

FACULTY OF SCIENCES

SYLLABUS FOR THE BATCH FROM THE YEAR 2023 TO YEAR 2026

Programme Code: BSMD

Programme Name: B.Sc. Medical (Semester I-II)

(SYLLABUS)

Examinations: 2023-24



Khalsa College, Amritsar

(An Autonomous College)

| | |
|--|-----------------------------|
| S.No. | PROGRAMME OBJECTIVES |
| PROGRAMME: B.Sc. NON MEDICAL/B.Sc. COMPUTER SCIENCE PROGRAMME Code: BSNM/BSCS | |

| |
|--|
| PROGRAMME OBJECTIVE: The objectives of the programme are: |
| 1. To teach fundamental concepts of sciences and its societal applications through a 3-year program. |
| 2. To provide the key knowledge and laboratory resources to prepare students for careers as professionals in the field of science. |
| 3. To equip students with advanced knowledge, research training and experience in specific areas of science. These skills will prepare the successful graduate for careers in government, academia, or industry. |

| |
|--|
| PROGRAMME SPECIFIC OUTCOMES (PSOS): |
|--|

| | |
|--------------|--|
| PSO-1 | To acquire knowledge in the subjects of Botany, Zoology, Chemistry and Biochemistry. |
| PSO-2 | To enable students to define and explain major concepts of biological sciences. |
| PSO-3 | To gain knowledge to correctly use biological and chemical instrumentation and proper laboratory techniques. |
| PSO-4 | To become efficient to communicate biological and chemical knowledge in oral and written form. |
| PSO-5 | To gain knowledge to recognize the relationship between structure and function at molecular and cellular levels. |

ELIGIBILITY: A candidate who has passed 10+2 medical examination from recognized board or any other examination considered equivalent there to be by the GNDU with 40% marks is eligible to apply (subject to change).

COURSE DURATION: 3 Years

COURSE SCHEME

SEMESTER - I

| Course Code | Course Name | Hours /Week | Credits | | | Total Credits | Max. Marks | | | | Page No. |
|------------------------|---|-------------|---------|---|---|---------------|------------|----|----|-------|----------------|
| | | | L | T | P | | Th | Pr | IA | Total | |
| BOT111A | Diversity of Microbes | 3 | 2 | 1 | 0 | 3 | 56 | - | 50 | 200 | 5-6 |
| BOT111B | Diversity of Cryptogams | 3 | 2 | 1 | 0 | 3 | 56 | - | | | 7-8 |
| BOT111P | Botany Lab – I (Based on BOT111A & BOT111B) | 4 | 0 | 0 | 2 | 2 | - | 38 | | | 9-10 |
| CHE111A | Inorganic chemistry-I | 3 | 2 | 1 | - | 3 | 56 | - | 50 | 200 | 11-12 |
| CHE111B | Organic Chemistry-I | 3 | 2 | 1 | - | 3 | 56 | - | | | 13-14 |
| CHE111P | Practical | 4 | 0 | 0 | 2 | 2 | - | 38 | | | 15-16 |
| ZOO-111A | Cell Biology | 3 | 2 | 1 | 0 | 3 | 56 | | 50 | 200 | 17-18 |
| ZOO-111B | Biodiversity-I | 3 | 2 | 1 | 0 | 3 | 56 | | | | 19-20 |
| ZOO-111P | Practical-I | 4 | 0 | 0 | 2 | 2 | | 38 | | | 21-22 |
| BHPB-1101 | ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ –I | 4 | 4 | 0 | 0 | 4 | 75 | | 25 | 100 | 23-24 |
| BPBI-1102 BPHC-1104 | ਮੁੱਢਲੀ ਪੰਜਾਬੀ-I (In Lieu of Compulsory Punjabi) or PUNJAB HISTORY & CULTURE(For those students who are not domicile of Punjab) | 4 | 4 | 0 | 0 | 4 | 75 | | 25 | 100 | 25-26 27-28 |
| BENC-1105 | English (Compulsory) | 4 | 4 | 0 | 0 | 4 | 75 | | 25 | 100 | 29-30 |
| ZDA-111 | DRUG ABUSE | 2 | 2 | 0 | 0 | 2 | 50 | | - | 50 | 31-32 |
| | | | | | | 34 | | | | 900 | |

| COURSE SCHEME | | | | | | | | | | | |
|---------------|--|-------------|---------|---|---|---------------|------------|----|----|-------|----------|
| SEMESTER - II | | | | | | | | | | | |
| Course Code | Course Name | Hours /Week | Credits | | | Total Credits | Max. Marks | | | | Page No. |
| | | | L | T | P | | Th | Pr | IA | Total | |
| BOT121A | Cell Biology | 3 | 2 | 1 | 0 | 3 | 56 | - | 50 | 200 | 33-34 |
| BOT121B | Genetics | 3 | 2 | 1 | 0 | 3 | 56 | - | | | 35-36 |
| BOT121P | Botany Lab - II(Based on BOT121A & BOT121B) | 4 | 0 | 0 | 2 | 2 | - | 38 | | | 37-38 |
| CHE121A | Inorganic Chemistry-I | 3 | 2 | 1 | - | 3 | 56 | - | 50 | 200 | 39-40 |
| CHE121B | Physical Chemistry-I | 3 | 2 | 1 | - | 3 | 56 | - | | | 41-42 |
| CHE121P | Practical | 4 | 0 | 0 | 2 | 2 | - | 38 | | | 43-44 |
| ZOO-121A | Ecology | 3 | 2 | 1 | 0 | 3 | 56 | - | 50 | 200 | 45-46 |
| ZOO-121B: | Biodiversity-ii (arthropoda to hemichordata) | 3 | 2 | 1 | 0 | 3 | 56 | - | | | 47-48 |
| ZOO-121P | Practical-I | 4 | 0 | 0 | 2 | 2 | - | 38 | | | 49-50 |
| BHPB-1201 | ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ -II | 4 | 4 | 0 | 0 | 4 | 75 | - | 25 | 100 | 51-52 |
| BPBI-1202 | ਮੁੱਢਲੀ ਪੰਜਾਬੀ-II | 4 | 4 | 0 | 0 | 4 | 75 | - | 25 | 100 | 53-54 |
| BPHC-1210 | (In Lieu of Compulsory Punjabi)or PUNJAB HISTORY & CULTURE.(For those students who are not domicile of Punjab) | | | | | | | | | | 55-56 |
| BENC-1205 | English (Compulsory) | 4 | 4 | 0 | 0 | 4 | 75 | - | 25 | 100 | 57-58 |
| ZDA-121 | DRUG ABUSE | 2 | 2 | 0 | 0 | 2 | 50 | - | - | 50 | 59-60 |
| | | | | | | 34 | | | | 900 | |

B.Sc. Medical Semester I
BOT111A
Diversity of Microbes

Teaching Hours (per week): 4

Total Credit: 4

Credits:LTP:310

Total Hours: 60

Maximum Marks: 56

Pass Marks: 35%

Time: 3 Hours

Instructions for the Paper Setters:

The question paper will be divided into 5 sections (Section A-E). Section A: (Total weightage 12 marks). This section will have 8 very short answer type questions (maximum limit 50 words) and students have to attempt any 6 questions. Each question will carry 2 marks. Questions are to cover from the whole syllabus. Section B, C, D and E: (Total weightage 44 marks). Each section will have two questions from one unit. The student will have to attempt one question from each section and question will carry 11 marks. The answers should not exceed 6 pages. The questions should not have more than two subparts.

Course Objectives:

| | |
|------|--|
| CO-1 | To acquaint students with basic concepts of diversity of Algae, Fungi, Bacteria, Viruses, Lichens etc. |
| CO-2 | To study systematic position, structure, and function of these microbes. |

UNIT-I

General Characters and Classification of Algae-Taxonomic parameters including those pertaining to photosynthetic pigments, cell wall, food reserves, flagellation. Life cycles in algae, Economic importance of algae: Uses of algae as food and feed; in agriculture and industry.

UNIT-II

Important features and life history of:

Chlorophyceae–*Volvox*, *Oedogonium*

Xanthophyceae–*Vaucheria*

Phaeophyceae–*Ectocarpus*

Rhodophyceae–*Polysiphonia*

UNIT-III

General characters, classification and economic importance of Fungi.

Important features and life history of:

Mastigomycotina– *Phytophthora*

Zygomycotina–*Mucor*

Ascomycotina–*Saccharomyces*, *Peziza*

Basidiomycotina–*Puccinia*, *Agaricus*

UNIT-IV

General account of viruses, nature, classification, structure, reproduction, TMV and bacteriophage

General account of bacteria structure, nutrition, reproduction

General account of cyanobacteria, distribution, thallus structure, cell structure, reproduction

General account of Lichens, Organisation of thallus: crustose, foliose and fruticose

Suggested Readings:

1. Dubey, R. and Maheshwari, D. (2016). A textbook of Microbiology. S. Chand and company, New Delhi.
2. Alexopoulos, C.J., Mims, C.W. and Blackwell, M. (2002). Introductory Mycology (4th Edition), Wiley - Blackwell, USA.
3. Dube, H.C. (2007). A Textbook of Fungi, Bacteria and Viruses (3rd edition), Scientific Publishers, India
4. Dube, H.C. (2012). An Introduction to Fungi (4th edition), Scientific Publishers., India.
5. James W. Brown. (2014). Principles of Microbial Diversity. ASM press, USA.
6. Ogunseitan, O. (2004). Microbial Diversity: Form and function in Prokaryotes. Wiley Publishers, USA.
7. Sharma, O.P. (2004). Text Book of Thallophytes. McGraw Hill Publishing Co., India.
8. Sharma, P.D. (2004). The Fungi, (2nd Edition) Rastogi Publication, India

Course Outcomes:

| | |
|------|--|
| CO-1 | This course makes student aware about the diversity in various life forms of plant kingdom. |
| CO-2 | It enables students to identify algae and fungi. |
| CO-3 | It enables students to structurally differentiate among different microbes. |
| CO-4 | Increase the awareness of human friendly viruses, bacteria, algae and their economic importance. |

B.Sc. Medical Semester I
BOT111B
Diversity of Cryptogams

Teaching Hours (per week): 4
Total Credit: 4
Credits:LTP:310
Total Hours: 60
Maximum Marks: 75
Pass Marks: 35%

Time: 3 Hours

Instructions for the Paper Setters:

The question paper will be divided into 5 sections (Section A-E). Section A: (Total weightage 12 marks). This section will have 8 very short answer type questions (maximum limit 50 words) and students have to attempt any 6 questions. Each question will carry 2 marks. Questions are to cover from the whole syllabus. Section B, C, D and E: (Total weightage 44 marks). Each section will have two questions from one unit. The student will have to attempt one question from each section and question will carry 11 marks. The answers should not exceed 6 pages. The questions should not have more than two subparts.

Course Objectives:

| | |
|------|--|
| CO-1 | The main objective of this course is to introduce the students with the basic knowledge of cyptograms. |
| CO-2 | To study the detailed structure, functions and reproductive system in cyptograms. |

UNIT-I

General characters and classification of bryophytes, Bryophytes as amphibians of plants kingdom, life cylce displaying alternation of generations, Affinities of bryophytes with algae and pteridophytes.

UNIT-II

Morphology, anatomy and reproduction of:

Marchantia,

Anthoceros,

Funaria,

(Developmental stages are excluded).Ecological and Economic importance of bryophytes.

UNIT-III

General characters and classification of Pteridophyta, Stellar System, Life cycle showing alternation of generations.

UNIT-IV

Morphology, anatomy and reproduction of *Rhynia*, *Lycopodium*, *Selaginella*, *Equisetum*, *Pteris*, *Marsilea*. (Developmental stages are excluded). Economic importance of Pteridophytes.

Suggested Readings:

1. Goffinet B. (2008). **Bryophyte Biology. Cambridge University Press, UK.**
2. Sambamurty, S.S. (2005). A Textbook of Bryophytes, Pteridophytes, Gymnosperms and Paleobotany. I K International Publishing House Pvt Ltd., India
3. Sharma, O.P. (2014). Bryophyta. Mc Graw Hill Education Pvt Ltd., India.
4. Rashid, A. (1998). An Introduction to Bryophyta. Vikas Publishing House Pvt. Ltd. New Delhi.
5. Vashistha, P.C., Sinha, A.K. and Kumar, A. (2010) Pteridophyta. S. Chand. Delhi, India

Course Outcomes:

| | |
|------|--|
| CO-1 | This course makes student aware about the diversity in various life forms of plant kingdom. |
| CO-2 | Students able to differentiate bryophytes and pteridophytes. |
| CO-3 | Students develop critical understanding on morphology, anatomy and reproduction of Bryophytes & Pteridophytes. |
| CO-4 | Students learn about evolution of first land plants. |

**B.Sc. Medical Semester I
BOT111P
PRACTICAL**

Teaching Hours (per week):4

Total Credit: 2

Credits:LTP:002

Maximum Marks: 38

Pass Marks: 35%

Time: 3 Hours

Course Objective

| | |
|------|--|
| CO-1 | The course will give hands on training to students to work in laboratories. |
| CO-2 | Understand the diversity among bacteria, algae, fungi, bryophytes and pteridophytes. |

Suggested Laboratory Exercises

Teachers may select plants/material available in their locality/institution.

1. Gram staining of bacteria.
2. Observation of disease symptoms in hosts infected by fungi, viruses and mycoplasma Section cutting of diseased material and identification of the pathogens as per the theory syllabus.
3. Study of the genera included in theory under algae and fungi.
4. Study of morphology, reproductive structures and anatomy Bryophytes (*Marchantia*, *Anthoceros* and *Funaria*) and Pteridophytes (*Lycopodium*, *Selaginella*, *Equisetum*, *Pteris* and *Marsilea*).

Suggested Readings:

1. Lee, R.E. (2008). Phycology, Fourth Edition, Cambridge University Press, USA.
2. Agrios, G.N. (1997). Plant Pathology, 4th edition, Academic Press, U.K.

Course Outcomes:

| | |
|------|---|
| CO-1 | Prepare and view specimens for examination using microscope. |
| CO-2 | Differentiate algae, fungi, bryophytes and pteridophytes on the basis of morphology, reproductive structures and anatomy. |

| | |
|------|---|
| CO-3 | Understand and identify plant diseases with special reference to the causative agents, symptoms and etiology. |
|------|---|

**B.Sc. Medical Semester I
CHE 111A
INORGANIC CHEMISTRY-I**

Teaching Hours (per week): 3

Credits:LTP:210

Total Hours: 45

Maximum Marks: 56

Pass Marks: 35%

Time: 3 Hours

Note for paper setter and students:

- 1. There will be five sections.**
- 2. Section A is compulsory and will be of 12 marks consisting of 8 short answer type questions carrying 2 mark each covering the whole syllabus. The answer should not exceed 50 words. The candidate will have to attempt any 6 questions in this section.**
- 3. Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 11 marks each from the respective unit. The candidates are required to attempt one question from each of these sections. Each question in these sections should not have more than two subparts.**
- 4. Non-programmable Scientific calculator is allowed.**

COURSE OBJECTIVE:

The aim of the course is to enhance the basic knowledge of students on the topics of the structure of atom, periodic properties, chemical bonding and its types and molecular interactions taking place in solids.

COURSE CONTENTS:

UNIT-I

1. Atomic Structure

11

Hrs.

Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, significance of ψ and ψ^2 , quantum numbers, radial and angular wave functions and probability distribution curves, shapes of s,p,d orbitals. Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements and ions.

UNIT-II

2. Periodic Properties

11 Hrs.

Position of elements in the periodic table; effective nuclear charge and its calculations. Atomic and ionic radii, ionization energy, electron affinity and electronegativity –definition, methods of determination or evaluation, trends in periodic table and applications in predicting and explaining the chemical behaviour.

UNIT-III

3. Chemical Bonding

11 Hrs

Covalent Bond –Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions. BeF_2 , BF_3 , CH_4 , PF_5 , SF_6 , IF_7 , SnCl_2 , XeF_4 , BF_4^- , SnCl_6^{2-} . Valence shell electron pair repulsion (VSEPR) theory to NH_3 , H_3O^+ , SF_4 , ClF_3 , ICl_2 and H_2O . MO theory, homonuclear (elements and ions of 1st and 2nd row), and heteronuclear (BO , CN^- , CO , NO^+ , CO^+ , CN), diatomic molecules, multicenter bonding in electron deficient molecule (Boranes). Percentage ionic character from dipole moment and electronegativity difference.

UNIT-IV

4. Ionic Solids

12 Hrs

Concept of close packing, Ionic structures, (NaCl type, Zinc blende, Wurtzite, CaF₂ and antiferite, radius ratio rule and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy and Born-Haber cycle, solvation energy and solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule. Metallic bonding, valence bond and band theories. Weak Interactions –Hydrogen bonding, Vander Waals forces.

BOOKS PRESCRIBED:

1. Inorganic Chemistry by Weller, Overton, Rourke and Armstrong, 7th Ed. Oxford University Press.
2. Concise Inorganic Chemistry by J. D. Lee, 5th Ed., Wiley India.
3. Advanced inorganic Chemistry by F. Albert Cotton, Geoffrey Wilkinson 6th Ed., Wiley.
4. Inorganic Chemistry: Principles of Structure and Reactivity by James E. Huheey 4th Ed., Pearson

COURSE OUTCOMES:

| S. No. | On completing the course, |
|------------|---|
| CO1 | Students will gain knowledge about the atomic structure, Schrodinger wave equation, quantum numbers, shapes of orbitals, rules governing the filling of electrons in orbitals and electronic configuration of elements and ions. |
| CO2 | Students will gain knowledge about positioning of elements in the periodic table, Slater's rule, periodic properties such as ionisation energy, electron affinity, electronegativity and its calculations and chemical behaviour of elements. |
| CO3 | Students will acquire knowledge of valence bond theory, hybridisation, shapes of molecules, VSEPR theory, MO theory, bonding in boranes and determination of percentage ionic character. |
| CO4 | Students will learn about close packing in solids, ionic structures, coordination number, radius ratio rules, Born-Haber cycle, solvating power and polarising power of ions by Fajan's rule. |
| CO5 | Students will acquire knowledge of metallic bonding, electron sea model, valence bond, band theories, hydrogen bonding and Vander Wall interactions. |

**B.Sc. Medical Semester I
CHE 111B
ORGANIC CHEMISTRY-I**

Teaching Hours (per week): 3

Total Credit: 3

Credits:LTP:210

Total Hours: 45

Maximum Marks: 56

Pass Marks: 35%

Time: 3 Hours

Note for paper setter and students:

- 1. There will be five sections.**
- 2. Section A is compulsory and will be of 12 marks consisting of 8 short answer type questions carrying 2 mark each covering the whole syllabus. The answer should not exceed 50 words. The candidate will have to attempt any 6 questions in this section.**
- 3. Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 11 marks each from the respective unit. The candidates are required to attempt one question from each of these sections. Each question in these sections should not have more than two subparts.**
- 4. Non-programmable Scientific calculator is allowed.**

COURSE OBJECTIVES:

(i) To expand the knowledge of basic concepts in organic chemistry.

(ii) To know the structure and formation of all the intermediates involved in chemical reaction.

COURSE CONTENTS:

UNIT-I

1. Structure and Bonding (5 Hrs.)
Hybridization, bond lengths and bond angles, bond energy, localized and delocalized chemical bond, Vander Waals interactions, resonance, hyperconjugation, aromaticity hydrogen bonding and Inductive and electrometric effects.
2. Mechanism of Organic Reactions (6 Hrs.)
Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents – electrophiles and nucleophiles. Types of organic reactions. Energy considerations. Reactive intermediates – Carbocations, carbanions, free radicals, carbenes, arenes and nitrenes(with examples). Assigning formal charges on intermediates and other ionic species.

UNIT-II

3. Alkanes (4 Hrs.)
Isomerism in alkanes, sources, methods of formation (with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids), physical properties and chemical reactions of alkanes. Mechanism of free radical halogenation of alkanes: orientation, reactivity and selectivity.
4. Alkenes and Alkynes (8 Hrs.)
Nomenclature of alkenes, methods of formation, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides, regioselectivity in alcohol dehydration. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions

of alkenes-mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration-oxidation, oxymercuration reduction. Epoxidation, ozonolysis, hydration, hydroxylation and oxidation with KMnO_4 . Substitution at the allylic and vinylic positions of alkenes. Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation, metal-ammonia reductions, oxidation and polymerization.

UNIT-III

5. Alkyl and Aryl Halides (7 Hrs.)

Nomenclature and classes of alkyl halides, chemical reactions. Mechanisms of nucleophilic substitution reaction of alkyl halides, $\text{S}_\text{N}2$ and $\text{S}_\text{N}1$ reactions with energy profile diagrams. Nuclear and side chain reactions. The addition-elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides.

6. Cycloalkanes: (5 Hrs.)

Baeyer's strain theory and its limitations. Ring strain in small rings (cyclopropane and cyclobutane), theory of strainless rings. The case of cyclopropane ring : banana bonds.

UNIT-IV

7. Arenes and Aromaticity (10 Hrs.)

Nomenclature of benzene derivatives. The aryl group. Aromatic nucleus and side chain. Structure of benzene: Molecular formula and Kekule structure. Stability and carbon carbon bond lengths of benzene, resonance structure, MO picture. Aromaticity : the Huckel's rule, aromatic ions. Aromatic electrophilic substitution-general pattern of the mechanism, role of σ and π complexes. Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio. Side chain reactions of benzene derivatives. Methods of formation and chemical reactions of alkylbenzenes.

BOOKS PRESCRIBED:

1. Organic Chemistry, J. Clayden, N. Greeves, S. Warren, 2nd Ed., Oxford university Press.
2. Advanced Organic Chemistry, by F. A. Carey, R. J. Sundberg, 2nd Ed., Springer.
3. Organic Chemistry by T. W. G. Solomons, 10 Ed., Wiley
4. Advanced Organic Chemistry by Jerry march, 4th Ed., Wiley

COURSE OUTCOMES:

| Sr. No. | On completing the course, |
|---------|--|
| CO1 | Students would have basics of Organic chemistry starting from bonding in organic compounds and notations in a reaction/ reaction mechanism |
| CO2 | would be able to identify the type of organic reaction and properties and structures of reactive intermediates involved in mechanisms. |
| CO3 | would know the methods of preparation and chemical as well as physical properties of Alkanes, Alkenes, Alkynes |
| CO4 | Basic nucleophilic substitution mechanisms in case of alkyl halides as well as aryl halides and their relative reactivities. |
| CO5 | would understand the concept of aromaticity and aromatic electrophilic substitution mechanism and examples |

**B.Sc. Medical Semester I
CHE 111P
PRACTICAL**

Teaching Hours (per week):4

Total Credit: 2

Credits:LTP:002

Maximum Marks: 38

Pass Marks: 35%

Time: 3 Hours

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

- I. Examiner will set two questions first based upon Inorganic Analysis and second based upon Laboratory Techniques
- II. Students will be asked to complete write up of both practical within first 20 minutes on the first sheet provided.
- III. On the second sheet provided after 20 minutes, students will perform and note the record on second sheet during the conduct of practical exam
- IV. The split of marks will be as under:
(Salt Analysis = 15, Lab Tech., M. Pt./B. Pt. = 12, Viva-voce = 8, Practical note book = 3)

COURSE OBJECTIVES:

1. *The students will learn about semi micro analysis. Cation analysis, Separation and identification of ions from groups I, II, III, IV, V, and VI.*
2. *The students will also learn to determine the melting and boiling point of compounds.*

COURSE CONTENTS:

Inorganic Chemistry: Semi Micro analysis. Cation analysis, Separation and identification of ions from groups I, II, III, IV, V, and VI. Anionic analysis. Four ions with no interference.

Organic Chemistry Laboratory Techniques

Determination of Melting Point

Naphthalene 80–82°C Cinnamic acid 132.5–133°C
Benzoic acid 121.5–122°C Salicylic acid 157.5–158°C
Urea 132.5–133°C Acetanilide 113.5–114°C
Succinic Acid 184.5–185°C m-dinitro benzene 90°C
P-dichlorobenzene 52°C Aspirin 135°C

Determination of Boiling Point

Ethanol 78°C Cyclohexane 81.4°C,
Benzene–80°C Toluene 110°C

BOOKS PRESCRIBED:

1. Salts and Their Reactions a Class-Book of Practical Chemistry, D. Leonard, Forgotten Books.
2. A Systematic Qualitative Chemical Analysis a Theoretical and Practical Study of Analytical Reactions of the More, Common Ions of Inorganic Substances, Forgotten Books.
3. Salt Analysis Chart by Sibaji Sarkar.

4. Physical Chemistry Laboratory Manual - An Interdisciplinary Approach 1 Edition by A. Anand, R. Kumari, 1st Ed. Dreamtech Press

COURSE OUTCOMES:

| S. No. | On completing the course, |
|---------------|---|
| CO1 | Students will gain knowledge about semi micro analysis. |
| CO2 | They will learn about cation analysis, separation and identification of ions from groups I, II, III, IV, V, VI. |
| CO3 | They will also learn about anion analysis. |
| CO4 | Students will learn about the technique for determination of melting points of various compounds. |
| CO5 | They will also learn about the technique for determination of boiling points of various compounds. |

B.Sc. Medical Semester I
COURSE CODE: ZOO-111
CELL BIOLOGY

Teaching Hours (per week): 3

Total Credits:3

Credits:LTP:210

Maximum Marks: 56

Pass Marks: 35%

Time: 3 Hrs.

Instructions for the Paper Setters:

1. There will be five sections.
2. Section A is compulsory and will be of 12 marks consisting of eight short answer type questions carrying two marks each covering the whole syllabus. The answer should not exceed 50 words. The candidate will have to attempt any six questions in this section.
3. Section B, C, D and E will be set from units I, II, III and IV respectively and will consists of two questions of 11 marks each from the respective units. The candidates are required to attempt one question from each of these sections. Each question in these sections should not have more than two sub-parts.

COURSE OBJECTIVES

| | |
|----------|--|
| 1 | Understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles |
| 2 | Understand how these cellular components are used to generate and utilize energy in cells |
| 3 | Understand the cellular components underlying mitotic cell division. |
| 4 | Apply their knowledge of cell biology to selected examples of changes or losses in cell function like responses to environmental or physiological changes or mutation. |

UNIT-I

- Methods in Cell Biology:
 - (a) Resolving Power of Microscope: Principles of light and phase contrast microscopy
 - (b) Electron microscopy (TEM and SEM): Principle and construction
 - (c) Fixation and fixatives; Bouin's Fluid (alcoholic and Aqueous), Carnoy's fluid, Normal Saline; Formalin solution, Mayer's albumen
 - (d) Grades of Alcohol
 - (e) Types of Stain: Borax carmine, Aceto-orcein, Haematoxylin, Eosin, Safranin, Leishman, Giemsa, Methylene Blue, Light green, fast green
 - (f) Preparation of Permanent slides: Temporary and Permanent mounting, single and double staining

UNIT-II

- Organization of Cell: Extra nuclear and nuclear, ultrastructure and functions of cell organelles
 - (a) Plasma Membrane: Structure of phospholipid, Fluid Mosaic Model
 - (b) Types of diffusion, osmosis, active & passive transport
 - (c) Bulk Transport: Phagocytosis, Pinocytosis
 - (d) Endoplasmic reticulum: Structure, types and associated enzymes
 - (e) Mitochondria: Structure, mitochondrial enzymes and role of mitochondria in respiration and mitochondrial DNA

UNIT-III

- Organization of Cell:
 - (a) Golgi complex: Structure and functions
 - (b) Ribosomes: Types of ribosomes, their structure and functions

- (c) Lysosomes: Polymorphism and their function
- (d) Centrosome: Structure and functions
- (e) Cilia and Flagella

UNIT-IV

- Nucleus: Structure and functions of nuclear membrane, nucleolus and chromosomes
- Cancer and its types; causes of cancer and characteristics of cancer cells.
- An elementary idea of cell transformation in cancer; role of P53 gene and telomerase enzyme
- An elementary idea of cellular basis of immunity: Active, passive, innate, humoral and cell mediated immunity, types and structure of antibody.

Suggested Readings

1. Alberts, B., Bray, D., Lewis, J., Raff, M. Roberts, K., Watson J.D.(1998), Molecular Biology of the Cell, Garland Publ. Inc., New York.
2. Chandra Roy, S and DE Kumar, K. (2001), Cell Biology, New Central Book Agency (P) Ltd. Kolkata.
3. Cooper, G. M. (2004), The cell, A Molecular Approach, ASM press, Washington, D. C.
4. De Robertis, E.D.P. De Robertis, E.M.F.(1995) Cell Biology and Molecular Biology (Eighth Edition), W.B. Saunders Co., Philadelphia.
5. Karp, G. (1984). Cell Biology (4th ed), McGraw Hill, New York. 6. Pawar, C.B (1999), Cell Biology, Himalaya Publishing House, Bombay

COURSE OUTCOMES

| | |
|-------|--|
| CO-1. | Understand the cell theory and cell principle. |
| CO-2. | Understand properties of cell like cell size, shape, number, life span and death |
| CO-3. | Know the structure and importance of prokaryotic (Mycoplasma, Bacteria, Cyanobacteria) and eukaryotic cell. |
| CO-4. | Study the theories of evolution of eukaryotic cell from prokaryotic cell. |
| CO-5. | Study the structure and functions of the cell organelles like Golgi complex, Endoplasmic reticulum, Mitochondrion, Ribosomes, Peroxisomes and glyoxysomes. |
| CO-6 | Develop understanding about various cell surface modifications: Glycocalyx, Microvilli and Caveolae |
| CO-7 | Study the cytoskeleton including microtubules, actin, myosin, intermediate filaments and their role in muscle contraction |
| CO-8 | Understand the phases of cell cycle including Mitosis and Meiosis. |

B.Sc. Medical Semester I
ZOO-111B:
BIODIVERSITY-I (PROTOZOA TO ANNELIDA)

Teaching Hours (per week): 3

Total Credits:3

Credits: LTP: 210

Maximum Marks: 56

Pass Marks:

35%

Time: 3 Hrs.

Instructions for the Paper Setters:

1. There will be five sections.
2. Section A is compulsory and will be of 12 marks consisting of eight short answer type questions carrying two marks each covering the whole syllabus. The answer should not exceed 50 words. The candidate will have to attempt any six questions in this section.
3. Section B, C, D and E will be set from units I, II, III and IV respectively and will consists of two questions of 11 marks each from the respective units. The candidates are required to attempt one question from each of these sections. Each question in these sections should not have more than two sub-parts.

COURSE OBJECTIVES

| | |
|----|--|
| 1. | Understand the animal kingdom. |
| 2. | Understand the taxonomic position of Protozoa to Annelida. |
| 3. | Understand the general characteristics of animals belonging to Protozoa to Annelida. |
| 4. | Understand the body organization of phylum from Protozoa to Annelida. |
| 5. | Understand the origin and evolutionary relationship of different phylum from Protozoa to Annelida. |

UNIT-I

Detailed study of the following animals-

- Protozoa:
 - *Amoeba proteus* emphasizing theories of amoeboid locomotion
 - *Paramecium caudatum* (Kappa particles in *P. aurelia*)
 - *Plasmodium vivax*

UNIT-II

Detailed study of the following animals-

- Porifera: Detailed study of the following animals-
 - *Sycon* (special reference to canal system)
- Coelenterata:
 - *Obelia*

UNIT-III

Detailed study of the following animals-

- Platyhelminthes:
 - *Fasciola hepatica*
 - *Taenia solium*
- Parasitic adaptations in *Fasciola* and *Taenia*

UNIT-IV

Detailed study of the following animals-

- Aschelminthes:
 - *Ascaris*
- Annelida:
 - *Pheretima posthuma*
- Economic importance of Earthworm

Suggested Readings:-

1. Barnes, R.D. (1999), Invertebrate Zoology. W.B. Saunder, Philadelphia.
2. Dhama, P.S. & Dhama, J. K (2001), Invertebrates, R. Chand & Co., New Delhi.
3. Barth, R. H. and Broshears, R. E (1982), The Invertebrate world. Holt Saunder, Japan.
4. Brusca, R. C. and Brusca, G. J. (2003), Invertebrates (2nd ed). Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts.
5. Engemann, J. G. and Hegner, R. W. (1981), Invertebrate Zoology (3rd ed.) Macmillan, New York.
6. Gardiner, M. S. (1972), The Biology of Invertebrates, McGraw Hill, New York.
7. Meglitsch, P. A. and Schran, F. R. (1991), Invertebrate Zoology (3rd ed). Oxford University Press, New York.
8. Pechenik, A. Jan. (2000), Biology of the invertebrates, (4th ed), McGraw Hill Book Co. Singapore.

COURSE OUTCOMES

| | |
|-------|--|
| CO-1. | The subject of biodiversity helps the students to know about the structural aspects of different animals |
| CO-2. | Students also gain knowledge about the taxonomies and evolutionary aspects of Zoology. |
| CO-3. | To study faunal diversity and learn to implement conservation measures to save biodiversity |

B.Sc. Medical Semester I
Practical
ZOO-111P: (Related to ZOO-111A and ZOO-111B)

Teaching Hours (per week): 3

Total Credits:3

Credits: LTP: 002

Maximum Marks: 38

Pass Marks:

35%

Time: 3 Hrs.

Important Note for Practical:

- Candidates will be required to submit their original note books containing record of their laboratory work.
- Wherever possible, students must be taken out for excursion to the field (Zoological gardens, sea shores, ponds and hill stations etc.) to study habitat and ecology of the animals.
- As per the latest UGC guidelines the dissections may please be avoided. In no case an animal falling under the categories of wildlife protection act 1972 should be caught or dissected. The rules of the Prevention of cruelty to Animals act 1960 should be familiar to all who are teaching the Zoology courses.

COURSE OBJECTIVES

| | |
|----|---|
| 1. | Understand the structure of invertebrates and classify them. |
| 2. | Understand various techniques like SEM, TEM and Chromatography. |
| 3. | Understand the structure and function of digestive, reproductive and nervous system of earthworm. |
| 4. | Understand the preparation of temporary slides. |

| | |
|---|---|
| 1 | Classification up to orders with ecological notes and economic importance (if any) of the following animals (Through Specimens or slides): |
| Protozoa | <i>Amoeba, Euglena, Trypanosoma, Noctiluca, Eimeria, Monocystis, Paramecium, Opalina, Vorticella, Balantidium, Nyctotherus, Polystomella</i> |
| Parazoa | <i>Sycon, Grantia, Euplectella, Hyalonema, Spongilla, Euspongia</i> |
| Cnidaria | <i>Porpita, Velella, Physalia, Aurelia, Rhizostoma, Metridium, Millipora, Alcyonium, Tubipora, Zoanthus, Madrepora, Favia, Fungia and Astringia Hydra (WM), Hydra with buds, Obelia (colony and medusa), Sertularia, Plumularia, Tubularia, Bougainvillea and Aurelia</i> |
| Platyhelminthes | <i>Dugesia, Fasciola, Taenia, Echinococcus</i> |
| Aschelminthes | <i>Ascaris (male and female), Trichinella, Ancylostoma</i> |
| Annelida | <i>Pheretima, Nereis, Heteronereis, Polynoe, Eunice, Aphrodite, Chaetopterus, Arenicola, Tubifex, Pontobdella</i> |
| 2 | Study of the permanent stained preparations |
| | LS and TS <i>Sycon</i> , gemmules, spicules and spongin fibers of a sponge |
| | TS <i>Hydra</i> (Testis and ovary region) |
| | TS <i>Fasciola</i> (Different regions) |
| | Miracidium, Sporocyst, Redia, Cercaria larvae of <i>Fasciola</i> |
| Scolex and proglottids of <i>Taenia</i> (mature and gravid) | |
| TS <i>Ascaris</i> (Male and Female) | |
| TS <i>Pheretima</i> (pharyngeal and typhlosolar regions), setae, septal nephridia, spermathecae and ovary of <i>Pheretima</i> (Earthworm) | |

| | | |
|----------|---|--|
| 3 | Temporary Preparation | Freshwater Protozoan culture; slide preparation |
| 4 | Demonstration of | digestive, reproductive and nervous systems of earthworm with the help of charts/ videos/ models |
| 5 | Cell Biology | Paper chromatography |
| | | Thin layers chromatography |
| | | Gel electrophoresis through photographs or through research laboratories |
| | | Familiarity with TEM & SEM |
| | | Study of different ultra-structures of cell organelles through photographs |
| 6 | Students must be taken out to study vermicomposting unit and submit the report. | |

Guidelines for conduct of practical Examination: -

| | | |
|---|--|---|
| 1 | Identify and classify the specimens A-C up to order. Write a note on their habit, habitat, special features and economic importance. | 9 |
| 2 | Identify the slides/models D-G and give two reasons for identification. | 8 |
| 3 | Identify the adaptive feature/nest. | 5 |
| 4 | Mark the distribution of animals of a realm on the map. | 5 |
| 5 | Project/ Assignment report | 5 |
| 6 | Viva-voce & Practical file. | 6 |

COURSE OUTCOMES

| | |
|-------|---|
| CO-1. | Have a knowledge about all the different phyla of invertebrates |
| CO-2. | Understand the comparative structure of invertebrates |
| CO-3. | Have an insight about the microscopic life |
| CO-4. | Differentiate invertebrates on the basis of morphological characteristics |

B.Sc. Medical Semester I
B. A., B. A. Social Science, B. Sc. Medical, B. Sc. Non-Medical,
B. Com. (Hons.), B. Com. (R), BBA, B. Sc. Economics, B. Sc. Computer Science
Semester-I
Compulsory Course
ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ

Credit & Marks Distribution, Eligibility and Pre-Requisites of the Course

| Course title & Code | Total Teaching Hours | Total Credits/ Hours per week | Credit distribution | | | Total Marks 100 | | Time Allowed in Exam | Eligibility criteria | Pre-requisite of the course (if any) |
|----------------------------|----------------------|-------------------------------|---------------------|---|---|--------------------|----|----------------------|-------------------------------|--|
| | | | L | T | P | Theory | IA | | | |
| ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ BPBI-1101 | 60 | 4 | 4 | 0 | 0 | 75 | 25 | 3 Hours | Class 12th pass in any stream | Studied Punjabi up to 10th Standard or working knowledge of Punjabi Language |

ਕੋਰਸ ਦਾ ਉਦੇਸ਼ Course Objective

- ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਪੈਦਾ ਕਰਨਾ।
- ਆਲੋਚਨਾਤਮਕ ਰੁਚੀਆਂ ਵਿਕਸਤ ਕਰਨਾ।
- ਵਿਦਿਆਰਥੀ ਦਾ ਹੋਰ ਵਿਸ਼ਿਆਂ ਸੰਬੰਧੀ ਬੋਧ ਵਿਕਸਿਤ ਕਰਨਾ।
- ਭਾਸ਼ਾਈ ਨੇਮਾਂ ਦੀ ਸਮਝ ਨੂੰ ਵਿਕਸਤ ਕਰਨਾ।

ਪਾਠ-ਕ੍ਰਮ ਨਤੀਜੇ Course Outcomes (COs)

- ਵਿਦਿਆਰਥੀ ਵਿਚ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਵਿਕਸਤ ਹੋਣਗੀਆਂ।
- ਵਿਦਿਆਰਥੀ ਦੀ ਸਾਹਿਤ ਸਿਰਜਣਾ ਦੀ ਸੰਭਾਵਨਾ ਵਧੇਗੀ।
- ਵਿਦਿਆਰਥੀ ਹੋਰ ਵਿਸ਼ਿਆਂ ਦਾ ਗਹਿਨ ਅਧਿਐਨ ਕਰਨ ਦੇ ਕਾਬਲ ਹੋਵੇਗਾ।
- ਵਿਦਿਆਰਥੀ ਭਾਸ਼ਾ ਦੇ ਵਿਆਕਰਨਿਕ ਪ੍ਰਬੰਧ ਤੋਂ ਜਾਣੂ ਹੋਵੇਗਾ।

ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ। ਪਹਿਲੇ ਭਾਗ ਵਿਚ 1.5-1.5 (ਡੇਢ-ਡੇਢ) ਅੰਕ ਦੇ ਅਤਿ-ਸੰਖੇਪ (Objective Type) 10 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜੋ ਕਿ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿਚੋਂ ਹੋਣਗੇ ਅਤੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਸਿਲੇਬਸ ਦੇ ਬਾਕੀ ਚਾਰ ਭਾਗਾਂ ਵਿਚ 02-02 ਲੇਖ ਨੁਮਾ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰੇਕ ਭਾਗ ਵਿਚੋਂ 01-01 ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੋਵੇਗਾ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 15 ਅੰਕ ਹੋਣਗੇ। ਪੇਪਰ ਸੈਂਟਰ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 25 ਅੰਕਾਂ ਦੀ ਹੈ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ 75+25=100 ਹਨ।

ਪਾਠ-ਕ੍ਰਮ

ਭਾਗ-ਪਹਿਲਾ

ਸਾਹਿਤ ਦੇ ਰੰਗ, ਡਾ. ਮਹਿਲ ਸਿੰਘ (ਸੰਪਾ.), ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।

ਭਾਗ ਪਹਿਲਾ - ਕਵਿਤਾ ਅਤੇ ਕਹਾਣੀ, ਡਾ. ਮਹਿਲ ਸਿੰਘ ਅਤੇ ਡਾ. ਆਤਮ ਰੰਧਾਵਾ (ਸਹਿ ਸੰਪਾ.)

(ਕਵਿਤਾ ਭਾਗ ਵਿਚੋਂ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ/ਕਵਿਤਾ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ। ਕਹਾਣੀ ਭਾਗ ਵਿਚੋਂ ਸਾਰ/ਵਿਸ਼ਾ-ਵਸਤੂ)

ਭਾਗ-ਦੂਜਾ

ਪੰਜਾਬ ਦੇ ਮਹਾਨ ਕਲਾਕਾਰ (ਸੰਪਾ. ਬਲਵੰਤ ਗਾਰਗੀ)

ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

(ਅੰਮ੍ਰਿਤਾ ਸ਼ੇਰਗਿੱਲ ਤੋਂ ਭਾਈ ਸਮੁੰਦ ਸਿੰਘ ਤਕ)

(ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ/ਨਾਇਕ ਬਿੰਬ)

ਭਾਗ-ਤੀਜਾ

(ੳ) ਪੈਰਾ ਰਚਨਾ

(ਅ) ਪੈਰਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ।

ਭਾਗ-ਚੌਥਾ

- (ੳ) ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ : ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਅਤੇ ਉਪ-ਭਾਸ਼ਾ ਦਾ ਅੰਤਰ,
: ਪੰਜਾਬੀ ਉਪਭਾਸ਼ਾਵਾਂ ਦੇ ਪਛਾਣ-ਚਿੰਨ੍ਹ
- (ਅ) ਪੰਜਾਬੀ ਭਾਸ਼ਾ : ਨਿਕਾਸ ਤੇ ਵਿਕਾਸ।

B.Sc. Medical Semester I
B. A., B. A. Social Science, B. Sc. Medical, B. Sc. Non-Medical,
B. Com. (Hons.), B. Com. (R), BBA, B. Sc. Economics, B. Sc. Computer Science
Semester-I
Compulsory Course
ਮੁਢਲੀ ਪੰਜਾਬੀ
(In Lieu of Compulsory Punjabi)

Credit & Marks Distribution, Eligibility and Pre-Requisites of the Course

| Course title & Code | Total Teaching Hours | Total Credits/ Hours per week | Credit distribution | | | Total Marks 100 | | Time Allowed in Exam | Eligibility criteria | Pre-requisite of the course (if any) |
|---------------------------|----------------------|-------------------------------|---------------------|---|---|-----------------|----|----------------------|-------------------------------|---|
| | | | L | T | P | Theory | IA | | | |
| ਮੁਢਲੀ ਪੰਜਾਬੀ BPBI-1102 | 60 | 4 | 4 | 0 | 0 | 75 | 25 | 3 Hours | Class 12th pass in any stream | NOT Studied Punjabi up to 10th Standard |

| ਕੋਰਸ ਦਾ ਉਦੇਸ਼ Course Objective | ਪਾਠ-ਕ੍ਰਮ ਨਤੀਜੇ Course Outcomes (COs) |
|---|---|
| <ul style="list-style-type: none"> ▪ ਵਿਦਿਆਰਥੀ ਨੂੰ ਗੁਰਮੁਖੀ ਲਿਪੀ ਤੋਂ ਜਾਣੂ ਕਰਾਉਣਾ। ▪ ਵਿਦਿਆਰਥੀ ਨੂੰ ਸ਼ੁੱਧ ਪੰਜਾਬੀ ਪੜ੍ਹਨਾ-ਲਿਖਣਾ ਸਿਖਾਉਣਾ। ▪ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀਆਂ ਵਿਆਕਰਨਕ ਬਾਰੀਕੀਆਂ ਤੋਂ ਜਾਣੂ ਕਰਾਉਣਾ। ▪ ਸ਼ੁੱਧ ਸੰਚਾਰ ਨੂੰ ਵਿਕਸਤ ਕਰਨਾ। | <ul style="list-style-type: none"> ▪ ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀ ਸਿਖਲਾਈ ਵਿਚ ਮੁਹਾਰਤ ਹਾਸਲ ਕਰਨਗੇ। ▪ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਚ ਮੁਹਾਰਨੀ, ਲਗਾਂ-ਮਾਤਰਾਂ, ਸਵਰ ਅਤੇ ਵਿਅੰਜਨ ਅੱਖਰਾਂ ਦੀ ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ ਸੰਬੰਧੀ ਸਮਝ ਵਿਕਸਿਤ ਹੋਵੇਗੀ। ▪ ਪੰਜਾਬੀ ਸ਼ਬਦ-ਜੋੜਾਂ ਦੀ ਜਾਣਕਾਰੀ ਹਾਸਲ ਕਰਕੇ ਉਹ ਸ਼ੁੱਧ ਪੰਜਾਬੀ ਲਿਖਣ-ਪੜ੍ਹਨ ਦੇ ਸਮਰੱਥ ਹੋਣਗੇ। ▪ ਉਹ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸ਼ੁੱਧ ਰੂਪਾਂ ਦੀ ਜਾਣਕਾਰੀ ਹਾਸਲ ਕਰਨਗੇ। |

ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ। ਪਹਿਲੇ ਭਾਗ ਵਿਚ 01-01 ਅੰਕ ਦੇ ਅਤਿ-ਸੰਖੇਪ ਉੱਤਰ ਵਾਲੇ (Objective Type) 11 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜੋ ਕਿ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿਚੋਂ ਹੋਣਗੇ ਅਤੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਦੂਸਰੇ ਭਾਗ ਵਿਚ, ਸਿਲੇਬਸ ਦੇ ਪਹਿਲੇ ਭਾਗ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨ੍ਹਾਂ ਵਿਚੋਂ ਕੋਈ ਦੋ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ। ਇਸੇ ਤਰ੍ਹਾਂ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਤੀਸਰੇ ਭਾਗ ਵਿਚ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜਿੰਨ੍ਹਾਂ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ। ਭਾਗ ਚੌਥੇ ਵਿਚ ਪੰਜ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨ੍ਹਾਂ ਵਿਚੋਂ ਚਾਰ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 4-4 ਅੰਕ ਹੋਣਗੇ। ਭਾਗ ਪੰਜਵੇਂ ਵਿਚ ਦਸ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨ੍ਹਾਂ ਵਿਚੋਂ 8 ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਹਰ ਪ੍ਰਸ਼ਨ ਦੇ 2-2 ਅੰਕ ਹੋਣਗੇ।

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 25 ਅੰਕਾਂ ਦੀ ਹੈ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ 75+25=100 ਹਨ।

**ਪਾਠ-ਕ੍ਰਮ
ਭਾਗ-ਪਹਿਲਾ**

(ੳ) ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ:

ਨਾਮਕਰਣ ਤੇ ਸੰਖੇਪ ਜਾਣ-ਪਛਾਣ: ਗੁਰਮੁਖੀ ਵਰਣਮਾਲਾ, ਅੱਖਰ ਕ੍ਰਮ, ਸਵਰ ਵਾਹਕ (ੳ, ਅ, ਏ), ਲਗਾਂ-ਮਾਤਰਾਂ, ਪੈਰ ਵਿਚ ਬਿੰਦੀ ਵਾਲੇ ਵਰਨ, ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਨ, ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ

(ਅ) ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ

ਭਾਗ-ਦੂਜਾ

ਗੁਰਮੁਖੀ ਆਰਥੋਗਰਾਫੀ ਅਤੇ ਉਚਾਰਨ:

ਸਵਰ, ਵਿਅੰਜਨ: ਮੁਢਲੀ ਜਾਣ-ਪਛਾਣ ਅਤੇ ਉਚਾਰਨ, ਮੁਹਾਰਨੀ, ਲਗਾਂ-ਮਾਤਰਾਂ ਦੀ ਪਛਾਣ

ਭਾਗ-ਤੀਜਾ

ਪੰਜਾਬੀ ਸ਼ਬਦ-ਜੋੜ: ਮੁਕਤਾ (ਦੋ ਅੱਖਰਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਤਿੰਨ ਅੱਖਰਾਂ ਵਾਲੇ ਸ਼ਬਦ), ਸਿਹਾਰੀ ਵਾਲੇ ਸ਼ਬਦ, ਬਿਹਾਰੀ ਵਾਲੇ ਸ਼ਬਦ, ਔਂਕੜ ਵਾਲੇ ਸ਼ਬਦ, ਦੁਲੈਂਕੜ ਵਾਲੇ ਸ਼ਬਦ, ਲਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਦੁਲਾਵਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਹੋੜੇ ਵਾਲੇ ਸ਼ਬਦ, ਕਨੌੜੇ ਵਾਲੇ ਸ਼ਬਦ, ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) ਵਾਲੇ ਸ਼ਬਦ

ਭਾਗ-ਚੌਥਾ

ਸੁੱਧ-ਅਸੁੱਧ ਸ਼ਬਦ

B.Sc. Medical Semester I

BPHC-1104

PUNJAB HISTORY & CULTURE (From Earliest Times to C 320)

(Special Paper in lieu of Punjabi compulsory)

(For those students who are not domicile of Punjab)

B. A.; B.A. (SS); B. A. (Hons. – English); B. Com. (Hons., R, Ac. & Finance); B. Sc. /Bio-Tech./Comp. Sc./Eco./FD/Food Sc./IT/Med./N.Med.; B.Sc. (Hons. –Botany, Chemistry, Mathematics, Physics, Zoology); B. of Mult.; B. in Int. & Mob. Tech.; BBA;BCA;BJMC; B. Voc. (Software Development, Theatre and Stage Craft, Food Processing, Textile Design & Apparel Technology)

SEMESTER–I

PUNJAB HISTORY & CULTURE (From Earliest Times to C 320 BC)(Special Paper in lieu of Punjabi compulsory)

(For those students who are not domicile of Punjab)

Teaching Hours (per week):4

Total Credit: 4

Credits:LTP:400

Total Hours: 60

Maximum Marks: 100

Time: 3 Hours

(Theory Marks: 75+Internal Assessment: 25)

Pass Marks: 35%

Instructions for the Paper Setters:

Question paper should consist of two sections—Section A and Section B. The paper setter must ensure that questions in Section–A do not cover more than one point, and questions in Section–B should cover at least 50 per cent of the theme.

Section–A: The examiner will set 15 objective type questions out of which the candidate shall attempt any 10 questions, each carrying 1½ marks. The total weightage of this section will be 15 marks. Answer to each question should be in approximately one to two sentences.

Section–B: The examiner will set 8 questions, two from each Unit. The candidate will attempt 4 questions selecting one from each Unit in about 1000 words. Each question will carry 15 marks. The total weightage of this section will be 60 marks.

Note: The examiner is to set the question paper in two languages: English & Hindi.

Course Objectives: The main objective of this course is to educate the history and culture of the Ancient Punjab to the students who are not domicile of the Punjab. It aims to familiarize these students with the physical features of ancient Punjab and its impact on its history and culture. It also provides them information about the different sources to construct the history and culture of the ancient Punjab. The course intends to provide knowledge of social, economic, religious life of the Harappan civilization, Indo-Aryans, teachings and impact of Jainism and Buddhism in the Punjab.

Unit-I

1. Physical features of the Punjab and impact on history.

2. Sources of the ancient history of Punjab.
Unit-II
3. Harappan Civilization: Town planning; social, economic and religious life of the Indus Valley People.
4. The Indo-Aryans: Original home and settlement in Punjab.
Unit-III
5. Social, Religious and Economic life during Rig Vedic Age.
6. Social, Religious and Economic life during later Vedic Age.
Unit-IV
7. Teachings and impact of Buddhism.
8. Jainism in the Punjab.

Suggested Readings:-

- L. Joshi (ed), *History and Culture of the Punjab*, Art-I, Patiala, 1989 (3rd edition)
 L.M. Joshi and Fauja Singh (ed), *History of Punjab*, Vol. I, Patiala 1977.
 Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.
 B.N. Sharma, *Life in Northern India*, Delhi. 1966.

Course Outcomes:

On Completing the Course, the Students will be able to :

- CO-1** Learn the history and culture of the Ancient Punjab.
CO-2 Study the physical features of ancient Punjab.
CO-3 Understand about the sources of the history of the Punjab.
CO-4 Analyse the social, economic, religious life of the Harappan civilization and Vedic-Aryans.
CO-5 Learn the teachings and impact of Jainism and Buddhism in the Punjab.

B.Sc. Medical Semester I
ENGLISH (COMPULSORY)
B.A./B.Com/B.Sc (Med/N. Med/C. Sc./Eco)/ BBA/BA (Social Science) B.Com (Hons.)
Code: BENC-1105

| L | T | P | Credits |
|----------|----------|----------|----------------|
| 4 | 0 | 0 | 4 |

Teaching Hours (per week):4

Total Credit:4

Max. Marks: 100

Theory: 75

Internal Assessment: 25

Time: 3 Hours

Instructions for the Paper Setter and Distribution of Marks:

The question paper will consist of four sections and the distribution of marks will be as under:

Section A: 15 Marks

Section B: 20 Marks

Section C: 20Marks

Section D: 20 Marks

Section–A

- 1. Twenty (20)** Questions on the usage of grammar related to the prescribed units of *Murphy's English Grammar* will be set. The students will be required to attempt any **Fifteen (15)**

(15X1= 15 Marks)

Section–B

- 2. EIGHT (8)** questions (four from each literary text) on theme, characterization, tone and style etc. will be set. The students will be required to attempt **any Five (5)** questions, choosing at least TWO from each prescribed text. The fifth question may be attempted from any prescribed text. The answer to each question should not exceed 15-20 sentences.

(5X4=20 Marks)

Section–C

- 3. One** question with internal choice, from *Tales of Life*, will be set.
(1X8 =8 Marks)
- 4. One** question with internal choice, from *Prose for Young Learners*, will be set.
(1X8 =8 Marks)
- 5. Six(6)** words on vocabulary will be set from the prescribed texts. The students will be required to answer any **Four(4)**.
(4X1= 4 Marks)

Section-D

- 6.** A question requiring the students to write a **Paragraph** on **ONE** of the **TWO** given topics.

(1X6 = 6 marks)

7. A question requiring the students to write an **APPLICATION** to the Head of an educational institution on **ONE** of the **TWO** given Topics.

(1X8=8 Marks)

8. **Eight(8)** Isolated Sentences on Translation from English to Vernacular (Punjabi/Hindi) will be set. The Students will be required to attempt any **Six(6)**.

(6X1= 6

Marks)

Course Objectives:

1. To read, interpret and write about a diverse range of texts in English.
2. To understand the prescribed texts analytically and critically.
3. To familiarise the students with the social, political, moral and cultural background of the prescribed texts.
4. To participate in the critical and cultural discourses of English.
5. To teach language and literature effectively with the support of ICT tools.
6. To become competent, committed, conscious, creative, and compassionate human beings.

Course Contents:

- 1) Stories at Sr. No. 1,2,3,5,6 from *Tales of Life*.
- 2) Essays at Sr. No. 1,2,3,5,6 from *Prose for Young Learners*.
- 3) Unit 1-25 from *Murphy's English Grammar*.

Texts Prescribed:

1. *Tales of Life* (Guru Nanak Dev University, Amritsar)
2. *Prose for Young Learners* (Guru Nanak Dev University, Amritsar)
3. *Murphy's English Grammar 4th Edition*(by Raymond Murphy) CUP

Course Outcomes:

The completion of this course enables students to:

1. appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu.
2. comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them.
3. understand fundamental grammatical rules governing tenses and make correct usage in their language.
4. write paragraphs on any given topic.

B.Sc. Medical Semester I
Course Code: ZDA111
Course Title- Drug Abuse: Problem, Management and Prevention
PROBLEM OF DRUG ABUSE
(Compulsory for all Under Graduate Classes)

Teaching Hours (per week):2

Total Credit: 2

Maximum Marks: 50

Pass Marks: 35%

Time: 3 Hours

Instructions for the Paper Setters:

- 1) There will be a total of 9 questions of which 5 are to be attempted.
- 2) Question 1 is compulsory and having 10 short answer type questions (1 mark each).
- 3) The remaining 8 questions (10 marks each) shall include 2 questions from each unit. Candidates shall be required to attempt 4 questions, one from each unit. Preferably, the question should not be split into more than two sub-parts.

Course Objectives- The course aims to:

| | |
|-------|--|
| CO-1. | Generate the awareness against drug abuse. |
| CO-2. | Describe a variety of models and theories of addiction and other problems related to substance abuse. |
| CO-3. | Describe the behavioral, psychological, physical health and social impact of psychoactive substances. |
| CO-4. | Provide culturally relevant formal and informal education programs that raise awareness and support for substance abuse prevention and the recovery process. |
| CO-5. | Describe factors that increase likelihood for an individual, community or group to be at risk of substance use disorders. |

UNIT-I

- **Meaning of Drug Abuse**

Meaning of drug abuse

Nature and Extent of Drug Abuse: State and National Scenario

UNIT-II

- **Consequences of Drug Abuse for**

Individual: Education, Employment, Income.

Family : Violence.

Society : Crime.

Nation : Law and Order problem.

UNIT-III

- **Management of Drug Abuse**

Medical Management: Medication for treatment of different types of drug abuses.

Medication to reduce withdrawal effects.

UNIT-IV

- Psychiatric Management: Counseling, Behavioral and Cognitive therapy.
- Social Management: Family, Group therapy and Environmental Intervention.

References:

1. Ahuja, Ram (2003), Social Problems in India, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. The Drug Crime Connection. Beverly Hills: Sage Publications. 23
4. Jasjit Kaur Randhawa & Samreet Randhawa, “Drug Abuse-Problem, Management & Prevention”, KLS, ISBN No. 978-81-936570-6-5, (2018).
5. Jasjit Kaur Randhawa & Samreet Randhawa, “Drug Abuse Problem, Management & Prevention”, KLS, ISBN No. 978-81-936570-8-9, (2019).
6. Jasjit Kaur Randhawa & Samreet Randhawa, “voZrI d[otos'A^(BPky'oh) ;wZf;nk, gqpzXB ns/o'eEkw”, KLS, ISBN No. 978-81-936570-7-1, (2018).
7. Jasjit Kaur Randhawa, “Drug Abuse -Management & Prevention”, KLS, ISBN No. 978-93-81278-80-2, (2018).
8. Kapoor. T. (1985) Drug epidemic among Indian Youth, New Delhi: Mittal Pub.
9. Modi, Ishwar and Modi, Shalini (1997) Drugs: Addiction and Prevention, Jaipur: Rawat Publication.
10. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
11. Rama Gandotra & Jasjit Kaur Randhawa, “voZrI d[otos'A^(BPky'oh) gqpzXB ns/ o'eEkw”, KLS, ISBN No. 978-93-81278-87-1, (2018).
12. Sain, Bhim 1991, Drug Addiction Alcoholism, Smoking obscenity New Delhi: Mittal Publications.
13. Sandhu, Ranvinder Singh, 2009, Drug Addiction in Punjab: A Sociological Study. Amritsar. Guru Nanak Dev University.
14. Singh, C. P. 2000. Alcohol and Dependence among Industrial Workers: Delhi: Shipra.
15. Sussman, S and Ames, S.L. (2008). Drug Abuse: Concepts, Prevention and Cessation, Cambridge University Press.
16. World Drug Report 2010, United Nations office of Drug and Crime.
17. World Drug Report 2011, United Nations office of Drug and Crime.

Course Outcomes:

The students will be able:

| | |
|----|---|
| 1C | To describe issues of cultural identity, ethnic background, age and gender in prevention, treatment and recovery. |
| . | To describe warning sign, symptoms, and the course of substance use disorders. |
| 3 | To describe principles and philosophy of prevention, treatment and recovery. |
| 4. | To describe current and evidenced-based approaches practiced in the field of drug addiction. |

B.Sc. Medical Semester II
BOT-121A
Cell Biology

Teaching Hours (per week): 3

Total Credit: 3

Credits:LTP:210

Total Hours: 60

Maximum Marks: 56

Pass Marks: 35%

Time: 3 Hours

Course Objectives:

| | |
|------|---|
| CO-1 | The main objective of this course is to provide fundamental knowledge of structural and functional aspects of cell and cell organelles. |
| CO-2 | To study detailed structure of chromosome and different types of alterations in chromosomes. |

UNIT-I

Cell: Prokaryotic and Eukaryotic cell, Ultrastructure and function of plant. Structure and Function of Cell Organelles:

Plastids

Mitochondria

Golgi apparatus

Endoplasmic reticulum

Vacuoles (sap, contractile and air vacuoles)

UNIT-II

Structure and Function of Nucleus: Ultrastructure; nuclear membrane; nuclear pore models; nucleoplasm; Nuclear matrix; chromatin; nucleolus.

Extranuclear Genome: Presence and function of mitochondrial and plastid DNA; plasmids and their types.

UNIT-III

Chromosome Organization: Morphology, centromere and telomere; nucleosome, giant chromosomes, chromosome alterations; deletions, duplications, translocations, inversions, variations in chromosome number, aneuploidy, polyploidy, sex chromosomes and their function.

UNIT-IV

The Cell Envelopes: Cell wall - structure and function;

Plasma membrane – Chemical composition, Membrane models and functions; membrane transport: diffusion, active, passive and bulk transport.

Suggested Readings:

1. Gupta, P.K. (2013). A Text–book of Cell and Molecular Biology (3rd edition). Rastogi Publications, Meerut, India
2. Johnson, A., Raff, L. and Walter, R. (2008). Molecular Biology of the Cell (5th Edition). Taylor and Francis Group, USA.
3. Karp, G. (2013). Cell and Molecular Biology: Concepts and Experiments (7th Edition). Wiley Publishers, USA.
4. Kleinsmith, L.J. and Kish, V.M. (1995). Principles of Cell and Molecular Biology (2nd edition). Harper Collins College Publishers, New York, USA.
5. Lodish, H., Berk, A., Kaiser, C. A., Krieger, M., Bretscher, A. and Ploegh, H. (2016). Molecular Cell Biology, W.H. Freeman & Co., New York, USA.
6. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics (5th Edition). John Wiley and Sons Inc., U.S.A.
7. Cooper, G.M. and Hausman, R.E. (2013). The Cell: A Molecular Approach (6th Edition). Sinauer Associates Inc.

Course Outcomes:

| | |
|------|--|
| CO-1 | Students learn about basic unit of life i.e. Cell. |
| CO-2 | Students learn about differences between prokaryotic and eukaryotic organism on the basis of cellular details. |
| CO-3 | It enables students to know about chromosomes, genes etc. |
| CO-4 | Students learn about the functional role of cell organelles. |

B.Sc. Medical Semester II
BOT-121B
Genetics

Teaching Hours (per week): 3

Total Credit: 3

Credits:LTP:210

Total Hours: 60

Maximum Marks: 75

Pass Marks: 35%

Time: 3 Hours

Instructions for the Paper Setters:

The question paper will be divided into 5 sections (Section A-E). Section A: (Total weightage 12 marks). This section will have 8 very short answer type questions (maximum limit 50 words) and students have to attempt any 6 questions. Each question will carry 2 marks. Questions are to cover from the whole syllabus. Section B, C, D and E: (Total weightage 44 marks). Each section will have two questions from one unit. The student will have to attempt one question from each section and question will carry 11 marks. The answers should not exceed 6 pages. The questions should not have more than two subparts.

Course Objectives:

| | |
|-------------|--|
| CO-1 | To introduce the students with history of genetics and heredity. |
| CO-2 | To study the basics of genetics (genetic material, variation, cell division, expression and regulation of genes etc.). |

UNIT-I

DNA-the Genetic Material: DNA structure; replication; DNA–protein interaction; the nucleosome model, Mutations: Types of mutations; Molecular basis of Mutations; Mutagens: physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); transposable genetic elements

UNIT-II

Genetic Inheritance: Mendelism: laws of segregation and independent assortment, linkage analysis; allelic and non–allelic interactions. (Incomplete dominance and co-dominance, Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits).

UNIT-III

Gene expression: Structure of gene, transfer of genetic information; transcription, translation, genetic code, Gene regulation, Operon model.

UNIT-IV

Population and Evolutionary Genetics: Allele frequencies, Hardy-Weinberg Law, role of natural selection, genetic drift. Genetic variation and Speciation.

Suggested Readings:

1. Brown, T.A. (2011). Genetics: A Molecular Approach (3rd Edition). BIOS Scientific Publishers, UK.
2. Fletcher, H., Hickey, I. and Winter, P. (2010). Instant Notes on Genetics (3rd edition) Taylor and Francis Group, USA.
3. Gardner, E.J., Simmons, M.J. and Snustad, D.P. (2012). Principles of Genetics (8th Edition). Wiley Sons, USA.
4. Gupta, P.K. (2016). Cell and Molecular Biology, Rastogi Publications, Meerut, India.
5. Kleinsmith, L.J. and Kish, V.M. (1995). Principles of Cell and Molecular Biology (2nd Edition). Harper Collins College Publishers, New York, USA.
6. Krebs, B. E., Goldstein, E.S. and Kilpatrick, S.T. (2011). Lewins Genes X. Jones and Bartlett Publishers, LLC, UK.
7. Lodish, H., Berk, A., Kaiser, C. A., Krieger, M., Bretscher, A. and ploegh, H. (2016). Molecular Cell Biology, W.H. Freeman & Co., New York, USA.
8. Singh, B.D. (2007). Molecular Genetics. Kalyani Publishers, India.
9. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics (5th Edition). John Wiley and Sons Inc., U.S.A.

Course Outcomes:

| | |
|------|---|
| CO-1 | It makes students aware about heredity and variation. |
| CO-2 | Students come to know how children are different from parents. |
| CO-3 | Develop concept wise understanding of laws of inheritance, genetic basis of loci and alleles and their linkage. |
| CO-4 | Students able to differentiate between alleles and non-alleles and allelic and non-allelic interactions. |
| CO-5 | Students learn about genetic material and various factors responsible for variations in plants. |

B.Sc. Medical Semester II
BOT-111P
PRACTICAL

Teaching Hours (per week):4
Total Credit: 2
Credits:LTP:002
Maximum Marks: 38
Pass Marks: 35%

Time: 3 Hours

Course Objective

| | |
|------|---|
| CO-1 | Train students for micropreparation of slides to understand the fundamentals of cell biology and related processes. |
| CO-2 | Students will learn the laws of inheritance and mode of inheritance of linked genes. |

Suggested Laboratory Exercises

Teachers may select plants/material available in their locality/institutions.

1. To study generalized plant cell structure from onion leaf peels; demonstration of staining and mounting methods.
2. Comparative study of cell structure in onion cells, *Hydrilla* and *Spirogyra*.
3. Study of cyclosis in *Tradescantia* Staminal Cells.
4. Examination of electron micrographs of eukaryotic cells with special reference to organelles: chloroplast, mitochondria, endoplasmic reticulum, golgi apparatus, nucleus).
5. Study of electron micrographs of viruses, bacteria, cyanobacteria and eukaryotic cells for comparative cellular organization.
6. Study of plastids to examine pigment distribution in plants.
7. Examination of various stages of mitosis and meiosis using appropriate plant material (e.g. onion root tips, onion flower buds).
8. Preparation of karyotypes from dividing root tip cells.
9. Cytological examination of special types of chromosomes: bar body, polytene chromosomes.
10. Working out the laws of inheritance using seed mixtures.
11. Working out the mode of inheritance of linked genes from test cross and/or F2 data.

Suggested Readings:-

1. Fukui, K. and Nakayama, S. 1996. Plant Chromosomes; Laboratory Methods, CRC Press, Boca Raton, Florida.
2. Gunning, B.E.S. and Steer, M.W. 1996. Plant Cell Biology; Structure and Function, Jones and Barlett Publishers, Boston, Massachusetts.
3. Harns, N. and Oparka, K.J. 1994. Plant Cell Biology, A Practical Approach. IRL Press, at Oxford University Press, Oxford, UK.
4. Sharma, A.K. and Sharma, A. 1999. Plant Chromosomes; Analysis. Manipulation and Engineering, Harwood Academic Publishers, Australia.
5. Plopper, G. (2016). Principles of Cell Biology. Jones and Barnett Learning, Boston, Massachusetts.

Course Outcomes:

| | |
|------|--|
| CO-1 | Students will gain knowledge on staining and fixation of specimens on slides. |
| CO-2 | Students will be able to critically examine the cell structure, its components and pigments. |
| CO-3 | Understand the basic cellular processes including mitosis and meiosis with the help of plant material. |
| CO-4 | Prepare karyotypes and gain knowledge on special chromosomes. |
| CO-5 | Understand the concept of inheritance and linked genes. |

B.Sc. Medical Semester II
CHE 121A
INORGANIC CHEMISTRY–II

Time: 3 Hours

Teaching Hours (per week):3
Total Credit: 3
Credits:LTP: 210
Total Hours: 45
Maximum Marks: 56
Pass Marks: 35%

Note for paper setter and students:

- 1. There will be five sections.**
- 2. Section A is compulsory and will be of 12 marks consisting of 8 short answer type questions carrying 2 mark each covering the whole syllabus. The answer should not exceed 50 words. The candidate will have to attempt any 6 questions in this section.**
- 3. Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 11 marks each from the respective unit. The candidates are required to attempt one question from each of these sections. Each question in these sections should not have more than two subparts.**
- 4. Non-programmable Scientific calculator is allowed.**

COURSE OBJECTIVES:

The aim of the course is to enhance the basic knowledge of students on the topics s-block elements, p-block elements, Transition elements and advance theories of acids, bases and Lux-Flood solvent systems.

COURSE CONTENTS:

| | | |
|--|----------|---------|
| | UNIT–I | 11 Hrs. |
| 1. Acids and Bases Arrhenius, Bronsted-Lowry, the Lux-Flood, solvent system and Lewis concepts of acids and bases. | | |
| 2. s-Block Elements Comparative studies, diagonal relationship, salient features of hydrides, salvation and complexation tendencies. | | |
| | UNIT–II | 11 Hrs. |
| 3. p–Block Elements–I Comparative study (including diagonal relationship) of groups 13–17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13–16, hydrides of boron–diborane and higher boranes, Borazine, borohydrides, fullerenes. | | |
| | UNIT–III | 11 Hrs. |
| 4. p–Block Elements-II Carbides, fluorocarbons, silicates (structural principle), tetrasulphurtetranitride, basic properties of halogens, interhalogens and polyhalide, Silicones and phosphazenes as examples of inorganic polymers, nature of bonding in triphosphazenes. | | |
| | UNIT–IV | 12 Hrs. |
| 5. Chemistry of Transition Elements | | |

Characteristic properties of *d*-block elements. Properties of the elements of the first transition series, their simple compounds and complexes illustrating relative stability of their oxidation states, coordination number and geometry. General characteristics of elements of Second and Third Transition Series, comparative treatment with their 3d analogues in respect of ionic radii, oxidation states, magnetic behaviour.

BOOKS PRESCRIBED:

1. Inorganic Chemistry by Weller, Overton, Rourke and Armstrong, 7th Ed. Oxford University Press.
2. Concise Inorganic Chemistry by J. D. Lee, 5th Ed., Wiley India.
3. Advanced inorganic Chemistry by F. Albert Cotton, Geoffrey Wilkinson 6th Ed., Wiley.
4. Inorganic Chemistry: Principles of Structure and Reactivity by James E. Huheey 4th Ed., Pearson

COURSE OUTCOMES:

| S. No. | On completing the course, |
|--------|---|
| CO1 | Students will be able to understand the physical and chemical properties of s-block, p-block and d-block elements. |
| CO2 | Students will be able to learn the basic similarities and differences between different groups of the periodic table. |
| CO3 | Students will understand the acid-base concepts in inorganic chemistry like Arrhenius concept, Bronsted-lowry and Lewis concepts. Students will be able to differentiate acids and bases. |
| CO4 | Students will learn about the colour, oxidation states, catalytic and magnetic properties of transition elements. |
| CO5 | Students will acquire some knowledge about important topics like inorganic benzene, boranes, silicones and phosphazenes. |

B.Sc. Medical Semester II
CHE 121B
PHYSICAL CHEMISTRY-I

Teaching Hours (per week):3

Total Credit: 3

Credits:LTP:210

Total Hours: 45

Maximum Marks: 56

Pass Marks: 35%

Time: 3 Hours

Note for paper setter and students:

- 1. There will be five sections.**
- 2. Section A is compulsory and will be of 12 marks consisting of 8 short answer type questions carrying 2 mark each covering the whole syllabus. The answer should not exceed 50 words. The candidate will have to attempt any 6 questions in this section.**
- 3. Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 11 marks each from the respective unit. The candidates are required to attempt one question from each of these sections. Each question in these sections should not have more than two subparts.**
- 4. Non-programmable Scientific calculator is allowed.**

COURSE OBJECTIVES:

The course is well designed to learn about the various states of matter-liquids, gases, and colloidal state, along with the colligative properties. The main aim of the course is to give the theoretical background as well as the application perspective of the physical parameters.

COURSE CONTENTS:

UNIT-I

11 Hrs.

1. Gaseous States 15 Hrs.

Postulates of kinetic theory of gases, deviation from ideal behaviour, van der Waal's equation of state.

2. Critical Phenomena: PV isotherms of real gases, continuity of states, the isotherms of van der Waal's equation, relationship between critical constants and van der Waals constants, the law of corresponding states, reduced equation of state.

UNIT-II

11 Hrs.

3. Molecular Velocities: Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Liquefaction of gases.

4. Liquid State 10 Hrs.

Intermolecular forces, structure of liquids (a qualitative description). Structural differences between solids, liquids and gases. Liquid crystals: Difference between liquids crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.

UNIT-III

6

Hrs.

5. Colloidal State 5 Hrs.

Definition of colloids, classification of colloids. Solids in liquids (Sol): kinetic, optical and electrical, properties, stability of colloids, protective action, Hardy Schulze law, gold number.

Liquids in liquids (emulsions): Types of emulsions, preparation. Emulsifiers. general applications of colloids.

6. Dilute Solution

5

Hrs

Methods of expressing concentrations of solutions, Ideal and non-ideal solutions, activity and activity coefficient of dilute solutions, Raoult's law for volatile components and for non-volatile components.

UNIT-IV

7. Colligative Properties

12

Hrs.

Colligative properties, relative lowering of vapour pressure, molecular weight determination. Osmosis, Law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point, Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties. Abnormal molar mass degree of dissociation and association of solutes.

BOOKS PRESCRIBED:

1. Physical Chemistry by P.W. Atkins, 8th Ed., Oxford University Press, 2006 (Indian Print).
2. Physical Chemistry by T. Engel & P. Reid, 1st ed., Pearson Education, 2006.
3. Physical Chemistry by Castellan, 3rd Ed., Addison Wesley/Narosa, 1985 (Indian Print)
4. Physical Chemistry by G. M. Barrow, 6th Ed., New York, McGraw Hill, 1996.
5. Physical Chemistry by R. J. Silbey, R. A. Albert & Mounji G. Bawendi, 4th Ed., New York: John Wiley, 2005.

COURSE OUTCOMES:

| S . No. | On completing the course, |
|---------|--|
| CO1 | Students will learn to implicate the concepts of gaseous state, kinetic theory, and van der Waals equations to real systems. |
| CO2 | Learn about applications of Liquid crystals in LCDs and Digital Electronics |
| CO3 | Colloidal solutions, their preparation, and properties would be helpful in understanding various physical parameters. |
| CO4 | Understanding of preparation of solutions based on different measurement basis and colligative properties |
| CO5 | Students will learn to handle and carry out the physical estimation of solutions, and molecular weight determination from colligative properties |

B.Sc. Medical Semester II
CHE 121P
PRACTICAL

Teaching Hours (per week):4

Total Credit: 2

Credits:LTP:002

Maximum Marks: 38

Pass Marks: 35%

Time: 3 Hours

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

- I. Examiner will set two questions first based upon Inorganic Analysis and second based upon Laboratory Techniques
- II. Students will be asked to complete write up of both practical within first 20 minutes on the first sheet provided.
- III. On the second sheet provided after 20 minutes, students will perform and note the record on second sheet during the conduct of practical exam
- IV. The split of marks will be as under:
(Crystallization = 12, Physical Chem. Practical = 15, Viva-voce = 8, Practical note book = 3)

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

- I. Examiner will set two questions first based upon Crystallization and second based upon Physical Chemistry
- II. Students will be asked to complete write up of both practical within first 20 minutes on the first sheet provided.
- III. On the second sheet provided after 20 minutes, students will perform and note the record on second sheet during the conduct of practical exam
- IV. The split of marks will be as under:

COURSE OBJECTIVES:

The main objective of the course is to create Crystallization skills in students so that they are able to purify the compounds selecting suitable solvent system. Student will also learn about physical techniques like Viscometry, Tensiometry, Calorimetry.

COURSE CONTENTS:

Crystallisation:

Concept of indication of crystallisation. Phthalic acid from hot water (using fluted filter paper & stem less funnel)
Acetanilide from boiling water.
Naphthalene from Ethanol
Benzoic acid from water

Physical Chemistry

1. To determine the specific reaction rate of hydrolysis of ethyl acetate catalysed by Hydrogen ions at room temperature.
 2. To study the effect of acid strength on hydrolysis of an ester.
- Viscosity, Surface Tension (Pure Liquids)
3. To study the viscosity and surface tension of CCI glycerine solution in water.
 4. To determine the solubility of benzoic acid at different temperatures and to determine H of

the dissolution process.

5. To determine the enthalpy of neutralisation of a weak acid/weak base versus strong base/strong acid and determine the enthalpy of ionisation of the weak acid/weak base.

6. To determine the enthalpy of dissolution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

BOOKS PRESCRIBED:

1. Practical Physical Chemistry by J. B. Yadav

COURSE OUTCOMES:

| S. No. | On completing the course, |
|--------|--|
| CO1 | Students will be able to measure important physical properties like surface tension, viscosity, density, enthalpy, heat of neutralization etc. |
| CO2 | Students will learn to examine various physical parameters by different methods. |
| CO3 | Students will learn to handle important apparatus like stalagmometer, Ostwalds viscometer and calorimeter. |
| CO4 | Students will learn to perform acid-base titrations. |
| CO5 | Students will learn to examine the rate of reactions (hydrolysis of ester). |

B.Sc. Medical Semester II
COURSE CODE: ZOO-121A
ECOLOGY

Teaching Hours (per week):3

Total Credit: 3

Credits: LTP: 210

Maximum Marks: 56

Time: 3 Hrs.

Pass Marks:
35%

Instructions for the Paper Setters:

1. There will be five sections.
2. Section A is compulsory and will be of 12 marks consisting of eight short answer type questions carrying two marks each covering the whole syllabus. The answer should not exceed 50 words. The candidate will have to attempt any six questions in this section.
3. Section B, C, D and E will be set from units I, II, III and IV respectively and will consist of two questions of 11 marks each from the respective units. The candidates are required to attempt one question from each of these sections. Each question in these sections should not have more than two sub-parts.

COURSE OBJECTIVES

| | |
|----|---|
| 1. | Describe the interaction between organisms and environment. |
| 2. | Describe the ecological adaptations in animals in different habitats. |
| 3. | Understand ecological niche and succession. |
| 4. | Understand the exchange of nutrients within the ecosystem. |
| 5. | Describe the population dynamics. |

UNIT-I

- Meaning of Ecology, its divisions and levels of organization
- Biotic and Abiotic components of Ecosystem, Ecological energetics (10% law), food chains and webs, major ecosystems of the world
- Temperature, light and soil as ecological factors

UNIT-II

- Biogeochemical cycles (Carbon, Nitrogen, Sulphur, Phosphorus and Water cycle)
- Adaptations, its types (Morphological, physiological and behavioural adaptations) in different animals

UNIT-III

- Characteristics of population and its regulation strategies
- Interactions among animals (Competition, Predation, Parasitism, Commensalism and Mutualism)
- Ecological succession and its types (Hydrosere and Xerosere), Concept of ecological niche

UNIT-IV

- Renewable and non-renewable natural resources and their conservation
- Causes, impact and control of air, water and soil pollution

Suggested Readings:-

1. Anderwartha, H.G. and Birch, L. C. (1970), The distribution and abundance of animals, University of Chicago Press, Chicago London.
2. Beeby, A. (1992), Applying Ecology, Chapman and Hall Madras.

3. Begon, M., Harper J. L. and Townsend, C. R. (1995), Ecology – Individuals, populations and communities, Blackwell Science, Cambridge UK.
4. Brewer, R. (1994), The science of Ecology, Saunders College of Publishing, New York.
5. Chapman, J. L. and Resis, M. J. (1995), Ecology- Principles and applications, Cambridge University Press, Cambridge UK.
6. Kaeighs, S. C. (1974), Ecology with special references to animal and Man, Prentice Hall Inc.
7. Kormondy, E.J. (1975), Concept of Ecology, Englewood Cliffs, N.J. Prentice Hall Inc.
8. Krebs C.J. (1982), Ecology, Harper & Row, New York. 9. Putmann, R. J. and Wratten, S. D. (1984), Principles of Ecology, Crown Helm, London.

COURSE OUTCOMES

| | |
|-------|---|
| CO-1. | Have a knowledge about the biodiversity |
| CO-2. | assess effects of human activities on biosphere |
| CO-3. | Pursue various courses M.Sc. Environmental studies etc. in future & can opt for carrier in academics. |
| CO-4. | Work for wildlife and biodiversity agencies. |

B.Sc. Medical Semester II
ZOO-121B
BIODIVERSITY-II (ARTHROPODA TO HEMICHORDATA)

Teaching Hours (per week):3

Total Credit: 3

Credits: LTP: 210

Maximum Marks: 56

Pass Marks:

35%

Time: 3 Hrs.

Instructions for the Paper Setters:

1. There will be five sections.
2. Section A is compulsory and will be of 12 marks consisting of eight short answer type questions carrying two marks each covering the whole syllabus. The answer should not exceed 50 words. The candidate will have to attempt any six questions in this section.
3. Section B, C, D and E will be set from units I, II, III and IV respectively and will consists of two questions of 11 marks each from the respective units. The candidates are required to attempt one question from each of these sections. Each question in these sections should not have more than two sub-parts.

COURSE OBJECTIVES

| | |
|----|---|
| 1. | Understand the animal kingdom. |
| 2. | Understand the taxonomic position of arthropods to hemichordates. |
| 3. | Understand the general characteristics of animals belonging to arthropods up to hemichordates. |
| 4. | Understand the body organization of phylum from arthropods to hemichordates. |
| 5. | Understand the origin and evolutionary relationship of different phylum from arthropods to hemichordates. |

UNIT-I

- **Arthropoda-** General characteristics and economic importance;
- Mouth Parts (types and modifications), Prawn (only appendages)
- Type study: *Periplaneta americana* (Cockroach)
- Social organizations in insects (Honey bee and Termite)

UNIT-II

- **Mollusca-** General Characteristics and Economic importance;
- Type study: *Pila globosa*
- Torsion and its effect, advantage and disadvantage of torsion, Detorsion, Pearl formation

UNIT-III

- **Echinodermata-** General Characteristics and Economic importance;
- Type study: *Asterias* (Star fish)
- Study of Echinoderm larvae

UNIT-IV

- **Hemichordata:** General Characteristics and Economic importance;
- *Balanoglossus* (External characters only)
- Affinities of Hemichordates with Non-Chordates and Chordates

Suggested Readings:-

1. Barnes, R.D. (1999), Invertebrate Zoology. W.B. Saunder, Philadelphia.
2. Dhami, P.S. & Dhami, J. K., Invertebrates, R. Chand & Co., New Delhi, 2001.
3. Barth, R. H. and Broshears, R. E (1982), The Invertebrate world. Holt Saunder, Japan.
4. Brusca, R. C. and Brusca, G. J. (2003), Invertebrates (2nd ed), Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts.
5. Engemann, J. G. and Hegner, R. W. (1981), Invertebrate Zoology (3rd ed), Macmillan, New York.
6. Gardiner, M. S. (1972), The Biology of Invertebrates, McGraw Hill, New York.
7. Meglitsch, P. A. and Schran, F. R. (1991), Invertebrate Zoology (3rd ed), Oxford University Press, New York.
8. Pechenik, A. Jan. (2000), Biology of the invertebrates, (4th ed), McGraw Hill Book Co. Singapore.

COURSE OUTCOMES

| | |
|-------|---|
| CO-1. | The subject of biodiversity helps the students to know about the structural aspects of different animals. |
| CO-2. | Students also gain knowledge about the taxonomies and evolutionary aspects of Zoology. |
| CO-3. | To study faunal diversity and learn to implement conservation measures to save biodiversity |
| CO-4. | The students get in depth knowledge about various animal phyla (Arthropoda to Hemichordata) |
| CO-5. | Detailed type studies of representative organisms of each phyla. |
| CO-6. | This course also provides detailed knowledge about evolutionary relationships between Non-Chordates, Hemichordates & Chordates. |

B.Sc. Medical Semester II
Practical
ZOO-121P: (Related to ZOO-121A and ZOO-121B)

Teaching Hours (per week):2

Total Credit: 2

Credits: LTP: 002

Maximum Marks: 38

Pass Marks:

35%

Time: 3 Hrs.

Important Note for Practical:

1. Candidates will be required to submit their original note books containing record of their laboratory work.
2. Wherever possible, students must be taken out for excursion to the field (Zoological gardens, sea shores, ponds and hill stations etc.) to study habitat and ecology of the animals.
3. As per the latest UGC guidelines the dissections may please be avoided. In no case an animal falling under the categories of wildlife protection act 1972 should be caught or dissected. The rules of the Prevention of cruelty to Animals act 1960 should be familiar to all who are teaching the Zoology courses.

COURSE OBJECTIVES

| | |
|----|--|
| 1. | Classify the organisms up to orders with their ecological notes and economic importance. |
| 2. | Understand the permanent stained slides of insects and molluscs. |
| 3. | Understand digestive and nervous system of <i>Periplaneta</i> . |
| 4. | Study abiotic and biotic components of an ecosystem. |
| 5. | Study and prepare the charts related to Zoogeographical realms. |

| | | | | | | | | | |
|-----------------------|--|---------------------|--|------------------|---|-----------------------|--|----------------------|----------------------|
| 1. | Classification up to orders with ecological notes and economic importance (if any) of the following animals: | | | | | | | | |
| | <table border="1"> <tr> <td>Arthropoda :</td> <td><i>Peripatus, Palaemon, Lobster, Cancer, Sacculina, Eupagurus, Lepas, Balanus, Cyclops, Daphnia, Lepisma, Periplaneta, Schistocerca, Mantis, Poeciloceris, Gryllus, Cicada, Forficula, Dragonfly, Termite queen, Apis, Bug, Moth, Beetles, Polistes, Bombyx, Pediculus, Scolopendra (Centipede), Julus (Millipede), Palamnaeus, Aranea, Limulus,</i></td> </tr> <tr> <td>Mollusca:</td> <td><i>Anodonta, Mytilus, Ostrea, Cardium, Pholas, Solen, Pecten, Haliotis, Patella, Aplysia, Doris, Limax, Loligo, Sepia, Octopus, Nautilus shell (Complete and T.S.), Chiton, Dentalium</i></td> </tr> <tr> <td>Echinodermata:</td> <td><i>Asterias, Echinus Ophiothrix, Antedon</i></td> </tr> <tr> <td>Hemichordata:</td> <td><i>Balanoglossus</i></td> </tr> </table> | Arthropoda : | <i>Peripatus, Palaemon, Lobster, Cancer, Sacculina, Eupagurus, Lepas, Balanus, Cyclops, Daphnia, Lepisma, Periplaneta, Schistocerca, Mantis, Poeciloceris, Gryllus, Cicada, Forficula, Dragonfly, Termite queen, Apis, Bug, Moth, Beetles, Polistes, Bombyx, Pediculus, Scolopendra (Centipede), Julus (Millipede), Palamnaeus, Aranea, Limulus,</i> | Mollusca: | <i>Anodonta, Mytilus, Ostrea, Cardium, Pholas, Solen, Pecten, Haliotis, Patella, Aplysia, Doris, Limax, Loligo, Sepia, Octopus, Nautilus shell (Complete and T.S.), Chiton, Dentalium</i> | Echinodermata: | <i>Asterias, Echinus Ophiothrix, Antedon</i> | Hemichordata: | <i>Balanoglossus</i> |
| Arthropoda : | <i>Peripatus, Palaemon, Lobster, Cancer, Sacculina, Eupagurus, Lepas, Balanus, Cyclops, Daphnia, Lepisma, Periplaneta, Schistocerca, Mantis, Poeciloceris, Gryllus, Cicada, Forficula, Dragonfly, Termite queen, Apis, Bug, Moth, Beetles, Polistes, Bombyx, Pediculus, Scolopendra (Centipede), Julus (Millipede), Palamnaeus, Aranea, Limulus,</i> | | | | | | | | |
| Mollusca: | <i>Anodonta, Mytilus, Ostrea, Cardium, Pholas, Solen, Pecten, Haliotis, Patella, Aplysia, Doris, Limax, Loligo, Sepia, Octopus, Nautilus shell (Complete and T.S.), Chiton, Dentalium</i> | | | | | | | | |
| Echinodermata: | <i>Asterias, Echinus Ophiothrix, Antedon</i> | | | | | | | | |
| Hemichordata: | <i>Balanoglossus</i> | | | | | | | | |
| 2. | Study of permanent stained preparations: | | | | | | | | |
| | Trachea and mouth parts of insects | | | | | | | | |
| | Radula and osphradium of <i>Pila</i> | | | | | | | | |
| | T.S. Star fish (Arm) | | | | | | | | |
| 3. | Study of | | | | | | | | |
| | Mouth parts of <i>Periplaneta</i> | | | | | | | | |
| 4. | Demonstration using charts/models/software | | | | | | | | |
| | Digestive and nervous system of <i>Periplaneta</i> | | | | | | | | |
| 5. | Ecology: | | | | | | | | |
| | Study of animal adaptations with the help of specimens, charts & models | | | | | | | | |
| | Study of abiotic and biotic components of an ecosystem | | | | | | | | |
| | Study of different types of nests in birds | | | | | | | | |
| | Study and preparation of charts Zoogeographical realms | | | | | | | | |
| 6. | Assignment: | | | | | | | | |
| | Study of local invertebrates fauna/Preparation of scrap book | | | | | | | | |

Guidelines for conduct of practical Examination: -

| | | |
|----|--|---|
| 1. | Identify and classify the specimens A-C up to order. Write a note on their habit, habitat, special features and economic importance. | 9 |
| 2. | Identify the slides/models D-G and give two reasons for identification. | 8 |
| 3. | Identify the adaptive feature of animals/nest. | 5 |
| 4. | Mark the distribution of animals of a realm on the map. | 5 |
| 5. | Project/ Assignment report | 5 |
| 6. | Viva-voce & Practical file. | 6 |

COURSE OUTCOMES

| | |
|-------|---|
| CO-1. | Differentiate invertebrates on the basis of morphological characteristics |
| CO-2. | Understand the comparative structure of invertebrates |
| CO-3. | Have an insight about the internal systems of different invertebrates |
| CO-4. | Have a knowledge about different phyla of invertebrates |

B.Sc. Medical Semester II
B. A., B. A. Social Science, B. Sc. Medical, B. Sc. Non-Medical,
B. Com. (Hons.), B. Com. (R), BBA, B. Sc. Economics, B. Sc. Computer Science
Semester-II
 Compulsory Course
ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ

Credit & Marks Distribution, Eligibility and Pre-Requisites of the Course

| Course title & Code | Total Teaching Hours | Total Credits/ Hours per week | Credit distribution | | | Total Marks 100 | | Time Allowed in Exam |
|----------------------------|----------------------|-------------------------------|---------------------|---|---|-----------------|----|----------------------|
| | | | L | T | P | Theory | IA | |
| ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ BPBI-1201 | 60 | 4 | 4 | 0 | 0 | 75 | 25 | 3 Hours |

| ਕੋਰਸ ਦਾ ਉਦੇਸ਼ Course Objective | ਪਾਠ-ਕ੍ਰਮ ਨਤੀਜੇ Course Outcomes (COs) |
|---|--|
| <ul style="list-style-type: none"> ▪ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਪੈਦਾ ਕਰਨਾ। ▪ ਆਲੋਚਨਾਤਮਕ ਰੁਚੀਆਂ ਨੂੰ ਵਿਕਸਤ ਕਰਨਾ। ▪ ਵਿਦਿਆਰਥੀ ਨੂੰ ਦਫ਼ਤਰੀ ਅਤੇ ਘਰੇਲੂ ਚਿੱਠੀ ਪੱਤਰ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਣਾ। ▪ ਭਾਸ਼ਾਈ ਗਿਆਨ ਵਿਚ ਵਾਧਾ ਕਰਨਾ। | <ul style="list-style-type: none"> ▪ ਵਿਦਿਆਰਥੀ ਦਾ ਸਾਹਿਤਕ ਬੋਧ ਵਿਕਸਤ ਹੋਵੇਗਾ। ▪ ਵਿਦਿਆਰਥੀ ਵਿਚ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਪ੍ਰਫੁੱਲਿਤ ਹੋਣਗੀਆਂ। ▪ ਵਿਦਿਆਰਥੀ ਚਿੱਠੀ-ਪੱਤਰ ਦੀ ਲਿਖਣ ਸ਼ੈਲੀ ਤੋਂ ਜਾਣੂ ਹੋਵੇਗਾ। ▪ ਵਿਦਿਆਰਥੀ ਸ਼ਬਦ ਬਣਤਰ ਤੋਂ ਜਾਣੂ ਹੋਵੇਗਾ। |

ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ। ਪਹਿਲੇ ਭਾਗ ਵਿਚ 1.5-1.5 (ਡੇਢ-ਡੇਢ) ਅੰਕ ਦੇ ਅਤਿ-ਸੰਖੇਪ (Objective Type) 10 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜੋ ਕਿ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿਚੋਂ ਹੋਣਗੇ ਅਤੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਸਿਲੇਬਸ ਦੇ ਬਾਕੀ ਚਾਰ ਭਾਗਾਂ ਵਿਚ 02-02 ਲੇਖ ਨੁਮਾ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰੇਕ ਭਾਗ ਵਿਚੋਂ 01-01 ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੋਵੇਗਾ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 15 ਅੰਕ ਹੋਣਗੇ। ਪੇਪਰ ਸੈੱਟਰ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 25 ਅੰਕਾਂ ਦੀ ਹੈ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ 75+25=100 ਹਨ।

ਪਾਠ-ਕ੍ਰਮ

ਭਾਗ-ਪਹਿਲਾ

ਸਾਹਿਤ ਦੇ ਰੰਗ, ਡਾ. ਮਹਿਲ ਸਿੰਘ (ਸੰਪਾ.), ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।

ਭਾਗ ਦੂਜਾ - ਵਾਰਤਕ ਅਤੇ ਰੇਖਾ-ਚਿੱਤਰ, ਡਾ. ਪਰਮਿੰਦਰ ਸਿੰਘ, ਡਾ. ਭੁਪਿੰਦਰ ਸਿੰਘ ਅਤੇ ਡਾ. ਕੁਲਦੀਪ ਸਿੰਘ ਢਿੱਲੋਂ (ਸਹਿ ਸੰਪਾ.) (ਵਾਰਤਕ ਭਾਗ ਵਿਚੋਂ ਸਾਰ/ਵਿਸ਼ਾ-ਵਸਤੂ। ਰੇਖਾ-ਚਿੱਤਰ ਭਾਗ ਵਿਚੋਂ ਸਾਰ/ਨਾਇਕ ਬਿੰਬ)

ਭਾਗ-ਦੂਜਾ

ਪੰਜਾਬ ਦੇ ਮਹਾਨ ਕਲਾਕਾਰ (ਸੰਪਾ. ਬਲਵੰਤ ਗਾਰਗੀ)

ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

(ਸਤੀਸ਼ ਗੁਜਰਾਲ ਤੋਂ ਸੁਰਿੰਦਰ ਕੌਰ ਤਕ)

(ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ/ਨਾਇਕ ਬਿੰਬ)

ਭਾਗ-ਤੀਜਾ

(ੳ) ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ

(ਅ) ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰੇ

ਭਾਗ-ਚੌਥਾ

(ੳ) ਸ਼ਬਦ-ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ-ਰਚਨਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਮੁਢਲੇ ਸੰਕਲਪ

(ਅ) ਸ਼ਬਦ-ਸ਼੍ਰੇਣੀਆਂ

B.Sc. Medical Semester II
B. A., B. A. Social Science, B. Sc. Medical, B. Sc. Non-Medical,
B. Com. (Hons.), B. Com. (R), BBA, B. Sc. Economics, B. Sc. Computer Science
Semester-II

Compulsory Course

ਮੁਢਲੀ ਪੰਜਾਬੀ

(In Lieu of Compulsory Punjabi)

Credit & Marks Distribution, Eligibility and Pre-Requisites of the Course

| Course title & Code | Total Teaching Hours | Total Credits/ Hours per week | Credit distribution | | | Total Marks 100 | | Time Allowed in Exam |
|---------------------------|----------------------|-------------------------------|---------------------|---|---|-----------------|----|----------------------|
| | | | L | T | P | Theory | IA | |
| ਮੁਢਲੀ ਪੰਜਾਬੀ BPBI-1202 | 60 | 4 | 4 | 0 | 0 | 75 | 25 | 3 Hours |

| ਕੋਰਸ ਦਾ ਉਦੇਸ਼ Course Objective | ਪਾਠ-ਕ੍ਰਮ ਨਤੀਜੇ Course Outcomes (COs) |
|---|---|
| <ul style="list-style-type: none"> ▪ ਵਿਦਿਆਰਥੀ ਅੰਦਰ ਸ਼ਬਦ ਬਣਤਰ ਦੀ ਸਮਝ ਵਿਕਸਤ ਕਰਨਾ। ▪ ਵਿਦਿਆਰਥੀ ਨੂੰ ਸ਼ਬਦ ਪ੍ਰਕਾਰ ਬਾਰੇ ਜਾਣਕਾਰੀ ਪ੍ਰਦਾਨ ਕਰਨਾ। ▪ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਵਿਆਕਰਨਕ ਪ੍ਰਬੰਧ ਸੰਬੰਧੀ ਗਿਆਨ ਕਰਾਉਣਾ। ▪ ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ ਦੁਆਰਾ ਪੰਜਾਬੀ ਸ਼ਬਦ ਭੰਡਾਰ ਵਧਾਉਣਾ। | <ul style="list-style-type: none"> ▪ ਉਹ ਪੰਜਾਬੀ ਸ਼ਬਦ-ਬਣਤਰ ਦੀ ਜਾਣਕਾਰੀ ਹਾਸਲ ਕਰਕੇ ਭਾਸ਼ਾਈ ਗਿਆਨ ਨੂੰ ਵਿਕਸਿਤ ਕਰਨਗੇ। ▪ ਪੰਜਾਬੀ ਸ਼ਬਦ-ਰਚਨਾ ਸੰਬੰਧੀ ਜਾਣਕਾਰੀ ਉਨ੍ਹਾਂ ਦੇ ਗਿਆਨ ਵਿਚ ਵਾਧਾ ਕਰੇਗੀ। ▪ ਵਿਦਿਆਰਥੀ ਸ਼ਬਦਾਂ ਦੀਆਂ ਭਿੰਨ-ਭਿੰਨ ਕਿਸਮਾਂ ਤੋਂ ਜਾਣੂ ਹੋਵੇਗਾ। ▪ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ ਬਾਰੇ ਸਮਝ ਹੋਰ ਵਿਕਸਿਤ ਹੋਵੇਗੀ। |

ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ। ਪਹਿਲੇ ਭਾਗ ਵਿਚ 01-01 ਅੰਕ ਦੇ ਅਤਿ-ਸੰਖੇਪ ਉੱਤਰ ਵਾਲੇ (Objective Type) 11 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜੋ ਕਿ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿਚੋਂ ਹੋਣਗੇ ਅਤੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਦੂਸਰੇ ਭਾਗ ਵਿਚ, ਸਿਲੇਬਸ ਦੇ ਪਹਿਲੇ ਭਾਗ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨ੍ਹਾਂ ਵਿਚੋਂ ਕੋਈ ਦੋ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ। ਇਸੇ ਤਰ੍ਹਾਂ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਤੀਸਰੇ ਭਾਗ ਵਿਚ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜਿੰਨ੍ਹਾਂ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ। ਚੌਥੇ ਵਿਚ ਪੰਜ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨ੍ਹਾਂ ਵਿਚੋਂ ਚਾਰ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 4-4 ਅੰਕ ਹੋਣਗੇ। ਭਾਗ ਪੰਜਵੇਂ ਵਿਚ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨ੍ਹਾਂ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ।

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 25 ਅੰਕਾਂ ਦੀ ਹੈ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ 75+25=100 ਹਨ।

**ਪਾਠ-ਕ੍ਰਮ
ਭਾਗ-ਪਹਿਲਾ**

ਪੰਜਾਬੀ ਸ਼ਬਦ-ਬਣਤਰ:

ਧਾਤੂ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਮਧੇਤਰ, ਪਿਛੇਤਰ), ਪੰਜਾਬੀ ਕੋਸ਼ਗਤ ਸ਼ਬਦ ਅਤੇ ਵਿਆਕਰਨਕ ਸ਼ਬਦ

ਭਾਗ-ਦੂਜਾ

ਪੰਜਾਬੀ ਸ਼ਬਦ-ਪ੍ਰਕਾਰ:

(ੳ) ਸੰਯੁਕਤ ਸ਼ਬਦ, ਸਮਾਸੀ ਸ਼ਬਦ, ਦੋਜਾਤੀ ਸ਼ਬਦ, ਦੋਹਰੇ/ਦੁਹਰੁਕਤੀ ਸ਼ਬਦ ਅਤੇ ਮਿਸ਼ਰਤ ਸ਼ਬਦ
 (ਅ) ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ

ਭਾਗ-ਤੀਜਾ

ਪੰਜਾਬੀ ਸ਼ਬਦ-ਰਚਨਾ:

ਇਕ-ਵਚਨ/ਬਹੁ-ਵਚਨ, ਲਿੰਗ-ਪੁਲਿੰਗ, ਬਹੁਅਰਥਕ ਸ਼ਬਦ, ਸਮਾਨਅਰਥਕ ਸ਼ਬਦ, ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਲਈ ਇਕ ਸ਼ਬਦ, ਸ਼ਬਦ ਜੁੱਟ, ਵਿਰੋਧਅਰਥਕ ਸ਼ਬਦ, ਸਮਨਾਮੀ ਸ਼ਬਦ

ਭਾਗ-ਚੌਥਾ

ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ

ਖਾਣ-ਪੀਣ, ਸਾਕਾਦਾਰੀ, ਰੁੱਤਾਂ, ਮਹੀਨਿਆਂ, ਗਿਣਤੀ, ਮੌਸਮ, ਬਜ਼ਾਰ, ਵਪਾਰ, ਧੰਦਿਆਂ ਨਾਲ ਸੰਬੰਧਿਤ

B.Sc. Medical Semester II
BPHC-1204
PUNJAB HISTORY & CULTURE (C 321 TO 1000 A.D.)
(Special Paper in lieu of Punjabi compulsory)
(For those students who are not domicile of Punjab)

B. A.; B.A. (SS); B. A. (Hons. – English); B. Com. (Hons., R, Ac. & Finance); B. Sc. Bio-Tech./Comp. Sc./Eco./FD/Food Sc./IT/Med./N.Med.; B.Sc. (Hons. –Botany, Chemistry, Mathematics, Physics, Zoology); B. of Mult.; B. in Int. & Mob. Tech.; BBA; BCA;BJMC; B. Voc. (Software Development, Theatre and Stage Craft, Food Processing, Textile Design & Apparel Technology)

SEMESTER–II
PUNJAB HISTORY & CULTURE (C 321 BC TO 1000 A.D.)
(Special Paper in lieu of Punjabi compulsory)
(For those students who are not domicile of Punjab)

Credit: 04
L- T- P
04-0-0

Time: 3 Hours

Total Marks: 100
Theory: 75
Internal Assessment: 25

Instructions for the Paper Setters:

Question paper should consist of two sections—Section A and Section B. The paper setter must ensure that questions in Section–A do not cover more than one point, and questions in Section–B should cover at least 50 per cent of the theme.

Section–A: The examiner will set 15 objective type questions out of which the candidate shall attempt any 10 questions, each carrying 1½ marks. The total weightage of this section will be 15 marks. Answer to each question should be in approximately one to two sentences.

Section–B: The examiner will set 8 questions, two from each Unit. The candidate will attempt 4 questions selecting one from each Unit in about 1000 words. Each question will carry 15 marks. The total weightage of this section will be 60 marks.

Note: The examiner is to set the question paper in two languages: English & Hindi.

Course Objectives: The main objective of this course is to educate the students who are not domicile of the Punjab about the history and culture of the Ancient Punjab. It is to provide them knowledge about the social, economic, religious, cultural and political life of the people of the Punjab during the rule of various dynasties such as The Mauryans, The Khushans, The Guptas, The Vardhanas and other ancient ruling dynasties of the period under study.

Unit-I

1. The Punjab under Chandragupta Maurya and Ashoka.
2. The Kushans and their Contribution to the Punjab.

Unit-II

3. The Punjab under the Gupta Emperors.

4. The Punjab under the Vardhana Emperors

Unit-III

5. Political Developments 7th Century to 1000 A.D.
6. Socio-cultural History of Punjab from 7th Century to 1000 A.D.

Unit-IV

7. Development of languages and Literature.
8. Development of art & Architecture.

Suggested Readings:-

L. Joshi (ed.), *History and Culture of the Punjab*, Part-I, Patiala, 1989 (3rd edition).

L.M. Joshi and Fauja Singh (ed), *History of Punjab*, Vol.I, Patiala 1977.

Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.

B.N. Sharma, *Life in Northern India*, Delhi. 1966.

Course Outcomes:

On completing the course, the students will be able to:

- CO-1** Understand the history and culture of the Punjab in Ancient Period.
- CO-2** Analyse social, economic, religious, cultural and political life of Ancient Indian dynasties.
- CO-3** Study about the political developments from 7th century to 1000AD.
- CO-4** Understand socio-cultural history of the Punjab from 7th century to 1000 AD.
- CO-5** Analyse language, literature, art and architecture of Ancient Punjab.

B.Sc. Medical Semester II
ENGLISH (COMPULSORY)
B.A./B.Com/B.Sc (Med/N. Med/C. Sc./Eco)/ BBA/BA (Social Science) B.Com (Hons.)
Code: BENC-1205

| L | T | P | Credits |
|---|---|---|---------|
| 4 | 0 | 0 | 4 |

Teaching Hours (per week):4

Total Credit:4

Max. Marks: 100

Theory: 75

Internal Assessment: 25

Time: 3 Hours

Instructions for the Paper Setter and Distribution of Marks:

The question paper will consist of four sections and the distribution of marks will be as under:

Section A: 15 Marks

Section B: 20 Marks

Section C: 20 Marks

Section D: 20 Marks

Section–A

1. Twenty (20) Questions on the usage of grammar related to the prescribed units of *Murphy's English Grammar* will be set. The students will be required to attempt any **Fifteen(15)**.

(15X1= 15 Marks)

Section–B

2. EIGHT (8) questions (four from each literary text) on theme, characterization, tone and style etc. will be set. The students will be required to attempt **any Five** questions, choosing at least **TWO** from each prescribed text. The fifth question may be attempted from any prescribed text. The answer to each question should not exceed 15-20 sentences.

(5X4=20 Marks)

Section–C

3. One question with internal choice, from *Tales of Life*, will be set.

(1X8 =8

Marks)

4. One question with internal choice, from *Prose for Young Learners*, will be set.

(1X8 =8

Marks)

5. Six(6) words on vocabulary will be set from the prescribed texts. The students will be required to answer any **Four(4)**.

(4X1= 4

Marks)

Section-D

6. The students will be required to answer **Six** questions from the **Comprehension Passage** set from the book *Prose for Young Learners*.

(6X1=6
Marks)

7. The students will be required to write an **Official Letter** on any **ONE** of the **TWO** given topics.

(1X8= 8 Marks)

8. The students will be required to write an **e-mail** on any **ONE** out of the **TWO** Topics.

(1X6= 6 Marks)

Course Objectives:

1. To read, interpret and write about a diverse range of texts in English.
2. To understand the prescribed texts analytically and critically.
3. To familiarise the students with the social, political, moral and cultural background of the prescribed texts.
4. To participate in the critical and cultural discourses of English.
5. To teach language and literature effectively with the support of ICT tools.
6. To become competent, committed, conscious, creative, and compassionate human beings.

Course Contents

- 1) Stories at Sr.No.7, 9,10,11,12 from *Tales of Life*.
- 2) Essays at Sr.No.7, 8, 9, 10,11 from *Prose for Young Learners*.
- 3) Unit 26-48 from *Murphy's English Grammar*.

Texts Prescribed:

1. *Tales of Life* (Guru Nanak Dev University, Amritsar)
2. *Prose for Young Learners* (Guru Nanak Dev University, Amritsar)
3. *Murphy's English Grammar 4th Edition* (by Raymond Murphy) CUP

Course Outcomes:

The completion of this course enables students to:

1. appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu.
2. comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them.
3. make correct usage of tenses, articles and nouns.
4. enrich their vocabulary and use new words in their spoken and written language.
5. write personal letters to their family and friends on various issues.

B.Sc. Medical Semester II
Course Code: ZDA121
Course Title-DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
DRUG ABUSE: MANAGEMENT AND PREVENTION
(Compulsory for all Under Graduate Classes)

Teaching Hours (per week):2

Total Credit: 2

Total Hours: 40

Maximum Marks: 50

Time: 3 Hours

Instructions for the Paper Setters:

- 1) There will be a total of 9 questions of which 5 are to be attempted.
- 2) Question 1 is compulsory and having 10 short answer type questions (1 mark each).
- 3) The remaining 8 questions (10 marks each) shall include 2 questions from each unit. Candidates shall be required to attempt 4 questions, one from each unit. Preferably, the question should not be split into more than two sub-parts.

Course Objectives:

The course aim is to

| | |
|-------|---|
| CO-1. | Describe the role of family in the prevention of drug abuse. |
| CO-2. | Describe the role of school and teachers in the prevention of drug abuse. |
| CO-3. | Emphasize the role of media and educational and awareness program. |
| CO-4. | Provide knowhow about various legislation and Acts against drug abuse. |

UNIT-I

- **Prevention of Drug abuse**
Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.

UNIT-II

- School: Counseling, Teacher as role-model.
- Parent-teacher-Health Professional Coordination, Random testing on students.

UNIT-III

- **Controlling Drug Abuse**
Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program

UNIT-IV

- Legislation: NDPS act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

References:

1. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
2. Gandotra, R. and Randhawa, J.K. 2018. voZrI d[otos'A (BPky'oh) gqpzXB ns o'eEkw. Kasturi Lal & Sons, Educational Publishers, Amritsar- Jalandhar.
3. Inciardi, J.A. 1981. The Drug Crime Connection. Beverly Hills: Sage Publications.
4. Modi, Ishwar and Modi, Shalini (1997) Drugs: Addiction and Prevention, Jaipur: Rawat Publication.

5. Randhawa, J.K. and Randhawa, Samreet 2018. Drug Abuse-Management and Prevention. Kasturi Lal & Sons, Educational Publishers, Amritsar- Jalandhar.
6. Sain, Bhim 1991, Drug Addiction Alcoholism, Smoking obscenity New Delhi: Mittal Publications.
7. Sandhu, Ranvinder Singh, 2009, Drug Addiction in Punjab: A Sociological Study. Amritsar: Guru Nanak Dev University.
8. Singh, C. P. 2000. Alcohol and Dependence among Industrial Workers: Delhi: Shipra.
9. World Drug Report 2011, United Nations office of Drug and Crime.
10. World Drug Report 2010, United Nations office of Drug and Crime

Course Outcomes:

The students will be able to:

| | |
|-------|---|
| CO-1. | Understand the importance of family and its role in drug abuse prevention. |
| CO-2. | Understand the role of support system especially in schools and inter-relationships between students, parents and teachers. |
| CO-3. | Understand impact of media on substance abuse prevention. |
| CO-4. | Understand the role of awareness drives, campaigns etc. in drug abuse management. |
| CO-5 | Learn about the Legislations and Acts governing drug trafficking and Abuse in India. |