 9. To record and analyze the cooling temperature of an hot object as a function of time using a thermocouple and suitable data acquisition system 10. To calibrate Resistance Temperature Device(RTD) using Null Method/Off-Balance Bridge 11. To prove the law of probability by using one coin, two coins and 10 or more coins. 12. To determine the coefficient of increase of volume of air at constant pressure. 13. To determine the coefficient of increase of pressure of air at constant volume. 	30

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4. Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.
 4. 20% numerical problems are to be set.
 5. Use of scientific (non-programmable) calculator is allowed.

Unit	Topics	Contact Hours
I	Basics of Atomic and Nuclear Physics: Basic concept of atomic structure; X rays characteristic and production; concept of bremsstrahlung and auger electron, The composition of nucleus and its properties, mass number, isotopes of element, spin, binding energy, stable and unstable isotopes, law of radioactive decay, Mean life and half life, basic concept of alpha, beta and gamma decay, concept of cross section and kinematics of nuclear reactions, types of nuclear reaction, Fusion, fission.	8

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II	Types of Radiation: Alpha, Beta, Gamma and Neutron and their sources, sealed and unsealed sources, Interaction of Photons Photoelectric effect, Compton Scattering, Pair Production, Linear and Mass Attenuation Coefficients, Interaction of Charged Particles: Heavy charged particles Beth-Bloch Formula, Stopping laws, Mass Stopping Power, Range, Straggling, Channeling and Cherenkov radiation. Beta Particles- Collision and Radiation loss (Bremsstrahlung), Interaction of Neutrons- Collision, slowing down and Moderation	8
III	Radiation detection and monitoring devices: Radiation Quantities and Units: Basic idea of different units of activity, KERMA, exposure, absorbed dose, equivalent dose, effective dose, collective equivalent dose. Radiation detection: Basic concept and working principle of gas detectors (Ionization Chambers, Proportional Counter, and Gieger Muller Counter), Scintillation Detectors.	7
IV	Radiation safety management: Biological effects of ionizing radiation, Operational limits and basics of radiation hazards evaluation and control: radiation protection standards, Application of nuclear techniques: Application in medical science (e.g., MRI, PET, Projection Imaging Gamma Camera, radiation therapy), Archaeology, Art, Crime detection, Mining and oil. Industrial Uses: Tracing, Gauging, Material Modification, Sterization, Food preservation.	7
	<p>Practicum</p> <ol style="list-style-type: none"> 1. Study the background radiation levels using Radiation meter. Study of characteristics of GM tube and determination of operating voltage and plateau length using background radiation as source (without commercial source). 2. Study of counting statistics using background radiation using GM counter. 3. Study of radiation in various materials (e.g. KSO₄ etc.). Investigation of possible radiation in different routine materials by operating GM at operating voltage. 4. Study of absorption of beta particles in Aluminum using GM counter. 5. Detection of a particles using reference source & determining its half life using spark counter 6. Gamma spectrum of Gas Light mantle (Source of Thorium) 7. Characteristics of Geiger Muller (GM) Counter: <p>Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination.</p>	30

Instructions for Paper-Setter

- Some questions will be set in total.
- Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No.
3. Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.
4. 20% numerical problems are to be set.
1. Use of scientific (non-programmable) calculator is allowed.

Unit	Topics	Contact Hours
I	INTERFERENCE Interference by Division of Wave front: Young's double slit experiment, Coherence, Conditions of interference, Fresnel's bi-prism and its applications to determine the wavelength of sodium light and thickness of a mica sheet, phase change on reflection. Interference by Division of Amplitude: Plane parallel thin film, production of colors in thin films, Interference due to transmitted light and reflected light, wedge shaped film (Basic idea), Newton's rings	10
II	DIFFRACTION Fresnel's diffraction: Huygens-Fresnel's theory, Fresnel's assumptions, rectilinear propagation of light, diffraction at a straight edge, rectangular slit and diffraction at a circular aperture (Basic idea). Fraunhofer diffraction: Single slit diffraction, double slit diffraction, plane transmission grating spectrum, dispersive power of grating, limit of resolution, Rayleigh's criterion, resolving power of a grating	10
III	POLARIZATION Polarization: Polarisation by reflection, refraction and scattering, Malus Law, Phenomenon of double refraction, Huygens's wave theory of double refraction (Normal and oblique incidence), Analysis of polarized 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, Polarimeters (Basic idea)	10

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IV	Lasers: Basic concept of absorption and emission of radiations, amplification and population inversion; Main components of lasers: (i) Active Medium (ii) Pumping (iii) Optical Resonator; Properties of laser beam, Metastable state, Types of Lasers (He-Ne Laser & Ruby Laser), Applications of Lasers Fibre optics: Optical fibres and their properties, Principal of light propagation through a optical fibre, Acceptance angle and numerical aperture, Types of optical fibres: Single mode and multimode fibres, Advantages and Disadvantages of optical fibers.	10
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SCHEME OF EXAMINATION
Semester-V

Paper I- 20UPHY 501A: Solid state Physics

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

Crystal Structure: Crystalline and amorphous solids, liquid crystals, crystal structure, periodicity, lattice and basis, crystal translational vectors and axes, unit cell and primitive Cell, Wigner Seitz primitive Cell, symmetry operations for a two dimensional crystal, Bravais lattices in two and three dimensions, Crystal planes and Miller indices, Crystal structures of Sodium Chloride and Diamond,

Unit II

Crystal Structure: X-ray diffraction, Bragg's Law and experimental X-ray diffraction methods, K-space and reciprocal lattice and its physical significance, reciprocal lattice vectors, reciprocal lattice to a simple cubic lattice, BCC and FCC.

Unit III

Free electron theory: Free electron gas models and its failures, Sommerfeld quantum theory, Hall Effect, Lattice vibrations: lattice vibration and concept of phonon, specific heat of solids, Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids.

Unit IV

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials, Classical Langevin Theory of dia- and Paramagnetic Domains, Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Super conductivity: Historical introduction, survey of superconductivity, super conducting systems.

References:

- Introduction to Solid State Physics, Charles Kittel, 8th Edition, 2004, Wiley India Pvt. Ltd.
- Elements of Solid State Physics, J.P. Srivastava, 4th Edition, 2015, Prentice-Hall of India.
- Solid State Physics by R.K. Puri and V.K. Babbar, S. Chand Publication.
- Solid State Physics : Structure and Properties of Material by M. A. Wahab
- Solid State Physics Neil W. Ashcroft and N. David Mermin, 1976, Cengage Learning



SCHEME OF EXAMINATION
Semester-V

Paper II- 20UPHY 502A: Statistical Physics

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 consists of 8 short question 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 question in all.
2. 20% numerical problems are to beset.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit-I

Probability, some probability considerations, basic idea of Permutations and Combinations, combinations possessing maximum probability, combinations possessing minimum probability, distribution of molecules in two boxes. Case with weightage (general). Phase space, microstates and macro states, statistical fluctuations constraints and accessible States. Entropy and Thermodynamic probability. Concept of Ensembles and type of Ensembles.

Unit-II

Postulates of Statistical Physics, Phase space and Application to One Dimension Harmonic Oscillator and Free particle, Division of phase space into cells, Basic approach in three statistics, Maxwell-Boltzmann Distribution Law, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression, Gibbs Paradox. Condition of equilibrium between two systems in thermal contact. Entropy and Probability.

Unit-III

Bose-Einstein statistics, Thermodynamic relations of a Completely Degenerate Bose Gas. Bose-Einstein condensation, liquid He (qualitative description), photon gas, Application of B.E. Statistics to Planck's radiation law

UNIT IV

Fermi-Dirac statistics, Thermodynamic relations of a Completely Degenerate Fermi gas, Fermi Energy, Electron gas in a Metal, Zero point energy, Specific Heat of Metals, Thermionic emission, White Dwarf Stars, Chandrasekhar Mass Limit, Comparison of three statistics M-B, B-E and F-D

References:

- Introduction to Statistical Mechanics, B.B. Laud, Macmillan 1981
- Statistical Physics, Berkeley Physics Course Volume 5 by F Reif (Tata McGraw-Hill Company Ltd, 2008)
- Statistical and Thermal Physics: an introduction by S.Lokanathan and R.S.Gambhir. (P.H.I., 1991).
- Statistical Mechanics by R. K. Patharia.(Oxford: Butterworth, 1996).
- Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears&G.L.Salinger. 1988, Narosa
- J.K. Sharma and K.K. Sarkar, Thermodynamics and statistical Physics, Himalaya Publishing House (1991, Bombay.)

SCHEME OF EXAMINATION
Skill Enhancement Course

20USECP 702: Electrical Circuits And Network Skills

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

NOTE:

1. The syllabus is divided into 3 units. Eight questions will be set up. Question no. 1 is compulsory. Question no. 1 will consists of 8 short question covering the entire syllabus. 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 beset.
3. Use of Scientific (non-programmable) calculator is allowed.

UNIT I

Basic Electricity Principles: Voltage, Current, Resistance, and Power. Ohm's law. Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with multimeter, voltmeter and ammeter. Understanding Electrical Circuits: Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources. Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money. Electrical Drawing and Symbols: Drawing symbols. Blueprints. Reading Schematics. Ladder diagrams. Electrical Schematics. Power circuits. Control circuits. Reading of circuit schematics. Tracking the connections of elements and identify current flow and voltage drop.

UNIT II

Generators and Transformers: DC Power sources. AC/DC generators. Inductance, capacitance, and impedance. Operation of transformers. Electric Motors: Single-phase, three-phase & DC motors. Basic design. Interfacing DC or AC sources to control heaters & motors. Speed & power of ac motor. Solid-State Devices: Resistors, inductors and capacitors. Diode and rectifiers. Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources.

UNIT III

Electrical Protection: Relays. Fuses and disconnect switches. Circuit breakers. Overload devices. Ground-fault protection. Grounding and isolating. Phase reversal. Surge protection. Interfacing DC or AC sources to control elements (relay protection device). Electrical Wiring: Different types of conductors and cables. Basics of wiring- Star and delta connection. Voltage drop and losses across cables and conductors. Instruments to measure current, voltage, power in DC and AC circuits. Insulation. Solid and stranded cable. Conduit. Cable trays. Splices: wirenuts, crimps, terminal blocks, split bolts, and solder. Preparation of extension board.

Reference:

- A text book in Electrical Technology - B L Theraja - S Chand & Co.
- A text book of Electrical Technology - A K Theraja
- Performance and design of AC machines - M G Say ELBS Edn.



M.Sc Physics (1st year)

Chaudhary Bansi Lal University Bhiwani

Scheme of Examination for the Post Graduate Programmes (M.Sc. Physics)
as per NEP 2020 Curriculum and Credit Frame work for Postgraduate Programmes
(Choice Based Credit System LOCF) with effect from the session 2025-26 (in a phased manner)

2-year PG Programme

Semester I

Course Type	Course Code	Nomenclature of course	Theory (T)/ Practical (P)	Credits	Contact hours per week				Internal Assessment Marks	End Term Examination Marks	Total Marks	Examination hours
					L	T	P	Total				
CC-1	25PN-PHY-101	Mathematical Physics	T	4	4	0	0	4	30	70	100	3
CC-2	25PN-PHY-102	Classical Mechanics	T	4	4	0	0	4	30	70	100	3
CC-3	25PN-PHY-103	Quantum Mechanics -I	T	4	4	0	0	4	30	70	100	3
DEC-I	25PN-PHY-105E	Electronic Devices and Circuits- I	T	4	4	0	0	4	30	70	100	3
	25PN-PHY-105M	Material Science -I										
CC-4	25PN-PHY-104	General Electronics-I	P	4	0	0	8	8	30	70	100	3
PC-1	25PN-PHY-106	Physics Lab- I	P	4	0	0	8	8	30	70	100	3
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Session: 2025-26

Part A - Introduction

Name of Programme	M.Sc. Physics		
Semester	1 st		
Name of the Course	Mathematical Physics		
Course Code	25PN-PHY-101		
Course Type	CC-I		
Level of the course	500-599		
Pre-requisite for the course (if any)	--		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	<p>CLO 101.1: Understand basics of group theory, preparation of group multiplication tables and construction of character table of symmetry groups.</p> <p>CLO 101.2: Find the Fourier series expansion, Fourier integrals, Fourier and Laplace transforms of functions and derivatives.</p> <p>CLO 101.3: Obtain explicit expressions of Hermite, Laguerre, Bessel and Legendre polynomials and to establish their recurrence relations and other properties.</p> <p>CLO 101.4: Derive Cauchy integral theorem, Cauchy integral formula, Taylor and Laurent series expansion of functions of complex variable and to evaluate some typical definite integral using the method of contour integration.</p>		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper-Setter

1. The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration.
2. The compulsory question (Question No. 1) will consist of at least 4 parts covering entire syllabus.
3. The question paper is expected to contain problems to the extent of 20% of total marks.
4. The examinee will be required to attempt 5 questions; selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	<p>Matrices and Group Theory: Matrices: Orthogonal, Unitary and Hermitian matrices, Eigenvalues and eigenvectors of matrices, Matrix diagonalization. Fundamentals of Group theory: Definition of a group and illustrative examples, Group multiplication table, rearrangement theorem, cyclic groups, sub-groups and cosets, permutation groups, conjugate elements and class</p>	15

	structure, normal divisors and factor groups, isomorphism and homomorphism, class multiplication. Group representation: Reducible and irreducible representations, great orthogonality theorem (without proof) and its geometric interpretation.	
II	Differential Equation: Solution of linear differential equation of first and second order with constant coefficients, ordinary point, singular point (Regular and Irregular), series solution around an ordinary point, series solution around a regular singular point by Frobenius method, Solution of Legendre's differential equation, Solution of Bessel's differential equation, Solution of Laguerre and Hermite's differential equations, Fourier transform, Fourier cosine and sine transform, Laplace transform, Properties of Laplace transforms, Inverse Laplace transformation.	15
III	Special Functions: Bessel Functions: Bessel functions of the first kind $J_n(x)$, Generating function, Recurrence relations, Expansion of $J_n(x)$ when n is half an odd integer, Integral representation; Legendre Polynomials $P_n(x)$: Generating function, Recurrence relations and special properties, Rodrigues' formula, Orthogonality of $P_n(x)$; Associated Legendre polynomials, Hermite and Laguerre Polynomials: generating function & recurrence relations only.	15
IV	Functions of a complex variable and calculus of residues: Complex algebra, Functions of a complex variable, Cauchy's integral theorem, Cauchy's integral formula; Taylor and Laurent expansions; Singularities; Cauchy's residue theorem, Cauchy principle value, Singular points and evaluation of residues, Jordan's Lemma; Evaluation of definite integrals of the type: $\int_0^{2\pi} f(\sin \theta, \cos \theta) d\theta$; $\int_{-\infty}^{\infty} f(x) dx$; $\int_{-\infty}^{\infty} f(x) e^{iax} dx$ using Cauchy's residue theorem.	15
Total Contact Hours		60
Suggested Evaluation Methods		
Internal Assessment: 30		End Term Examination: 70
> Theory	30	> Theory: 70
• Class Participation:	5	Written Examination
• Seminar/presentation/assignment/quiz/class test etc.:	10	
• Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1. Group Theory and Quantum Mechanics by M. Tinkam.		
2. Mathematical Methods for Physicists (4 th edition) by G. Arfken.		
3. Mathematical Methods for Physicists (6 th edition) by Arfken and Weber.		
4. Mathematical Physics for Physicists and Engineers by L. Pipes.		
5. Introduction to Mathematical Physics by C. Harper.		

Session: 2025-26

Part A - Introduction

Name of Programme	M.Sc. Physics		
Semester	1 st		
Name of the Course	Classical Mechanics		
Course Code	25PN-PHY-102		
Course Type	CC-2		
Level of the course	500-599		
Pre-requisite for the course (if any)	--		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	<p>CLO 102.1: Demonstrate a basic and advanced knowledge of Lagrangian and Hamiltonian Formulations and solve related problems. Identify the cyclic coordinates and understand their importance in Hamiltonian formulation.</p> <p>CLO102.2: Acquire knowledge of canonical Transformation and various generating functions for this transformation. Develop a deep understanding to tackle the problems of classical mechanics under small oscillations.</p> <p>CLO 102.3: Demonstrate the concept of motion of a particle under central force and apply advanced methods to deal with central force problems. Use Hamilton-Jacobi theory for finding the solutions of various Classical systems.</p> <p>CLO 102.4: Understand the foundations of nonlinear dynamics in general and chaotic motion and fractals, in particular. Perform stability analysis of cubic an harmonic oscillator and undamped pendulum, and find chaotic trajectories.</p>		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist of at least 4 parts covering entire syllabus. The question paper is expected to contain problems to the extent of 20% of total marks. The examinee will be required to attempt 5 questions; selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	Lagrangian and Hamiltonian formulations: Hamilton's principle,	15

	Derivation of Lagrange's equations from Hamilton's principle, Principle of Least Action and its applications, Canonical Transformation; The Hamiltonian Formalism: Canonical formalism, Hamiltonian equations of motion, The physical significance of the Hamiltonian, Cyclic coordinates, Routhian procedure and equations, Derivation of Generating functions, examples, properties, Derivation of Hamiltonian equations from variational principle.	
II	Poisson bracket and theory of small oscillations: Poisson bracket, special cases of Poisson bracket, Poisson theorem, Poisson bracket and canonical transformation, Jacobi identity and its derivation, Lagrange bracket and its properties, the relationship between Poisson and Lagrange brackets and its derivation, the angular momenta and Poisson bracket, Liouville's theorem and its applications; Theory of small oscillations: Formulation of the problem, Eigenvalue equation and the principle axis transformation, frequencies of free vibrations and normal coordinates, free vibrations of a linear triatomic molecule.	15
III	Two-body central force problem and H-J theory: Two body central force problem: Reduction to the equivalent one body problem, the equation of motion and first integrals, classification of orbits, the Virial theorem, the differential equation for the orbit, integrable power law in time in the Kepler's problem, scattering in central force field; H-J Theory: H-J equation and their solutions, use of H-J method for the solution of harmonic oscillator problem, Hamilton's principle function, Hamilton's characteristic function and their properties.	15
IV	Introductory non-linear dynamics: Classical Chaos: Linear and nonlinear systems, periodic motion, Perturbation and KAM theorem, dynamics in phase space, phase portraits for conservative systems, attractors, classification and stability of equilibrium points, stability analysis of cubic and harmonic oscillator and un-damped pendulum, chaotic trajectories and Liapunov exponent, Poincare Map, Henon-Hiels Hamiltonian, bifurcation, driven-damped harmonic oscillator, the logistic equation, Fractals and dimensionality.	15
Total Contact Hours		60
Suggested Evaluation Methods		
Internal Assessment: 30		End Term Examination: 70
> Theory	30	> Theory: 70
• Class Participation:	5	Written Examination
• Seminar/presentation/assignment/quiz/class test etc.:	10	
• Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1. Classical Mechanics (3 rd ed., 2002) by H. Goldstein, C. Poole and J. Safko, Pearson Edition		
2. Classical Mechanics by John R Taylor.		
3. Chaos and Integrability in nonlinear dynamics: An introduction (1989) by Michael Tabor.		
4. Nonlinear dynamics: Integrability, Chaos and patterns (2003) by M. Lakshmanan and S. Rajasekar.		
5. Classical Mechanics, J.C. Upadhyaya, Himalaya Publishing House.		

Session: 2025-26

Part A- Introduction

Name of Programme	M. Sc. Physics
Semester	1 st
Name of the Course	Quantum Mechanics-I
Course Code	25PN-PHY-103
Course Type	CC-3
Level of the course	500-599
Pre-requisite for the course (if any)	--

Course Learning Outcomes (CLOs)
After completing this course, the learner will be able to:

- CLO 103.1:** Realize basic quantum-mechanical view point, learn its wave mechanical & matrix formulations, and solve the Schrödinger equation for simple potentials, including harmonic and central potentials.
- CLO 103.2:** Construct matrices for observables and wave functions in different representations, apply matrix theory to linear harmonic oscillator, and describe the time-development of a quantum system in Schrödinger, Heisenberg and Interaction pictures.
- CLO 103.3:** Calculate the eigenvalues and eigen functions for the orbital and general angular momenta, learn the matrix representation of angular momentum, and perform addition of two angular momenta.
- CLO 103.4:** Grasp the concepts of identity & indistinguishability, understand symmetric and anti-symmetric wave functions, construct spin and total wave functions for a system of two spin $\frac{1}{2}$ particles, and comprehend connection among spin, symmetry & statistics.

Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist of at least 4 parts covering entire syllabus. The question paper is expected to contain problems to the extent of 20% of total marks. The examinee will be required to attempt 5 questions; selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact
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		Hours
I	Schrodinger formulation of Quantum Mechanics: Recapitulation of basic concepts: Two-slit experiment with <i>em</i> radiation and matter particles, Quantum-mechanical view point, The Schrödinger wave equation, Expectation values, Ehrenfest theorem; Interpretative postulates of quantum mechanics: Dynamical variables as Hermitian operators, Eigenvalues and eigen functions, Expansion in eigen functions; Illustration of postulates for energy and momentum: Ortho normality of eigen functions, Reality of eigenvalues, Closure property, Probability function and expectation value, Co-ordinate and momentum representations of wave function, Uncertainty principle for two arbitrary observables; Problems: A charged particle in a uniform static magnetic field (eigen functions and Landau levels); The Hydrogen atom (reduced mass, radial wave functions and energy eigenvalues).	15
II	Matrix formulation of Quantum Mechanics: Preliminaries: Hermitian and unitary matrices, Transformation and diagonalization of matrices, Matrices of infinite rank; Representation of observables and wave functions as matrices, Transformation theory, choice of basis, change of basis, unitary transformations, Hilbert space representation; Dirac's ket and bra notation; Time-development of quantum system: Schrödinger, Heisenberg and Interaction pictures, Link with classical equations of motion, Quantization of a classical system; Application to motion of a particle in an <i>em</i> field; Matrix theory of the harmonic oscillator: Spectrum of eigenvalues and eigen functions, Matrices for position, momentum and energy operators (energy representation).	15
III	Quantum theory of Angular Momentum: Orbital angular momentum operator L , Cartesian and spherical polar co-ordinate representation, Commutation relations, Orbital angular momentum and spatial rotations, Eigenvalues and eigen functions of L^2 and L_z , Spherical harmonics; General angular momentum J : Eigenvalues and eigen functions of J^2 and J_z , Matrix representation of angular momentum operators, Spin angular momentum, Wave function including spin (Spinor); Spin one-half: Spin eigen functions, Pauli spin matrices; Addition of two angular momenta, Clebsch-Gordan coefficients and their calculation for $j_1 = j_2 = 1/2$, $j_1 = 1, j_2 = 1/2$ and $j_1 = j_2 = 1$; The Wigner-Eckart theorem.	15
IV	Many-particle systems and identical particles: Many-particle Schrödinger wave equation, Stationary-state solutions; Systems of identical particles, Physical meaning of identity, Principle of indistinguishability, Exchange and transposition operators, Totally symmetric and anti-symmetric wave functions, Time-invariance of symmetry, Construction of symmetric and anti-symmetric wave functions, Connection among spin, symmetry and statistics of identical particles, Fermions and bosons; Spin and total wave functions for a system of two spin $1/2$ particles, Pauli exclusion principle and Slater determinant; Application to the electronic system of the helium atom (<i>para</i> - and <i>ortho</i> -	15

helium); Limit of distinguishability of identical particles; Basic idea of quantum entanglement.		Total Contact Hours		60
Suggested Evaluation Methods				
Internal Assessment: 30			End Term Examination: 70	
➤ Theory		30	➤ Theory: 70	
• Class Participation:		5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:		10		
• Mid-Term Exam:		15		
Part C-Learning Resources				
Recommended Books/e-resources/LMS:				
1. Quantum Mechanics (3 rd edition) by L. I. Schiff				
2. Quantum Mechanics (2 nd edition) by B. H. Bransden and Joachain				
3. Quantum Mechanics (3 rd edition) by S. Gasiorowicz				
4. Quantum Mechanics (3 rd edition) by E. Merzbacher				
5. Quantum Mechanics by John L. Powell and B. Crasemann				
6. Quantum Mechanics by A. K. Ghatak and S. Loknathan				
7. Introductory Quantum Mechanics (4 th edition) by Richard L. Liboff				
8. Quantum Mechanics: Concepts and Applications (2 nd edition) by N. Zettili				
9. Quantum Mechanics by Y. B. Band and Y. Avishai				

Part A - Introduction			
Name of Programme	M.Sc. Physics		
Semester	1 st		
Name of the Course	Electronic Devices and Circuits-I		
Course Code	25PN-PHY-105E		
Course Type	DEC-I		
Level of the course	500-599		
Pre-requisite for the course (if any)	--		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	<p>CLO 104.1: Be aware of the general characteristics of important semiconductor materials. Develop a deep understanding of the basic design, operation and characteristics of a pn-junction and a BJT along with knowledge of the basic network theorems and their applications in electronic circuit analysis.</p> <p>CLO 104.2: Learn to devise and analyze various transistor amplifier models. Understand the concept of negative feedback and its importance in amplifiers.</p> <p>CLO 104.3: Perform a load-line analysis and design of various biasing schemes in amplifiers. Acquaint with the frequency response of variously coupled amplifiers and sources of noise in electronic devices.</p> <p>CLO 104.4: Gain knowledge of classification, sources of distortions and their estimation, operation and determination of efficiency of power amplifiers. Clearly understand the need of regulation, operation and circuit analysis of different voltage and current regulators.</p>		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			
<p>Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist of at least 4 parts covering entire syllabus. The question paper is expected to contain problems to the extent of 20% of total marks. The examinee will be required to attempt 5 questions; selecting one question from each unit and the compulsory question. All questions will carry equal marks.</p>			
Unit	Topics		Contact Hours
I	Basics of pn-junction, BJT and Network Theorems: Semiconductors: intrinsic and extrinsic semiconductors, charge densities in p and n type semiconductors, conduction by charge drift and diffusion, the pn-junction, energy level diagrams of		15

	pn-junction under forward and reverse bias conditions, derivation of pn-diode equation, Zener diode, Zener and avalanche breakdowns, clipping and clamping circuits; The bipolar junction transistor: basic working principle, configurations and characteristics, voltage breakdowns, Network theorems: node, mesh, superposition, Miller's, Thevenin's and Norton's theorems.	
II	Amplifier Models, Feedback and Biasing: Two port network analysis: active circuit models, gain in decibels, equivalent circuit for BJT, the trans conductance model for BJT, analysis of CE, CB, and CC amplifiers; An amplifier with feedback, effect of negative feedback on gain and its stability, distortions, input and output impedances of amplifiers, Location of quiescent (Q) point, biasing circuits for amplifiers: fixed bias, emitter feedback bias & voltage feedback bias, bias compensation, bias techniques for linear integrated circuits, thermal runaway and thermal stability.	15
III	Frequency Response of Amplifiers: The amplifier pass band, mid frequency range response of a direct coupled CE cascade, the high frequency equivalent circuit (Miller effect), the high frequency response of a direct coupled CE cascade, the frequency response of RC and transformer coupled CE amplifiers, gain-frequency plots of amplifier response (Bode plots), bandwidth of cascaded amplifiers, bandwidth criterion for the transistor, the gain-bandwidth product, composite amplifier designs, bootstrapping in amplifiers, noise in amplifiers, noise figure.	15
IV	Power Amplifiers and Regulators: Power amplifiers: class A large signal amplifier, second and higher order harmonic distortions, the transformer coupled power amplifier, impedance matching, efficiency, push-pull amplifiers, class-B amplifiers, complementary stages, cross over distortions, class-AB operation, heat sinks, derating curve; Electronic voltage regulators: basic operation and analysis of Zener diode voltage regulator, single BJT shunt and series regulators, feedback series BJT regulator and current regulator, overload and short circuit protection circuits.	15
Total Contact Hours		60
Suggested Evaluation Methods		
Internal Assessment: 30		End Term Examination: 70
➤ Theory	30	➤ Theory: 70
• Class Participation:	5	Written Examination
• Seminar/presentation/assignment/quiz/class test etc.:	10	
• Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1. Electronic fundamentals and applications (5 th Ed.) by J. D. Ryder.		
2. Integrated Electronics by J. Millman and C. C. Halkias.		
3. Circuits and Networks: Analysis and Synthesis by A.Sudhakar and S.M.S. Palli		
4. Electronic devices and circuits by Y. N. Bapat.		
5. Pulse, digital and switching waveforms by J. Millman and H. Taub.		
6. Millman's Electronic Devices and Circuits by J. Millman, C. C. Halkias&SatyabrataJit		
7. Electronic Devices and Circuit Theory by Robert L Boylestadand Louis Nashelsky.		
8. Solid state Electronic Devices by B.G. Streetman and S.K. Banerjee.		
Session: 2025-26		
Part A- Introduction		

M.Sc Physics (2nd year)

Syllabi Department of Physics, CBU

W.E. Session 2023-24

Chaudhary Bansi Lal University, Bhiwani Scheme of Examination for M.Sc. - PHYSICS

Semester-IV (w.e.f. 2023-24)

Credits= 28

Marks=600

Sr. No.	Course Paper Code	Courses	Type of Course	Credit			Contact Hours Per Week			Examination Scheme			Total Marks
				Theory (L+T)	Practical Seminar	Total	Theory	Practical Seminar	Total	Major Test (End Semester Exam)	Internal Assessment	Practical Seminar	
1	22PHY 401	Statistical Mechanics	C.C.	4+1	—	5	4+0+1	—	5	80	20	—	100
2	22PHY 402	Atomic & Molecular Physics-II	C.C.	4+1	—	5	4+0+1	—	5	80	20	—	100
3		Discipline Specific Elective III	C.C.	4+1	—	5	4+0+1	—	5	80	20	—	100
4		Discipline Specific Elective IV		4+1	—	5	4+0+1	—	5	80	20	—	100
5	22PHY 403	Physics Laboratory-VII PG Dissertation**		—	4	4	—	8	8	—	20	80	100
6	22PHY 406	Physics Laboratory-VIII PG Dissertation**		—	4	4	—	8	8	—	40	160	200
	**22PHY 407	PG Dissertation		—	8	8	—	16	16	—	—	—	600
Total						28			16				

**Total number of students' engaged in the PG Dissertation offered (ONLY for UTD students) will be two per faculty member (regular) per year, and allotment will be made on the basis of merit cum preference of the students. Students opting for project will be exempted from the corresponding laboratory course. However, dissertation evaluation-examination fee (if any) shall be borne by the student as per University norms.

C.C. = Core Course, D.S.E. = Discipline Specific Elective, O.E.C. = Open Elective Course

Note: 1. L-Lecture, T-Tutorial

2. The same Discipline Specific Elective Courses are to be taken as in semester III and only in combination from the table given below i.e. if one selects 22PHY 403A from DSE I then accordingly he/she will have 22PHY 403A as one course from DSE III and 22PHY 404A as another course from DSE IV

Syllabi, Department of Physics, CBLU

w.e.f. session 2023-24

**M.Sc.-PHYSICS
SEMESTER-III**

22PHY-302

Atomic and Molecular Physics-I

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**Atomic Physics (11 hrs.)**

Physical interpretation of quantum numbers, Pauli principle, Terms for equivalent & non-equivalent electron atom, Space Quantization, Stern-Gerlach experiment, Normal & anomalous Zeeman effect, Stark Effect, Paschen-Back effect, Spectrum of He atom, spectra of alkali elements, and fine structure in alkali spectra, Intensities of spectral lines: General selection rule, Hyperfine structure of Spectra lines, Isotope effect and effect of Nuclear Spin, width of spectral lines.

Unit - II**Molecular Physics (10 hrs.)**

Type of molecular energy states and molecular spectra, Diatomic molecules and their rotational spectra, Types of molecules, Diatomic linear, symmetric top, asymmetric top and spherical top molecules, Rotational spectra of diatomic molecules as a rigid rotator, isotope effect in rotational spectra, energy levels and spectra of non-rigid rotator, intensity of rotational lines.

Unit - III**Vibrational Spectra of diatomic molecules (10 hrs.)**

Born Oppenheimer approximation, Vibrational coarse structure of electronic bands, Progression and sequences, Vibrational energy of diatomic molecule, Diatomic molecules as a simple harmonic oscillator, Energy levels and spectrum, Morse potential energy curve, Molecules as vibrating rotator, vibration spectrum of diatomic molecules, PQR branches.

Unit - IV**Electronic Spectra of diatomic molecules and Fluorescence (10 hrs.)**

Silent feature of electronic spectra, formation of electronic spectra, Intensity of electronic bands in absorption and in emission-Frank Condon Principle and Condon parabola, Dissociation and pre-dissociation, Dissociation energy, Rotational fine structure of electronic bands, The Franck-Condon Principle, Fluorescence, Phosphorescence and their mechanism, Kasha's rule, Quantum Yield, Non-radiative transition, Jablonski Diagram.

Suggested Readings:

1. Principles of fluorescence spectroscopy by Joseph R. Lakowicz
2. Atomic spectra & atomic structure, Gerhard Herzberg, Dover publication, New York.
3. Molecular structure & spectroscopy, G. Anulhas, Prentice - Hall in India, New Delhi.
4. Fundamentals of molecular spectroscopy, Colin N. Barwell & Elaine M. McCash, Tata McGraw - Hill publishing company limited.
5. Introduction to Atomic spectra by Raj Kumar
6. Spectra of Diatomic molecules by Gerhard Herzberg



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Syllabi, Department of Physics, CBU

w.e.f session 2023-24

**M.Sc.-PHYSICS
SEMESTER-III**

**22PHY-304C
Electronics-I**

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 and Number system(12hrs.)

Digital signals, properties of digital signal : switching time, time period and frequency, duty cycle, difference between analog signal and digital signals. Number system: types of number system (binary, octal, decimal, hexadecimal), conversion between different number systems. Binary arithmetic, signed magnitude numbers, complement of a number system, complement arithmetic, Binary coded decimal (BCD), weighted and weighted codes. Binary to gray and gray to binary conversion.

Unit - II

Logic gates and Boolean algebra (12 hrs.)

Logic system (DC logic system, pulse logic system AND-OR-Invert, OR-AND-Invert, Design logic gates using logic families (RTL, DTL, TTL, MOS, ECL). Boolean Algebra - Boolean laws and theorems, sum of product (SOP) and product of sum (POS) expressions, minterm, maxterm, canonical SOP and POS form expressions, Implementation of SOP/POS by using minimum number of two input NAND/NOR gates only, Logical form Diagram.

Unit - III

Combinational circuits(10 hrs.)

Karnaugh map upto four variable system, Half adder, full adder, Half-subtractor, Full subtractor, multiplexer, De-multiplexer, Encoder, Decoder, Comparator, Parity checker and generator.

Unit - IV

Sequential circuits(11hrs.)

Flip-Flops (FF): RS latch, clocked RS flip-flop, J-K flip-flop, race around condition in J-K flip-flop, T-FF, D-FF. Characteristics equations for flip-flops, state transition diagrams for flip-flops, Master slave flip-flop, Registers, Shift registers and its applications. Counters: Parameters (mode, time period, frequency, duty cycle), types of counter: asynchronous, synchronous, reduction of states of a counter by using preset/clear.

Suggested Readings:

1. Digital Principles and Application by Leach malvino (Tata McGraw Hill)
2. Digital logic Design - Brian Holdsworth
3. Digital logic by J.M. Yarbrough (Thomson Publication)
4. Digital electronics by Morris Mano
5. Digital electronics by William Gothmann (Prentice publication)
6. Integrated Electronics by J. Millman and C.C Halkias (Tata - McGraw Hill)



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Syllabi, Department of Physics, CBLU

we 1 session 2023-24

M.Sc.-PHYSICS SEMESTER-III

22PHY-303C

Physics of Nano-materials

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

Review of Density of States(10 hrs.)

Free electron theory (qualitative idea) and its features, Idea of band structure, Metals, insulators and semiconductors, Concept of effective Mass, Density of States in Bands, Variation of Density of States with Energy, Variation of Density of States and Band Gap with Size of Crystal, Electronic Structure From Bulk to Quantum Dot, Electronic States in Direct and Indirect Semiconductor Nano-crystals, Excitons in Direct and Indirect Band Gap Semiconductors.

Unit - II

Reduced Dimensional systems (11 hrs.)

Quantum Confinement, Electron confinement in One, Two and Three Dimensional Infinitely Deep Square Well Potentials, Density of States and Optical Absorption in Quantum Well, Quantum wires: Electron Wave Function and Energy, Density of States, Quantum Dots: Electron Wave Function and Energy, Density of States, Idea of Hetero-junction LED, Quantum Well Laser and Quantum Dot Laser, Coulomb Blockade and Single Electron Transistor

Unit - III

Synthesis/Fabrication of Nanomaterials/Nanostructures(11 hrs.)

Bottom up and Top down Approaches for Synthesis of Nano Materials, Synthesis of Zero-Dimensional Nanostructures (Nanoparticles): Sol-Gel Process, Synthesis inside Micelles or Using Micro-Emulsions and Growth Termination, Epitaxial Core-Shell Nanoparticles, Ball Milling, One-Dimensional Nanostructures (Nanowires, Nano rods Nanotubes), Vapor (or solution)-liquid-solid (VLS or SLS) growth and Size Control, Electrochemical deposition, Lithography, Two-Dimensional Nanostructures (Thin Films & Quantum Wells), Molecular Beam Epitaxy (MBE), MOCVD, Cluster Beam Evaporation, Ion Beam Deposition, Chemical Bath Deposition Technique

Unit - IV

Characterization of Nanomaterials/Nanostructures(10 hrs.)

Effect of Particle Size and Strain on Width of XRD Peaks of Nanomaterials, Determination of Crystallite/Particle Size and Strain in Nanomaterials Using Debye Scherrer's Formula and Williamson-Hall's Plot, Transmission Electron Microscopy: Basic principle, Brief Idea of Set up, Sample Preparation, Imaging Modes (Dark & Bright Field), Selected Area Electron Diffraction, Photoluminescence (PL) Spectroscopy: Basic Principle and Idea of Instrumentation, Shift in PL Peaks with Particle Size, Determination of Alloy Composition in Thin Films of Compound Semiconductors, Estimation For Width of Quantum Wells, Raman Spectroscopy: Basic Principle and idea of Instrumentation

Suggested Readings:

- 1. The Physics of Low Dimensional Semiconductors John H. Davies Cambridge Uni Press
2. Nanotechnology- An Introduction J.J. Ramsden William Andrew Elsevier
3. Nano-optoelectronics Sensors & Devices Ning Xi & King w. Chiu Lau -W.A.Elsevier
4. Quantum Heterostructures- Microelectronics & Optoelectronics V.V. Mitin, V.A. Kochelp & M.A. Stroscio Cambridge University Press
5. Nanostructures & Nanomaterials Synthesis, Properties & Applications G. Cao Imperial College Press
6. Introduction to Nanotechnology C.P.Poole Jr. & F.J. Owens - John Wiley & Sons
7. Nanotechnology M. Wilson, K. Kannangara, G. Smith, M. Strimmons & H. Ragusa

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Syllabus, Department of Physics, CBLU

w.e.f. session 2023-24

**M.Sc.-PHYSICS
SEMESTER-III**

22PHY-301

Electrodynamics

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

Review of Electrostatics and Magnetostatics (11 hrs.)

Potential and Laplace equations. Solution of Laplace equation in Rectangular coordinates and spherical coordinates. electrostatic boundary conditions, energy stored in continuous charge distribution. Multipole expansion: potential at large distances, the monopole and dipole terms. Electric field in matter: Bound current, field inside dielectrics. Electric displacement, susceptibility and energy stored in dielectrics.

Magnetic vector potential, Magnetostatic boundary conditions, multipole expansion of the vector potential, field of a magnetized object: Bound current, magnetic field inside matter, Ampere's law in Magnetized material, boundary conditions, magnetic susceptibility and permeability.

Unit II

Electromagnetic Waves and Radiation by Moving Charges (12 hrs.)

Faraday's law, induced Electric Field, energy in magnetic fields, Maxwell's equation in free space and matter, charge and energy conservation, Poynting's theorem, Newton's third law in electrodynamics, Maxwell's stress tensor, conservation of momentum, Wave equation, Electromagnetic wave in vacuum, energy and momentum of EM wave, EM wave in matter, Reflection and Refraction of electromagnetic waves at a plane interface between dielectrics, Fresnel relations, Brewster's angle. Wave propagation in conducting media: absorption and dispersion, Wave guides: TE and TM modes in rectangular wave guides.

UNIT-III

Potential, fields and Radiations (10 hrs.)

Potential formulation: Scalar and vector potential, Gauge transformations, Coulomb and Lorentz Gauge, Retarded potentials, Liénard-Wiechert potentials and fields due to moving point charge, Dipole radiation: Electric dipole radiation and magnetic dipole radiations, Total power radiated by moving charge: Larmor's formula and its relativistic generalization, Radiation reaction.

Unit - IV

Electrodynamics and Relativity (10 hrs.)

The Special theory of relativity, Lorentz transformation and basic kinematic results of special relativity, structure of space-time, Review of Four vectors and Lorentz transformation in four dimensional space, Mathematical properties of the space-time of special relativity, Electromagnetic field tensor and covariance of Electrodynamics under Lorentz transformation.

Suggested Readings:

1. Introduction to Electrodynamics by D. J. Griffiths.
2. Classical Electrodynamics by J.D. Jackson
3. Electrodynamics by S. P.uri.
4. Introduction to Electrodynamics by A. Z. Capri and P. V. Puri.
5. Introduction to Plasma Physics by F. F. Chen.
6. Introduction to Plasma Theory by D. R. Nicholson.

Chaudhary Bansi Lal University, Bhiwani
Scheme of Examination for M.Sc. PHYSICS

Sr. No.	Course/Paper Code	Courses	Type of Course	Credit			Contact Hours Per Week			Marks-750			Total Marks
				Theory (L+T)	Practical /Seminar	Total	Theory	Practical /Seminar	Total	Major Test (End Semester Exam)	Internal Assessment	Practical	
1	22PHY 301	Electrodynamics	C.C.	4+1	--	5	4+1	--	5	80	20	--	100
2	22PHY 302	Atoms & Molecular Physics-I	C.C.	4+1	--	5	4+1	--	5	80	20	--	100
3		Discipline Specific Elective I <small>(On one of the following subject categories open candidates)</small>	D.S.E.	4+1	--	5	4+1	--	5	80	20	--	100
4		Discipline Specific Elective II <small>(On one of the following subject categories open candidates)</small>	D.S.E.	4+1	--	5	4+1	--	5	80	20	--	100
5	22PHY 305	Physics Laboratory-IV		--	4	4	--	8	8	--	20	80	100
6	22PHY 306	Physics Laboratory-V		--	4	4	--	8	8	--	20	80	100
7	22PHY 307	Seminar	S.E.C.	--	2	2	--	4	4	--	--	50	50
8	22PHY 308	Open Elective-II	O.E.C.	2	0	2	2	--	2	80	20	--	100
Total						32			42				750

C.C. = Core Course, D.S.E. = Discipline Specific Elective, O.E.C. = Open Elective Course

Note: 1. L-Lecture, T-Tutorial

2. The Discipline Elective Courses will be selected only in combination from the table given below i.e. if one select 22PHY 303A from DSE, I then accordingly he/she will have 22PHY 304A as another course from DSE, II.

Discipline Specific Elective I		Discipline Specific Elective II	
22PHY 303A	Radiation Physics	22PHY 304A	Condensed Matter Physics-I
22PHY 303B	Material Science-I	22PHY 304B	Nuclear Physics-I
22PHY 303C	Physics of Nano-materials	22PHY 304C	Electronics-I

3. The Discipline Elective Courses can be offered depending upon the availability of the resources and facilities.

4. For Open Elective II, students will have to choose a course from the list of open electives offered by other Departments of the University



M.Sc.-PHYSICS
SEMESTER-IV

22PHY-401
Statistical Mechanics

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

Foundations of Statistical Mechanics (12hrs.)

The macroscopic and microscopic states, Postulate of equal a priori probability, Contact between statistics and thermodynamics, Entropy of mixing and the Gibbs paradox, Sackur-Tetrode equation, Ensemble theory, Concept of ensemble, Phase space, Density function, Ensemble average, Liouville's theorem, Stationary ensemble, The micro canonical ensemble, Application to the classical ideal gas; The canonical ensemble, Canonical partition function, Thermodynamics of a system of non-interacting classical harmonic oscillators and magnetic system using canonical ensemble, Calculation of statistical quantities

Unit - II (12 hrs.)

The Grand canonical ensemble and grand canonical partition function, Calculation of statistical quantities, Thermodynamics of a system of classical ideal gas using grand canonical ensemble, Energy and density fluctuations, Quantum-mechanical ensemble theory, Density matrix, Equation of motion for density matrix, Quantum-mechanical ensemble average, Statistics of indistinguishable particles, Two types of quantum statistics- Fermi-Dirac and Bose-Einstein statistics, Fermi-Dirac and Bose-Einstein distribution functions using microcanonical and grand canonical ensembles (ideal gas only), Statistics of occupation numbers, Ideal Bose gas, Internal energy, Equation of state, Bose-Einstein Condensation and its critical conditions, Bose-Einstein condensation in ultra-cold atomic gases: its detection and thermodynamic properties, Black body radiations, liquid Helium.

Unit - III (10 hrs.)

Ideal Fermi gas, Internal energy, Equation of state, Completely degenerate Fermi gas, electron gas in metals, thermionic emission; Cluster expansion method for a classical gas, Simple cluster integrals, Mayer-Urdell relations, Virial expansion of the equation of state, Van der Waal's equation, Validity of cluster expansion method.

Unit - IV (10 hrs.)

Phase transitions, Construction of Ising model, Solution of Ising model in the Bragg-William approximation, Critical exponents, Landau theory of phase transition, Scaling hypothesis, One and two-dimensional Ising model, Thermodynamic fluctuations and their probability distribution law, Spatial correlations in a fluid, Connection between density fluctuations and spatial correlations, Brownian motion

Suggested Readings:

1. Statistical Mechanics by R. K. Pathria (2nd edition)
2. Statistical Mechanics by R. K. Pathria and P. D. Beale (1st edition)
3. Statistical and Thermal Physics by F. Reif
4. Statistical Mechanics by K. Huang
5. Statistical Mechanics by L. D. Landau and E. M. Lifshitz
6. Statistical Mechanics by R. Kubo

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Syllabi, Department of Physics, CBLU

w.e.f. session 2023-24

**M.Sc.-PHYSICS
SEMESTER-IV**

22PHY-402

Atomic and Molecular Physics-II

2Maximum 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**Atomic Physics(10 hrs.)**

The origin of X-Rays, X-Ray emission spectra, Dependence of position of Emission lines on the atomic number, X-Ray emission (Doublet) spectra, Satellites, Continuous X-ray Emission, X-Ray Absorption spectra

Unit - II**Molecular Physics (10 hrs.)**

Raman Effect - quantum theory - molecular polarizability, pure rotational Raman spectra of diatomic molecules - vibration rotation Raman Spectrum of diatomic molecules, Intensity alternation in Raman spectra of diatomic molecules, application of Raman spectroscopy in the structure determination of simple molecules.

Unit - III**NMR Spectroscopy(10 hrs.)**

NMR: Basic principles, spin-spin and spin-lattice relaxation times, chemical shift and spin-spin coupling, Applications of NMR spectroscopy, Mossbauer spectrometer, Isomer nuclear transition, resonance fluorescence, Mossbauer Effect, Mossbauer nuclei, Isomer shift, quadrupole splitting, magnetic hyperfine structure, application of Mossbauer spectroscopy.

Unit - IV**ESR Spectroscopy and Laser(10 hrs.)**

ESR spectrometer, substances which can be studied by ESR, Resonance condition, Relaxation mechanisms, Features of ESR spectra (a) the g factor (b) Fine structure (c) hyperfine structure (d) hyperfine structure Applications of ESR, spontaneous and stimulated emission, absorption, Einstein coefficient, properties of laser beams, laser application in holography, laser induced fusion.

Suggested Readings:

1. Principles of fluorescence spectroscopy by Joseph R. Lakowicz.
2. Atomic spectra & atomic structure, Gerhard Herzberg; Dover publication, New York.
3. Molecular structure & spectroscopy, G. AmalDas, Prentice - Hall of India, New Delhi.
4. Fundamentals of molecular spectroscopy, Colin N. Banwell & Elaine M. McCash, Tata McGraw - Hill publishing company limited.
5. Introduction to Atomic spectra by H.E. White.
6. Spectra of diatomic molecules by Gerhard Herzberg.
7. Concepts of Modern Physics by Arthur Beiser (McGraw-Hill Book Company, 1987).



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Syllabi, Department of Physics, CBLU

w.e.f. session 2023-24

M.Sc.-PHYSICS SEMESTER-II

22PHY-404C Electronics-II

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

Negative resistance devices & Memories(10 hrs.)

Tunnel diode, Backward diode, Uni-junction transistor, p-n-p-n devices, p-n-p-n characteristics, Thyristors, silicon controlled switch, SCR and SCS characteristics, Semiconductor Memories: ROM, PROM, and EPROM, Ram, Static and Dynamic Random Access Memories (SRAM and DRAM), Content addressable memory, other advanced memories.

Unit - II

MICROPROCESSOR 8085(10 hrs.)

Buffer registers, Bus organized computers, SAP-I, Microprocessor (µP) 8085 Architecture, memory interfacing, interfacing I/O devices, Assembly language programming, Instruction classification, addressing modes, op code and operand, fetch and execute cycle, timing diagram, machine cycle, instruction cycle and T states, Data transfer logic and branch operations- Programming examples.

Unit - III

MICROPROCESSOR 8086(11 hrs.)

Architecture of microprocessor 8086, Pin description for minimum and maximum modes, internal operation, addressing modes, memory interfacing examples based on addressing scheme, Instruction format for constructing machine language codes, Instruction set and directives, Stacks, Procedures, Macros and interrupts, I/O interfacing and data transfer scheme, Programming example.

Unit - IV

IC fabrication(12 hrs.)

Silicon planar process, crystal growth, wafer production, thermal oxidation, high pressure oxidation, concentration enhanced oxidation, chlorine oxidation, lithography & pattern transfer, etching process, dopant addition, ion implantation, diffusion, CVD, epitaxial and non-epitaxial films, Monolithic IC technology, III fabrication, fabrication of FET/NMOS enhancement as well as depletion transistor, fabrication of CMOS devices, Monolithic diodes.

Suggested Readings

1. Microprocessor Architecture, Programming and Applications with 8085, R.S. Gaonkar, PHI
2. Electronic Devices and Circuits Theory, Robert Boylested and Louis Nashelsky,
3. Integrated Electronics by J. Millman and C.C. Halkias (Tata - McGraw Hill)
4. Fundamentals of electronics by J. D. Ryder (Prentice Hall Publication)
5. Fundamentals of Microprocessor and Microcomputer - B. Ram
6. Microprocessor System the 8086/8088 Family - Liu and Gibson
7. Microprocessor Architecture Programming and Application : R.S. Gaonkar
8. Introduction to microprocessor: A.P. Mathur

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Syllabi, Department of Physics, CBLU

Winter session 2023-24

**M.Sc.-PHYSICS
SEMESTER-IV**

22PHY-403C

Experimental Techniques in Physics

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(10 hrs.)

Experimental Techniques to observe the defects in Lattice. Electron Microscopy: Transmission Electron Microscope (TEM) and X-ray Diffraction Technique. Experimental methods of observing dislocations and tracking faults. Optical Techniques: Photo Luminescence, FTIR and Raman Spectroscopic techniques.

Unit-II(10 hrs.)

Surface Analytical Techniques: Electron Spectroscopies-Auger, XPS (ESCA), UV-photo emission, X-ray absorption techniques: EXAFS, NEAFS, Secondary Ion Mass Spectroscopy (SIMS), Rutherford Back Scattering (RBS) and low Energy electron diffraction techniques.

Unit-III(10 hrs.)

Opto-Electronic Devices: Solar Cells, Photo Diodes, Photo-detectors, LEDs, Data Interpretation and Analysis: Precision and Accuracy, Error Analysis, Propagation of Errors, Least Squares fitting: Linear and Non-linear curve fitting, Chi-square test. Modulation Techniques: Amplitude Modulation, Frequency Modulation.

UNIT-IV(10 hrs.)

Spectroscopic and Scanning Probe Techniques: Detailed study of spectroscopic techniques: ESR (electron spin resonance) and NMR; Scanning Probe Techniques: STM (Scanning Tunneling Microscopy), AFM (Atomic Force Microscopy), STS (Scanning Tunneling Spectroscopy).

Suggested Readings:

1. Crystal Growth and Characterization by R. Ueda and J.B. Mullin
2. Experimental Techniques of Surface Science by Woodruff and Delchar
3. Solid State Physics by Beach and Luth
4. Solid Surfaces by Inach
5. Solid Surfaces by Prutton
6. Physics at Surfaces by Zangwill
7. Solid State Physics by Pari&Babbar
8. X-ray Crystallography by Azaroff



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