SUPPORTING DOCUMENTS 1.1.1

COURSE PLANS

TABLE OF CONTENTS

Biotechnology

Course: BIOTECH3C11TH
ANIMAL BIOTECHNOLOGY

Theory examination: 50 marksPractical examination: 20 marksInternal Assessment: 30 marks

Note: The Examiner will set a total of nine (9) questions covering all topics/ units of the prescribed course by setting at least two questions from each unit. Out of the nine questions, one question containing ten (10) short- answer type questions that will cover entire course will be compulsory. The candidate will attempt a total of five questions (one from each unit) including the compulsory question. All questions will carry equal marks.

UNITI(10 Periods)

Gene transfer methods in Animals – Microinjection, Embryonic Stem cell, gene transfer, Retrovirus & Gene transfer.

UNITII(10 Periods)

Introduction to transgenesis. Transgenic Animals – Mice, Cow, Pig, Sheep, Goat, Bird, Insect. Animal diseases need help of Biotechnology – Foot-and mouth disease, Coccidiosis, Trypanosomiasis, Theileriosis.

UNITIII(20 Periods)

Animal propagation – Artificial insemination, Animal Clones. Conservation Biology – Embryo transfer techniques. Introduction to Stem Cell Technology and its applications.

UNITIV(20 Periods)

Genetic modification in Medicine - gene therapy, types of gene therapy, vectors in gene therapy, molecular engineering, human genetic engineering, problems & ethics.

Course Plan

UNITI **(10 Periods)**

Gene transfer methods in Animals – Microinjection, Embryonic Stem cell, gene transfer, Retrovirus & Gene transfer.

Content	No of Lectures Required	Lesson Outcome
Gene transfer methods in Animals – Microinjection, Embryonic Stem cell	5	Students are educated about the various methods of gene transfer in animals such as microinjection, stem cell transfer etc.
Retrovirus & Gene transfer.	5	The various viral methods of gene transfer in animal cells are also illustrated to the students

UNITII **(10 Periods)**

Introduction to transgenesis. Transgenic Animals – Mice, Cow, Pig, Sheep, Goat, Bird, Insect. Animal diseases need help of Biotechnology – Foot-and mouth disease, Coccidiosis, Trypanosomiasis, Theileriosis.

Content	No of Lectures Required	Lesson Outcome
Introduction to transgenesis. Transgenic Animals – Mice, Cow, Pig, Sheep, Goat, Bird,	5	Students are given an insight into the details of the production and applications of transgenic animals
Animal diseases need help of Biotechnology – Foot-and mouth disease, Coccidiosis, Trypanosomiasis, Theileriosis	5	The role of biotechnology in treatment, diagnosis and prevention of animal diseases is discussed with the students

UNITIII **(20 Periods)**

Animal propagation – Artificial insemination, Animal Clones. Conservation Biology – Embryo transfer techniques. Introduction to Stem Cell Technology and its applications.

Content	No of Lectures Required	Lesson Outcome
Animal propagation – Artificial insemination, Animal Clones. Conservation Biology	10	Students are given a detailed insight into the reproductive technology including animal cloning, artificial insemination and conservation biology
Embryo transfer techniques. Introduction to Stem Cell Technology and its applications.	10	The concept of embryo transfer techniques in animals and humans and their applications along with the stem cell technology are explained in depth to the students.

UNITIV **(20 Periods)**

Genetic modification in Medicine - gene therapy, types of gene therapy, vectors in gene therapy, molecular engineering, human genetic engineering, problems & ethics.

Content	No of Lectures Required	Lesson Outcome
Genetic modification in Medicine - gene therapy, types of gene therapy, vectors in gene therapy,	10	Students are educated about the concept of gene therapy, their types and applications.
Molecular engineering, human genetic engineering, problems & ethics.	10	The techniques involved in the molecular engineering and human genetic engineering along with the problems and ethics involved are briefed to the students

Teaching Learning Activities
Teaching and learning will be made more effective through activities like • Power Point Presentations • Group Discussions • Smart Boards • Debates • Quiz Competitions • Poster Making • Paper Presentations • Class Tests

Botany

COURSE PLAN: B.Sc II
Plant Physiology and Metabolism (BOTA 202)

1.	MOTIVATION P.K Testing	1. What is plant physiology? 2. What is the importance to study plant functioning. 3. Name few important metabolic processes in plants. 4. Give some examples of Diffusion and Osmosis that you have observed in daily life. 5. What is the difference between guttation and transpiration. 6. Give some examples of macro and micro nutrients 7. What is photosynthesis? 8. What is respiration? 9. What is the difference between aerobic and anaerobic respirations? 10. How atmospheric nitrogen is fixed by the plants. 11. Give some examples of nitrogen fixers. 12. What are plant phytohormones? 13. Give examples of various plant hormones. 14. Which plant hormone is help in stomatal movement? 15. What is phytochrome and how it is different from cryptochrome ? 16. What is photoperiodism? 17. Which hormone is responsible for flowering in plants?
2.	LEARNING OBJECTIVES	1. To familiarize students with various metabolic processes in plants. 2. To aware students about the role of microorganisms in nitrogen fixation in plants. 3. To enable students to understand about the plant hormones and their role in plant growth and regulation. 4. To familiarize students with effect of light duration and temperature on plants growth.

Dept. of Botany Course Plan

3.	CONTENTS	**Unit 1: Introduction** Applications of plant physiology in agriculture & horticulture. **Plant-water relations** (8 Lectures) Importance of water, Diffusion. Osmosis, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation, Mechanism of Stomatal movements. **Unit 2** **Mineral nutrition** (8 Lectures) Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps. **Unit 3** **Translocation in phloem** (4 Lectures) Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading. **Unit 4** **Photosynthesis** (12 Lectures) Photosynthetic Pigments (Chl a, b, xanthophylls, carotene); Photosystem I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C3, C4 and CAM pathways of carbon fixation; Photorespiration. **Unit 5** **Respiration** (8 Lectures) Glycolysis, anaerobic respiration, TCA cycle; Oxidative phosphorylation, Glyoxylate, Oxidative Pentose Phosphate Pathway. **Unit 6** **Enzymes** (4 Lectures) Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition. **Unit 7** **Nitrogen metabolism** (4 Lectures) Biological nitrogen fixation; Nitrate and ammonia assimilation. **Unit 8** **Plant growth regulators** (6 Lectures)

		Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene. **Unit 9** **Plant response to light and temperature** (6 Lectures) Photoperiodism (SDP, LDP, Day neutral plants); Phytochrome (discovery and structure), red and far red light responses on photomorphogenesis; Vernalization. Practical applications of vernalization and photoperiodism.
4.	METHODOLOGY	1. Class lectures 2. Discussion 3. Topic related Power point Presentations 4. Live demonstrations
5.	TEACHING-LEARNING ACTIVITIES	1. White boared and marker 2. Power point presentation
8.	REFERENCES	1. Taiz, l. and Zeiger, E 1998. Plant Physiology (2nd edition) Sinnaur Associates Inc. Publishers, Massachusetts, USA. 2. Bhatia, K.N. 2018. Plant Physiology and Metabolism. Trueman Publishers, Jaladhar.
9.	ASSIGNMENTS	1. Power point presentation by students on important metabolic processes of the plants. 2. Assignments

Course Plan

Course I: - BIOLOGY AND DIVEERSITY OF ALGAE AND FUNGI

1.	MOTIVATION P.K Testing	1. What is the difference between algae and fungi. 2. What are the basic criteria's used for the classification of algae and fungi. 3. What is algal bloom. 4. What are the economic importance of algae and fungi. 5. What is lichen. 6. Name the algae used as biofertilizers. 7. What kind of cell organization is found in algae and fungi.
2.	LEARNING OBJECTIVES	1. To familiarize students with morphological and reproductive characteristic features of Algae and Fungi. 2. To aware students about range of habit, habitat, and thallus organization in different divisions of algae and fungi. 3. To make students aware about the economic importance of algae and fungi. 4. To impart knowledge about structure and function of lichens and their role as pollution indicator. 5. To enable students to understand the life cycles of different algal and fungal division. 6. To familiarize students with uses of fungi in various microbiological and biotechnological processes.
3.	CONTENTS	**Course I:** **BIOLOGY AND DIVEERSITY OF ALAGAE AND FUNGI** **Algae:** 1. Algae in diversified habitats (terrestrial, fresh water, marine) 2. Thallus organization in algae 3. Cell ultra-structure 4. Reproduction (Vegetative, asexual, sexual) and patterns of life cycle. 5. Criteria for classification of algae (pigments, reserved food, flagella). 6. Fine structure of algal plastids. 7. Algal blooms. 8. Algal biofertilizres 9. Economic importance of algae 10. General account of lichens and their economic importance. **Fungi:** i) Introduction to Mycology: General characteristics of fungi, their significance to human, organization of fungal cell, thallus and modifications thereof; ultrastructure,

		reproduction (vegetative, asexual, sexual), recent trends in classification. ii) Comparative study of habit, habitat, somatic organization, anamorphs, teleomorphs and evolutionary tendencies ,in any of these phases in the life cycle of the members of Dictyosteliomycota and Myxomycota (Dictyostelium, physarum) Chytridiomycota and Oomycota (olpidium, synchytrium, Allomyces, Plasmodiophora, Saprolegnia, Pythium, Pyytophora and Downy mildews), Zygomycota (within members of Zygomycetes), Ascomycota (Ascocarp development, ascocarp types, centrum types and their bearing on classification, with emphasis on Protomyces, Taphrina, Yeast, Penicillum, Aspergillus, Chaetomium, Neurospora, Claviceps and Venturia; and general account of powdery mildews and Discomycetes, Basidiomycota, (basidiocarp types, development, general account of Hymenomycetes, Ustilaginomycetes and urediniomycetes, Alternaria, Helminthosporium, Cercospora, Colletotrichum, Pyricularia, Fusarium iii) Sex hormones in fungi, Heterothallisum and parasexual cycle in fungi, nutrition in fungi (saprophytes, parasites, predators, symbionts). iv) Importance of Fungi in different microbiological and Biotechnological processes fungi min food and food industry , as agents of bio-deterioration and biodegradation, in agriculture, in medical biotechnology and as agents of biotransformation, bio sorption and bio mining.
4.	METHODOLOGY	1. Class lectures 2. Discussion 3. Power point presentation 4. Live demonstrations and field visits
5.	TEACHING AIDS	1. White board and marker 2. Power point presentation 3. Charts 4. Field excursion

8.	REFERENCES	• **Algae:** 1. Fritsch, F. E. The structure and reproduction of algae. Vol. I & II, London, Cambridge Univ. Press (1971-72) 2. Kamat, N. D. (1982), Topics in algae, Sai Kirpa Prakashan, Aurangabad. 3. Kumar, H. D. (1988). Introductory Phycology. Affiliated East-West Press limited, New Delhi. 4. Round, F. E (1986). The biology of algae. Cambridge University Press, Cambridge. 5. Kumar, H. D.. (1985). Algal cell Biology. Affiliated East-West Pres Limited, New Delhi. 6. Moris. I. (1967). An Introduction to the Algae. Hutchinsen University Library, London. **Fungi:** 1. Ainsworth, G. C., Sparrow, F. K. And Man, A. F. S. The fungi- an advanced treatise Academic Press, 1973. 2. Alexopoulos, C. J. and Mims, C. W. Introductory mycology, 3rd Edition , Wiley- Easter, New Delhi 3. Alexopoulos, C. J. and Mims, C, W. and Blackwell, M, Introductriy mycology. John Wiley and Sons. 1996 4. Deacon, J. W. Introction to Modern Mycology ELBS. 5. Moore- Landerckar, E. J. 1972. Fundamentals of the fungi. Prentice hall, Englewood Cliffs. 6. Burnett, H. L. Fundamentals of Mycology. Edwand Arnold, London. 7. Aneja Krand Mehrotra R. S. Introductory Mycology. 8. Dube, R. and Mukerji, K. G. 2001. Microbial Technology A. P. H. Publishing corporation, New Delhi. 9. Gupta, R and Mukerji, K. G. 2001 Microbial Technology A. P. H. Publishing Corporation, New delhi.
9.	ASSIGNMENTS	1. Power point presentation by students on the given topics. 2. Written assignments.

Chemistry

CHEMISTRY
Course Plan: Mr. Nishant
CHEM 102TH
STATES OF MATTER, CHEMICAL KINETICS & FUNCTIONAL ORGANIC CHEMISTRY

Objective: To make students aware and give them understanding regarding two important branches of Chemistry i.e. Physical Chemistry and Organic Chemistry.

Section	Name of Topic	No. of Lectures	Learning Outcomes
A	**Kinetic Theory of Gases**	16	
	Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation. Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. van der Waals equation of state for real gases. Boyle temperature (derivation not required).	4	Students will get awareness about the gaseous state
	Critical phenomena, critical constants and their calculation from van der Waals equation. Andrews isotherms of CO2.	4	Students will get the understanding about the nature and how the gases are liquified
	Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation – derivation not required) and their importance. Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation). Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only).	5	Students will get the understanding about the speeds of gaseous molecules
	Liquids Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on	3	Students will understand the nature of liquids, properties like surface tension

	surface tension and coefficient of viscosity of a liquid (qualitative treatment only)		and viscosities of liquids
B	**Solids**	14	
	Forms of solids. Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes. Laws of Crystallography - Law of constancy of interfacial angles, Law of rational indices. Miller indices. X– Ray diffraction by crystals, Bragg's law. Structures of NaCl, KCl and CsCl (qualitative treatment only). Defects in crystals.	4	Students will understand about the solids its types, X-Ray diffraction studies
	Chemical Kinetics The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction. Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half–life of a reaction.	4	Students will get understanding regarding the speeds of chemicals reactions.
	General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation.	3	They will understand the categorization of different chemical reactions on the basis of various orders
	Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only).	3	Students will get the understanding about that how a chemical reaction occurs
C	**Aromatic hydrocarbons**	17	
	Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. **Aromatic hydrocarbons** Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: (Case benzene):	7	Students will get understanding regarding functional group organic chemistry.

	Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Craft's reaction (alkylation and acylation) (upto 4 carbons on benzene). Side chain oxidation of alkyl benzenes (upto 4 carbons on benzene).		They will get understanding regarding different types of electrophilic substitution reactions
	Alkyl Halides (Upto 5 Carbons) Types of Nucleophilic Substitution (SN1, SN2 and SNi) reactions.	2	Students will understand about the nature of alkyl halides and how they show chemical reactions like SN1 and SN2
	Preparation: from alkenes and alcohols **Reactions:** hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation, Williamson's ether synthesis. Aryl Halides Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions.	3	Students will get understanding about alcohols and how they can be prepared and how they react.
	Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by –OH group) and effect of nitro substituent. Benzyne Mechanism: KNH2/NH3 (or NaNH2/NH3). Reactivity and Relative strength of C-Halogen bond in alkyl, allyl, benzyl, vinyl and aryl halides.	5	Students will understand certain important chemical reactions with mechanism like Elimination addition reactions, Nucleophilic substitutions reactions of Chlorobenzene
D	**Alcohols, Phenols and Ethers (Up to 5 Carbons)**	16	
	Alcohols: Preparation: Preparation of 1o, 2° and 3° alcohols: using Grignard reagent, Ester hydrolysis, Reduction of aldehydes, ketones, carboxylic acid and esters.	3	Students will get understanding about the

			preparations of Alcohols
	Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, alk. $KMnO_4$, acidic dichromate, conc. HNO_3). Oppeneauer oxidation Diols: (Upto 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement.	3	Students will get understanding chemical reactions of Alcohols
	Phenols: (Phenol case) Preparation: Cumene hydroperoxide method, from diazonium salts. Reactions: Electrophilic substitution: Nitration, halogenation and sulphonation. Reimer - Tiemann Reaction, Gattermann-Koch Reaction, Houben–Hoesch Condensation, Schotten – Baumann Reaction.	3	Students will get understanding about Phenols and how those are prepared
	Ethers (aliphatic and aromatic): Cleavage of ethers with HI.	2	Students will get understanding about the Ethers and how those are prepared
	Aldehydes and ketones (aliphatic and aromatic): (Formaldehye, acetaldehyde, acetone and benzaldehyde) **Preparation:** From acid chlorides and from nitriles.	2	Students will get understanding about the Aldehydes and Ketones and how those are prepared
	Reactions: Reaction with HCN, ROH, $NaHSO_3$, NH_2-G derivatives. Iodoform test. Aldol Condensation, Cannizzaro's reaction, Wittig reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction. Meerwein-Pondorff Verley reduction.	3	Students will get understanding regarding certain important reactions like Clemensen reduction, Wolf Kishner Reduction, Meerwein

			Pondorf Verley Reduction, Benzoin condensation etc.

Teaching Learning Activities:

Online Teaching using MS-Teams
PowerPoint presentations
Discussions
Lectures
Webinars
Demonstrations

Course Plan
B.COM 3rd Year
Management Accounting
BC 3.5 (c)(DSE-3)

Faculty:
Mr. Manu Mahajan
Department of Commerce
St. Bede's College

COURSE OBJECTIVES:

- To impart basic knowledge of Management Accounting.
- To familiarize the students with various concepts of Management Control Techniques.

LEARNING OBJECTIVE:
The objective of this paper is to help students to acquire conceptual knowledge of management accounting and to impart Skills for Management Control Techniques.

UNIT- 1 **Introduction**	
Name of the topic	**No. of lectures**
A) Introduction to Management Accounting	
Definition, Meaning and Functions of Management Accounting	3 lectures
Need and importance of Management Accounting	1 lectures
Difference between Financial Accounting and Management Accounting, Cost Accounting Vs. Management Accounting	2 lecture
Tools and Techniques of Management Accounting	2 lecture

Advantages and Limitations of Management Accounting, Scope of Management Accounting	1 lecture
B) Ratio Analysis	
Introduction to ratios, Meaning and definitions of ratios, Various types of ratios	1 lecture
Advantages and disadvantages of Ratio Analysis	1lecture
Formulas for calculation of various ratios	1 lecture
Numerical Problems on Ratio Analysis	5 lectures
Du -Pont	1 lecture

LEARNING OUTCOMES
Students will be able to:

- Understand the concept of Management Accounting.
- Understand the concept of various types of ratios and their utility.

UNIT – II
Budget and Budgetary Control

Name of the Topic	**No. of lectures**
Meaning, Definitions and objectives of Budgetary Control	1 lecture
Limitations and Steps in Budgetary Control	1 lecture
Types and Classification of Budgets	1 lecture
Practical Problems on Cash Budget	3 lectures
Practical Problems on Flexible Budget	2 lectures
Practical Problems on Sales Budget	1 lecture
Practical Problems on Production Budget	1 lecture
Zero Base Budgeting- Concept, Merits and Demerits	1 lecture
Difference between Traditional Budgeting and Flexible Budget; Concept of Master Budget	1 lecture

LEARNING OUTCOME
Students will be able to:

- Understand the concept of preparation of different types of Budgets.

UNIT – III
Marginal Costing

Name of the Topic	**No. of lectures**
Meaning, Definitions of Marginal Cost and Marginal Costing	1 lecture

Advantages and Disadvantages of Marginal Costing	1 lecture
Calculation of P/V Ratio, B.E.P (in Rs. And in Units), Margin of Safety; Difference between Profit & Contribution, How P/V ratio can be increased	2 lectures
Problems of Marginal Costing	1 lecture
Break even Chart:- Advantages & Disadvantages	1 lecture
Numerical Problems on Marginal Costing	9 lectures
LEARNING OUTCOME Students will be able to: • Understand the concept of Break –even point. • Understand how to make Break even graph and P/V graph.	

UNIT – IV **Standard Costing**	
Name of the Topic	**No. of lectures**
Meaning, Definitions of Marginal Cost and Marginal Costing	1 lecture
Advantages and Disadvantages of Marginal Costing	1 lecture
Calculation of P/V Ratio, B.E.P (in Rs. And in Units), Margin of Safety; Difference between Profit & Contribution, How P/V ratio can be increased	2 lectures
Problems of Marginal Costing	1 lecture

TEACHING LEARNING ACTIVITIES	• Interactive Lecture • Discussions • Chalk and talk method • Assignments • Presentations • Class Tests • Role Play • You tube videos • Smart Board

REFERENCES	• Arora, M.N. Management Accounting. Vikas Publishing House, New Delhi. • Maheshwari, S.N. and S.N. Mittal. Management Accounting. Shree Mahavir Book Depot, New Delhi. • Singh, S. K. and Gupta Lovleen. Management Accounting – Theory and Practice. Pinnacle Publishing House. • Khan, M.Y. and Jain, P.K. Management Accounting. McGraw Hill Education

Course Plan
M.Com. 1st Sem.
Statistical Analysis for Decision Making
Paper Code:- M.C. 1.4

COURSE OBJECTIVES:

- Understand Probability Theory
- Analyse Sampling Techniques
- Apply Testing Hypothesis, Chi-square, F-test , t-test etc.
- Comprehend Simple Correlation and Regression

UNIT- 1	
LEARNING OUTCOMES: To enable students to: • Learn about the basics concepts of Mean, Median, Mode, Harmonic Mean and Geometric Mean. • Understand the different types of Partition Values, Concept of Mean Deviation and Standard Deviation and Coefficient of Variation. • Understand the concept of Skewness, Kurtosis & Moments.	
Name of the topic	**No. of lectures**
Introduction to Mean, Median, Mode, Geometric Mean and Harmonic Mean.	5 lectures
Measures of Dispersion	7 lectures
Skewness, Kurtosis and Moments	3 lecture
An overview of subsidiary books, preparation of ledger accounts.	3 lecture
UNIT – II	
LEARNING OUTCOMES: To help students: • To understand Correlation & Regression Analysis (Two Variables only) • To understand the concept of Index Numbers	
Name of the Topic	**No. of lectures**
Correlation Analysis- Karl Pearson's Coefficient of Correlation, Spearman's Rank Correlation	5lectures
Types of Correlation and difference between Correlation and Regression and their properties	2 lectures

Index Numbers:- Meaning, types and uses, Methods of constructing price and quantity indices (simple and aggregate)	2 lectures	
Test of Adequacy, Chain base index numbers, Base shifting, splicing and deflating	2 lectures	
Problems in the constructing index numbers; Consumer Price Index	2 lectures	
UNIT – III		
LEARNING OUTCOMES: To help students :- • Learn about the theory of Probability , Baye's Theorem and Probability Distributions		
Name of the Topic	**No. of lectures**	
Probability as a concept	2 lectures	
Approaches to defining Probability; Addition and Multiplication laws of probability	4 lectures	
Conditional Probability	2 lecture	
Baye's Theorem	2 lectures	
Probability Distribution as a Concept	2 lectures	
Binomial, Poisson and Normal distributions- their properties and parameters	5lecture	
UNIT – IV		
LEARNING OUTCOMES: To enable students to:- • Learn about the Tests of hypothesis formulation; hypothesis and error on hypothesis testing • Learn about parametric and non-parametric tests		
Name of the Topic	**No. of lectures**	
Statistical Inferences, Testing of Hypothesis and Estimation; Sampling Distributions and Procedure of testing Hypothesis	7 lectures	
Hypothesis Testing- Small and Large Samples (Z test, t-test & F-test)	9 lectures	
Non- parametric Tests- Chi square, Run test, Median test, Kruskal-Wallis test, Mann- Whitney U test	10 lectures	

TEACHING LEARNING ACTIVITIES

- Interactive Lecture
- Group Discussions
- Assignments
- Class Tests
- Power Point Presentations
- Chalk and Talk Method
- Role Play
- Smart Boards

References

1. Johnson, R.D and Siskin, B.R Quantitative techniques foe business decision. Prentice Hall of India, 1984.
2. Hien , L.W- Quantitative Approach to managerial decision . Practice Hall of India, 1983.
3. Levin, Richard I. and Rubin David S – Statistics for Management , Prentice Hall of India , 1983.
4. Chou- Ya- Lun; Statistical Analysis. Holt, Rinchart and Winslon, 1980.
5. Tulsian P.C., Jhunjhnuwala Bharat, Business Statistics. S.Chand Publications.
6. Hooda, R.P, Statistical Methods
7. Elhance D.L., Elhance Veena, Aggarwal B.M., Fundamentals of Statistics. Kitab Mahal

COURSE PLAN

COMPTER FUNDAMENTALS: BCA0102

Semester: First

Paper Title : Computer fundamentals **L T P**

Paper Code : BCA0102 **2 0 0**

OBJECTIVES:

After covering the computer fundamentals in approximately 30 lectures, the course shall aim to acquaint the students about the basic features of computers including:

- Characteristics of Computers
- Generations of computers
- Hardware & Software
- Block diagram of computer
- Main memory
- I/O devices
- Operating System
- Programming Languages
- Application Softwares

UNIT-I

Introduction: Characteristics of Computers, Evolution of computers, Capabilities and limitations of computers, Generations of computers, Types of computers(micro, mini, main frame, supercomputers), Block diagram of computer, Basic components of a computer system0 Input unit, output unit, Arithmetic logic Unit, Control unit, central processing unit, Instruction set, registers, processor speed, type of processors. **[No. of Hours : 8 hours]**

UNIT-II

Memory: main memory organization, main memory capacity, RAM, ROM, EPROM, PROM, cache memory, PCs specifications. Secondary Storage Devices- Magnetic Tape, Magnetic Disks0Internal Hard Disk, External Hard Drives, Floppy Disks, Optical Disks-CD, VCD, CD-R, CD-RW, DVD, Solid State Storage0Flash Memory, USB Drive **[No. of Hours : 6 hours]**

UNIT-III

Input devices: Keyboard, Pointing Devices0mouse, Touch Screens, Joystick, Electronic pen, Trackball, Scanning Devices-Optical Scanners, OCR, OMR, Bar Code Readers, MICR, Digitizer, Electronic card reader, Image Capturing Devices-Digital Cameras. Output devices- Monitors0 CRT, LCD/TFT, Printers- Dot matrix, Inkjet, Laser, Plotters-Drum, Flatbed, Screen image projector. **[No. of Hours : 8 hours]**

UNIT-IV

Computer Software: Software and its Need, Types of software0System software, Application software, System software0operating system, utility program, programming languages, assemblers, compilers and interpreter, introduction to operation system for PCs-DOS, windows, linux, file allocation table (FAT & FAT32), files & directory structure and its naming rules, programming languages0machine, assembly, high level, 4GL, their merits and demerits, application software and its types – word0processing, spreadsheet, presentation graphics.

[No. of Hours : 8 hours]

	Topic	**Lectures**
1	Introduction and characteristics of computers	1
2	Evolution of computers, capabilities and limitations of computers	1
4	Generations of computers	1
5	Types of computers	1
6	Block diagram of computer	1
7	basic components of computer system, Input output Unit	1
8	Arithmetic logic Unit, Control Unit, Central Processing Unit	1
9	Instruction Set, registers, processor speed, type of processors	1
10	Memory: main memory organization	1
11	Main memory capacity, Ram, Rom	2
12	EPROM, PROM, cache memory	1
13	Secondary storage devices, magnetic Tapes, magnetic Disk	2
14	Internal hard Disk, External hard disk, Floppy Disks	2
15	Optical disks-CD, VCD, CD-R, CD-RW, DVD	2

16	Solid state storage Flash Memory, USB Drives	
17	Input devices: Keyboard, pointing Devices : Mouse	
18	Touch Screens, Joystick, Electronic Pen	
19	Trackball, scanning Devices-Optical Scanners	
20	OCR,OMR	
21	bar Code Reader, MICR digitizer	
22	Electronic card reader and Digital cameras	2
23	Output Devices-Monitor,CRT,LCD/TFT	
24	Printers: DOT Matrix ,Inkjet, laser	
25	Plotters-Drum, flatbed	
26	Screen image projector	
27	Computer Software : Software and its Need	
28	Types of software system	
29	Operating system Utility	
30	Programming languages, assemblers, Compilers and Interpreter	2
31	Introduction to operating System for PC-s and DOS	1
32	Windows and Linux	1
33	File allocation table, files and directory and naming rules	1
34	Programming languages: Machine, assembly, high level	
35	4GL,merits and demerits of programming languages	1
36	application software and its types	1
37	word processing, spread sheet, presentation graphics	1

Teaching Learning Activities:

- Online Teaching using MS-Teams
- PowerPoint presentations
- Discussions
- Lectures
- Webinars
- Demonstrations

Text and Reference books:

- **Pradeep K. Singh, Priti Sinha,"Computer Fundamentals". BPB Publications**
- **RajaRaman V, "Fundamentals of Computers", Prentice Hall, India**

Economics

Course Plan
Introductory Econometrics
B.A II Honours 2021-22

Course No. ECONHA206
Course title: Introductory Econometrics
Nature of Course: DSC – 10
Number of credits: 6
Course Description This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.

Learning Outcomes: The course will prepare students for advanced econometrics course by building their ability to explorer and estimate economic relationship using regression analysis and providing broad knowledge about basic statistical tools like frequency distribution, probability distribution, statistical testing of hypothesis, correlation, regression analysis and expected values. Students will get deep understanding of least square analysis and its practical applications, problems related to autocorrelation, heteroskedasticity, multicollinearity and model specification. They would be able to formulate symbol econometric models, make predictions and draw inferences with the help of hypothesis testing and statistical tests. After studying this course, the students would be able to understand and analyse the data and research papers and articles using econometric tools.
Teaching Learning Activities: Lectures, class tests, individual assignments, group assignments, quizzes, discussions, question answer and problem-solving sessions.

Lecture Outline

UNIT I Elements of Statistical Inference	
Aug & Sept	The concepts of population, samples, parameter and statistic will be discussed.
	Students will learn the meaning of estimation theory.
	Students will understand the difference between point estimation and interval Estimation.
	Asymptotic properties will be explained with the help of examples.
	The method of least squares to estimate population parameters will be discussed.
	The method of Maximum Likelihood to estimate population parameters will be discussed.
	Students will get familiar with the concept of hypothesis testing. After explaining the meaning of hypothesis, they will learn the methods of formulation of hypothesis.
	After explaining the desirable characteristics of a hypothesis, types of hypotheses will be discussed with the help of examples.
	The procedure for testing hypothesis will be explained to the students. They will learn about null and alternate hypothesis.
	Students will learn about level of significance and confidence intervals.
	Type I and type II errors will be explained to students. Students will learn about one tailed and two tailed tests with the help of diagrams.
	They will understand the meaning of rejection region and acceptance region.
	Students will learn the meaning of power of a test and degrees of freedom.
UNIT II Simple Linear and Multiple Regression Models	
Oct & Nov	Two-variable linear regression model will be introduced.

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	Assumptions under CLRM will be discussed with the help of examples and diagrams.
	OLS method of estimation will be explained with proofs.
	After discussing the importance of stochastic error term, properties of an estimator will be explained in detail along with proofs.
	Variance and covariance of the OLS estimator will be derived.
	Gauss-Markov theorem and its proof will be explained.
	Students will be introduced to the multiple regression-k-variable linear regression model.
	Students will learn about R2 and Adjusted R2. ANOVA will be discussed.
UNIT III Regression with Dummy Variables	
Dec	Students will learn the meaning of Dummy variables with the help of examples.
	Students will study the dummy variable trap with the help of examples and diagrams.
	Structural change Model will be discussed with the help of examples.
	Interaction effects will be explained.
	Seasonal analysis of time series will be discussed in detail with the help of proofs and diagrams.
	Piecewise linear regressions will be discussed with the help of diagrams
UNIT IV Violations of Classical Assumptions	
Feb & March	Students will understand the meaning of violations of classical assumptions. Multicollinearity will be explained with the help of examples and diagrams. Sources and Consequences of multicollinearity will be discussed with the help of examples.
	Detection and measures of multicollinearity will be explained with proofs.
	Heteroscedasticity will be explained with the help of examples and diagrams. Detection and solution heteroscedasticity will be discussed with the help of examples.
	Autocorrelation-sources and consequences of autocorrelation will be explained in these classes. Detection and remedial measures of autocorrelation will be discussed.
	Students will understand the meaning of specification error. Reasons of specification error viz. omission of a relevant variable; inclusion of irrelevant variable will be discussed with the help of examples.

Readings:

1. Jay L. Devore, Probability and Statistics for Engineers, Cengage Learning, 2010. 2. John E. Freund, Mathematical Statistics, Prentice Hall, 1992.
3. Richard J. Larsen and Morris L. Marx, An Introduction to Mathematical Statistics and its Applications, Prentice Hall, 2011.
4. D. N. Gujarati and D.C. Porter, Essentials of Econometrics, McGraw Hill, 4th edition, International Edition, 2009.
5. Christopher Dougherty, Introduction to Econometrics, Oxford University Press, 3rd edition, Indian edition, 2007.
6. Jan Kmenta, Elements of Econometrics, Indian Reprint, Khosla Publishing House, 2nd edition, 2008.
7. Richard J. Larsen and Morris L. Marx, An Introduction to Mathematical Statistics and its Applications, Prentice Hall, 2011.
8. Sadhu A.N. and A. Singh, Research Methodology in Social Sciences, Himalaya Publishing House.
9. Gopal, M.H., Research Methodology in Social Sciences, Asia Publishing House, New Delhi.

COURSE PLAN

2021-2022

Faculty Name: Swati Kapil

Course Name: Economy of Himachal Pradesh

Subject Code: ECONA313

ECONHA307

ECONA313

Learning Objectives:

- To help students learn about the characteristics and basic features of Himachal Pradesh.
- To enable students to learn about the economy of Himachal Pradesh, improvements made so far.
- To help students learn about sectoral composition and contribution of various sectors in the economy of Himachal Pradesh

Unit I	
Name of the Topic	**No: of Lectures**
Basic Features of Himachal Pradesh	1
Land endowment	2
State Income	1
State Finances	1
Planning in Himachal Pradesh	2
Budget of the current year	2

Unit II	
Name of the Topic	**No: of Lectures**
Role of Agriculture and Horticulture in Himachal Pradesh	5
Agricultural marketing	2
Agricultural Finance	2
Agricultural Diversification	1

Unit III	
Name of the Topic	**No: of Lectures**
Industrial growth in HP	3
Labour welfare measures	2
Hydro power generation in HP	3
Environmental issues of HP	2

Unit IV	
Name of the Topic	**No: of Lectures**
Transportation in HP	3
Social Welfare Schemes in HP	2
Role of tourism in the economy of HP	3

Teaching Methodology:

- Interactive Online classes on MS- Teams.
- Online quizzes, assignments, class discussions
- Peer teaching, paper presentations.

Teaching Aids:

- Blackboard, Power point presentations

Learning Outcomes:

Students were able to:

Summarize the topics discussed

Answer the questions asked pertaining to the topics

Give overview of the contents

References:

1. Economic Survey, Various Issues, Department of Economics and Statistics, GoHP.

2. Himachal Pradesh Development Report, Planning Commission. GoI.

3. Sharma, L.R. (1987), The Economy of Himachal Pradesh: Growth and Structure: a Study in Development Performance, Mittal Publishing.

4. Ashok Kumar Tiwari, 2000, Infrastructure and economic development in Himachal Pradesh, Indus Publishing.

5. Y.S. Parmar, Years of Challenge and Growth, Rubicon Publishing House.

English

M.A. English Course Plan

Course Title: Shakespeare and his Contemporaries

Course Code: DSC MENG 103

Course Credits: 6

Name of the Book	Details on the Lecture	No. of Lectures
Christopher Marlowe: *Doctor Faustus*	Basic Introduction to the Text and the Author	1
	Historical and Political Background of the Time	2
	The Form of the Text (as a Tragedy and as a Morality Play), Other associated Literary traditions and the Author's Innovation	2
	A Close Reading of the Text	4
	Major and Minor Themes	2
	Contemporary Criticisms	1
	Questions and Further Discussion	1
	Tutorials	3
William Shakespeare: *Twelfth Night*	Basic Introduction to the Text and the Author	1
	Historical and Political Background of the Time	2
	The Form of the Text (as a Comedy), other associated Literary traditions and the Author's Innovation	2
	A Close Reading of the Text	4
	Major and Minor Themes	2
	Contemporary Criticisms	1
	Questions and Further Discussion	1
	Tutorials	3
William Shakespeare: *Tempest*	Basic Introduction to the Text and the Author	1
	Historical and Political Background of the Time	2
	The Form of the Text (as a Tragicomedy), other associated Literary traditions, like the Masque ad Anti-Masque, and the Author's Innovation	2

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	A Close Reading of the Text	4
	Major and Minor Themes	2
	Contemporary Criticisms	1
	Questions and Further Discussion	1
	Tutorials	3
Ben Jonson: *Volpone*	Basic Introduction to the Text and the Author	1
	Historical and Political Background of the Time	2
	The Form of the Text (as a Comedy and Morality Play), other associated Literary traditions like the Beast Fable, the Masque, etc. and the Author's Innovation	2
	A Close Reading of the Text	4
	Major and Minor Themes	2
	Contemporary Criticisms	1
	Questions and Further Discussion	1
	Tutorials	3

B.A (Hons.) Course Plan

Course Code: ENGHONS102

Course Title: European Classical Literature

Credits: 6

Course Contents: Homer: Iliad; Sophocles: Oedipus Rex; Plautus: The Pot of Gold

Name of the Book	Lecture Details	No. of Lectures
Homer's *Iliad*	In these classes the students will be introduced to the epic poem and they will learn about the definition, devices and conventions of an epic. They will also be introduced to the history of epic poetry from Homer to Virgil to Milton.	4
	In this class, the *Iliad* will be read and important aspects will be discussed with the students.	10
	Various important topics like *Iliad* as an epic poem, the role of supernatural machinery, and Homer's narrative technique will be discussed.	4
	Paper presentations on Odyssey by students.	2
Sophocles' *Oedipus Rex*	The students will learn about the features and history of Greek tragedy. They will be introduced to Sophocoles, Aristotle and also to *Oedipus Rex*.	5
	In these classes the play *Oedipus Rex* will be read and explained.	8
	In these two classes focus will be on the important aspects of the play namely, character sketches of Creon, *Oedipus Rex*, Tieresias; role of the chorus, theory of Greek tragedy, plot construction and ideal tragic hero.	5
	Paper presentations on Oedipus Rex by students.	2
Plautus' *Pot of Gold*	Students will be introduced to the theory of comedy with special reference to the *Pot of Gold*. Also they will learn about the differences between a tragedy and a comedy.	4
	The *Pot of Gold* will be read in detail in these classes. Students will be explained the use of satire and dramatic irony during the course of reading this play.	9
	Important aspects of the play will be discussed. These will include character sketches of Euclio, Megadorus the slave; comic elements in the play, *Pot of Gold* as a satire on greed and miserliness, Megadorus's view on marriage and dowry etc.	5
	Paper presentations on important aspects of the play by students.	2

B.A Course Plan

Course Code: ENG AEEC/SEC 301

Course Title: Technical Writing

Unit	**Details**	**No. of Lectures**
Unit – I Language Skills	i) Introduction to parts of speech. ii) Types of verbs and tenses. iii) Active, passive voice. iv) Narration and use of punctuation	1 3 2 2
Unit – II Technical Writing	i) Manual and its preparation ii)Memorandum iii) Agenda iv)How to write minutes of the meeting v)PowerPoint presentation	2 1 1 3 3
Unit – III Writing Skills	i) Introducing a project report ii) Format of a project report iii) Organisation of a project report iv) Contents of a project report.	2 2 2 2
Unit – IV Data Analysis	i) Introducing the basic concepts of maths ii) Qualitative analysis of data iii) Quantitative analysis iv) Interpreting data with the help of various graphs and charts.	3 2 2 2
Classroom activities	Class presentations, Quizzes, and class tests	5

Department of Geography

Learning Objectives and Learning Outcomes

Subject: Hydrology and Oceanography

BA- 3rd Year (Honours)

LEARNING OBJECTIVES

- To understand Hydrological cycle at global and Regional level.
- To understand hydrological input and output.
- To differentiate between different forms and types of precipitation.
- To differentiate between interception evaporation.
- To understand the importance of evaporation and then the condensation into the hydrological cycle.
- To differentiate between underground and surface run-off.
- To understand the working of interception and transpiration.
- To understand the river discharge and the problems of river basins.
- To understand the problems of floods and other river related disasters.
- To understand the difference between Tides and waves and their mode of origin.
- To study different oceanic deposited.
- To understand the origin of Coral and their importance.

LEARNING OUTCOME

- The students are able to understand the importance and the working of Hydrological cycle.
- The hydrological input and output is understood.

- The students are able to differentiate between transpiration, evaporation and evapotranspiration.
- The difference between evaporation and condensation is clarified.
- The pre-requisite conditions for precipitation are understood.
- The importance of infiltration and seepage in the generation of underground water is cleared.
- The origin of coral reefs is understood.
- The importance of marine resources is clarified.
- The mode of origin of tidal and surface waves is clarified.

Teaching learning activities:-

- Black board method
- Group discussion
- Role play method
- Power point presentation
- Quiz competition
- Field survey/ field visit
- Demonstration through models
- Class test
- Assignments
- Models/ project works

Department of Hindi

2018 -2019 के पाठ्यक्रम के आधार पर पाठ्यक्रम योजना

बी. ए. द्वितीय वर्ष 2021-22

प्रश्न पत्र : SKILL ENHANCEMENT COURSE

SEC – 2

HIND 206

विषय : अनुवाद विज्ञान

डॉ देविना अक्षयवर

हिंदी विभाग

सेंट बीड्स कॉलेज

कक्षा : बी.ए. द्वितीय वर्ष

विषय : अनुवाद विज्ञान

क्रेडिट : 04

पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल एवं प्रायवेट परीक्षार्थी)

पूर्णांक : 70 (रेगुलर परीक्षार्थी)

आतंरिक मूल्यांकन : 30

समय : तीन घंटे

सहायक पुस्तक : 'अनुवाद विज्ञान', डॉ नगेंद्र

शिक्षण - उद्देश्य :

1. छात्राओं को हिंदी भाषा तथा साहित्य के क्षेत्र में ज्ञान अर्जित करने के अतिरिक्त, उनके भाषिक कौशल में वृद्धि करना।

2. साहित्य की गहरी समझ के लिए अनुवाद की उपयोगिता पर ज्ञान बढ़ाना।

3. तुलनात्मक साहित्य के क्षेत्र में निपुण होने के लिए उनकी योग्यता को निखारना।

पाठन - प्रक्रिया

इकाई 1

1.1 अनुवाद का तात्पर्य, अनुवाद के विभिन्न प्रकार - भाषांतरण, सारानुवाद तथा रूपांतरण में साम्य-वैषम्य। अनुवाद के प्रमुख प्रकार- कार्यालयी, साहित्यिक, ज्ञान-विज्ञानपरक, विधिक, वाणिज्यिक।

1.2 अनुवाद के शिल्पगत भेद , अविकल अनुवाद (लिटरल), भावानुवाद/छायानुवाद, आशु अनुवाद, डबिंग, कंप्यूटर अनुवाद।

इकाई 1 में छात्राओं को अनुवाद का अर्थ एवं उसकी परिभाषा बताते हुए उसके प्रकार पर भी समझाया जाएगा। भाषांतरण, सारानुवाद तथा रूपांतरण में समानताएं एवं असमानताओं के बारे में भी समझाया जाएगा। अनुवाद के शिल्पगत भेदों पर भी उनका ज्ञानवर्धन किया जाएगा।

इकाई 1 के अंतर्गत पाठों को पूरा करने के लिए निर्धारित समय - 31 अगस्त से 30 सितम्बर तक।

इकाई 2

2.1 साहित्यिक अनुवाद के प्रमुख रूप- काव्यानुवाद, कथानुवाद, नाट्यानुवाद

2.2 अनुवाद में पर्यवेक्षण (वेटिंग) की भूमिका

साहित्यिक अनुवाद का अर्थ तथा उसके भेदों के बारे में छात्राओं को समझाया जाएगा। अनुवाद के क्षेत्र में पर्यवेक्षण का तात्पर्य क्या है, इस विषय से भी छात्राओं को परिचित किया जाएगा।

इकाई 2 के अंतर्गत पाठों को पूरा करने के लिए निर्धारित समय – 1 अक्टूबर से 31 अक्टूबर तक।

इकाई 3

3.1 वैज्ञानिक तकनीकी शब्दावली का अनुवाद, मुहावरों/ लोकोक्तियों का अनुवाद, संक्षिप्ताक्षरों तथा कूटपदों का अनुवाद, आंचलिक शब्दावली का अनुवाद, व्यंजनापरक, लाक्षणिक पद प्रयोगों का अनुवाद

3.2 अनुवाद की सम्पादन प्रविधि

3.3 अनुवादक की अर्हता और सफ़ल अनुवाद के अभिलक्षण

इकाई 3 में वैज्ञानिक तकनीकी शब्दावली का अनुवाद किस प्रकार किया जाता है, इसका ज्ञान छात्राओं को दिया जाएगा। मुहावरों एवं लोकोक्तियों के शाब्दिक

अनुवाद से जुड़ीं समस्याएँ, संक्षिप्ताक्षरों एवं कूटपदों के अनुवाद की विधि, आंचलिक शब्दावली का अनुवाद, व्यंजनापरक, लाक्षणिक शब्दों आदि के अनुवाद को लेकर संभावनाओं एवं चुनौतियों के बारे में छात्राओं को अवगत कराया जाएगा। अनुवाद की सम्पादन प्रविधि, अनुवादक की अर्हता तथा एक सफ़ल और कुशल अनुवादक के गुणों आदि विषयों पर भी छात्राओं का ज्ञान बढ़ाया जाएगा। चूंकि यह विषय उनके लिए नया है, इसलिए कई तकनिकी शब्दावलियों को श्यामपट पर लिखकर उनके अर्थ बताए जाएँगे।

इकाई 3 के अंतर्गत पाठों को पूरा करने के लिए निर्धारित समय - 1 नवम्बर से 30 नवम्बर तक।

इकाई 4

4.1 विश्व भाषाओं की प्रमुख कृतियों के हिंदी अनुवाद एवं हिंदी की प्रमुख कृतियों के विश्व भाषाओं में किये गए अनुवाद

4.2 भारत में अनुवाद प्रशिक्षण के प्रमुख केंद्र, अनुवाद के राष्ट्रीय प्राधिकरण के गठन की आवश्यकता

4.3 हिंदी अनुवाद का भविष्य

इकाई 4 में छात्राओं को विश्व की अनेक भाषाओं में हिंदी की साहित्यिक कृतियों के किये गए अनुवादों तथा हिंदी भाषा में विश्व के विभिन्न देशों में बोली जाने

वाली भाषाओं की श्रेष्ठ अनूदित कृतियों के बारे में समझाया जाएगा, इस प्रकार विश्व भर की उम्दा साहित्यक कृतियों को सुपाठ्य बनाने में अनुवाद की क्या भूमिका है, इस पर उन्हें समझाया जाएगा। अनुवाद के क्षेत्र में छात्राओं की रुचि बढ़ाने एवं इस विषय को गंभीरता से लेने के उद्देश्य से उन्हें उन समस्त प्रमुख संस्थाओं के बारे में समझाया जाएगा, जो कुशल अनुवादक बनने के लिए प्रशिक्षण देती हैं, साथ ही भारत में अनुवाद के राष्ट्रीय प्राधिकरण गठित करना क्यों आवश्यक है, इस पर भी उन्हें समझाया जाएगा। इन सभी तत्वों के आधार पर हिंदी अनुवाद के भविष्य पर सोचने-विचारने के लिए छात्राओं को प्रेरित किया जाएगा।

इकाई 4 के अंतर्गत पाठों को पूरा करने के लिए निर्धारित समय - 1 दिसम्बर से 28 फरवरी तक।

प्रथम सत्र (सितम्बर -दिसम्बर) के बीच छात्राओं के ज्ञानवर्धन तथा पढ़ाए गए पाठों की आवृत्ति के लिए उन्हें गृह कार्य, असाइनमेंट तथा क्लास टेस्ट(10 अंकों पर) दिए जाएँगे, उनकी लघु-परीक्षा ली जाएगी और उनका आतंरिक मूल्यांकन 15 अंकों पर किया जाएगा ।

द्वितीय सत्र (फरवरी - मार्च) के बीच वार्षिक परीक्षा की दृष्टि से सभी विषयों की आवृत्ति तथा विगत परीक्षाओं के प्रश्न-पत्रों पर उन्हें कक्षा में लेखन - कार्य दिए जाएँगे।

पाठन - प्रविधि

निर्धारित पाठ्य पुस्तक के आधार पर लिखित एवं मौखिक पाठ्य-सामग्री प्रदान की जाएगी।

श्यामपट्ट/श्वेतपट्ट का प्रयोग करते हुए छात्राओं की सुविधा हेतु कठिन शब्दों को लिखा जाएगा।

प्राध्यापिका के अतिरिक्त किसी अन्य विशेषज्ञ के लेक्चर पाठ्य सामग्री या फिर विडिओ के रूप छात्राओं के साथ साझा किये जाएँगे।

इकाई 1 के अंतर्गत पाठों को पूरा करने के लिए निर्धारित समय - 31 अगस्त से 30 सितम्बर तक।

इकाई 2

2.1 मैथिलीशरण गुप्त तथा जयशंकर प्रसाद का व्यक्तित्व एवं कृतित्व : सामान्य परिचय

2.2 मैथिलीशरण गुप्त तथा जयशंकर प्रसाद की काव्यगत विशेषताएँ

2.3 मैथिलीशरण गुप्त : कविताएँ -

भारत भारती, मातृ भूमि, आशा, सन्देश

2.4 जयशंकर प्रसाद :कविताएँ -

ले चल वहाँ भुलावा देकर, बीती विभावरी जाग री , अरुण यह मधुमय देश हमारा, हृदय का सौंदर्य

इकाई 2 में द्विवेदी युग की सामान्य प्रवृत्तियाँ समझाते हुए मैथिलीशरण गुप्त की काव्यगत विशेषताएँ समझायी जाएँगी और भारत की स्वतंत्रता के लिए जो सांस्कृतिक पुनर्जागरण की भावना तत्कालीन नेताओं में थीं, वही राष्ट्रीय चेतना कवि की रचनाओं में किस प्रकार झलकती है, इस पर समझाया जाएगा। छायावादी

युग के कवि, जयशंकर प्रसाद भी परतंत्र भारत की जनता को सक्रिय करने और अपने देश की स्थिति में सुधार लाने के लिए किस प्रकार कविताओं के माध्यम से प्रेरित करते हैं, छात्राओं को यह समझाया जाएगा। कविताओं की सप्रसंग व्याख्या लिखने की विधि बताते हुए छात्राओं से अभ्यास कराया जाएगा।

इकाई 2 के अंतर्गत पाठों को पूरा करने के लिए निर्धारित समय – 1 अक्टूबर से 31 अक्टूबर तक।

इकाई ३

3.1 सूर्यकांत त्रिपाठी निराला तथा सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' का व्यक्तित्व एवं कृतित्व : सामान्य परिचय

3.2 सूर्यकांत त्रिपाठी निराला तथा सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' की काव्यगत विशेषताएँ

3.3 सूर्यकांत त्रिपाठी निराला : कविताएँ -

वर दे, वीणा वादिनी वर दे, तोड़ती पत्थर, स्नेह निर्झर बह गया, विधवा

3.4 सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' : कविताएँ -

उड़ चल, हारिल, कलगी बाजरे की, साँप, नया कवि : आत्म स्वीकार

इकाई 3 में छायावादी कवि सूर्यकांत त्रिपाठी निराला की कविताओं के पाठन के माध्यम से छात्राओं को कवि की बहुआयामी काव्य-प्रतिभा से परिचित कराया

जाएगा। निराला के व्यक्तित्व के अनुसार उनके कृतित्व के कथ्य में भी किस प्रकार परिवर्तन होता है, यह समझाया जाएगा। प्रयोगवादी कवि अज्ञेय की कविताओं को पढ़ाते हुए छात्राओं को कवि की प्रयोगवाद सम्बन्धी धारणा समझायी जाएगी।

इकाई 3 के अंतर्गत पाठों को पूरा करने के लिए निर्धारित समय - 1 नवम्बर से 30 नवम्बर तक।

इकाई 4

4.1 नागार्जुन तथा नरेश मेहता का व्यक्तित्व एवं कृतित्व : सामान्य परिचय

4.2 नागार्जुन तथा नरेश मेहता की काव्यगत विशेषताएँ

4.3 नागार्जुन : कविताएँ -

यह दन्तुरित मुस्कान, प्रेत का बयान

4.4 नरेश मेहता : कविताएँ -

तीर्थ जल, पीले फूल कनेर के, मेघ मैं

इकाई 4 में छात्राओं को प्रगतिवादी कवि नागार्जुन तथा नरेश मेहता के व्यक्तित्व एवं कृतित्व पर समझाते हुए उनकी प्रगतिवादी विचारधारा से अवगत कराया जाएगा। उनकी कविताओं में प्रकृति से लिए गए उपमानों के माध्यम से किस प्रकार व्यक्ति एवं समाज से जुड़े महत्ववपूर्ण मुद्दे व्यक्त हुए हैं, उसका ज्ञान दिया

जाएगा तथा आधुनिक कविता में कथ्य एवं शिल्प की दृष्टि से क्या नवीनता पायी जाती है, इस पर भी प्रकाश डाला जाएगा।

इकाई 4 के अंतर्गत पाठों को पूरा करने के लिए निर्धारित समय - 1 दिसम्बर से 28 फरवरी तक।

प्रथम सत्र (सितम्बर -दिसम्बर) के बीच छात्राओं के ज्ञानवर्धन तथा पढ़ाए गए पाठों की आवृत्ति के लिए उन्हें गृह कार्य, असाइनमेंट तथा क्लास टेस्ट(10 अंकों पर) दिए जाएँगे, उनकी लघु-परीक्षा ली जाएगी और उनका आतंरिक मूल्यांकन 15 अंकों पर किया जाएगा ।

द्वितीय सत्र (फरवरी - मार्च) के बीच वार्षिक परीक्षा की दृष्टि से सभी विषयों की आवृत्ति तथा विगत परीक्षाओं के प्रश्न-पत्रों पर उन्हें कक्षा में लेखन - कार्य दिए जाएँगे।

पाठन - प्रविधि

निर्धारित पाठ्य पुस्तक के आधार पर लिखित एवं मौखिक पाठ्य-सामग्री प्रदान की जाएगी।

श्यामपट्ट/श्वेतपट्ट का प्रयोग करते हुए छात्राओं की सुविधा हेतु कठिन शब्दों को लिखा जाएगा।

प्राध्यापिका के अतिरिक्त किसी अन्य विशेषज्ञ के लेक्चर पाठ्य सामग्री या फिर विडिओ के रूप छात्राओं के साथ साझा किये जाएँगे।

Department of History

HISTORY (PASS COURSE)

COURSE PLANS

BA I YEAR

2020-2021

LEARNING OBJECTIVES

- Appreciate the importance and relevance of studying history.
- Understand historical construction of India's ancient past.
- Know about various types of source materials used by ancient historians.
- Identify changing traditions of history writings.
- Recognize the Harappan cultures as the first known urban cultures of India.
- Examine the nature of Vedic society, religion and philosophy.
- Rise of renunciatory traditions and their social roots: Buddhism and Jainism
- Review significant socio- cultural developments during post Mauryan period
- Trace the early history of south India during this period
- Examine the general dynamism of cultural developments in ancient India
- Review significant socio- cultural pollical, religious developments during Gupta period
- Trace the history of south India towards early medieval India
- Examine the general dynamism of cultural developments in ancient India

LEARNING OUTCOME

- To earn a basic narrative of historical events in a specific region of the world in a specific time frame.
- To articulate factual & contextual knowledge of specific places & times, to make careful comparisons (across time, space & culture).

Dept. of History Course Plan

- The ability to use bibliographical tools for the advanced study of history.
- To understand & evaluate different historical ideas, various arguments and point of view.
- To develop an appreciation of themselves & of other through the study of the past in local, regional, national and global context.
- To instils an appreciation of the uniqueness of visual evidence and cultivate the skill of using visual evidence to understand human activity of the recent and distant past.

Name of Department: History
Faculty Name: Ms Punam Chauhan
Course Name: History of India from the Earliest Times up to 300 CE
Course Code: HIST (A)101
Course Type: DSC 1

UNIT- 1	No. of Lectures
Introduction to the subject and Syllabus	1
a. Sources and interpretation	6
b. Changing interpretation of early Indian History	2
c. Survey of Palaeolithic, Mesolithic and Neolithic cultures	6
UNIT – II	
a. Harappa Civilization: origin, extent urban features-town planning, economy, society and religion: decline, Chalcolithic culture	4
b. Vedic culture: polity, economy society and religion	4
c. Beginning of the iron age and Megalithics	1
UNIT-III	
a. Emergence of Mahajanapadas: *rajayas and ganas/sanghas*	3
b. Magadhan Expansion	1
c. Buddhism & Jainism: doctrine, spread	3
UNIT- IV	
a. The Mauryan Empire: state and administration, economy, Ashoka's Dhamma, art and architecture	8
b. Post Mauryan Age with special reference to Shunga, Saravanan's, Kushans; polity, economy society art	8
c. Sangam Age; polity, economy and society	3
Assignment: Rise of Jainism& Buddhism in India	
Minor Test: March 6,2021	

Dept. of History Course Plan

Teaching-Learning Activities
1. Class Presentations.
2. Assignments.
3. Role Play.
4. Field Visit.
5. Power Point Presentations.
6. Collaborative Teaching like Group Discussions.
7. Quiz.
8. Peer Teaching.
9. Special Lectures.
10. Inter Disciplinary Activities.
11. Screening of Movies.

Department of Home Science

COURSE PLAN

BANHE-A- 101: FUNDAMENTALS OF NUTRITION AND FOOD SCIENCE

Credit 4 (Theory) Credit 2 (Practical)	Total Lecture
	60
Name of the course	Discipline specific course
Lectures to be delivered	60

Course Objectives

The course will provide knowledge pertaining to the relationship between food, nutrition and health, nutrients, preparation of dishes. It will familiarize students with fundamentals of food, nutrients and their relationship to health. It will create awareness with respect to deriving maximum benefit from available food resources.

Learning Objectives

The student is expected to understand the relationship between food, nutrition, nutrients, their sources, learn about the various food group with respect to their nutritive value, properties, selection and various method of preparing food.

UNIT	TOPIC	No. of Lectures required	Learning Outcomes
UNIT 1	**BASIC CONCEPTS IN FOOD AND NUTRITION**	**5**	
	• Basic terms in food and nutrition • Understanding relationship between food, nutrition and health. • Functions of food – physiological, psychological and social.	A bridge class will be organised before starting of the course to familiarise the students with the various units to be covered. Basic terms like food, nutrition, nutrients etc. will be explained. They will refer to their text books and the exact definition of food and nutrition will be discussed. The various expects of food, nutrition and health will then by the teacher.	The questions of the students pertaining to food will be answers. They will be asked to refer to the books related to nutrition in the library. An assignment will be given to them pertaining to definitions, functions of food.

		The teacher will explain to the student the meaning and concept of balance diet, the factors effecting the persons health.	
UNIT II	**NUTRIENTS**	**20**	
	Function, dietary sources and clinical manifestations of deficiency/ excess of the following nutrients: • Carbohydrates, lipids and proteins • Fat soluble Vitamins – A, D, E, K • Water soluble Vitamins – Thiamine, riboflavin, niacin, pyridoxine, folate, Vitamin B12 and Vitiman C • Minerals : Calcium, Iron and Iodine	The students will be asked questions pertaining to their knowledge of various nutrients. The working of nutrients in the body will be discussed. The composition, functions, deficiencies, excess and RDA of each nutrient will be studied separately. The differentiation of Vitamins into fat and water soluble categories will be discussed. Important minerals will be enumerated in detail.	Quiz consisting of questions dealing with unit – II will be organised. An assignment on nutrients will be given to the students. Presentation will be presented by the students.
UNIT III	**FOOD GROUPS**	**25**	
	Selection, nutritional contribution and changes during cooking of the food groups : • Cereals • Pulses • Fruits and vegetables • Eggs • Meat, poultry and fish • Fats and oils	The students will be asked to name all food groups. The rich sources of all the nutrients will be discussed. How to select the food groups. The effect of different methods of cooking will be discussed.	The students will be asked to follow the guidelines while selecting/purchasing the food items.
UNIT IV	**METHODS OF COOKING AND**	**10**	

	PREVENTING NUTRIENT LOSSES		
	• Dry, moist, frying and microwave cooking • Advantages, disadvantages and the effect of various methods of cooking on nutrients • Minimizing nutrient losses	The students will be asked questions regarding the use of various methods of cooking in their homes. They will be asked about the best method of cooking. Different methods of cooking will be discussed in class. The loss of nutrients due to faulty methods of cooking will be elaborated upon. The methods to be used to minimize the loss of nutrients will be discussed.	The students will be asked to go through the recipe books in library and note down five recipes pertaining to different methods of cooking. Minimize the nutrient losses while cooking at home.

BANHE-A-101(P): FUNDAMENTALS OF NUTRITION AND FOOD SCIENCE

PRACTICAL

S.No.	TOPIC
1.	Weights and measures, preparing market order and table setting
2.	Food preparation, understanding the principles involved, nutritional quality and portion size
3.	Recipe writing and cooking of the following: • Beverages: Hot tea/coffee, Milk shake/lassi, fruit-based beverages • Cereals: Boiled rice, pilao, chapatti, parantha, puri, pastas • Pulses: Whole, dehusked • Vegetables: curries, dry preparations • Milk and milk products: Kheer, custard • Egg preparations: Bolled, poached, fried, scrambled, omelette • Soups: Broth, plain and cream soups • Baked products: Plain cake, Marble cake, Sponge cake • Snacks: pakoras, cutlets, upma, poha, sandwiches • Salads: salads and salad dressings

Department of Mathematics

Department of Mathematics
Course Plan B.Sc. II year
Real Analysis (MATH201TH)

1	Motivation (Previous Knowledge testing)	1. What are Real Numbers? 2. Differentiate between Complex numbers and Real numbers? 3. What is Limit? 4. How many Indeterminate form are their? 5. Name them? 6. What is sequence? 7. Differentiate between sequence and series?
2	Learning objective	To make student understand theory of sequences and series. Real line, bounded sets. Familiarize the concept of Cluster points, Leibnitz's test, M test, p- test etc
3	Content	**Unit-I:** (15 Lectures) Real line, bounded sets, suprema and infima, completeness property of R, Archimedean property of R, intervals. Concept of cluster points and statement of Bolzano-Weierstrass theorem. **Unit-II:** (15 Lectures) Real Sequence, Bounded sequence, Cauchy convergence criterion for sequences. Cauchy's theorem on limits, order preservation and squeeze theorem, monotone sequences and their convergence (monotone convergence theorem without proof). **Unit-III:** (15 Lectures) Infinite series. Cauchy convergence criterion for series, positive term series, geometric series, comparison test, convergence of p-series, Root test, Ratio test, alternating series, Leibnitz's test (Tests of Convergence without proof). Definition and examples of absolute and conditional convergence. **Unit-IV:** (10 Lectures) Sequences and series of functions, Pointwise and uniform convergence. Mn-test, M-test, Results about uniform convergence, Power series and radius of convergence.
4	Methodology	Class Lecture Discussion

Dept. of Mathematics Course Plan

5	Teaching Learning Activities	Chalk/ Pen and Talk
6	References	1. T. M. Apostol, Calculus (Vol. I), John Wiley and Sons (Asia) P. Ltd., 2002. 2. R.G. Bartle and D. R Sherbert, Introduction to Real Analysis, John Wiley and Sons (Asia) P. Ltd., 2000. 3. E. Fischer, Intermediate Real Analysis, Springer Verlag, 1983. 4. K.A. Ross, Elementary Analysis- The Theory of Calculus Series- Undergraduate Texts in Mathematics, Springer Verlag, 2003.

Department of Microbiology

GE-2
COURSE: BIOTECH1GE02TH
CELL BIOLOGY (THEORY)

Year end examination: 50 marks
Practical examination: 20 marks
Internal Assessment: 30 marks

Note: The Examiner will set a total of nine (9) questions covering all topics/ units of the prescribed course by setting at least two questions from each unit. Out of the nine questions, one question containing ten (10) short-answer type questions that will cover entire course will be compulsory. The candidate will attempt a total of five questions (one from each unit) including the compulsory question. All questions will carry equal marks.

Unit 1 Structure and organization of Cell **(20 Periods)**

Cell Organization – Eukaryotic (Plant and animal cells) and prokaryotic Plasma membrane: Structure and transport of small molecules
Cell Wall: Eukaryotic cell wall, Extra cellular matrix and cell matrix interactions, Cell-Cell Interactions - adhesion junctions, tight junctions, gap junctions, and plasmodesmata (only structural aspects)
Mitochondria, chloroplasts and peroxisomes
Cytoskeleton: Structure and organization of actin filaments, association of actin filaments with plasma membrane, cell surface protrusions, intermediate filaments, microtubules
Nucleus :Nuclear envelope, nuclear pore complex and nuclear lamina Chromatin – Molecular organization Nucleolus

Unit 2 Protein Sorting and Transport **(15 Periods)**

Ribosomes, Endoplasmic Reticulum – Structure, targeting and insertion of proteins in the ER, protein folding, processing and quality control in ER, smooth ER and lipid synthesis, export of proteins and lipids
Golgi Apparatus – Organization, protein glycosylation, protein sorting and export from Golgi Apparatus
Lysosomes

Unit 3 Cell Signalling **(10 Periods)**

Signalling molecules and their receptors Function of cell surface receptors
Pathways of intra-cellular receptors – Cyclic AMP pathway, cyclic GMP and MAP kinase pathway

Unit 4 Cell Cycle, Cell Death and Cell Renewal **(15 Periods)**

Eukaryotic cell cycle and its regulation, Mitosis and Meiosis
Development of cancer, causes and types
Programmed cell death
Stem cells
Embryonic stem cell, induced pleuripotent stem cells

COURSE: BIOTECH1GE02PR CELL BIOLOGY

(PRACTICAL)

Practicals

1. Study a representative plant and animal cell bymicroscopy.
2. Study of the structure of cell organelles through electronmicrographs
3. Cytochemical staining of DNA – Feulgen
4. Demonstration of the presence of mitochondria in striated muscle cells/ cheek epithelial cell using vital stain Janus Green B
5. Study of polyploidy in Onion root tip by colchicine treatment.
6. Identification and study of cancer cells byphotomicrographs.
7. Study of different stages ofMitosis.
8. Study of different stages ofMeiosis.

Suggested Readings

1. Hardin J, Bertoni G and Kleinsmith LJ. (2010). Becker's World of the Cell. 8th edition. Pearson.
2. Karp G. (2010) Cell and Molecular Biology: Concepts and Experiments. 6th edition. John Wiley & Sons. Inc.
3. De Robertis, EDP and De Robertis EMF. (2006). Cell and Molecular Biology. 8th edition. Lipincott Williams and Wilkins, Philadelphia.
4. Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. 5th Edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.

Course Plan

Unit 1: Structure and organization of Cell

Cell Organization – Eukaryotic (Plant and animal cells) and prokaryotic Plasma membrane: Structure and transport of small molecules

Cell Wall: Eukaryotic cell wall, Extra cellular matrix and cell matrix interactions, Cell-Cell Interactions - adhesion junctions, tight junctions, gap junctions, and plasmodesmata (only structural aspects)

Mitochondria, chloroplasts and peroxisomes

Cytoskeleton: Strcture and organization of actin filaments, association of actin filaments with plasma membrane, cell surface protrusions, intermediate filaments, microtubules

Nucleus :Nuclear envelope, nuclear pore complex and nuclear lamina Chromatin – Molecular organization Nucleolus

Contents	No of Lectures Required	Lesson Outcome
Cell Organization – Eukaryotic (Plant and animal cells) and prokaryotic	2	Students will learn about the different types of cells such as eukaryotic, prokaryotic, plant cells and animal cells, their organization and function
Plasma membrane: Structure and transport of small molecules	4	Students are given an understanding of the bilayer structure of the cell membrane, the fluid mosaic model and the various other models proposed to describe the structure of the cell membrane. An illustration of the range of transport mechanisms through the cells, cell permeability as well their importance.is given to the students.
Cell wall, extracellular matrix, cell cell interaction and cell adhesion	4	The detailed structure of the different types of cell walls and their role in cell protection will be taught to the students. An insight into an intricate network composed of an array of multidomain macromolecules organized in a cell/tissue-specific manner that compose the extracellular matrix, as well as the various molecules involved in cell adhesion and cell-cell interaction is given to the students.
Mitochondria	2	Students are taught about the detailed structure and the functions of mitochondria, its biogenesis, energy generation from F_0-F_1 particles
Chloroplast and Peroxisomes	2	Students are taught about the detailed structure and the

		functions of chloroplast and peroxisomes, role in energy generation and biogenesis.
Cytoskeleton: Structure and organization of actin filaments, association of actin filaments with plasma membrane, cell surface protrusions, intermediate filaments, microtubules	3	Students are taught about the complex interlinking form of the proteins i.e. the cytoskeleton that provides mechanical support and shape to the cell to carry out essential functions like movement and division.
Nucleus :Nuclear envelope, nuclear pore complex and nuclear lamina Chromatin – Molecular organization Nucleolus	3	Students are taught about the detailed structure and the functions of nucleus, nucleolus and chromosomes.

Unit 2 Protein Sorting and Transport

Ribosomes, Endoplasmic Reticulum – Structure, targeting and insertion of proteins in the ER, protein folding, processing and quality control in ER, smooth ER and lipid synthesis, export of proteins and lipids

Golgi Apparatus – Organization, protein glycosylation, protein sorting and export from Golgi Apparatus Lysosomes

Contents	No of Lectures required	Lesson Outcome
Ribosomes	4	Students are taught about the detailed structure and the functions of ribosomes specifically its role in protein synthesis
Structure and Functions of Endoplasmic Reticulum	4	Students will be educated about the in-depth structure of the endoplasmic reticulum, its types as well as the various functions performed by the endoplasmic reticulum required for the normal functioning of the cell.
Export of proteins and lipids from ER	2	Students will be taught the detailed mechanism of modification and transport of proteins and lipids from the ER.
Golgi Apparatus – Organization, protein glycosylation, protein sorting and export from Golgi Apparatus Lysosomes	5	Students will be educated about the in-depth structure of the Golgi apparatus as well as the various functions performed by the Golgi apparatus required for the normal functioning of the cell including protein secretion.

Unit 3 Cell Signalling

Signalling molecules and their receptors Function of cell surface receptors

Pathways of intra-cellular receptors – Cyclic AMP pathway, cyclic GMP and MAP kinase pathway

Contents	No of lecture required	Lesson Outcome
Types of signaling molecules and receptors	2	Students are educated about the various types of cell signaling molecules and the receptors involved.
Cell surface receptors and signaling pathways	4	The mechanism of action of cell surface receptors and their functions in cell signaling are described to the students. Various signaling pathways such as MAP kinase, cyclic AMP, cyclic GMP and GPCRs are taught to the students.
Intra-cellular receptors and signaling pathways	4	Students will get an understanding of the various intra-cellular signaling receptors and signaling pathways.

Unit 4 Cell Cycle, Cell Death and Cell Renewal

Eukaryotic cell cycle and its regulation, Mitosis and Meiosis Development of cancer, causes and types.

Programmed cell death Stem cells Embryonic stem cell, induced pleuripotent stem cells

Contents	No of lecture required	Lesson Outcome
Cell cycle and its regulation	5	An in-depth mechanism-based understanding of the cell division cycles mitosis and meiosis and their regulatory mechanisms is given to the students.
Cancer	4	Students are educated about what is cancer, its types, causes, agents involved and the molecular basis of cancer such as oncogenes and proto-oncogenes
Programmed cell death	3	Students will learn about the mechanism of programmed cell death i.e. apoptosis and the various components involved
Stem cells Embryonic stem cell, induced pleuripotent stem cells	3	An illustration of the stem cells, their types and mechanism of their differentiation into different cell types is given to the students,

Teaching Learning Activities
Teaching and learning will be made more effective through activities like • Power Point Presentations • Group Discussions • Smart Boards • Debates • Quiz Competitions • Poster Making • Paper Presentations • Class Tests

Department of Music

COURSE PLAN (2021-22)

HINDUSTANI MUSIC: VOCAL AND INSTRUMENTAL CODE: MUSA 101 TH

SECTION-III (Basic Principles of Indian music and biographies of musicians, composers and musicologists)

1.	MOTIVATION: P.K. TESTING:		1.What do you understand by raag? 2.Can anyone tell me what is literal meaning of taal? 3.What are different types of raag? 4. How many taals are there in music?
2.	LEARNING OBJECTIVE:		The main objective behind imparting the knowledge of music to students is to promote highest levels of human aspirations and to develop analytical, creative and intuitive understanding for cultural and aesthetic experiences through active participation. Another objective is to provide guidance to students to prepare them for life skills through mentorship, internships, and training as educators.
3.	CONCEPTS/COURSE OBJECTIVES:		In this section students get a good deal of understanding about raag, its types and taal with its type to give them a deep understanding about the basics of Indian music.
4.	CONTENTS:		Study of prescribed Raagas and Taalas. Raaga- Alhaiya Bilawal, Kafi, Bhairav Taal- Teental, Dadra
5.	METHODOLOGY:		1. Explanation 2. Question probing Skill
6.	TEACHING LLEARNING ACTIVITIES:		Black board, chart, chalks, musical instruments.
7.	EVALUATION:		Students are monitored and evaluated by the teacher on the basis of their quality knowledge they gained by learning the concepts. Evaluation being the most important tool in making teaching learning process effective, aids student's learning process with respect to the fulfilment of

Dept. of Music Course Plan

			the teaching learning objectives. It increases the magnitude of teaching learning process by organising, coordinating, planning and teaching as well as evaluating them. One of the methods is to give them regular tests, minor tests and assignments.
8.	SUMMARY:		An overview of the concepts is taken from the students separately. They summarized the topics by sequencing and categorizing the information. They impart knowledge regarding the topic in the class by group discussion and draw appropriate inferences. They can also create a visual representation of the topics so as to get a quality knowledge of the content.
9.	REFRENCES:		Swar Bharti Dr. Gian Chand, Sangeet prabodhika, -Dr. P.N. Bansal, Dr. Gian Chand, Bhatkahnde Sangeet Shastra- V.N. Bhatkahnde, Sangeet Parvah- Dr. Gian Cand, Dr. Dev Raj Sharma, Rag Vigyan- Dr. P.N. Parvardhan, Hamare Sangeet Ratna- Laxmi Narayan Garg,
10.	ASSIGNMENTS:		Assignment on- 1. Biographies of Pt. Vishnu Narayan Bhatkhande

Department of Political Science

CLASS – B.A I

PAPER I DSC – Introduction to Political Theory

S. No.	DATE	TOPICS TO BE COVERED	No. of Lectures	ACADEMIC ACTIVITY
1.	26th Aug -30th Aug 2020	1.Discussion of the syllabus 2. Suggested Readings 3. Pattern of the Exam 4. Pattern of Internal Assessment	2	• Bridge Classes • Orientation of departmental students • Explaining about E-content (college library), Departmental Library
2.	1st Sep-30th Sep,2020	UNIT –I 1.What is Politics? 2.Evoution of Political Science as a subject. 3. Approaches to study Political science. 4.What is Political Theory and its relevance?	1 2 3 3	• Group Discussion on Politics • Power Point Presentations • Assignments
3.	1st Oct-30th Oct. 2020	UNIT –II 1.What is State? 2. Elements & meaning of state. 3.Various Theories on origin of state 4.Civil Society ,its meaning and relevance 5. Relationship between civil society and state	2 1 3 3 2	• Tutorials • Quiz • Class Test • Explaining Glorious revolution • PPT-Civil war
4.	1st Nov.-30th Nov. 2020	6.Theoretical Concepts – Liberty Equality Justice	2 2 2	• Lecture • Assignments • Paper Presenatation

Dept. of Political Science Course Plan

		UNIT-III 1. What is Democracy ? 2.Debates on Democracy & economic growth. 3.Tenets of democrarcy. 4.Types of Dempocracy.	 1 3 2 3	• Discussion on previous year papers • Lecture Method
5.	3rd Dec.-31st Dec. 2020	1.Liberalistic & socialist Perspective. 2.Differnce between liberalism and socialism. 3. Why socialism? Relevance of Socialism.	3 3 3	• Class tests • MCQ's • Tutorials • Class discussion
6.	9th Feb,-16th march 2021	UNIT-IV 1.Protective Discrimination 2.What is Principle of Fairness?Principles. 3.Rawlsian theory of Justice	 2 3 2	• Presenataions • Class Discussion • Tutorial • Quiz • Minor Tests
7.	17th march-7 April,2021	4.Institution of Family and State Intervention . Revision 1.Revision of the syllabus	4 4	• Paper Presentation • PPT • Lecture mode • Class Test
Total			**60**	

CLASS – B.A I

PAPER DSC-1B POLS102 – Indian Goverment and Politics

S. No.	DATE	TOPICS TO BE COVERED	No. of Lectures	ACADEMIC ACTIVITY
1	27th Aug - 30th Aug 2020	1.Discussion of the syllabus 2. Suggested Readings 3. Pattern of the Exam 4. Pattern of Internal Assessment 5 Relevance of the subject	2	• Bridge Classes • Orientation of departmental students Explaining about E-content ,Inflibnet (college library), Departmental Library
2	3rdSep-9th Oct.2020	UNIT –I 1.Nature Of Indian State. 2.Historical background of	2	• Discussion on Indian as a Nation

		making of Indian State 3.Approaches ton study Indian politics-Marxist Theory, Liberal State. 4. Difference between Liberal & Marxist Theory	3 3 3	State • Lecture Method • Power Point Presentations
3	5th Oct-30th Oct. 2020	1.Gandhian Approach,it's relevance 2.Local Self Government,Urban and rural. UNIT- II 1.Indian Preamble, its, features and relevance 2.Indian Constitution and it's making. 3.Fundamental Rights-Features,Scope,Limitations	2 3 3 2 2	• Class discussion • Objective Questions • Lecture method • MCQ's • Tutorials
4	1st Nov.-7th Dec. 2020	4.Fundamental Duties-Need and relevance 5.Difference between Fundamental Rights and Fundamental Duties 6.Directive Principles 7.Parliament,Indian ,Office of Prime Minister.	3 3 2 2	• LectureMethod • Assignments • Paper Presenatations • Discussion on previous year papers
5	3rd Dec.-31st Dec. 2020	8.Judicial set up Of India. 9.Hierarchy of the Courts in India and their Features. 10.Nature of appointment of the judges,Power Structure of India.	2 3 3	• LectureMethod • Power Point Presentation • Class Test
7	9th Feb.-1st March 2021	UNIT-III 1.Concept of Secular State, Role of religion in Politics. 2.Party and party systen in India. 3.Differencce between National and State Parties. UNIT-IV 1.What are Social Movements? Workers Movements,peasants' Movements,Women's Movements.	3 2 3 4	• Lecture Method • Power Point Presentation • Paper Presentation

8	10th March,2021-27 th March,2021	2.Economic system Of Indian. 3.Economic Reforms after 1990's-Liberalization, Privatization and Globalization.	2 3	• Lecture Method • Power point presentation • Class discussion • Question paper discussion
Total			60	

B.A. II

DSC-1C –POLS 201-Comparative Government and Politics

S. No.	DATE	TOPICS TO BE COVERED	No. of Lectures	ACADEMIC ACTIVITY
1	14th Aug-29th August,2020	1.Brief Discussion of the syllabus 2. Suggested Readings 3. Pattern of the Exam 4. Pattern of Internal Assessment 5. Origin of Comparative Politics as a separate discipline	5	• Bridge Classes • Orientation of departmental students • Discussion on Scope of the subject
2	1ST Sep-30th Sep,2020	UNIT-I 1.Nature of Comparative Politics and Government. 2.Difference between Comparative Govt. and Comparartive Politics 3.Methods and approaches to study the subject. 4.Relevance of the Comparative government and Politics	3 2 3 2	• Lecture Method • Power Point Presentation • Paper Presentation • Class Discussion
3	3rd Oct.-30th Oct.2020	UNIT-II 1.Different types of regimes in the World. 2.Authoritarian Regime and their presence in the world. 3.Democratic regimes- what is Democracy? Forms-Direct, Indirect	2 3 3 2	• LectureMethod • Class Discussion • Class Quiz • Power Point Presentation by students

4	3rd Nov-28th Nov2020	UNIT-II 1.Classification of Political systems- Parliamentary form of Govt- Features,U.k and Constitutional Monarchy. 2. Presidential form of Govt.- U.S.A ad it's Congress	2 3	• Lecture Method • Power Point Presentation • Paper Presentation • Class Test
5	1st Dec.-30th Dec,2020	4.What is Federalism?Features of Federal form of Government. 5.Unitary form of Government –Features and scope 6.Difference between Federal and Unitary form of Government	3 3 4	• Paper Presentation by students • Lecture method • Group Discussion • Assignments
6	10th Feb-1st March,2021	UNIT-III 1.What is electoral system? 2.First Past the Post System.- Features, significance. 3.Limitations of First past the Post System 4.What is Proportioanl Representation? 5.Significance of Proportional Representation and Limitations.	1 3 2 2 4	• Lecture Method • Class Discussion • Power Point Presentation • Class test
7	10th March - 8th April2021	UNIT –IV 1.Party system in world. 2.Forms of Party system- One Party,Two Party and Multi-Party system. 3.What is welfare State. 4. Need od welfare State	 3 4 2 2	• Group Dsiscussion on Party System. • Lecture Method • Paper Presentation
	TOTAL		60	

Department of Physics

Course Plan (2021-22)

Physics

B.Sc. I

MECHANICS

Name of the Course: PHYSICS-DSC 1A

MECHANICS (Credits: Theory-04)

Code PHYS101TH

Unit-I

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients.

After completing this topic "Students will be able to

- write down the required ordinary differential equation, and correctly calculate the answer
- identify the type of differential equation (homogeneous, linear vs. nonlinear, constant vs. variable coefficients, 1st, 2nd, or higher order, etc) and choose the correct method to solve that type of ODE.
- use initial conditions as part of their solutions to ODEs.

Coordinate systems and motion of a particle: Volume, velocity and acceleration in Cartesian and Spherical co-ordinate systems, Solid angle.

After completing this topic "Students will be able to

- explain the physical meaning of position, velocity, and acceleration and describe how they are related to each other.
- write position velocity and acceleration in cartesian, plane polar and spherical polar coordinates
- solve problems in plane polar and spherical coordinates.
- take time derivatives of unit vectors

Dept. of Physics Course Plan

Space Time Symmetry and Conservation Laws: Relationship of conservation laws and symmetries of space and time.

After completing this topic "Students will be able to

- state properties of space and time
- understand that the homogeneity of free space leads to law of conservation of linear momentum
- understand that the isotropy of free space leads to law of conservation of angular momentum
- understand that the homogeneity of time leads to law of conservation of energy
- explain both conceptually and mathematically how force (F) and potential (U) are related and when this relation is applicable.

Frames of Reference: Inertial frames of reference, Galilean transformation and Galilean invariance. Non-inertial frames, Coriolis force and its applications; Foucault's pendulum.

After completing this topic "Students will be able to

- Learn the concept of frames of reference in physics and differentiate between inertial and non-inertial frames of references
- understand concept of absolute space and time.
- understand Galilean transformations and principle of relativity.
- check invariance of different laws of physics under Galilean transformations.
- understand what is the Coriolis force
- understand how does the Coriolis force affect the direction of motion in the northern hemisphere and in the southern hemisphere
- understand how does the Coriolis force influence the direction of trade winds on Earth
- compare simple pendulum with Foucault's pendulum in terms of gravity and momentum
- Interpret the motion of Foucault's pendulum in terms of Earth's rotation
- Describe and calculate the period of Foucault's pendulum based on the latitude of its location

Unit-II

Gravitation and Inverse Square Force Law:

Newton's Law of Gravitation, Various forces in nature (qualitative). Central and non-central forces, Inverse square force, Centre of mass. Equivalent one body problem. Reduced mass, angular momentum in central force field. Equation of motion under a force law. Equation of orbit and turning points. relationship between eccentricity and energy, Kepler's laws., Basic idea of global positioning system (GPS).

After completing this topic "Students will be able to

- understand that all objects, irrespective of their masses, experience the same acceleration g when falling freely under the influence of gravity at the same point on the Earth.
- understand that if gravity is the only force acting on an object, the sum of kinetic energy and gravitational energy is constant
- identify and describe each of Kepler's three laws of planetary motion.
- describe the fundamental theory and concepts of the Global Positioning System

Unit-III

Rotational Motion and Kinematics of Elastic and Inelastic Collisions: Angular velocity, angular momentum, Torque, Conservation of angular momentum, Elastic and inelastic collisions, coefficient of restitution, Elastic collisions in laboratory and C.M. systems, Velocities, angle and energies in elastic collisions in C.M. and lab. Systems, Classical Scattering: Cross- section for elastic scattering, Rutherford scattering (with derivation).

After completing this topic "Students will be able to

- describe the essential features of elastic and inelastic collisions, and give examples of each
- use the law of conservation of momentum, and (when appropriate) the law of conservation of kinetic energy, to solve a variety of simple collision problems.
- Differentiate between Laboratory and C.M frames
- Understand Rutherford Scattering

Unit-IV

Special Theory of Relativity: Concept of stationary universal frame of reference and search for ether. Michelson- Morley experiment, postulates of special theory of relativity. Lorentz transformations. Observer in relativity. Relativity of simultaneity.

Effects of Relativity: Length contraction. Time dilation. Relativistic addition of velocities. Relativistic Doppler effect. Variation of mass with velocity and mass energy equivalence. Increase of mass in an inelastic collision, Relativistic momentum and energies. Transformation of momentum, energy. Minkowsky space.

After completing this topic "Students will be able to

- understand the concept of special relativity and its applications to Physical Sciences
- establish the non-existence of the hypothesised stationary aether through the null result of Michelson-Morley experiments with interferometer.
- derive & understand Lorentz Transformation equations.
- understand the concept of constant relative motion of different bodies in different frames of references
- use the Lorentz Transformation equation to:
  - describe events and how it will be reported by different observers in different frames of references
  - determine proper time and dilated time
  - determine proper length and contracted length
  - prove the invariability of physical laws

These LO will be verified by regular class tests, weekly assignments, group projects, Quizzes and minor test.

Department of Psychology

DEPARTMENT OF PSYCHIOLOGY

COURSE PLAN

(DSE-1A) EXPERIMENTAL PSYCHOLOGY (BAPSYCA309TH/PR)

UNIT: I (09 Periods)

Types of Sensation: Structure and function of Visual and auditory Sensation.

CONTENTS	LECTURES REQUIRED	LEARNING OUTCOMES
Introduction to experimental psychology.	2	In this topic a brief introduction will be given to students about experimental psychology.
Sensation and types of sensation.	3	In this topic students will study about the concept of sensation, basic principles of sensory systems and types of sensations
Structure and function of visual sensation	2	Students will learn about the different parts of the eye and their functions with the help of a diagram.
Structure and function of auditory sensation	2	Structure and function of the ear will be discussed in the class with the help of a diagram

UNIT: II (09 Periods)

Perceptual Processes: Perceptual organization: Gestalt Theory, Laws, Concept of Figure and Ground.

CONTENTS	LECTURES REQUIRED	LEARNING OUTCOMES
The concept of perception.	2	Students will be introduced about the concept, nature and principles and of perception with the help of examples and diagrams.
Perceptual processes	2	In this topic students will learn about the different types of perceptual processes.
Gestalt theory and the concept of figure and ground	2	In this topic, students will be introduced to the school of gestalt psychology and the main proponents of gestalt theory.
Perceptual organization	3	Students will learn about different principles of perceptual organization with the help of diagrams.

UNIT: III (08 Periods)

Depth Perception, Monocular and Binocular Cues.

CONTENTS	LECTURES REQUIRED	LEARNING OUTCOMES
The concept of depth perception.	2	Students will learn about depth perception, 2D and 3D images will the help of diagrams.
Monocular and binocular cues	2	In this topic students will study about different monocular and binocular cues of depth perception with the help of diagrams and examples.
Perception of movement	2	Students will be given a detailed information about various concepts of movement perception.
The concept and theories of illusion	2	Students will be made aware about various types of illusions and their explanations will be given with the help of theories.

UNIT: IV (07 Periods)

Nature and types Attention. Factors affecting attention.

CONTENTS	LECTURES REQUIRED	LEARNING OUTCOMES
The concept of attention	2	Students will learn about the concept and nature of attention.
Types of attention	2	The different types of attention will be discussed with the students
Factors affecting attention	3	External and internal factors affecting attention will be discussed with students in detail.

Teaching/Learning Activities	• Blackboard • Practicals • Demonstrations • Discussions • Brainstorming questions • Presentations • Class tests

(DSC-1) INTRODUCTION TO PSYCHOLOGY (BAPSYCHA101TH/PR)

UNIT: I (10 Periods)

Introduction: What is psychology? Perspectives on behavior; Methods of psychology (special emphasis on experimentation); subfields of psychology; Psychology in modern India.

CONTENTS	LECTURES REQUIRED	LEARNING OUTCOMES
What is psychology?	2	The concept of psychology and various schools of psychology will be discussed with the students in detail.
Perspective on behaviour	2	The concept of behaviorism and its main proponents will be taught to the students.
Methods of psychology	2	Students will learn about the various research methods of psychology and special emphasis will be paid on experimental method.
Subfields of psychology	2	Students will be made aware about various fields of psychology and their relevance.
Psychology in modern India	2	Students will study about when and where psychology was first introduced in India and the advances in psychology.

UNIT: II (15 Periods)

Perception: Perceptual processing, Role of attention in perception, Perceptual organization, Perceptual sets, Perceptual constancies, depth perception, distance and movement; Illusions.

CONTENTS	LECTURES REQUIRED	LEARNING OUTCOMES
The concept of perception.	2	Students will be introduced about the concept and nature of perception.
Perceptual constancy and perceptual processing	2	Students will learn about various types of perceptual constancies and perceptual processing.
Role of attention	2	The role of attention in perception and nature of attention will be taught to the students.
Perceptual organization	2	Different types of gestalt principles of organization will be discussed with the students.
Depth perception	3	The concept of depth perception along with the cues of depth perception will be taught to the students.
Distance and movement	2	Students will be given a detailed information about various concepts of movement perception.
Illusions	2	Students will be made aware about various types and theories of illusions.

UNIT: III (10 Periods)

Learning: Principles and applications of Classical conditioning, operant conditioning, and observational learning; Learning strategies.

CONTENTS	LECTURES REQUIRED	LEARNING OUTCOMES
The concept of learning	2	Students will be introduced about the concept and nature of learning.
Classical and operant conditioning	4	Students will learn about principles and applications of classical and operant conditioning in detail with the help of examples and diagrams.
Observational learning	2	The concept and elements of observational learning will be taught to the students.
Learning strategies	2	Students will be informed about various learning strategies and their uses.

UNIT: IV (11 Periods)

Memory: Models of memory: Levels of processing, Parallel Distributed Processing model, and Information processing, Forgetting, Improving memory. Emotions: Components and theories.

CONTENTS	LECTURES REQUIRED	LEARNING OUTCOMES
The concept memory	2	Students will be introduced about the concept and processes of memory.
Models of memory	3	Students will learn about various models of memory with the help of examples and flow charts.
Forgetting and improving memory	3	Students will be taught about the concept, types and theories of forgetting. They will also learn about various strategies for improving memory.
Emotions	3	The concept, components and various theories of emotions will be discussed in detail with the students.

Teaching/Learning Activities	• Flow charts • Quiz • Presentations • Practicals • Brainstorming questions • Assignments

Department of Physical Education

Department of Physical Education
PED 101 TH
Course Plan: Introduction to Physical Education

Unit	Topic	No of Hour's
Unit I	Introduction 1. Meaning, Definition, Need and Scope of Physical Education. 2. Aim and Objectives of Physical Education. 3. Importance of Physical Education in present era. 4. Misconceptions about Physical Education. 5. Relationship of Physical Education with General Education. 6. Physical Education as an Art and Science.	**16 hrs**
Unit II	1. Historical Development of Physical Education in India {Pre-Independence-(Ancient India, Medieval and British Period)}. 2. Physical Education in India (Post-Independence). 3. Contribution of Akhadas, Vyayamshalas and Y.M.C.A. 4. Modern Perspectives: National Awards/State Awards and Honours, Arjuna Award, Rajiv Gandhi Khel Ratna Award, Dronacharya Award, M.A.K.A. Trophy and Parshu Ram Award. 5. Eminent Sports Personalities of different games.	**16 hrs**
Unit III	**Biological Basis of Physical Education** 1. Growth and Development, Differences	**16 hrs**

Dept. of Physical Education Course Plan

	between growth and development, Factors affecting growth and development. 2. Anatomical and Physiological Differences between Male and Female. 3. Effects of Heredity and Environment on Growth and Development.	
Unit IV	Emerging Trends in Physical Education 1. Career Opportunities/Avenues in Physical Education and Sports: a. As a Physical Education teacher. 10 b. Coach / trainee. c. Gym instructor. d. Physiotherapist. e. Psychologist. f. Dietitian. g. Sports administrator/manager h. Rehabilitator 2. Adventurous Sports 3. Water Sports 4. Fast growing professions and emerging trends in physical education and sports.	**16 hrs**
Books	**References:** 1. Barrow, Harold M., "Man and Movement: Principles of Physical Education", Lea and Febiger, Philladelphia, 1983. 2. Bucher, Charles A. &Wuest, Deborah A., "Foundations of Physical Education and Sports", 11th Edition, The CV Mosby Co., St. Louis, 1991.	

	3. Krishna Murthy V. &Paramesara Ram, N., "Educational Dimensions of Physical Education", 2nd Revised edition, Print India, New Delhi, 1990	

Teaching Learning Activities:

- Teacher-student interaction
- Student-student interaction
- Problem based learning
- The use of audio, video visuals
- Planning, Management and Organization
- Lecture Method
- Class-Test
- Practical and Assignments
- Demonstrations and exercises
- Debate and competitions
- Individual student activities
- Student pair activities
- Student group activities
- Interactive game activities
- Presentations

Department of Zoology

COURSE PLAN (2024-2025)
St. Bede's College Shimla
Zoology Pass Course
B.Sc. III Year

Course No.	**ZOOL 301 TH**
Course title:	**Applied Zoology**
Nature of Course:	**DSE IA**
Number of credits:	**4**

LEARNING OBJECTIVES OF ZOOLOGY	1. The objective of teaching Zoology is to create general awareness among them about the biodiversity and its impact on society. At the same time, it is expected that the students, on reading this course, shall develop attitude toward science (e.g., interest in animals, attitude toward new discoveries) and scientific attitude (i.e., open-minded, honesty, or skepticism). 2. To enable the student to develop scientific attitude where student shall have a desire to know and understand, questioning to all various statements, search for data and their meaning, search for verification, and consideration of consequences. 3. To develop in the students positive attitude towards Zoology showing increased attention to classroom instruction and participation more in science activities 4. The objective of studying Non Chordates in Zoology allows students to see science as a way of dealing with problems faced regarding conservation of animals and students become more curious about the material world and use different scientific methods to conserve animals. 5. It is with this aim in mind that all students attains scientific literacy. 6. To enable the student to create student-cantered environment where students improve on their own ideas, raise questions, and undertake investigations. Studying non-chordates starts with real world issues

	and various measures implemented to conserve the biodiversity.

Course Description: Applied Zoology is an interdisciplinary field that applies principles of zoology to address real-world problems and challenges in various sectors including conservation, agriculture, medicine, and industry. This course provides an in-depth understanding of the diverse aspects of zoology and its practical applications in the modern world. Studying Applied Zoology starts with real world issues : silk rearing, honey production, attack of pests on stored grains etc

1.	MOTIVATION P.K Testing	1. What do you understand by the term host? 2. What is difference between symbiosis and commensalism? 3. What is the causative agent of Tuberculosis? 4. What is the causative agent of Typhoid? 5. Can you name few examples of Rickettsiae and Spirochaetes 6. What is the vector of Plasmodium 7. Which disease is caused by *Entamoeba histolytica, Plasmodium vivax* and *Trypanosoma gambiense.* 8. *Ancylostoma duodenale* and *Wuchereria bancrofti* belongs to which phylum? 9. Define pest 10. Which disease is caused by *Pediculus humanus corporis, Culex, Aedes* and *Xenopsylla cheopis* 11. What do you understand by the term estrus 12. What is poultry farming 13. What do you understand by entrepreneurship 14. Name few accessories used in aquarium
2.	CONCEPTS/COURSE OBJECTIVES	1. To understand the dynamics between hosts and parasites, Definitions and concepts related to host-parasite interactions such as parasitism, symbiosis, commensalism, reservoirs, zoonosis, definitive host, and intermediate host. 2. To develop knowledge about disease transmission modes by understanding preventive measures and control strategies for diseases like Tuberculosis and Typhoid. 3. To understand *Rickettsia prowazekii,*

		Borrelia recurrentis, and *Treponema pallidum*: their characteristics, pathogenicity, and diseases caused. 4. To learn about the life history and pathogenicity of protozoan parasites like *Entamoeba histolytica, Plasmodium vivax*, and *Trypanosoma gambiense*. 5. To understand the life history and pathogenicity of helminths like *Ancylostoma duodenale* and *Wuchereria bancrofti*. 6. To develop deep knowledge about economically important insects, their biology, methods of control, and the damage they cause to crops or stored products. 7. To understand medically important insects like *Pediculus humanus corporis, Anopheles, Culex, Aedes,* and *Xenopsylla cheopis*, and their significance in disease transmission and control. 8. To understand preservation and artificial insemination in cattle. 9. To develop deep knowledge about the induction of early puberty and synchronization of estrus in cattle. 10. To learn about principles of poultry breeding, management of breeding stock, broilers, and processing and preservation of eggs. 11. To understand genetic improvements in the aquaculture industry, induced breeding and transportation of fish seed.

Course Plan

Unit	Title	Lectures	Date	Teaching Methodology	Learning Outcomes
1	Introduction to Host-parasite Relationship: Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis	**3**	July 16 2024- July 18, 2024	**Methodology:** Jigsaw Technique: Various terminology used in Parasitology for better understanding of the subject	Students will be able to understand the relationships between organisms, especially regarding parasitism, symbiosis, and how various organisms interact within ecological systems and affect each other's well-being and survival.
2	Unit 2: Epidemiology of Diseases Transmission, Prevention, and control of diseases: Tuberculosis, typhoid	**7**	July 19 2024- August 8, 2024	**Methodology:** Flipped Classroom Approach	Students will be able to equip themselves with knowledge about the modes of transmission, preventative measures, and control strategies specific to Tuberculosis and Typhoid, enabling them to contribute to disease management, public health interventions, and community education efforts.
3	Unit 3: Rickettsiae and Spirochaetes Brief account of *Rickettsia prowazekii, Borrelia recurrentis* and *Treponema pallidum*	**6**	August 13, 2024- August 20, 2024	**Methodology: Power point presentation on various diseases** Brief account of life history, mode of infection and pathogenicity of following	Studying these microorganisms provides students with insights into the characteristics, modes of transmission and associated diseases, of *Rickettsia prowazekii, Borrelia recurrentis*, and

				pathogens of *Rickettsia prowazekii, Borrelia recurrentis* and *Treponema pallidum*	*Treponema pallidum*. This knowledge will help them in healthcare industry for diagnosing, treatment, and prevention strategies for these respective infections.
4	Unit 4: Parasitic Protozoa Life history and pathogenicity of *Entamoeba histolytica, Plasmodium vivax* and *Trypanosoma gambiense*	**8**	August 22, 2024-September 3, 2024	**Methodology: Problem-Based Learning**	Studying these specific parasitic protozoa and their life history, pathogenic mechanisms, and modes of transmission shall provide students with essential knowledge crucial for healthcare, epidemiology, and understanding the impact of these infections on global health.
5	Unit 5: Parasitic Helminthes Life history and pathogenicity of *Ancylostoma duodenale* and *Wuchereria bancrofti*	**5**	September 6, 2024-September 19, 2024	**Methodology: Interactive Lecture, Demonstration method.**	By studying these parasitic organisms, their life cycles, modes of transmission, and the diseases they cause, students will develop an understanding of the public health implications, epidemiology, prevention, and treatment strategies associated with *Ancylostoma duodenale* (hookworm) and *Wuchereria bancrofti* (causing lymphatic filariasis). This

					knowledge shall help them in identifying the regions where these infections are endemic, to implement effective control measures and improve public health outcomes.
6	Unit 6: Insects of Economic Importance Biology, Control and damage caused by *Helicoverpa armigera, Pyrilla perpusilla* and *Papilio demoleus, Callosobruchus chinensis, Sitophilus oryzae* and *Tribolium castaneum*. .	**8**	September 26, 2024-October 29, 2024	**Methodology:** Field Trips and Experiential Learning	By studying these agricultural pests, their biology, control methods, and the damage they cause to crops and stored products, students will acquire insights into effective pest management strategies crucial for sustainable agriculture and food security. This knowledge shall help them in developing approaches to minimize crop losses and maintain the quality of stored agricultural commodities.
7	Unit 7: Insects of Medical Importance Medical importance and control of *Pediculus humanus corporis, Anopheles, Culex, Aedes, Xenopsylla cheopis*	**8**	October 31, 2024-November 18, 2024	**Methodology:** Presentations by student panels from the class: class invited to participate	By studying these vectors and their medical importance, as well as control strategies, students shall gain insights into the significance of these arthropods in disease transmission. The student shall be able to understand effective control measures for preventing disease outbreaks and

					maintaining public health in various regions globally.
8	Unit 8: Animal Husbandry Preservation and artificial insemination in cattle; Induction of early puberty and synchronization of estrus in cattle	**8**	November 21, 2024-December 24, 2024	**Methodology: Power point presentation, Online resources.**	By studying these topics, students will gain insights into reproductive management techniques used in cattle breeding programs. This knowledge shall be essential for cattle farmers and agricultural professionals involved in animal husbandry and reproductive technologies. The students shall be able to understand these practices which contribute in enhancing the genetic quality, reproductive efficiency, and productivity of cattle herds.
9	Unit 9: Poultry Farming Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs	**5**	December 26, 2024-February 20, 2025	**Methodology: Visit to Poultry farm to study the processing and preservation techniques of eggs**	The students shall be able to learn about conventional breeding methods, such as selective breeding and crossbreeding, and modern techniques like genetic manipulation and genomic selection used to enhance desirable traits in poultry.