SURESH GYAN VIHAR UNIVERSITY
Accredited by NAAC with 'A' Grade

DETAILED SYLLABUS

2025-2029

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-I (Autumn)**

ENGLISH LANGUAGE - I	**[EN-103]**

I-SEM. BA-B.Ed	**EVALUATION**
SCHEDULE PER WEEK LECTURES-2 CREDITS-2	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To enable the student to:

1. Have an understanding of grammar
2. Make themselves aware of various professional writing

UNIT	**Course Contents**	
I	Grammar Sentences, Prepositions, Subject-verb agreement, Correct Usage- Tenses, Active & Passive, Modals, Direct and indirect Speech, Idioms, Determiners	6
II	Vocabulary Building Introduction, Synonyms, Antonyms, Homophones, Homonyms, Words Often Confused, One Word Substitution, Affixes, Select Vocabulary of about 300-500 new words	
III	Verbal Communication Definition, Working with customers, developing professional telephone skills & improving informal communication	7
IV	Professional Writing Writing Official/ Business/ Formal letters; Writing Application and CV; Writing for Official Meetings Report Writing- Size of the Report, Kinds of Reports, How to write Reports, Format for reporting Technical Proposals: Parts, Types, Writing of Proposal, Significance.	6
V	Composition Paragraph Writing- Parts of a paragraph, Writing a good paragraph, Characteristics of a good paragraph; Developing Outlines, Note- making, Review Writing	6
Reference Books	Sasikumar ,V. Dutta And Rajeevan, A course In Listening And Speaking-I Foundation Books,2006. Sawhney, Panja and Verma Eds. English At The Workplace Macmillan 2003. Singh,R.P., Professional Communication, OUP 2004. Judith Leigh. CV's and Job Applications, OUP 2004. Arthur Waldhorn and Arthur Zeiger, English Made Simple, Rupa and Co. Gunashekar Ed. A Foundation Enhlish Course For Undergrautes, Bookiciefi, Hyderabad. Quirk and Greenbaum, A University Grammar of English Longman 1973.	

Recommended by BOS on :		

DETAILED SYLLABUS

2025-2029

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-I (Autumn)**

Elementary Computers	**[CP-105]**

I-SEM. BA-B.Ed	**EVALUATION**
SCHEDULE PER WEEK LECTURES-2 CREDITS-2	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To enable the student to:

This course aims to give a general understanding of how a computer works, Aware about operating system, various Computer Languages and number system, Give a general understanding of Internet, information technology, e-commerce and Networks

UniT-I	**Introduction** **8 hours**
Types of computers and generations .Basic architecture of computers and its building blocks .Input-Output devices, Memories, Overview, definition and function of operating system, need of operating System,	
UNIT-**II**	**Classification of Computer Languages,** **8 hours**
Machine, assembly and high level languages .Brief idea of operating system, Assembler, compiler and interpreter, Number Systems :Binary, octal, decimal and hexadecimal representation of numbers. Integers and floating point numbers. Representation of characters	
UNIT **-III**	**An overview of information technology**, **6 hours**
difference between data and information, quality, of information, Information system. Introduction to internet: www, web browser, search engine, email, open source software's, Search Engine optimization	
UNIT-**IV**	**Introduction to e-commerce7 hours**
Introduction to e-commerce and its advantage, Types of E-Commerce, B2B, B2M, M2B, M2M, Electronic payment system, E-governance, Introduction to Information Security, cryptography, digital signature and smart card technology,	
UNIT-**V**	**Introduction to LAN, WAN, MAN:7 hours**
Transmission mediaData transmission type: Introduction to OSI reference model, Analog and digital signals,, Network topologies, client-server architecture, ISDN, Broad Band	
Text Book	Computer Fundamentals: Architecture and Organization, by B Ram, New Age International Publisher
Reference Books	**Recommended Books:** Computer Fundamentals: Architecture and Organization, by B Ram, New Age International Publisher 1. Information Technology and the Networked Economy, Second Edition **By**McKeown, Patrick G. 2. Internet & Intranet Engineering, Tata McGraw Hill company. 3. Information Technology by AjitPoonia. 4. Information Technology by D.P. Sharma

Mode of Evaluation: (Percent Weightage)	Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT
Recommended by BOS on :	
Approved by Academic Council on:	

SURESH GYAN VIHAR UNIVERSITY
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DETAILED SYLLABUS

2025-2029

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-I (Autumn)**

Environmental Studies	**[ES-101]**

I-SEM. BA-B.Ed	**EVALUATION**
SCHEDULE PER WEEK LECTURES-2 CREDITS-2	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To enable the student to:

The learning objective of course is: To create an understanding regarding the eco system, To gain knowledge about relation between environment and human races.

Unit-I	**Man & Environment**
Man & Environment: Definition of Environment & its various components. Ecosystem concepts. Dependence of Man on nature for its various needs. Human population growth & its impacts on environment. Environment & human health. Environmental concerns including climate change, Global warming, Acid Rain, Ozone layer Depletion etc. Environmental ethics. Traditional ways of utilizing various components of environment. Sustainable developments.	
Unit- II	**Natural Resources**
Natural Resources: Forest resources, Mining, Dams & their effects on forests & tribal people. Water resources-over utilization of water, floods, droughts and conflicts over water resources. Mineral Resources- Use of various minerals for Human welfare & environmental effects of mining. Food resources -World food problem. Impacts of changing Agriculture practices on Environment. Energy Resources-Renewable and non renewable energy Resources & exploration of alternative energy sources. Land Resources- land degradation, soil erosion, desertification and soil contamination.	
Unit-III	**Ecosystems**
Ecosystems: Structure & function, energy flow, food chains, food webs, Ecological pyramids. Basics of forest grasslands, desert & aquatic ecosystem (Ponds, Streams, Lakes, Rivers, Oceans & Estuaries)	
Unit-IV	**Biological Diversity**

Biological Diversity: Genetic, species & ecosystem diversity, Values of Biodiversity, Global, National & Local Biodiversity. Hot-spots of Biodiversity, threat to biodiversity. Endangered & endemic species of India. Conservation of biodiversity in situ & ex-situ	
Unit-V	**Environment pollution**
Environment pollution: Causes, effects & control of- Air pollution, Water pollution, Soil pollution, Noise Pollution, Thermal pollution & Nuclear Hazards. Solid wastes & their Management. Disaster Management-Flood, Drought, Earthquake, Landslides etc.	
Reference books/Text Books	1. Agarwal KC, 2001. Environmental Biology, Nidi Publishers Ltd. Bikaner. 2. Bharucha Erach, 2003. The Biodiversity of India, Mapin Publishing Pvt. Ltd, Ahmedabad – 3. Brunner RC, 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480pgs. 4. Clark RS, Marine Pollution, Clanderson Press, Oxofrd (TB). 5. Cunningham WP, Cooper TH, Gorhani E & Hepworth MT, 2001. Environmental Encyclopaedia, Jaico Publishing House, Mumbai
Mode of Examination	Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT
Recommended By BOS on:	
Approved by academic council on:	

SURESH GYAN VIHAR UNIVERSITY

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DETAILED SYLLABUS

2025-2029

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-I (Autumn)**

BOTANY-I (MICROBES, ALGAE, FUNGI AND ARCHEGONIATAE)	**BY-111**

I-SEM. B.Sc-B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

- To create an understanding regarding plant taxonomy,
- To gain knowledge about plant diversity and morphology of microbes,
- To have understanding about algae and fungi.

Unit	**Contents of the Subject**	**No. of Teaching Hours required**

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1	**Plant Taxonomy** Plant Taxonomy. Principles of classification, nomenclature; comparative study of different classification systems, viz. Linnaeus, Bentham & Hooker, Engler&Prantl, Hutchinson, and Cronquist. Herbarium techniques and important Botanic Gardens.	7
2	**Microbes** Viruses- Discovery, general structure, replication (general account), DNA virus (T-phage) Lytic and lysogenic cycle, RNA virus (TMV); Economic iDJ.portance; Bacteria- Discovery, General characteristics and cell structure; Reproduction- vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.	7
3	**Algae** General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae; Morphology and life-cycles of the following: Nostoc, Chlamydomonas, Oedogonium, Vaucheria, Fucus, Polysiphonia. Economic importance of algae	7
4	**Fungi** Introduction- General characteristics , ecology and signiticance, range of thallus organization, cell wall composition , nutrition, reproduction and classification; True Fungi- General characteristics, ecology and significance, life cycle of Rhizopus (Zygomycota) Penicillium, Alternaria (Ascomycota), Puccinia, Agaricus (Basidiomycota); Symbiotic Associations-Lichens: General account, reproduction and significance; Mycorrhiza: ectomycorrhiza and enclomycorrhiza and their signiticance	7
5	**Archegoniate** Unifying features of archegonintes, Transition to land habit , Alternation of generations. General characteristics , adaptations to land habit , Classification, Range of thallus organization. general characteristics, classification, Early land plants (Cooksonia and Rhynia).	8
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

- Eames, A. J. 1981. Morphology of Angiosperms .McGraw Hill, New York.
- Gifford, E.M. and Foster, A.S. 1989. Morphology and Evolution of Vascular Plants. W.H. Freeman, New York.
- Sporne, K.R. 1974. Morphology of Angiosperms. Hutchinson University Press, London.

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DETAILED SYLLABUS

2025-2029

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-I (Autumn)**

Fundamentals of Chemistry-I	**[CY 111]**
I-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1.

Unit	Contents of the Subject	No. of Teaching Hrs required
1	**Atomic Structure: Recapitulation**: Bohr's theory Time independent Schrodinger equation (H Ψ = EΨ). Schrodinger equation for hydrogen atom. Radial and angular nodes and their significance. Radial distribution functions (1s and 2s AO). Significance of quantum numbers, orbital angular momentum and quantum numbers mr and ms. Shapes of s, p and d AO. Electronic configurations of the elements. Concept of exchange energy. Relative energies of AO, Anomalous electronic configurations.	07
2	**Covalent bonding:** VB Approach: Concept of hybridization and VSEPR theory. Resonance and resonance energy Molecular Orbital Approach : LCAO method, bonding and anti bonding MOs and their characteristics for s-s, s-p and p-p combination of atomic orbital's, non- bonding combination of orbital's ,MO treatment of homo nuclear diatomic molecules of 1st and 2nd periods and hetero nuclear diatomic molecules such as CO, NO and NO+	08

3	**Fundamentals of Organic Chemistry**: Cleavage of Bonds: Homolysis and Heterolysis. Structure, shape and reactivity of organic molecules Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions free radicals. Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Benzenoids and Huckel's rule	06
4	**Stereochemistry: Conformations** ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newman, Sawhorse and Fischer representations. Concept of chirality (up to two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). Threo and Erythro; D and L; cis - trans nomenclature; R/ S (for up to 2 chiral carbon atoms) and E / Z Nomenclature (for up to two C=C systems).	07
5	**Aliphatic Hydrocarbons** Alkanes: Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbe's synthesis, from Grignard reagent. Reactions: Free radical Substitution: Halogenations. Alkenes: Preparation, Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeff's rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes.	08
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1 Barrow, G. M. Physical Chemistry Tata McGraw-Hill (2007).
2. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
3. Mahan, B. H. University Chemistry 3rd Ed. Narosa (1998).
4. I. L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
5. R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
6. Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand

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DETAILED SYLLABUS

2025-2029

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-I (Autumn)**

Chemistry-I Lab	**[CY 161]**

I-SEM. B.Sc. B.Ed.
SCHEDULE PER WEEK
CREDITS-2
Practical -3

S.No	Name of Experiment
01	1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
02	2. Estimation of oxalic acid by titrating it with KMnO4.
03	3. Estimation of water of crystallization in Mohr's salt by titrating with KMnO4.
04	4. Estimation of Fe(II) ions by titrating it with K2Cr2O7 using internal indicator.
05	5. Estimation of Cu(II) ions iodometrically using Na2S2O3.
06	1. Detection of extra elements (N,S,Cl,Br,I) in organic compounds (containing upto two extra elements)
07	2. Separation of mixtures by Chromatography: Measure the Rf value in each case (combination of two compounds to be given
08	a. Identify and separate the components of a given mixture of 2 amino acids (glycine, aspartic acid,
09	glutamic acid, tyrosine or any other amino acid) by paper chromatography. b. Identify and separate the sugars present in the given mixture by paper chromatography.

Reference Books:

1. Vogel's Qualitative Inorganic Analysis, A.I. Vogel , Prentice Hall ,7th Edition.
2. Vogel's Quantitative Chemical Analysis, A.I. Vogel , Prentice Hall ,6th Edition.
3. Textbook of Practical Organic Chemistry, A.I. Vogel , Prentice Hall, 5th edition.
4. Practical Organic Chemistry, Mann F. G. & Saunders B. C, Orient Longman, 1960.

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DETAILED SYLLABUS

2025-2029

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-I (Autumn)**

Zoology-ISYSTEMATICS AND ANIMAL DIVERSITY	**[** ZY-111 **]**

I-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1. To create an understanding regarding the multicellular animal.
2. To gain knowledge about reproduction in non-chordates.
3. To have understanding about hemichordate.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Classification of multicellular animals:** Criteria for classification of multicellular animals. Taxonomy and classification: General principles of taxonomy - Binomial nomenclature, - Trinomial nomenclature, Rules of nomenclature, Concept of Five kingdom, concept of protozoa, metazoan and levels of organization. Basis of Classification: symmetry, coelom, segmentation and embryology.	8

2	**Non–Chordates:** General characters and Outline Classification upto class, Economic importance:-Protozoans - Entamoebahistolytica. Poriferans - Skeleton and canal system of sponges.Coelenterates - Coral and coral reefs.Platyhelminths - Parasitic adaptations. Aschelminthes - Nematodiasis..	8
3	**Non–Chordates:** General characters and Outline Classification up to class, Economic importance:-Annelids –Vermiculture. Arthropods - Larval forms. Molluscs - Pearl culture. Echinoderms - Water vascular system	7
4	**Hemichordata:** Classification (up to class) and Habit, habitat, distribution and General characters:-Protochordates: Urochordates, Cephalochordates**.** Cyclostomes.	7
5	**Chordates:** General characters and Outline Classification up to order, Economic importance:- Fishes, Amphibian, Reptiles, Birds and Mammals.	6
	Total	**36**

Practicum/ Graded Assignments:

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. R .L.Kotpal :Modern text book of biology – Invertebrate –(Rastogi Publication, Meerut).
2. Jordan, E. L. : Invertebrate Zoology (S. Chand Co. New Delhi.).
3. Dhami and Dhami : Invertebrate Zoology (S. Chand & Co. New Delhi).
4. Shrivastava, : Economic Zoology. (CommercialPub.brue,N.Delhi).
5. Vishwapremi K.K., : Economic Zoology (AkashdeepPub.House,New Delhi).
6. V.P.Agrawal and L. D.Chaturvedi: A text book of Invertebrate Zoology –(Jagmander Book Agency, New Delhi).
7. R.L.Kotpal :Modern text book of biology –Vertebrate –(Rastogi Publication, Meerut).
8. Young, J.Z. : Life of Vertebrate.(E L B S) 1983.Oxford.
9. Dalela, R.C. : A text book of Chordate Zoology, (Jai Prakash Nath publications, Meerut.).
10. Newman, H.H. : The phylum Chordate, (Satish Book Enterprise, Agra).

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DETAILED SYLLABUS
2021-2025

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-II (Spring)**

Human values and Ethics	HUM-102
SCHEDULE PER WEEK LECTURES-2 CREDITS-2	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

The learning objective of course is:

1) To understand meaning, nature and scope of ethics and values
2) To learn about human rights.
3) To learn individual and society.
4) To understand the basic of Indian ethics
5) To learn the basics of professional ethics.

Unit-I	**Introduction:**
Definition of Ethics and Values, Character and Conduct , Nature and Scope of Ethics ,Uses of Ethics	
Unit- II	**Human Rights:**
Rules and Regulations, Rights and Duties, Integrity and Conscience, Civil rights, Human rights. Fundamentals rights.	
Unit-III	**Individual and Society:**
Theories of Society, Social Relationships and Society,Individuals behavior in diverse group and social groups**,** Environmental ethics and nature.	
Unit-IV	**Indian Ethics:**
Lesson from Mahatma Gandhi , Society and Trusteeship, Indian constitution, Directive Principles of State	
Unit-V	**Professional Ethics:**
Human Goals , Ethics in Public Administration, , Ethics and Civil Servants , Ethical Values and Management	
Reference books/Text Books	1. Govindarajan M (Author) 2013. Professional Ethics and Human Values. Kindle Edition. 2. R.S. Naagarazan. 2016. A Textbook on Professional Ethics and Human Values. New Age International. 3.Jayshree Suresh 2003. Human Values and Professional Ethics Paperback. S. Chand publisher
Mode of Examination	Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT
Recommended By BOS on:	

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DETAILED SYLLABUS
2021-2025

Department: School of Education **Year: I**
Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-II (Spring)**

English Language – II	**EN-104**
SCHEDULE PER WEEK LECTURES-2 CREDITS-2	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To enable the student to:

1. Have an understanding of grammar
2. Make themselves aware of various professional writing

UNIT	**Course Contents**	**Total Contact Hours = 31**
I	**Commercial Correspondence:** a) Style and Construction b) Significant Commercial terms and Phrases c) Letter of Inquiry d) Letter of Quotation e) Letter of Order f) Letter of Execution of Order g) Letter of Complaint h) Letter of Collection i) Circular Letter j) Application for Agency	**6**
II	**Official Correspondence:** Official Letter a) Semi-Official Letter b) Memorandum Journalistic Competitions on Commercial Topics: a) Editorial Note on a Commercial Topic b) Letter to the Editor on Economic and Commercial Topics c) Script Writing for the Media d) Journalistic Report Writing, Press Release e) Writing Advertisement Copy f) Writing for Internet Precise Writing	**6**
III	**Theme Writing (Report writing/Academic and Journalistic writing)**	**7**
IV	**Paragraph Writing and Essay writing**	**6**
V	**Advanced Comprehension**	**6**
Recommended by BOS on :		

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DETAILED SYLLABUS
2021-2025

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-II (Spring)**

BOTANY-II (PLANT ANATOMY AND EMBRYOLOGY)	**[** BY-112 **]**

II-SEM. B.Sc-B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

- To create an understanding regarding plant anatomy,
- To gain knowledge about plant diversity and anatomy of plants,
- To have understanding about medicinal plants and economic botany.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Meristematic, permanent tissues and Organs** Root and shoot apical meristems; Simple and complex tissues**.** Structure of dicot and monocot root stem and leaf.	7
2	**Secondary Growth, Adaptive and protective systems** Vascular cambium- structure and function, seasonal activity. Secondary growth in root and stem , Wood (heartwood and sapwood). Epidermis, cuticle, stomata; General account of adaptations in xerophytes and hydrophytes.	7
3	**Structural organization of flower** Structure of anther and pollen; Structure and types of ovules ; Types of embryo sacs, organization and ultrastructure of mature embryo sac. Pollination mechanisms and adaptations; Double fertilization; Seed-structure appendagesand dispersal mechanisms.	8

4	**Embryo and endosperm** Endosperm types, structure and functions; Dicot and monocot embryo; Embryo endosperm relationship.	7
5	**Apomixis and polyembryony** Definition, types and practical applications, reproductive behaviour of the species, type of endosperm development, effect of pollination on embryo development, the effect of pollination on polyembryony.	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

- Bhojwani, S.S. &Bhatnagar, S.P. (2011). Embryology of Angiosperms. VikasPublication House Pvt. Ltd. New Delhi. 5th edition.
- Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.\

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DETAILED SYLLABUS
2021-2025

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-II (Spring)**

Fundamentals of Chemistry-II	**[CY 112]**
II-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

Unit	Contents of the Course	Hrs
I	**Chemical Thermodynamics:** (a)State of a system, state variables, intensive and extensive variables, concept of heat and work, First Law of thermodynamics. Calculation of work (w), heat (q), changes in internal energy (ΔU) and enthalpy(ΔH) for expansion or compression of ideal gases under isothermal and adiabatic conditions Calculation of w, q, ΔU and ΔH for processes involving changes in physical states. (b)Thermo chemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution.	8
II	**Chemical Equilibrium:** (a)Free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium. (b)Distinction between ΔG and ΔGθ, Le Chatelier's principle. Relationships between Kp, Kc and Kx for reactions involving ideal gases.	7
III	**Ionic Equilibrium :** **(a)**Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common in effect, (b)Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle.	7
IV	**Aromatic hydrocarbons** (a)Preparation of benzene from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions of benzene): Aromatic electrophilic substitution: nitration, halogenations and sulphonation. Friedel Craft's reaction (alkylation and acylation). Side chain oxidation of alkyl benzenes (Upto 4 carbons on benzene). (b)Organic Halogen Compounds Types of Nucleophiles Substitution (SN^2, SN^1) reactions. Preparation of Alkyl Halides from alkenes and alcohols. Reactions: hydrolysis, nitrite & nitro formation, nitrile & iso-nitrile formation. Williamson's ether synthesis: Elimination and substitution.	8
V	**Aliphatic and Aromatic Hydroxy Compounds**	8

	(a)Alcohols: Preparation: Ester hydrolysis, Reduction of aldehydes, ketones, carboxylic acid and esters. Reactions: With sodium, HX, Oppeneauer oxidation Diols: oxidation of diols. Pinacol-Pinacolone rearrangement. (b)**Phenols**: Preparation and Reactions, acidic nature : Electrophilic substitution: Nitration, halogenations and sulphonationn. Reimer - Tiemann Reaction, Gattermann-Koch Reaction,	
Total Hours		38

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Reference Books:

1. Vogel's Qualitative Inorganic Analysis, A.I. Vogel , Prentice Hall ,7th Edition.
2. Vogel's Quantitative Chemical Analysis, A.I. Vogel , Prentice Hall ,6th Edition.
3. Textbook of Practical Organic Chemistry, A.I. Vogel , Prentice Hall, 5th edition.
4. Practical Organic Chemistry, Mann F. G. & Saunders B. C, Orient Longman, 1960

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DETAILED SYLLABUS
2021-2025

Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-II (Spring)**

Chemistry-II Lab	**CY-162**	**C (L, T, P) = 2 (0, 0, 3)**
II-SEM. B.Sc. B.Ed. **SCHEDULE PER WEEK** **CREDITS-3** **Practical -3**		

S.No	Name of Experiment	
01	Determination of enthalpy of ionization of acetic acid.	
02	Purification of organic compounds by crystallization (from water and alcohol) and distillation.	
03	Criteria of Purity: Determination of melting and boiling points	
04	Bromination of Phenol/Aniline	
05	Benzoylation of amines/phenols	
06	3. Preparations: Mechanism of various reactions involved to be discussed..	

07	2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide	
08	Recrystallisation, determination of melting point and calculation of quantitative yields to be done.	

Reference Books:

1. Textbook of Practical Organic Chemistry, A.I. Vogel , Prentice Hall, 5th edition.
2. Practical Organic Chemistry, Mann F. G. & Saunders B. C, Orient Longman, 1960.
3. Senior Practical Physical Chemistry, B.D.Khosla, R. Chand & Co.
4. Vogel's Qualitative Inorganic Analysis, A.I. Vogel , Prentice Hall ,7th Edition.
5. Vogel's Quantitative Chemical Analysis, A.I. Vogel , Prentice Hall ,6th Edition.
6. Textbook of Practical Organic Chemistry, A.I. Vogel , Prentice Hall, 5th edition.
7. Practical Organic Chemistry, Mann F. G. & Saunders B. C, Orient Longman, 1960.

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DETAILED SYLLABUS
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Department: School of Education **Year: I**

Program Name: Integrated (B.Sc + B.Ed.) Four Year Programme **Semester-II (Spring)**

Zoology-IIANIMAL PHYSIOLOGY AND BIOCHEMISTRY	**[BDBSE 116]**

II-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1. To create an understanding regarding the animal physiology.
2. To gain knowledge about biomolecules.
3. To have understanding about carbohydrate metabolism.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**

1	**Introduction to cell:** Introduction to cell: Morphology, size, shape and characteristics of Prokaryotic, Eukaryotic, Plant and animal cells; cell-theory. Cell membrane: Characteristics of cell membrane molecules, fluid mosaic model of Singer and Nicolson, concept of unit membrane. Cell membrane transport: Passive (diffusion and osmosis facilitated (mediated) and active transport.	7
2	**Digestion, Respiration and Excretion:** Physiology of digestion, Absorption of carbohydrates, proteins, lipids, Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood, Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism	7
3	**Cardiovascular and Reproduction System:** Composition of blood, Hemostasis, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle, Physiology of male reproduction: hormonal control of spermatogenesis; Physiology of female reproduction: hormonal control of menstrual cycle.	7
4	**Protein, Lipidsand Carbohydrates:** Protein classification, Amino acids, zwitterion, Structure of Protein, Transamination, Deamination and Urea Cycle Carbohydrates and lipid Classification, Structure and physiochemical Properties of Monosaccharides, Oligosaccharides and polysaccharides, Lipids, Wax, Glycerol and Triacyl Glycerol, Glycolysis, Krebs Cycle, Pentosc phosphate pathway , Gluconeogenesis, Glycogen metabolism, electron transport chain, Biosynthesis and oxidation of lipid.	7
5	**Nerve and muscle:** Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres, Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.	8
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Karp, G. 2010. Cell and Molecular Biology: Concepts and Experiments. 6th Edition. John Wiley & Sons. Inc.
2. De Robertis, E.D.P. and De Robertis, E.M.F. 2006. Cell and Molecular Biology. 8th edition. Lippincott Williams and Wilkins, Philadelphia.
3. Cooper, G.M. and Hausman, R.E. 2009. The Cell: A Molecular Approach. 5th edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.
4. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. 2009. The World of the Cell. 7th edition. Pearson Benjamin Cummings Publishing, San Francisco.
5. Nelson, D.L., Cox, M.M. (2004) Lehninger Principles of Biochemistry, 4th Edition, WH Freeman and Company, New York, USA

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BOTANY III (BRYOPHYTA AND PTERIDOPHYTAC)	**[BY-213]**

III-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

- To create an understanding regarding the Bryophytes,
- To gain knowledge about Pteridophyta.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Bryophyta: Introduction** Bryophytes: General characters and classification Sporophytic generation, Gametophytic generation, alternation of generations, Affinities of Bryophyta with algae and Pteridophyta.	7

2	**Bryophyta: Type Studies :**Structure, Reproduction , life cycle, systematic position and economic importance of Hepaticopsida: *Riccia*, *Marchantia* and *Porella*, Anthoceratopsida-*Anthoceros*, Polytrichum, Bryopsida-*Sphagnum, Funaria*.	7
3	**Pteridophytes- Introduction** The first vascular land plant, general characters of pteridophytes, types of steles, development of sporangia (eusporangiate and leptosporangiate), life cycle of pteridophytes (homosporus and heterosporus), Important characteristies of Psilopsida, Lycopsida, Sphenopsida, and Pteropsida, classification of Pteridophyta. Economic importance of Pteridophytes.	7
4	**Pteridophyta: Type Studies** General characters and classification (Sporne's), Structure, reproduction, life cycle and systematic position of Rhynia, Lycopodium, Equisetum and Marsileapsilotopsida: psilotum, sphenopsida: equisetum, .Stelar evolution, heterospory and seed habit in Pteridophytes. Morphology, anatomy and reproduction of Lycopodium, Selaginella, Equisetum, Adiantum and Marsilea.	7
5	**Lichens** Lichens- General characters, Types of lichens: Crustose, Foliose and Fructicose, habitat, structure, reproduction, economic and ecological importance of lichens, indicators of environment	8
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books

- M. S. 1985. Cryptpogamic Botany. Vol. I and II second edition. Tata McGraHillPublishing Co. Ltd., New Delhi. Saxena Manjula K. and Tyagi, Annuja (2015), Algae, Lichens and Bryophyta, B.Sc. Pt-I, Paper I, University of Rajasthan, CBH, Jaipur.
- Watson E.V. 1971. The structure and life of Bryophytes. Hutchinson University Library, London
- Sporne, K.R. 1967. The Morphology of Bryophytes. Hutchinson University Library, London.
- Smith, G.M. 1938. Crytogramic Botany Vol. II. Bryophytes and Pteridophytes. Mc Graw Hill Book Company, London.
- Parihar, N.S. 1965. An Introduction to Bryophyta. Central Book Depot, Allahabad.
- Vashishta, B. R., Sinha, A. K. and Kumar, A. 2011. Botany for degree students, Bryophyta. S. Chand and Co. New Delhi.

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Chemistry –III (Inorganic Chemistry-I)	**[CY 211]**
III-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 Tutorial -1 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1. To encourage Inorganic aspects of Chemistry and knowledge is added
2. To develop knowledge by teaching Knowledge dissemination

Unit	Contents of the Subject	No. of Teaching Hrs required
1	**Atomic Structure: Recapitulation**: Bohr's theory Time independent Schrodinger equation (H Ψ = EΨ). Schrodinger equation for hydrogen atom. Radial and angular nodes and their significance. Radial distribution functions (1s and 2s AO). Significance of quantum numbers, orbital angular momentum and quantum numbers mr and ms. Shapes of s, p and d AO.	07

	Electronic configurations of the elements. Concept of exchange energy. Relative energies of AO, Anomalous electronic configurations.	
2	**Covalent bonding:** VB Approach: Concept of hybridization and VSEPR theory. Resonance and resonance energy Molecular Orbital Approach : LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combination of atomic orbital's, non- bonding combination of orbital's ,MO treatment of homonuclear diatomic molecules of 1st and 2nd periods and heteronuclear diatomic molecules such as CO, NO and NO+	08
3	**Fundamentals of Organic Chemistry**: Cleavage of Bonds: Homolysis and Heterolysis. Structure, shape and reactivity of organic molecules Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions free radicals. Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Benzenoids and Huckel's rule	07
4	**Stereochemistry: Conformations** ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newman, Sawhorse and Fischer representations. Concept of chirality (up to two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). Threo and Erythro; D and L; cis - trans nomenclature; R/ S (for up to 2 chiral carbon atoms) and E / Z Nomenclature (for up to two C=C systems).	07
5	**Aliphatic Hydrocarbons** Alkanes: Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbe's synthesis, from Grignard reagent. Reactions: Free radical Substitution: Halogenations. Alkenes: Preparation, Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeff's rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes.	07
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

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Zoology III-GENETICS AND EVOLUTIONARY BIOLOGY	**ZY-213**

III-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1.To create an understanding regarding Mendelian genetics.

2.To gain knowledge about genetic disorder.

3.To have understanding about molecular genetics.

4. Able to understand environmental biotechnology.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Mendelian Genetics:** Mendelian Genetics: - Mendel's laws of inheritance. Monohybrid and dihybrid cross. Dominance. Incomplete dominance. Current status of Mendelism. Genetic variation: Variation in chromosome number (Euploidy and Aneuploidy).	8
2	**Genetic disorders in Human beings:** Genetic disorders in Human beings (Down's, Turner's, Klinefelter's and Edward's syndrome) Types of chromosomal mutations. Molecular basis of gene mutation, mutagens, crossing over and linkage.	7

3	**Sex-determination:** Sex-determination XX-XY. XO-XY and WZ mechanisms. Sex-linked inheritance (X-and Y-linked) Color blindness. Haemophilia.Gene interactions. Supplementary, complementary, epistasis and inhibitory. Multiple allele-ABO, Rh and MN blood groups and their inheritance, polymorphic genes.	7
4	**Molecular genetics:** Molecular genetics: Nucleic acids, structure, function and type of DNA. Structure, function and types of RNA, genetic code. Transcription, protein synthesis. Gene structure (Recon. muton, cistron) and regulation of gene (lac operon: inducible and repressible system). Bacterial genetic transformation, Transduction and conjugation. Lytic and lysogenic cycle. Elementary idea about eugenics. Elementary idea about genetic engineering. Gene cloning and recombinant DNA technology (Vectors for gene transfers. Plasmids and phages). Restriction enzymes.	7
	Evolution: Natural selection as a guiding force – Its attributes and action Basic characteristics of natural selection. Colouration, camouflage and mimicry, Co-adaptation and co-evolution, Man-made causes of change – Industrial melanism; brief mention of drug, pesticide, antibiotic and herbicide resistance in various organisms. Modes of selection, Polymorphism, Heterosis and Balanced lethal systems. Genetic Drift (Sewall Wright effect) as a stochastic/random force – Its attributes and action. Basic characteristics of drift; selection vs. drift, Bottleneck effect. Founder principle	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1.Microbial genetics – Friedfelder
2. Principles of gene manipulation – Old and Primrose
3. Genes VII by Lewine
4. Microbiology –Pelczar
5Text book of Microbiology by Tortora
6. Microbiology by Brock

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Zoology IV-ENDOCRINOLOGY AND ETHOLOGY	**ZY-215**

III-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1.To create an understanding regarding the Endocrinology.
2. To gain knowledge about hormone regulation.
3. To have understanding about the ethology.
4. Able to understand MRI and CT scan.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Endocrinology:** Introduction, basics and functions. Glands: Exocrine and endocrine; Secretions: Autocrine and paracrine. Hormones: Chemical nature and properties, role in homeostasis. Structure and functions of major endocrine glands: Pituitary, thyorid, parathyroid, adrenal gland, pancreas; their hormones, role and abnormalities due to hyposecretion and hypersecretion. Structure and functions of minor endocrine glands: Thymus, pineal, GIT, kidney, heart; endocrine glands in insects; their hormones and role.	8
2	**Endocrinology:** Control and regulation of secretion and molecular mechanism. Regulation of hormone secretion; positive and negative feedback control mechanism. Extra cellular and intracellular receptors. Second messengers: Cyclic AMP, PIP2, IP3, DG, G-protein, protein kinase and role of Ca++ as messenger; cell signalling; amplification of signal. Molecular mechanism of insulin action.	7

3	**Endocrinology:** Role in reproduction. Hormones from testis, ovary and placenta, their structure and functions. Importance of hormones in sexual differentiation in embryo. Hormonal control of menstrual cycle, implantation, pregnancy. Parturition and lactation. Different types of contraceptives, their composition and effects.	6
4	**Ethology:** Introduction and basics. Introduction and history of behaviour, approaches and study of animal behaviour (ecological, physiological, evolutionary and neural methods) MRI and CAT scan. Genetic basic of animal behaviour and evolution of ethology.Biological clock; circadian and circannual rhythms.Learning and imprinting, instinct behavior.	7
5	**Ethology:** Areas of behavior. Searching of food: Honey bee, rhesus monkey and langoor. Social behaviour and organization : Honey bee, termite, mammals (black-buck and monkeys).Communication, fights and alarm call : Vocal, visual, tactile, olfactory and acoustic; honey bee language; pheromonal and hormonal basis of aggression, brain hormone relation in sexual behaviour. Migration in fishes and birds. Orientation: Taxes and kinesis.	8
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Barrington EJW -General & comparative
2. Endoctrinology-Oxford, Claredon Press
3. Williams R.H. -Text Book of Endocrinology-W.B. Saunders
4. Martin C. R. - Endocrine Physiology-Oxford University Press.
5. Darnell, J. Lodish H. and Baltimore D. Molecular CellBiology- -Scientific, American Book USA

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III-SEM. B.Sc. B.Ed.CY-261
EVALUATION

SCHEDULE PER WEEK

Practical -3

CREDITS-2

S.No	Name of Experiment	
01	Determination of enthalpy of ionization of acetic acid.	
02	Purification of organic compounds by crystallization (from water and alcohol) and distillation.	
03	Criteria of Purity: Determination of melting and boiling points	
04	Bromination of Phenol/Aniline	
05	Benzoylation of amines/phenols	
06	3. Preparations: Mechanism of various reactions involved to be discussed..	
07	2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide	
08	Recrystallisation, determination of melting point and calculation of quantitative yields to be done.	

Reference Books:

8. Textbook of Practical Organic Chemistry, A.I. Vogel , Prentice Hall, 5th edition.
9. Practical Organic Chemistry, Mann F. G. & Saunders B. C, Orient Longman, 1960.
10. Senior Practical Physical Chemistry, B.D.Khosla, R. Chand & Co.
11. Vogel's Qualitative Inorganic Analysis, A.I. Vogel , Prentice Hall ,7th Edition.
12. Vogel's Quantitative Chemical Analysis, A.I. Vogel , Prentice Hall ,6th Edition.
13. Textbook of Practical Organic Chemistry, A.I. Vogel , Prentice Hall, 5th edition.

Practical Organic Chemistry, Mann F. G. & Saunders B. C, Orient Longman, 1960.

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BASICS IN EDUCATION	**[ED-207]**

III-SEM. B.SC.-B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

4. Concept, need, scope and aims of education.
5. Forms of education and role of agencies.
6. Philosophical basis of education- in Indian and Western context.
7. Relationship between education, society and culture.
8. Concept of autonomy and its importance for teacher and learner.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Education in modern context:** 1. Meaning, concept and nature of education. 2. Need, importance and scope of education. 3. Aims of education, 4. Forms of education (formal, informal, and non- formal) 5. Agencies in education: family, community, school, state and religious institutions.	12
2	**Philosophical basis of education:** 1. Meaning, concept and need of educational philosophy. 2. Educational implication of Philosophical thoughts of: a) Geeta, Quran. b) Bible and Gurugranth sahib. 3. Educational implication of Philosophical thoughts of: a) Mahatama Gandhi and Ravindra Nath Tagore. b) Swami vivekanand.	12

3	**Implication of Educational Philosophy of the following schools:** 1. Idealism, Naturalism and Pragmatism. 2. Humanism, Buddhism and Jainism. In relation to aims, curriculum, teaching methods, pupil - teacher relationship and discipline.	12
4	**Education in socio-cultural context:** 1. Education as a sub-system of social system. 2. Functions of education. 3. Social aspects of education: education as a social process of social change, social stratifications, social mobility, and modernization. 4. Concept of culture: cultural lag, composite culture, role of education in preservation, transmission and enrichment of culture.	12
5	**Autonomy of Teacher and Learner:** 1. Concept and meaning of autonomy. 2. Need and importance of autonomy. 3. Types of autonomy. 4. Autonomy of teacher and learner. 5. Hindering factors in autonomy and remedies for promoting autonomy.	12
	Total	**60**

Practicum/ Graded Assignments:

1. Visit to the different types of denominational schools and prepare the report on any one of the activity.
2. Preparation of collage or scrape book of eminent educationist.
3. Preparation of a chart of different schools of philosophies related to educational components.
4. Discussion on the topic “Autonomy of the teacher”.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Bhatia, B.D. (1981); The theory and practice of education,Doaba House, Bookseller and Pub., Delhi
2. Bhatia, Kamal Bhatia, Baldeo (1994);The Philosophical and Sociological Foundation of Education,Doaba House, Bookseller and Pub., Delhi.
3. Chaube, S.P. (1997); Land marks in modern Indian education, Himalaya Pub. , Delhi.
4. Murthy, S.K. (2008); Philosophical Foundation of Education, Vinodpustak mandir,Agra.

5. Saxena Radha, Sharma G.N., Shastri Ine (2000);UbherteHuaiBharatiyaSamaj Mein Shiksha and Shikshak,Classic Pub., Jaipur.
6. Shrivatav S.N., Rai C.P. (1996); AdhunikBharatiyaSamaj Mein Shiksha, Niraj Pub., Rohtak .
7. Carr, D. (2005); Making sense of education: An introduction to the Philosophy and theory of education and teaching, Routledge

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Pre-internship – II B (TP- 102)(2 weeks)

S. No.	Pre-preparation of teaching practice	Internal/ External Assessment
1.	Preparation of lesson plans - 3 in each subjects	2 credits (Internal)
2.	Preparation of unit plan-1 in each subject	
3.	Delivery of lesson plans in the schools (2 in each subject)	
4.	Observation of day to day school activities and preparation of detail report of any two activities	

1. Components of CIEof Pre-Internship-II(III – Semester):

• Preparation of lesson plans	20
• Preparation of unit plan	20
• Delivery of lesson plans in the schools	20
• Observation of day to day school activities and Preparation of detail report of any two activities	20
	100

Seminar/presentation/ workshop: Shall be evaluated internally.
Work shall be evaluated on the following topics/ other relevant area:

(a) Instructional planning (lesson plan, unit plan & yearly plan)
(b) Formulation of instructional objectives and content analysis
(c) Teaching skills
(d) Measurement and evaluation
(e) Innovative teaching
(f) Preparation of teaching aids
(g) Reading and reflecting on text (EPC)
(h) Creative writing
(i) Reading reflection
(j) Improving listening skills
(k) Language and curriculum
(l) Research Based Project (Action Research/Survey)

Components of CIE of Seminar /Ws/ Presentation/tutorial (I & II Semester):

• Attendance	25
• Presentation skills	25
• Report submission/ File Work	30
• Participation in the activities	20
	100

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BOTANY IV- (GYMNOSPERM AND ANGIOSPERMS)	**[BY-214]**

IV-SEM. B.Sc-B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

- To create an understanding regarding diversity of Gymnosperms and their classification, structure and reproduction,
- To gain knowledge about economic importance of Gymnosperms and Angiosperms,
- To have understanding about fossil.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Gymnosperm: Introduction** Gymnosperms: Important Characteristics, distribution, Classification up to classes, Anatomy, Life cycle patterns: Sporophyte: male and female cones, Gemetophyte, Male and female gametophytes, fertilization, embryo and seeds, Ecological and Economic importance of Gymnosperms, affinities of Gymnosperm with Pteridophytes and Angiosperm.	7
2	**Gymnosperm: Type Studies** General characteristics of Cycadales, Coniferales and Ephadrales, Morphology, anatomy, reproduction and life cycle of *Cycas*, *Pinus* and *Ephedra*	8
3	**Angiosperms Introduction** Classification as per Bentham and Hooker with economic importance, dicotyledons: Polypetalae: Menispermaceae, Meliaceae, Anacardiaceae, Umbelliferae. Gamopetalae: Sapotaceae,	7

	Verbenaceae, Asteraceae Apetalae: Urticaceae, Polygonaceae, Monocotyledons: Cannaceae.	
4	**Anatomy** Anomalous secondary growth: Abnormal behavior of normal cambium Eg.Achyranthes and Mirabilis stem. Accessory cambium formation and its activity. Eg. Bougainvillea and Boerhaavia stem, Abnormal secondary growth in fleshy roots. Eg. Carrot, Raphanus and Beet root, Nodal Anatomy:-Unilacunar, Trilacunar, Multilacunar. Leaf Trace and Leaf Gaps, Branch trace and Branch gaps	7
5	**Palaeobotany:** Fossilization, Types of fossils, Techniques of fossil study, Geological time scale. Fossil Pteridophytes: General characters, structure and spore producing organs of *Rhynia*, reconstructed plants of *Lepidodendron* and *Calamites,* Fossil Gymnosperms: *Glossopteris* and *Williamsonia*	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

- Smith G. N. 1955. Cryptogamic Botany Vol. II – Bryophyta and Pteridophyta. Tata Mc Graw Hill Publishing Co. Ltd. New Delhi.
- Vashishta, P.C.1972 Botany for Degree Students, Vol IV- Vascular Cryptogams (Pteridophyta), S.Chand& Co. Pvt. Ltd.
- Vashishta, P.C. 1976 Gymnosperms, S.Chand& Co. Pvt. Ltd.
- Pandey, B.P.1997. A text book of Bryophyta, Pteridophyta and Gymnosperms. K.Nanth and Co., Meerut
- P.C. Trivedi, Meena, P and Verma, L. Pteridophyta, Gymnosperm and Palaeobotany, RBD Publication House, Jaipur & New Delhi.

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BOTANY V (CELL BIOLOGY AND GENETICS)	**BY-216**

IV-SEM. B.Sc-B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

- The students will be equipped with a number of commonly used numerical algorithms , knowledge and skills in performing numerical computation using MATLAB.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Cell and Cell Organelles** The Cell Theory; Prokaryotic and eukaryotic cells; Cell size and shape; Eukaryotic Cell components. Mitochondria:- Structure, marker enzymes, composition; Semiautonomous nature; Symbiont hypothesis; Proteins synthesized within mitochondria; mitochondrial DNA. Chloroplast- Structure, marker enzymes, composition; semiautonomous nature, chloroplast DNA. ER, Golgi body &Lysosomes:-Structures and roles. Peroxisomes and Glyoxisomes:_Structures, composition, functions in animals and plants and biogenesis. Nucleus:- Nuclear Envelope- structure of nuclear pore complex; chromatin; molecular organization, DNA packaging in eukaryotes, euchromatin and hcterochromatin, nucleolus and ribosome structure (brief).	7
2	**Molecular Biology** History of molecular biology, DNA, Meselson and Stahl's Replication experiment. chromatin, molecular organisation of chromosome: Nucleosome-solenoid Model, Gene Concepts and expression, Polymerase Chain Reaction, DNA sequencing, DNA finger printing Central Dogma. Reverse transcriptase and its application, Transcription and Translation, RNA processing, capping, splicing, and polyadenylation, Transcription in eukaryotes, Translation, initiation,elongation and termination, Jacob-Monad and lac operon,	7

	negative and positive control, structure of promoter.	
3	**Mendelian Genetics and its Extension :**Principles of inheritance, Incomplete dominance and co-dominance, Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Sex-linked, sexinfluenced and sex-limited characters inheritance. Linkage and crossing over, Cytological basis of crossing over, Molecular mechanisms of crossing over including models of recombination, Recombination frequency as a measure of linkage intensity, Two factor and three factor crosses, Interference and coincidence, Somatic cell hybridization.	8
4	**Mutations:** Types of gene mutations (Classification), Types of chromosomal aberrations (Classification, figures and with one suitable example of each), Molecular basis of mutations in relation to UV light and chemical mutagens; Detection of mutations: CLB method, attached X method. Chromosomal mechanisms of sex determination in Drosophila and Man	7
5	**Combination in Bacteria and Viruses:**Conjugation, Transformation, Transduction, Complementation test in Bacteriophage, Transposons in bacteria, Ac-Ds elements in maize and P elements in Drosophila, Transposons in humans	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

- Brown, T. A. 2010. Gene cloning and DNA analysis: An Introduction. Blackwell Publication, USA.
- Buchanan, B., Gruissem, W. and Jones, R. 2000. Biochemistry and Molecular Biology of Plants. American Society of Plant Biologists., USA.
- An Introduction to Plant Tissue Culture, M.K. Razdan, Oxford and IBH Publishing
- Experiments in Plant Tissue Culture, J.H. Dodds and L.K. Roberts, Cambridge University Press
- Plant Biotechnology and Transgenic Plants, K.M.O. Caldenty, W.H. Barz and H.L. Wills, Marcel Dekker
- Plant Biotechnology, J. Hammond, P. McGarvy and V. Yusibov, Springer Verlag.

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SCHOOL OF EDUCATION
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Chemistry- V (Physical chemistry-I)	**[CY 212]**
IV-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 Tutorial -1 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: This course deals with the application of structure and theory to the study of physical aspects including reaction dynamics, isotope effects and molecular orbital theory applied. Electrochemistry for fuel systems of daily life

Unit	**Contents of the Subject**	**No. of Teaching Hrsrequired**
1	**Colloidal States**: Definition of colloids, classification of colloids; Solids in liquids (sols): properties – kinetic, optical and electrical; stability of colloids, protective action, Hardy-Schulze law, gold number. Liquids in liquids (emulsions): types of emulsions, preparation, Emulsifier, Liquids in solids (gels): classification, preparation and properties, inhibition, general application of colloids, colloidal electrolytes.	**07**
2	**Chemical Kinetics I** Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction, concentration dependence of rates, mathematical characteristics of simple chemical reactions – zero order, first order, second order, pseudo order, half life and mean life, electro kinetics phenomena.	08
3	**Chemical kineticsII:** Theories of chemical kinetics. Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis), Expression for the rate constant based on equilibrium constant and thermodynamic aspects, Catalysis.Introduction to corrosion, homogeneous theory, forms of corrosion, corrosion monitoring and prevention methods.	06
4	**Electrochemistry** Electrolyte Solutions , Electrical Conductivity , Electrified Interfaces, Equilibrium Electrochemistry , Dynamic Electrochemistry , Electrolysis , Applications of electrolysis, Galvanic cell, electrochemical cell, Nernst equation, electrodes, cell reaction, primary and secondary storage, applications., Biological Electrochemistry.	07

5	**Thermodynamics – II** Statistical thermodynamics , Thermodynamic equilibrium , Quasi-static transfers between simple systems are nearly in thermodynamic equilibrium and are reversible , Non-equilibrium thermodynamics Account in terms of states of thermodynamic equilibrium , Thermodynamic processes between states of thermodynamic equilibrium , Dependent and independent variables for a process,industrial applications of thermodynamics.	08
	Total	**60**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

References and Text Books:

1. R.G. Compton and G.H.W. Saunders, Electrode Potentials Oxford Chemistry Primer
2. A.C. Fisher Electrode Dynamics Oxford Chemistry Primer
3. Barrow, G. M. Physical Chemistry Tata McGraw-Hill (2007).
4. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
5. Mahan, B. H. University Chemistry 3rd Ed. Narosa (1998).

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Zoology-VCOMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATEC	**[ZY-216]**

IV-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1.To create an understanding regarding the comparative anatomy.

2. To gain knowledge about developmental biology.

3. To have understanding about the embryonic adaptation

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Comparative Anatomy:** Derivatives of integument w.r.t. gland s and digital tips, digestive glands, Sense Organs, Types of receptors. Comparative account of brain, Digestive, Urinogenital, circulatory, Skeletal, respiratory system.	8
2	**Developmental Biology-Scope and Early Events:** Developmental Biology-Scope and Early Events:Historical review and types and scope of embryology.Gametogenesis:Formation of egg and spemi.Vitellogenesis Fertilization: Activation of ovum, essence of activation: changes in the organization of the egg cytoplasm.Parthenogensis.	7
3	**Developmental Biology-Pattern and Processes:** Developmental Biology-Pattern and Processes:Cleavage: Definition, planes and patterns among non-chordatesand chordates_ significance of cleavage. blastulationandmorulation. Fate maps, morphogenetic cell movements, significance of gastrulation. Embryonic induction; primary organizer, differentiation and competence. Development of chick up to 96 hours stage.	7
4	**Embryonic adaptations:** Embryonic adaptations: i. Extra-embryonic membranes in cheek_ their development and functions. ii. Placentation in Mammals: Definition. Types. classification on the basis of morphology and histology; ltmctiottsol placenta.	7
5	**Dimensions in Developmental Biology:** Dimensions in Developmental Biology. Regeneration Various types of stem cells and their applications. Cloning of animals: i. Nuclear transfer technique. ii. l-. Embryo transfer technique.Teratology. Biology of aging.	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Principles of Development. Lewis Wolpert, Oxford universityPress. Oxford.
2. An Introduction to Embryology. Balinsky, B.l. : W.B. Sauders.Philadelphia.
3. Development Biology. Berrill. NJ. McGraw Hill book Company. New York.
4. Principles of Animal Developmental Biology :Goyal S.C. I, Himalaya Publishing Co., Mumbai.
5. Fundamentals of Comparative Embryology :Huettner, A.F.Millan, New York. _
6. Elements of Chordate Embryology Jain P.C. Visual Publication.Delhi.
7. Chordate Embryology :Verma. P .S. Agrawal. V.K. and Tyagi,B.S.. S. Cltand and Co. New Delhi.
8. Development Biology. Veer BalaRastogi and M.S. Jayaraj, KedarNathRamnath, Meerut

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BOTANY IV- (GYMNOSPERM AND ANGIOSPERMS)	**[BY-264]**

IV-SEM. B.Sc-B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

- To create an understanding regarding diversity of Gymnosperms and their classification, structure and reproduction,
- To gain knowledge about economic importance of Gymnosperms and Angiosperms,

- To have understanding about fossil.

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Gymnosperm: Introduction** Gymnosperms: Important Characteristics, distribution, Classification up to classes, Anatomy, Life cycle patterns: Sporophyte: male and female cones, Gemetophyte, Male and female gametophytes, fertilization, embryo and seeds, Ecological and Economic importance of Gymnosperms, affinities of Gymnosperm with Pteridophytes and Angiosperm.	7
2	**Gymnosperm: Type Studies** General characteristics of Cycadales, Coniferales and Ephadrales, Morphology, anatomy, reproduction and life cycle of *Cycas*, *Pinus* and *Ephedra*	8
3	**Angiosperms Introduction** Classification as per Bentham and Hooker with economic importance, dicotyledons: Polypetalae: Menispermaceae, Meliaceae, Anacardiaceae, Umbelliferae. Gamopetalae: Sapotaceae, Verbenaceae, Asteraceae Apetalae: Urticaceae, Polygonaceae, Monocotyledons: Cannaceae.	7
4	**Anatomy** Anomalous secondary growth: Abnormal behavior of normal cambium Eg.Achyranthes and Mirabilis stem. Accessory cambium formation and its activity. Eg. Bougainvillea and Boerhaavia stem, Abnormal secondary growth in fleshy roots. Eg. Carrot, Raphanus and Beet root, Nodal Anatomy:-Unilacunar, Trilacunar, Multilacunar. Leaf Trace and Leaf Gaps, Branch trace and Branch gaps	7
5	**Palaeobotany:** Fossilization, Types of fossils, Techniques of fossil study, Geological time scale. Fossil Pteridophytes: General characters, structure and spore producing organs of *Rhynia*, reconstructed plants of *Lepidodendron* and *Calamites,* Fossil Gymnosperms: *Glossopteris* and *Williamsonia*	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

- Smith G. N. 1955. Cryptogamic Botany Vol. II – Bryophyta and Pteridophyta. Tata Mc Graw Hill Publishing Co. Ltd. New Delhi.
- Vashishta, P.C.1972 Botany for Degree Students, Vol IV- Vascular Cryptogams (Pteridophyta), S.Chand& Co. Pvt. Ltd.
- Vashishta, P.C. 1976 Gymnosperms, S.Chand& Co. Pvt. Ltd.
- Pandey, B.P.1997. A text book of Bryophyta, Pteridophyta and Gymnosperms. K.Nanth and Co., Meerut
- P.C. Trivedi, Meena, P and Verma, L. Pteridophyta, Gymnosperm and Palaeobotany, RBD Publication House, Jaipur & New Delhi.

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EVALUATION
SCHEDULE PER WEEK
Practical -2
CREDITS-2

S. No.	Name of Experiment
1	Estimation of borax - Standard Sodium Carbonate
2	Estimation of Sodium Hydroxide - Standard Sodium Carbonate
3	Estimation of HCl – standard oxalic acid.
4	Estimation of Copper - Standard Copper sulphate
5	Estimation of Potassium dichromate - Standard Potassium dichromate Complexometric
6	Estimation of Magnesium using EDTA.
7	Estimation of Zinc using EDTA.
8	Estimation of ferrous ion using Diphenyl amine / N-Phenylanthranilic acid as indicator. Precipitation titration
9	Estimation of Chloride in neutral medium. (Demonstration - experiment)
10	Estimation of ferrous sulphate – Standard FAS.

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CONTEMPORARY INDIA AND EDUCATION	**ED-254**

IV-SEM.B.SC.- B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: The pupil teacher will be able to understand:

1. School in a social context, role of education in developing socialistic patterns.
2. Constitutional provisions of education in India.
3. Issues and concern and their impact on education.
4. Recommendations of different policies on education.
5. Role of educational institution for creating new social order.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**School as a social context:** 1. School culture and issues of society. 2. Class room as a social context. 3. Role of education in developing socialistic patterns. 4. Rights for gender equality and the implication for social change.	12
2	**Constitutional provisions of education in India for marginalized groups and socially depreved children in relation to:** 1. Equality. 2. Liberty. 3. Justice. 4. Secularism. 5. Socialism.	12

3	**Emerging Indian concerns and their educational implications:** 1. Meaning and concept of liberalization, Globalization, Privatization. 2. Harmful effects of conflict and violence on world. 3. Role of UNO and its agencies in International relationship. 4. Global challenges in Indian education system.	12
4	**Policies on education:** 1. Kothari commission recommendations and their implementation in the context of education 2. National policy on education 1986, its review 1992. 3. Right to education (2009-10)	12
5	**Issues of contemporary Indian society:** 1. Gender equality and equity. 2. Child rights. 3. Women empowerment. 4. Role of educational institution for creating new social order.	12
	Total	**60**

Practicum/ Graded Assignments:

Discussions/ Presentations/ Poster making/ Charts/ Debate/ Symposium:

a) School as a social context.
b) Gender equality.
c) Child rights/ RTE – 2009-10.
d) Women empowerment.
e) Education for marginalized group.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Krishna Murti, J. (1973);Education and the significance of life ,B.I. Pub. Pvt. Ltd., New Delhi
2. Mathur, S.S. (1973); A Sociological approach to Indian Education , Vinod pustak mandir,Agra
3. Mohanty Jagannath (1994); Indian Education in the Emerging Society, Sterling publishers, New Delhi.
4. Rawat, P.L. (1965); History of Indian Education, Ram Prasad and Sons, Agra.
5. Saxena, N.R. Swaroop (1981); Principles of Education, Loyal Book Depot., Meerut

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Pre-internship – II B (TP- 102)(2 weeks)

S. No.	Pre-preparation of teaching practice	Internal/ External Assessment
1.	Preparation of lesson plans – 3 in each subjects	2 credits (Internal)
2.	Preparation of unit plan-1 in each subject	
3.	Delivery of lesson plans in the schools (2 in each subject)	
4.	Observation of day to day school activities and preparation of detail report of any two activities	

2. Components of CIEof Pre-Internship-II(III – Semester):

- Preparation of lesson plans 20
- Preparation of unit plan 20
- Delivery of lesson plans in the schools 20
- Observation of day to day school activities and Preparation of detail report of any two activities 20

100

Seminar/presentation/ workshop: Shall be evaluated internally.
Work shall be evaluated on the following topics/ other relevant area:

(m) Instructional planning (lesson plan, unit plan & yearly plan)
(n) Formulation of instructional objectives and content analysis
(o) Teaching skills
(p) Measurement and evaluation
(q) Innovative teaching
(r) Preparation of teaching aids
(s) Reading and reflecting on text (EPC)
(t) Creative writing
(u) Reading reflection
(v) Improving listening skills
(w) Language and curriculum
(x) Research Based Project (Action Research/Survey)

Components of CIE of Seminar /Ws/ Presentation/tutorial (I & II Semester):

• Attendance	25
• Presentation skills	25
• Report submission/ File Work	30
• Participation in the activities	20
	100

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BOTANY-VI (ANALYTICAL TECHNIQUES IN PLANT SCIENCES)	**[BY-311]**

B.Sc-B.Ed. Semester-V (Autumn)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

- To create an understanding regarding imaging techniques,
- To gain knowledge about cell fractionation,
- To have understanding about spectroscopy and chromatographic techniques.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Imaging and Related Techniques:** Principles of microscopy; Light microscopy; Fluorescence microscopy; Confocal microscopy; use of fluorochromes: Flow cytometry (FACS), instrumentation and applications of fluorescence microscopy. Chromosome Karyotyping, FISH, chromosome painting; Transmission and Scanning electron microscopy, sample preparation for electron microscopy, cryofixation, negative staining, shadow casting, freeze fracture, freeze etching.	6
2	**Cell fractionation** Centrifugation: Differential and density gradient centrifugation, sucrose density gradient, CsCl gradient, analytical centrifugation, ultracentrifugation. Marker enzymes: Use in biological research, auto-radiography, pulse chase experiment.	8
3	**Spectrophotometry and Chromatography** Principle and its application in biological research. Principle; Paper chromatography; Column chromatography, TLC, GLC, HPLC, Ionexchange chromatography; Molecular sieve chromatography; Affinity chromatography.	8

4	**Characterization of proteins and nucleic acid** Mass spectrometry; X-ray diffraction; X-ray crystallography; Characterization of proteins and nucleic acids; Electrophoresis: AGE, PAGE, SDS-PAGE	7
5	**Biostatistics:** Statistics, data, population, samples, parameters; Representation of Data: Tabular, Graphical; Measures of central tendency: Arithmetic mean, mode, median; Measures of dispersion: Range, mean deviation, variation, standard deviation; Chi-square test for goodness of fit.	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

- An Introduction to Practical Biochemistry (1996) 3rd ed., Plummer, D.T. TataMcGraw-Hill Publishing Co. Ltd. (New Delhi).
- Plant Microtechnique and Microscopy (1999) Ruzin, S.E. Oxford University Press (New York) U.S.A.
- Short Protocols in Molecular Biology (1995) 3rd ed., Ausubel, F., Brent, R.,Kingston, R. E., Moore, D.D., Seidman, J.G., Smith, J.A., Struhl, K. John Wiley &Sons.
- Biostatistical Analysis (2012) 4th ed., Zar, J.H. Pearson Publication U.S.A.

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SCHOOL OF EDUCATION
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SEMESTER : V

Chemistry-VI (Inorganic Chemistry-II))	**[CY 311]**
B.Sc-B.Ed. Semester-V (Autumn)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 Tutorial -1 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: 1. To train qualified, adaptable, motivated, and responsible Mathematicians who will contribute to the scientific and technological development.
2.To impact knowledge by teaching
3.To advance knowledge by research

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Coordination Chemistry** Coordination Compounds: Nomenclature Werner's coordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory crystal field theory of transition metal complexes. Application in Industries by Magnetic properties of transition metal complexes	07
2	**Chemistry of Transition Metals:** Properties of d-block elements. Binary compounds (hydrides, carbides and oxides) of the elements of the first transition series and complexes with respect to relative stability of their oxidation states, coordination number and geometry. Chemistry of Elements of Second and Third Transition Series: General characteristics, comparative treatment of Zr/Hf, Nb/Ta, Mo/W in respect of ionic radii, oxidation states. Industrial application of transition metals	08
3	**Inner Transition Elements: Actinides and Lanthanides** :Definition of the f elements; position in the periodic table; Properties of the atoms and ions: ionization energies, electrode potentials, metallic and ionic radii; Colour and electronic spectroscopy; Magnetism; Solid state compounds: halides and oxides; Coordination chemistry of the lanthanides and actinides; Commercial applications;Rare earth Oxides used for Industries.	06

4	**Organometallic compounds; Definition** Nomenclature, Preparation properties and application and bonding of alkyl and Aryl compound. Electronic and Ionic Conduction , Metals, insulators and semiconductors, electronic structure of solids application in electronic and electrical industries. Bonding of ligands, Reactions of organometallic, Electron accountancy, Oxidative addition and reductive elimination, Insertion and α/β-elimination, Industrial organometallic catalysis, Olefin catalysis Organometallic compounds and application in electronic materials.	07
5	**Recent Advances In Inorganic Chemistry** : Borane, Silanes, Inorganic nanotechnology, Zeolite, Bio-inorganic chemistry (must emphasize the metal) Ceramics, Inorganic thin films, Intercalation compounds, Super acids , High-temperature superconductors, nanowire battery, Perovskites nonvolatile memory materials.	08
	Total	**60**

Practicum/ Graded Assignments:

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

References and Text Books:

1. Basic Inorganic Chemistry F.A. Cotton. G. Wilkinson and P.L. Gaus. Wiley.
2. Concise Inorganic Chemistry, J.D. Lee ELBS.
3. Concepts of Models Inorganic Chemistry B.Douglas. D.McDaniel and J.Alexander, John Wiley.
4. Inorganic Chemistry. D.E. Shriver P.W. Atkins and C.H. Langford, Oxford.
5. Inorganic Chemistry, W.W. Porterfield Addison Wesley.
6. Inorganic Chemistry, A.G. Sharpe. ELBS.
7. Inorganic Chemistry, G.L. Miessler and D.A. Tarr, Prentice Hall.
8. Group Theory and Its Chemical Applications: P. K. Bhattacharya
9. Inorganic Chemistry: J. E. Huyee, Principles of Structure & Reactivity, 3rd Ed.
10. Selected Topics in Inorganic Chemistry: W. U. Malik, G. D. Tuli and R. Madan

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Zoology VI(ENVIRONMENTAL BIOLOGY)	**[ZY-311]**

B.Sc-B.Ed. Semester-V (Autumn)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1. To create an understanding regarding concepts of ecology.
2. To gain knowledge about habitat ecology.
3. To have understanding about waste water technology.
4. Able to understand environmental biotechnology

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Concept of Ecology:** Abiotic and Biotic Factors • Energy flow in ecosystem • Food chain and Food web • Biogeochemical cycle: C02. Nand P • Population Concept- Characteristics of population. Factors affecting population growth. • Community Concept-Succession, Periodicity ,Indicators.	8
2	**Habitat Ecology:** Fresh water habitat - Factors and classification. • Marine habitat- Factors and classification • Terrestrial habitat - Factors and classification. • Ecological divisions of India. • Natural resources and their Conservation with special reference to forests	7
3	**Man and Environment:** Wild life conservation (Laws, National Parks and Sanctuaries of MP) • Environmental degradation and pollution . • Thermal and Noise pollution • Radiation Ecology ,Global Warming and Green House Effect • Urbanisation and effect of human population on environment.	7

4	**Waste Management Technologies:** Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, Biomedical waste handling and disposal, Nuclear waste handling and disposal, Waste from thermal power plants, Case histories on Bhopal gas tragedy, Chernobyl disaster, Seveso disaster and Three Mile Island accident and effect of human population on environment.	7
5	**Diseases:** Causes, symptoms and control of Social and economic factors of disease including role of health services and other organizations: Infectious (Bacterial-Tuberculosis, Typhoid; Viral- AIDS, Poliomyelitis, Hepatitis; Protozoan- Leishmaniasis, Malaria,Cholera, Lifestyle and Inherited/genetic diseases, Immunological diseases; Cancer; Diseases impacting on Western versus developing societies.	7
	Total	**36**

Practicum/ Graded Assignments:

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. OdumE.P.,Fundamental of Ecology- WB Saunders
2. Call man, Ecology- Johnwilley& Sons
3. K. Clark, Elements of Ecology - Wiley • Harper & Row, Elements of Ecology Smith R.S. - New York
4. K.C. Agarwal, Wild Life in India Conservation and Management- Nidhi Pub.
5. M ..ShamimJairajPuri, Biological Diversity and Environment
6. Kumar &Asija , Biodiversity Principles & Conservation- Agrobios
7. Saharia, Wild life of India- Natraj Publisher • K.C. Agarwal, Biodiversity- Botanica
8. Jha, Genes & Evolution- John Pub. • Colbert, Evolution- Wiley- Liss
9. B.D. Sharma, Indian Wild life Resource & Development, Daya Pub

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ZOOLOGY-VII MICROBIOLOGY	**ZY-313**

B.Sc-B.Ed. Semester-V (Autumn)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1. To create an understanding regarding microbiology.
2. To gain knowledge about microbial nutrition and growth.
3. To have understanding microbial cell organization.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**History of Microbiology and classification** History of development of microbiology as a discipline, Spontaneous generation versus biogenesis, development of various microbiological techniques, concept of fermentation, establishment of fields of medical microbiology, immunology and environmental microbiology Molecular methods of assessing microbial phylogeny- molecular chronometer, phylogenetic trees, rRNA, DNA and proteins as indicator of phylogeny. Major Divisions of life- Domains, Kingdoms.	7
2	**Microbial Nutrition and Growth** Nutritional types of microorganisms, growth factors, culture media-synthetic and complex, types of media; isolation of pure cultures, growth curves, mean growth rate constant, generation time; general concept of effect of environmental factors on growth of microbes; sterilization and disinfection; activity, use of physical methods (heat, low temperature, filtration, radiation)and chemical agents (phenolics, halogens, heavy water, sterilization gases).	7
3	**Microbial Cell organization** Cell size, shape and arrangement, glycocalyx, capsule, flagella, fimbriae and pili; Cell-wall: Composition and detailed structure of Gram positive and Gramnegative cell walls, Archaebacterial cell wall, Gram and acid fast staining mechanisms, lipopolysaccharide (LPS) and protoplasts.	7

	Effect ofantibiotics and enzymes on the cell wall; Cell Membrane: Structure, function and chemical composition of bacterial and archaeal cell membranes; Cytoplasm: Ribosomes, mesosomes, inclusion bodies, nucleoid, chromosome and plasmids; Endospore: Structure, formation, stages of sporulation.	
4	**Microbial Genetics** Bacterial recombination: general and site specific and replicative; Bacterial plasmids - fertility factor, col plasmid; Bacterial conjugation- (Hfr, F`, F+ X F-); Transformation; Transduction- generalized and specialized	7
5	**Food and Microbiology** Overview of importance of microbiology in food and industrial microbiology; Microorganism growth in food; extrinsic and intrinsic factors for food spoilage; microorganisms causing food spoilage in fresh food, milk, and canned food; Preservation of foods by aseptic handling, high temperature, low temperature, dehydration, osmotic pressure, chemicals and radiations; preparation of fermented food products, fermented milk such as yoghurt, curd and cheese.	7
	Total	**36**

Practicum/ Graded Assignments:

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1.Sharma P.D. Microbilogy - Rastogi Pub. Meerut.

2. Madigan and Martinko: Brock Biology of Microorganisms (2006, Prentice Hall)

3. Prescott, Harley and Klein: Microbiology (1999, McGraw)

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SCHOOL OF EDUCATION
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2025-2029
B.Sc-B.Ed. Semester-V (Autumn)

Chemistry –V Lab	CY-361

EVALUATION
SCHEDULE PER WEEK
Practical -2
CREDITS-2

S. No.	Name of Experiment
1	Estimation of borax - Standard Sodium Carbonate
2	Estimation of Sodium Hydroxide - Standard Sodium Carbonate
3	Estimation of HCl – standard oxalic acid.
4	Estimation of Copper - Standard Copper sulphate
5	Estimation of Potassium dichromate - Standard Potassium dichromate Complexometric
6	Estimation of Magnesium using EDTA.
7	Estimation of Zinc using EDTA.
8	Estimation of ferrous ion using Diphenyl amine / N-Phenylanthranilic acid as indicator. Precipitation titration
9	Estimation of Chloride in neutral medium. (Demonstration - experiment)
10	Estimation of ferrous sulphate – Standard FAS.

Reference Books:

1. Vogel's Qualitative Inorganic Analysis, A.I. Vogel, Prentice Hall, 7th Edition.
2. Vogel's Quantitative Chemical Analysis, A.I. Vogel, Prentice Hall, 6th Edition.

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CURRICULUM AND SCHOOL	**[ED-301]**

B.Sc-B.Ed. Semester-V (Autumn)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1. Meaning, scope, need and aims of curriculum.
2. Difference between curriculum and syllabus and relationship between curriculum syllabus and text book.
3. Curriculum at different level and principles of curriculum construction.
4. Role of school in executing the curriculum.
5. Role of head teacher's management in curriculum engagement. Curriculum frame work of NCF – 2005.
6. Acquaint them with the school support system and state and central agencies- role of administration and management.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Introduction to curriculum:** 1. Meaning and concept of curriculum. 2. Need and aims of curriculum in schools. 3. Difference between curriculum and syllabus, and relationship between curriculum syllabus and text book. 4. Visualizing curriculum at different level: national, state, school and class. 5. Principles of curriculum construction.	12
2	**Curriculum development at school level:** 1. Understanding different approaches of curriculum: Subject center approach, Learner center approach and integrated approach. 2. Process of curriculum making: a) Formulating aims and objectives. b) Determinants of curriculum construction. c) Selection criteria for subject matter. d) Organization of subject matter. e) Instructional material.	12

3	**School support system:** 1. Educational administration and management: meaning, concept and difference between administration and management and its role for supporting the schools. 2. Community, society and family as a support system. 3. State agencies: SCERT, State Department of Education and DIET. 4. Central agencies: NCERT, NCTE, CBSE.	12
4	**Curriculum implementation and monitoring:** 1. Reviewing of aims and process of curriculum development 2. Process of curriculum evaluation and revision. 3. Role of government bodies in monitoring of the curriculum. 4. NCF – 2005.	12
5	**School: a site of curriculum engagement/ Implementation** 1. Role of school in executing the curriculum. 2. Essential conditions of school for transecting the curriculum smoothly (physical and human resources). 3. Role of stakeholders- Head/Principal, teachers, management and govt.	12
	Total	**60**

Practicum/ Graded Assignments:

1. Preparation of a CD of different types of curriculum and their importance.
2. P.P. Presentation on process of curriculum making in any subject.
3. Preparation of an observation scale for the roles of school personnel for conduction/ execution of curriculum.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Agarwal, J.C.; School Administration, Surya Publication, Meerut.
2. Aggrawal, J.C. (1990); Curriculum reforms in India, Duaba House, Delhi.
3. Devis I (1976); Objectives in curriculum design, Mc Graw Hill Co., London.
4. J.M. and Chase J.B. (1969); Curriculum principles and social trends, New Art, America US.
5. Kaushik, S.L; Shiksha ka Vikas, Rajasthan Hindi Granth Academy, Jaipur.
6. Kelly, A.V. (1989); The Curriculum: Theory and Practice, Paul Chapman Pub., London.
7. Krug, E. (19857); Curriculum Planning, Harper and Rao, New York.
8. Mahendi, B. Arora, G.L and Goyal, B.R. (1981); Our Curriculum Concern, NCERT, New Delhi.
9. Mamidi, M.R. and Ravishankar, S. (1984); Curriculum development and Educational Technology, Sterling Pub., Delhi.

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SCHOOL OF EDUCATION
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2025-2029

ICT-A TOOL IN TEACHING LEARNING – I	**[ED-303]**

B.Sc-B.Ed. Semester-V (Autumn)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-2 CREDITS-2	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint the pupil teacher with the:

1. ICT application in class room and professional development and in teaching learning process.
2. Awareness about functioning of computer, concept of hardware and software and education software, computer memory and its unit.
3. Basic features of windows: MS-Office, MS-Excel and preparation of slides.
4. Computer aided instruction concept and modes.
5. Internet and multimedia Concept and its educational uses.
6. Role of computer in education system.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Information and communication technologies – an Introduction** a) Meaning and definition of ICT: information and communication basics, nature and scope of a communication system – sender, receiver, message and the medium, one-to-one, one-to-many, and many-to-many communication. b) Information and Communication Technologies in Teaching Learning: Teaching learning contexts and the need for ICT devices and applications. c) Applications of Information and Communication Technologies: Classroom and ICT, Professional development and ICT, School management and ICT.	12
2	**Computer Fundamentals:** 1. General awareness about functioning of Computer- a. Characteristics and uses of Computer in Education (Planning, question paper preparation, evaluation, open learning system) b. Block diagram of Computer c. Classification of Computer 2. Concept of hardware, software and education software. 3. Input/output devices 4. Primary storage devices & secondary storage devices. 5. Computer memory and its units-RAM, ROM bit and byte	12
3	**Operating System:**	12

	1. Basic features of Windows 2. Windows and it's accessories a) Explorer b) File Manager c) Paint d) Managing Printing **MS-Office** MS-Word-Text Management, Preparation of Resume, Application, Bio-data, tables & commands **MS-Excel-** Preparation of Table, Chart, formulas & commands **POWER POINT-** Preparation of Slides, Paper Presentation & commands	
4	**Computer as teaching machine:** a. Computer Aided Instruction (CAI)-Concept and modes b. Concept of other terms like CMI (Computer Managed Instructions) CBI (Computer Based Instructions) CALT Computer Assisted Learning and Teaching) c. Information Technology and Computer (Concept, role, impact on education system) **Internet and Multimedia** 1. Videoconferencing, Chatting, Videocalls, E-Mail, Internet surfing for educational purpose websites, Search Engines. 2. Concept of Multimedia and its educational uses	12
5	**Computer and its role** Role of Computer in Education System – • library Management, • Education and School management, • evaluation system • education and research	12
	Total	**60**

Practicum/ Graded Assignments:

1. Identifying appropriate media and material for effective use in the transaction of lesson.
2. Critical analysis of Teaching aids and their applications in instruction and learning
3. Critical analysis of a computer based media packages with reference to its use in learning process.
4. Preparation and presentation of slides for teaching any topic at the school level.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Reghavan, S.S; Macro Computer in Science and Language teaching, Mysore R.C.E.
2. Osborne A; An Introduction to Micro Computers, Galgolia Book Source, New Delhi.
3. Kaur Harjit; Computer, Aatmaram & Sons, New Delhi.
4. Vakatachamal, S.; Computer ek parichay, Pitambar publication company Pvt. Ltd. New Delhi.

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SCHOOL OF EDUCATION
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UNDERSTANDING A DISCIPLINE SCIENCE	**[ED-313]**

B.Sc-B.Ed. Semester-V (Autumn)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: The pupil teacher will be able to understand:

1. The ethical aspect of science and science for environmental health and piece.
2. Different discipline of science: biological and physical.
3. Development of various skills in science teaching.
4. Contemporary issues in science education.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Nature and scope of Science:** a) Science: its meaning, definition nature and importance. b) Scope of science. c) Innovation and creativity in science. d) Ethical aspects of science. e) Science for environment health and peace.	9
2	**Different disciplines of Science – I** a) Physical Science: meaning, nature and importance of Physical Science. b) Scope of Physics and Chemistry as a subject. c) Objectives of teaching Physical Science in School level. d) Role of eminent scientist in the field of Physical Science. e) Contribution of Issac Newton, CV Raman, Dalton, Neil Bohr, J.C. Bose in the field of Science.	9
3	**Different disciplines of Science – II** a) Biological science as an area of science: meaning, concept and importance. b) Scope of Biology: Botany, Zoology, Biotechnology, Microbiology. c) Place and values of teaching Biology at school level.	9

	d) Objectives of teaching Biology at secondary and senior secondary level. e) Main discoveries and development in Biology.	
4	**Learning and teaching in Science Education:** a) Motivating science students to learn scientific process/method. b) Developing scientific temper/attitude in school students at secondary and senior secondary. c) Involving learners in teaching learning process: Projects, Group Discussions, Investigatory Approach, and Experimental Learning. d) Developing various skills in science teachers. e) Developing various skills among in the students.	9
5	**Contemporary issues in Science Education:** a) Science and technology. b) Science and society. c) Science and economy. d) Language and science. e) Teacher empowerment.	9
	Total	**45**

Practicum/ Graded Assignments:

1. Contribution of eminent personalities (Discipline related).
2. Importance of discipline related areas in building up the career (Seminar).
3. Prepare an innovative plan for teaching any topic of your discipline.
4. Prepare the support material of any unit of your discipline.
5. PPP of the recent trends in Science teaching.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Sood, J.K.; Teaching Life Sciences, Kohli Publishers, Chandigarh
2. Sharma, L.M.; Teaching of Science & Life Science, Dhanpat Rai & Sons, Delhi.
3. Vadav, M.S.; Modern methods of teaching sciences, Anmol Publisher, Delhi.
4. Singh, U.K. & Nayab, A.K.; Science Education, Common wealth Publishers Daryaganj, New Delhi.
5. Venkatash, S.; Science Education in 21st century, Anmol Publishers, Delhi.

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DETAILED SYLLABUS
2025-2029

BOTANY VII (PLANT PHYSIOLOGY)	**[BY-312]**

B.Sc-B.Ed. Semester-VI (Spring)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

- To create an understanding regarding the plant water relation,
- To gain knowledge about mineral nutrition,
- To have understanding about photosynthesis,Cell fractionation,
- To have understanding about spectroscopy and chromatographic techniques.

Unit	**Contents of the Subject**	**No. of Teaching Hours required**
1	**Plant Water Relations** Structure and properties of water Absorption of water (active and passive), Ascent of sap; Pathway of water movement; concepts of symplast and apoplast,Guttationand transpiration, Significance of transpiration Physiological role of stomata	8
2	**Mineral Nutrition** Macro and Micro nutrients; Role of essential nutrients in plant metabolism and their deficiency symptoms, Absorption of mineral elements, Active and passive absorption, Simple and facilitated diffusion, Donnan equilibrium Role of ATP, Carrier systems, proton pump and ion flux.	8
3	**Photosynthesis** Definition and Significance**,** Site of photosynthesis, Photochemical phase, Electron transport chain.Photophosphorylation- (cyclic and non cyclic).	7

4	**Photorespiration** Biosynthetic phase, Benson and Calvin cycle, Hatch and Slack pathway, Photorespiration Significance	7
5	**Plant Growth And Development** Physiological effect of Auxin. Cytokinins, Gibberellinsand Ethylene and their role in plant development. Physiology of senescence and abscission Brief outlines on, Photoperiodism, Vernalization. Phytochrome.	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

- 1. Daubenmier, RF.1970. Plants and Environment: A text book of Plant Autoecology, Wiley Eastern Private Limited
- Dennis, D.T., Layzell, D.B., Lefebre, D.D. and Turpin, D.H. (1997) Plant Metabolism. Addison Wesley Longman.
- Hopkins, W.G. and Huner, P.A. (2008) Introduction to Plant Physiology. John Wiley and Sons.
- Kaul RP (2009) Plant Metabolism. Swastik Publishers and Distributors.
- Koromondy EJ 1996 Concepts of Ecology 4th Edition Prentice-Hall of India Pvt. Ltd. New Delhi
- Misra KC 1988 Manuals of Plant Ecology (3rd Edition) Oxford and IBH Publishing Co., New Delhi.
- Mukherjee S., Ghosh AK., 2006 Plant Physiology New Central Book Agency Calcutta

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BOTANY-VIII (BIOTECHNOLOGY & UTILIZATION OF PLANTS)	**[BY-314]**

B.Sc-B.Ed. Semester-VI (Spring)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

- To create an understanding regarding biotechnology,
- To gain knowledge about genetic engineering,
- To have understanding about medicinal plants and economic botany.

Unit	**Contents of the Subject**	**No. of Teaching Hours required**
1	**Biotechnology** Functional definition; basic aspects of plant tissue culture; cellular totipotency differentiation and morphogenesis; biology of Agrobacterium; vectors for gene delivery and marker genes; salient achievements in crop biotechnology.	6
2	**Genetic engineering** Tools and techniques of recombinant DNA technology; cloning vectors; genomic and DNA library; transposable elements; techniques of gene mapping and chromosome walking.	8
3	**Utilization of plants** Centres of origin distribution, cultivation, harvesting & economic values of the following. Food plants : Rice, wheat, maize, potato and sugarcane. Fibers : Cotton, coir and jute with reference to their sources, characteristic, classification & uses. Vegetable oils : Groundnut, mustard and cocount with reference to properties, extraction & classification	8
4	**General account of sources** General account of sources of firewood, timber and bamboos. Spices : Medicinal plants : General account with special reference to Rauwolfia, Cinchona, Neem& Opium. Beverages : Tea and coffee with reference to cultivation, harvesting & processing & utility. Rubber : Technique for manufacture, properties & uses.	7

5	**Useful microbes in biotechnology** Useful microbes in biotechnology; strain selection and improvement with special reference to the role of genetic engineering in strain development, Importance and application of plant tissue and animal cell culture, development of transgenic plants and animals, Prospects of microbial biotechnology in the context of agriculture, environment, medicine and energy, Regulation of the safety of biotechnology procedures and products, Genetically engineered microbes: fate and effects	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

- Brown, T.A. (1998). Molecular Biology Labfax II: Gene Cloning and DNA Analysis. II Edition, Academic Press, California, USA.
- Glick, B.R. and Pasternak, J.J. (2009). Molecular Biotechnology - Principles and Applications of Recombinant DNA. IV Edition, ASM press, Washington, USA.
- Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009). An Introduction to Genetic Analysis. IX Edition. Freeman and Co., N.Y., USA.
- Snustad, D.P. and Simmons, M.J. (2009). Principles of Genetics. V Edition, John Wiley and Sons Inc.
- Watson, J.D., Myers, R.M., Caudy, A. and Witkowski, J.K. (2007). Recombinant DNA-Genes and Genomes- A Short Course. III Edition, Freeman and Co., N.Y., USA.
- Beauchamp, T.I. and Childress, J.F. (2008). Principles of Biomedical Ethics. VI Edition, Oxford University Press.

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Chemistry-VII (Physical &MiscChemistry-II)	**[CY -312]**
B.Sc-B.Ed. Semester-VI (Spring)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 Tutorial -1 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives : This course deals with the application of structure and theory to the study of Solution colligative properties , Nuclear chemistry and heterogeneous system

Unit	**Contents of the Subject**	**No. of Teaching Hrs required**
1	**Solution and Colligatives :** Expression of Concentration of Solids in Liquids ,Solid Solutions ,Colligative Properties -Relative Lowering of Vapor Pressure ,Raoult's Law Elevation of Boiling Point ,Depression of Freezing Point ,Osmotic Pressure ,Determination of Molecular Masses using Colligative Properties 'Van't Hoff Factor and Calculations involving it ,	07
2	**Nuclear Chemistry:** Nuclear chemistry; Fundamental particles of nucleus (nucleons); Concept of nuclides and its representation; Isotopes, isobars and isotones (with specific examples); Forces operating between nucleons (n-n, p-p, & n-p); Qualitative idea of stability of nucleus (n/p ratio). Radiochemistry: Natural and artificial radioactivity; Radioactive disintegration series, Radioactive displacement law, Radioactive decay rates, Half-life and average life, Nuclear binding energy, Mass defect and binding energy. Nuclear reactions; spallation, nuclear fission and fusion. Application radioactive waste management radioactivity.	08
3	**Phase equilibrium**: Heterogeneous system, Phase diagram of one and two component system. **Surface chemistry:** Interface (chemistry) Surface modification of biomaterials with proteins, Surface finishing, Surface modification, Surface phenomenon, Tribology **electrocardiography. Polarography theory, Ilkovic equation; half wave potential and its significance**	06
4	**Soil and Environmental Biogeochemistry** : Soil Chemistry, Chemistry of Soils: interactions between soil solids, precipitates and solution phases including: mineralogy, ion exchange, adsorption, weathering and buffering, soil colloidal .Soil Humic Substances. **Soil Testing's and salinity**	07

5	**Environmental and Green Chemistry : Environmental Issues** :Go Green ,Consumer Health & Food Safety Concerns , Environmental Disasters, Chemical reactions in environment, Impact of primary and secondary pollutants **Basics of Green Chemistry.** Definition of green chemistry, How green chemistry differs from cleaning up pollution, Green chemistry's 12 principles Green chemistry's roots in the Pollution Prevention Act of 1990 **.**Intellectual property Right	08
	Total	**36**

Practicum/ Graded Assignments:

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

References and Text Books:

1 Barrow, G. M. Physical Chemistry Tata McGraw-Hill (2007).

2. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).

3. Mahan, B. H. University Chemistry 3rd Ed. Narosa (1998).

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
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Chemistry VIII (Organic Chemistry-II)	**[CY -314]**
B.Sc-B.Ed. Semester-VI (Spring)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 Tutorial -1 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives : It focuses on the methods used to identify the structure of organic molecules, advanced principles of organic stereochemistry, organic reaction mechanisms, and methods used for the synthesis of organic compounds. Additional special topics include illustrating the role of organic chemistry in biology, medicine, and industry.

Unit	**Contents of the Subject**	**No. of Teaching Hrs required**
1	**Aldehyde and Ketone :** Aldehyde synthesis by deportation or hydrolysis ,Aldehyde synthesis by oxidation of alcohols and rearrangements , 1,3-Dike tone synthesis by oxidation , Insole synthesis Ketone synthesis by oxidation of alcohols, Nucleophilic addition reactions.	07
2	**Carboxylic Acids:** Structure , Acidity, Synthesis , Carboxylic Acid Derivatives : Acryl Transfer Reactions : Background , Acid Chlorides/Anhydrides , Esters Amides , Chemistry of Nitriles : Formation Reactions. Acids, Tartaric acid Citric acid	08
3	**Conjugated Systems**: Molecular Orbital Theory: Conjugated Systems and frontier Molecular Orbital Theory Correlation diagrams, Pericyclic Reactions – Introduction to Electrocyclic– and Cycloadditions reactions, 1,3 and 1,5 Sigmatropic Rearrangements.	06
4	**Polymers :** Thermoplastcs and Thermosetts, polymerization classification, compounding of plastics, Elastomers natural and artificial rubber Industrial application of polymers biodegradable plastics.Industrial Process in polymers injection molding, foaming, reinforcing and fiber spinning.	07

5	**Advanced Organics :** Reaction intermediates and determination of reaction mechanism, concept of medicinal chemistry and drug design. Photochemistry, laws of photochemistry, Jablonski diagram, Norish-I & II reactions, Concept of Spectroscopy, IR, NMR, Mass, Raman and UV-visible spectroscopy for organic compounds, sample handling, instrumentation and applications	08
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

References and Text Books:

1. Carey, F. A., and R. J. Sundberg. Advanced Organic Chemistry, Part A: Structure and Mechanisms. 4th Ed. New York, NY: Springer, 2000.
2. Joule, J. A., and K. Mills. Heterocyclic Chemistry. 4th ed. Malden, MA: Blackwell Science, 2000.
3. L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
4. R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
5. ArunBahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand
6. Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
7. S.M.Mukherjee and S.P.Singh ,Reaction Mechanism in Organic Chemistry,Mc Millan (2004).

Bhupinder Mehta and Manju Mehta, Organic Chemistry, PHI Learning (2009).

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2025-2029

ZOOLOGY-VIII APPLIED ZOOLOGY	**ZY-312**

B.Sc-B.Ed. Semester-VI (Spring)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

1.To create an understanding regarding aquaculture.
2. To gain knowledge about sericulture.
3. To have understanding about lac culture and apiculture

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Principles of Aquaculture** Concept of Commercial Fish Production, Site, Species, System, Business Selection/Evaluation/Permits and Regulations Production Planning/Types of Production Systems, Record Keeping, Water Budgets, Pond Preparation- Liming and Fertilizing, Pond Preparation.	7
2	**Sericulture, Lac culture and Apiculture** History, Classification and Biology of Honey Bees Social Organization of Bee Colony, Artificial Bee rearing (Apiary), Beehives – Newton and Langstroth Bee Pasturage Selection of Bee Species for Apiculture Bee Keeping Equipment Methods of Extraction of Honey (Indigenous and Modern). Sericulture, Lac culture.	7
3	**Pisciculture and Aquarium fish keeping** Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed, The potential scope of Aquarium Fish Industry as a Cottage Industry, Exotic and Endemic species of Aquarium Fishes Insect & Unwanted Fish Control, Handling/Grading/Transportation/Harvesting.	7

4	**Poultry keeping** Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs	7
5	**Insects of Economic and Medicinal Importance** Biology, Control and damage caused by Helicoverpaarmigera, Pyrillaperpusilla and Papiliodemoleus, Callosobruchuschinensis, Sitophilus oryzae and Triboliumcastaneum, Medical importance and control of Pediculushumanus corporis, Anopheles, Culex, Aedes, Xenopsyllacheopis.	8
	Total	**36**

Practicum/ Graded Assignments:

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1.Dunham R.A. (2004). Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications, U.K.

2.Prost, P. J. (1962). Apiculture. Oxford and IBH, New Delhi.

3.Bisht D.S., Apiculture, ICAR Publication.

4.Singh S., Beekeeping in India, Indian council of Agricultural Research, New Delhi.

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2025-2029

YOGA EDUCATION	**[ED-302]**

B.Sc-B.Ed. Semester-VI (Spring)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-2 CREDITS-2	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: The pupil teacher will be able to understand:

1. Define the philosophy of yoga.
2. Explain the psychology of yoga.
3. Describe the socio-moral base of yoga.
4. Explain physiology of Yoga.
5. Classify yoga, yogic diet and yogic lifestyle.
6. Explain medical aspects of yoga in terms of improving mental health and reducing stress.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Concept of Yoga:** 1. What is yoga? (Philosophical & Psychological aspects) 2. Types of yoga (Eight folder path). 3. Importance of yoga.	**6**
2	**Basis of yoga:** 1. Patanjali yogsutra. 2. Bhagwat Gita. 3. Yog upnishad.	6
3	**Theories of yoga practice:** 1. Asana. 2. Pranayam. 3. Kriyas. 4. Dhayan.	6
4	**Yoga Asans:** 1. Types of yoga asans. 2. Advantage of yoga exercise. 3. Precautions to be taken during yoga and exercise.	6

5	**Health and yoga:** 1. Effect of yoga exercise on different system of body. 2. Yoga and diseases. 3. Personality development through yoga.	6
	Total	**30**

Practicum/ Graded Assignments:

1. Prepare charts for different asana and exercises.
2. Prepare a presentation on any topic of yoga from syllabus.
3. Visit to different yoga centers and prepare a report.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Bawara, B. V. (1993). Aapki Apni Baat, Haryana: Divine Radiance Publications.
2. Besant, A. (2005) An Introduction to Yoga., New Delhi: Cosmo
3. Iyenger, B.K.S. (1996). Lighter on Yoga. New Delhi: Harper Collins Publishers India Private Limited
4. Larson, J. G. & Bhattacharya, R. S. (2007). Encyclopedia of Indian Philosophies, Vol. XII.Yoga: Gerald James Larson and Ram Shankar Bhattacharya, New Delhi: Motilal Banarsidass Publications.
5. Lata, P. (1996). Intelligence, Creativity, Self-concept and Personality Characteristics of Delinquents and Non-delinquents. Chandigarh: Panjab University.
6. Lzmailovich, Omand, S. (1960). Patanjali Yoga Pradeep. Gorakhpur: Gita Press
7. Rai, V.C. (1989). Effect of Sahaj Yoga Meditation on Cardiac Disorders. Delhi Medical College: Department of Physiology
8. Rao, P. V. K. (1995). Scientific and Psychological Significance of Yoga. Banaras Hindu University: Department of Education
9. Yadav, Y. P. & Yadav, R. (2003). Art of Yoga, New Delhi: Friends
10. Yogacharya,O. S. (2007). Freedom of Body and Mind: Yogasanas, Pranayam and Meditation, New Delhi: Rawat

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
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PEDAGOGY OF A SCHOOL SUBJECT GENERAL SCIENCE (Part – II)	**[ED-310]**

B.Sc-B.Ed. Semester-VI (Spring)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (0) & ESE (0)]

Objectives:

1. Understand the nature, scope, values and objectives of teaching science at secondary level.
2. Develop competence in teaching different topics of science effectively.
3. Develop scientific temper & provide teaching in scientific method of their student.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Curriculum planning and critical appraisal:** 1. Concept and meaning of General Science curriculum at secondary and senior secondary level. 2. Analysis of curriculum and syllabus of General Science of Rajasthan board and CBSE board at school level. 3. Need and importance of General Science text book. 4. Characteristics of good text book. 5. Language across the curriculum.	**9**
2	**Instructional support of systems - I:** 1. Meaning: need and importance of instructional support system. 2. Classification and types of teaching aids. 3. Audio visual aids. 4. Preparation of low cost teaching aids. 5. Recent trends in teaching aids.	**9**
3	**Instructional support of systems - II:** 1. School labs and experimental work. 2. Establishment of good quality labs at secondary and senior secondary level. 3. Organization of science clubs, fairs and exhibitions. 4. Excursion, field trips and educational tour. 5. Use of community resources.	**9**

4	**Co-curricular activities:** 1. Meaning and concept of co - curriculum activity. 2. Need and its importance. 3. Classification and its types at school level. 4. Planning, organization and its execution.	**9**
5	**Innovation and recent trend in TLP:** 1. Concept and meaning of teaching learning process. 2. Innovative method in General Science teaching of school level. 3. Need and importance in present context. 4. New trends in teaching General Science in relation to ICT.	**9**
	Total	**45**

Practicum/ Graded Assignments:

1. Prepare a plan on career avenues related to the subjects.
2. Prepare the chart with pictures of eminent personalities of the subjects.
3. Observation of teacher and learner behavior in the class.
4. Prepare a program institution based plan on nay unit.
5. Survey on teaching methods used by regular teachers in Schools.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

4. Sood, J.K.; Teaching Life Sciences, Kobli Publishers, Chandigarh
5. Sharma, L.M.; Teaching of Science & Life Science, Dhanpat Rai & Sons, Delhi.
3. Kulsherstha, S.P.; Teaching of Biology, Loyal Book Depot, Meerut.
4. Yadav, K.; Teaching of life sciences, Anmol publishers, Daruagaj, Delhi
5. Vadav, M.S.; Modern methods of teaching sciences, Anmol Publisher, Delhi.
6. Singh, U.K. & Nayab, A.K.; Science Education, Common wealth Publishers Daryaganj, New Delhi
7. Venkataih, S.; Science Education in 21st century, Anmol Publishers, Delhi.
8. Yadav, M.S. (Ed); Teaching science at High level, Anmol Publishers, Delhi

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2025-2029

PEDAGOGY OF A SCHOOL SUBJECT CHEMISTRY (Part – II)	**[ED-308]**

B.Sc-B.Ed. Semester-VI (Spring)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To enable the student teacher to:

1. Understand the nature, place, values and objectives of teaching Chemistry at secondary/senior secondary level.
2. Establish its correlation with other subjects.
3. Use various approaches and methods of teaching chemistry.
4. Acquire the ability to develop instructional support system.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Curriculum planning and critical appraisal:** 1. Concept and meaning of chemistry curriculum at secondary and senior secondary level. 2. Analysis of curriculum and syllabus of chemistry of Rajasthan board and CBSE board at school level. 3. Need and importance of chemistry text book. 4. Characteristics of good text book. 5. Language across the curriculum.	**9**
2	**Instructional support of systems - I:** 1. Meaning: need and importance of instructional support system. 2. Classification and types of teaching aids. 3. Audio visual aids. 4. Preparation of low cost teaching aids. 5. Recent trends in teaching aids.	**9**
3	**Instructional support of systems - II:** 1. Chemistry labs and experimental work. 2. Establishment of chemistry labs at secondary and senior secondary level. 3. Organization of science clubs, fair and exhibition. 4. Excussion field trips and educational tour. 5. Use of community resources.	**9**

4	**Co-curricular activities:** 1. Meaning and concept of co - curriculum activity. 2. Need and its importance. 3. Classification and its types at school level. 4. Planning, organization and its execution.	**9**
5	**Innovation and recent trend in TLP:** 1. Concept and meaning of teaching learning process. 2. Innovative method in chemistry teaching of school level. 3. Need and importance in present context. 4. New trends in teaching chemistry in relation to ICT.	**9**
	Total	**45**

Practicum/ Graded Assignments:

1. Prepare a plan on career avenues related to the subjects.
2. Prepare the chart with pictures of eminent personalities of the subjects.
3. Observation of teacher and learner behavior in the class.
4. Prepare a program institution based plan on nay unit.
5. Survey on teaching methods used by regular teachers in Schools.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Yadav, M.S.; Teaching of chemistry, Anmol publication, New Delhi.
2. Yadav, M.S.; Teaching science at Higher Level, Anmol Publications, New Delhi.
3. Misra, D.C.; Chemistry Teaching, Sahitya.
4. Kherwadkal, Anjali; Teaching of Chemistry by Modern Method, Sarup & Sons.New Delhi.
5. Das, R.C; Science Teachg in Schools, Sterling Publishers Pvt.Ltd., New Delhi.
6. Venkataih,S. ; Science education in 21st Century, Anmol Publishers, New Delhi.
7. Rao,D.B.; World Conference on Science Education, Discovery Publishing House, New Delhi.

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2025-2029

School Internship-III	**[TP-201]**

VII-SEM. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK PRACTICAL-36 CREDITS-18	EXAMINATION TIME = (3) HOURS [CIE (60) ESE (40)]

S. No.	**Teaching Practice and Practical Work**	**Internal/ External Assessment**
1.	Regular class room teaching delivery of 25 lessons in each subject (25*2 = 50 lessons)	20 credits (Internal+ External)
2.	Participation of co-curricular activities	
3.	Observation of teaching of peers (20 in each discipline and its report preparation)	
4.	Evaluation of lesson plans	
5.	Diagnostic test followed by remedial teaching	
6.	Involvement of student in lesson with the regular teacher in all day to day functioning along with teaching	
7.	2- discussion lessons	
8.	Exhibition of teaching aids	
9.	Organization of school trips	
10.	Research based project (action plan/ survey)	2 credits (Internal)
11.	Understanding the self- Conduction of various activities related to yoga, meditation, life skills, values and peace for school students as per instructions given by schools (EPC)	2 credits (Internal)
12.	2 - final lessons	

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2025-2029

CREATING AN INCLUSIVE SCHOOL	**[ED-408]**

VIII-SEM.B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:On completion of this course the students will be able to:

1. Understand the global and national commitments towards the education of children with diverse needs.
2. Appreciate the need for promoting inclusive practice and the roles andresponsibilities of all concerned personnel.
3. Develop critical understanding of the recommendations of various commissionsand committees towards teacher preparation for inclusive education.
4. Understand the nature of difficulties encountered by children and prepare conductive teaching learning environment in inclusive schools.
5. Analyze special education, integrated education, mainstream and inclusive education practices.
6. Identify and utilize existing resources for promoting inclusive practice.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Inclusive education** 1. Definition, concept and importance of inclusive education 2. Concept and difference of integrated, inclusive education and main stream education. 3. Historical perspective on inclusive education	12

2	**Children with diverse needs-** 1. Concept and meaning of Diverse needs 2. Definition and characteristics of children with sensory (hearing, visual and physically challenged) intellectual(gifted, talented, mentally challenged)developmental disability (autism, cerebral palsy, learning disability) 3. Slow learner and underachiever- meaning, definition, concept and types, characteristics.	12
3	**Preparation for inclusive education** 1. Concept and meaning of diverse needs. 2. Meeting the diverse needs- brief account of existing educational services in India for special, integrated and inclusive education. 3. Building inclusive learning friendly classrooms in relation to teacher and teaching methodologies, class room management and curriculum.	12
4	**Supporting children with diverse needs** 1. Role of teachers and management in an inclusive setting 2. Role of resource teachers, special educators and counselors. 3. Adaptation in instructional objective curriculum and co-curricular activities for meeting diverse needs of children with sensory, intellectual, learning disable, rural, tribal, girls, SC, ST and minority group	12
5	**Other aspect in inclusive education** 1. Assessment in inclusive education system. 2. Recommendation for inclusive education system in India 3. Critical investigation into inclusive education system in India.	12
	Total	**60**

Practicum/ Graded Assignments:

1. Discussion in group, presentation by students and seminar, visit to ashram,schools/institutions with innovation practices, internet.
2. Preparation of status report on education (elementary/secondary) of socially
3. Disadvantaged groups in a district/state region.
4. Evaluation of text books from the social group equality perspective.
5. Preparation of reportIdentification of research topic in the area of education of socially disadvantagedsections and preparation of proposals.

Note: Scheme of CIE

- Class tests : 10marks

- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Chudhary, B. (1992): *Tribal Transformation in India.* Vol.-V, New Delhi.
2. Jain, S.C. (2005): *Education and socio-economic development.* Concept publishing house, New Delhi.
3. Kagan, T.S. (2000): *Worldwide Diversity and Human Rights.* Orient Longman Pvt
4. Ltd., New Delhi.
5. Ogbu, J.U. (1978): *Minorities, education and caste.* Academic Press, New York.
6. Reissman, F. (1962): The Culturally deprived child. Harper and Raw Publishers, New Delhi.
7. Sadavinich, A.R. (2007): *Sociology of Education.* Rutledge, New York.

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2025-2029

MAJOR CONCERN AND ISSUES IN INDIAN EDUCATION	**[ED-410]**

VIII-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: On completion of this course the student will be able to:

1. Students will be able to understand the concept of peace and peace education, importance and aims.
2. Gain insight into the life skills education and need of life skills education, dimensions of life skills education.
3. Understand the meaning and concept of human rights education, aims, and status of human rights education.
4. Student will be able to understand the gender discrimination scenario in India, gender sensitive life skills approach of education.

5. Student will be able to understand the concept of private school versus expensive education wastage and stagnation demerits of contemporize examination system, problem of discipline, single teacher school.

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Peace education and value education** 1. Meaning & concept of peace and peaceeducation. 2. Principle of peace education. 3. Role of education in peace education role of teacher in peace education. 4. Meaning and concept of values and value education. 5. Role of education in developing values and ethics among students.	12
2	**Life Skills** 1. Meaning of life skills education. 2. Concept of life skills education. 3. Aims of life skills education. 4. Needs of life skills education. 5. Types of life skills education. 6. Dimensions of life skills education.	12
3	**Human rights** 1. Meaning of human rights education. 2. Concept of human rights education. 3. Need of human rights education. 4. Aims of human rights education. 5. Status of human rights in Indian Society. 6. Remedies for the protection of human rights.	12
4	**Gender Sensitizations** 1. Meaning of gender sensitization. 2. Gender discrimination scenario in India. 3. Education for women equality and gender sensitization. 4. Gender sensitive life skills approach of education.	12
5	**Major challenges in Indian education system** 1. Private school versus expensive education. 2. Wastage and stagnation. 3. Demerits of contemporary examination systems. 4. Problem of discipline.	12

	5. Single teacher school.	
	Total	**60**

Practicum/ Graded Assignments:

- *Prepare a PPT on* Gender discrimination scenario in India.
- *Prepare a CD on* Education for women equality and gender sensitization.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

Sr.No.	Name of Book	Author	Publisher
1	Educating the educators	Sharma M.L.	The Indian publication, Amballa Cantt.
2	Teacher Education, Modern Trends	Chakrabarti, Mohit	Kanishka Publisher, New Delhi
3	Challenges in Teacher Education	Chakrabarti, Mohit	Daya publishing, Delhi
4	Management of Teaching Education	Shrivastava, G.N. Prakash	Concept publishing, New Delhi
5	New directions in the education of Indian teachers	Desai D.M.	M.S. university, Baroda
6	Better Teacher education, Delhi	Pires, E.A.	Delhi University Press
7	Theory –Practical of teacher education in India,	Srivastava R.C.	Allahbad
8	Education of India Teacher	Uday Shankar	New Delhi, Slerling publishers
9	Teacher in emerging Indian society	M.S. Ansari	International publishing home
10	Teacher education in Dillema	Dr. M.S. Singh	Astha publication

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2025-2029

ASSESSMENT OF LEARNING	**[ED-412]**

VIII-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: The pupil teacher will be able to understand:

1. The concept of assessment, Measurement and evaluation.
2. Importance of different types of assessment and assessment devices.
3. Concept of Continuous and comprehensive evaluation- Grading system, CCE and year based evaluation.
4. Concept, need and importance of examination system.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Concept of assessment:** 1. Meaning and concept of assessment. 2. Purpose of assessment 3. Measurement and evaluation: meaning and concept 4. Interrelationship between measurement and evaluation 5. Objectives of measurement and evaluation.	12
2	**Classification of assessment:** 1. Based on purpose: prognostic, formative, diagnostic and summative. 2. Based on scope : teacher made and standardized 3. Attribute measured: achievement, aptitude, and attitude. 4. Nature of information gathered: qualitative and quantitative.	12

	5. Mode of response: oral, written, practical.	
3	**Assessment devices:** 1. Use of projects, assignment, worksheet, practical work, activities and seminar and report as assessment devices. 2. Cooperative learning and Participatory assessment. 3. Self, peer and teacher assessment. 4. Feed back to/from student, parents and teachers.	12
4	**Continuous and comprehensive evaluation:** 1. Concept, need and meaning. 2. Objectives and aims of CCE. 3. Grading system of evaluation 4. Difference between CCE and traditional method of evaluation. 5. Role of teachers in CCE.	12
5	**Examination system:** 1. Meaning and its concept. 2. Need and importance 3. Examination system: semester system, Annual system and entrance exam and their influence on students and school system. 4. Different types of questions (objective based) and blue print for school examinations.	12
	Total	**60**

Practicum/ Graded Assignments:

1. Prepare a report on the assessment scheme of SGVU School of Education.
2. Prepare the format of summative and formative assessment.
3. Demonstration of co-operative learning in peer groups.
4. Presentation of comprehensive and continuous evaluation scheme.
5. Preparation of Blue print on any one unit.
6. Preparation of the format for practical/ project evaluation and peer evaluation of participatory learning on the basis of CCE.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Allen L.G. (1995); Educational Psychology and classroom, Washington New York, John Willey and sons Inc. 1966
2. Bansal, V.P. (1958); Text book of Educational Psychology , Allahabad Indian Press
3. Bhatnagar, R.P. ; Educational Psychology , Vishwa Widhya, Pub. Gorakhpur
4. Bernard, M (1972); Psychology of Learning and Teaching , N.Y., Mc Graw Hill
5. Bhatnagar, Suresh (1976); Educational Psychology , Loyal Book Depot., Meerut
6. Blair, Jones and Simpson (1962); Educational Psychology, New York Mc Millon
7. Bhatia, H.R. (1968); Elements of Educational Psychology , Orient Lengman Calcutta
8. Crow L.D. and Crow A. (1973); Educational Psychology, Erassia Pub. House, New Delhi
9. Dorajh N.L. (1970); Advanced Educational Psychology, Allied Pub. Delhi
10. Garrison, K.C. (1956); Psychology of Adolescence , Prentice Hall, New York
11. Hurlock, E.B. (1955); Adolescence development, London Mc Grow Hill Co.
12. John P. , Deccan (1968); The Psychology of learning and instruction , Prentice Hall, India
13. Kundu, Dibaker (1991); Modern education psychology , Prentice Hall , New York
14. Rao Usha (2008); Advanced Educational Psychology, Himalaya Pub. House, Bomba

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2025-2029

LEARNER AND LEARNING	**[ED-414]**

VIII-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint the pupil teacher with the:

1. Growth and development of learners- concept, Factors effecting development and Dimension of individual development.
2. Different psychological attribute and Handling the learners on the basis of Cognitive ability, Disability and adjustment.

3. Concept and importance of motivation for teachers and learners.
4. Theories of motivation and Theories of learning- Constructivism, Gestalt, Insight etc.

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Growth and development of learner:** 1. Meaning, concept and difference between growth and development. 2. Factors effecting development. 3. Various stages of development from childhood to adolescence. 4. Dimensions of individual development in relation to physical, cognitive, affective, language and social aspect (in childhood and adolescent). 5. Principles of growth and development.	12
2	**Individual differences among learners:** 1. Meaning and concept of Individual differences. 2. Differences in different psychological attribute: intelligence, aptitude, interest, creativity, values, achievement and personality. 3. Handling the learners with: a) Cognitive ability: Gifted and Slow Learner. b) Disability: Handicapped, Dyslexia. c) Personality: Maladjusted, Delinquent.	12
3	**Learning:** 1. Concept, meaning and classification of learning. 2. Steps in learning process. 3. Nature and characteristics of learning. 4. Factors affecting leaning. 5. Managing the learning and teaching.	12
4	**Theories of learning:** 1. Stimulus response. 2. Insight. 3. Conditioning theory (skinner). 4. Gestalt. 5. Constructivism	12
5	**Learning and Motivation:** 1. Meaning and concept of motivation in learning. 2. Kind of motivation: Extrinsic and Intrinsic Motivation. 3. Characteristics of motivated behavior. 4. Importance of motivation for teachers and learners. 5. Psycho analytic and cognitive field theories of motivation.	12

	Total	**60**

Practicum/ Graded Assignments:

1. Observation of any child of age group 12 to upward on different dimensions of development and prepare a report.
2. Administration of any psychological test to identify the peculiar characteristics of the learner.
3. Prepare a plan for motivating the students as per their needs.
4. Administration of a tool to identify the learner styles of learning the different subjects.
5. Preparation of a lesson plan based on constructivism approach.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

1. Agarwal.J.C.; Essentials of Educational Psychology, Vikas Publishing House Pvt. Ltd.
2. Bigge; Learning Theories for Teachers, Harper, N.Y.
3. Blair, Jones and Simpson; Educational Psychology, Macmillan, N.Y.
4. Chauhan, S.S.; Advanced Educational Psychology, Vikas Publication House,N.D.
5. Garrison, K.C. (1956); Psychology of adolescence,Prentice Hall, New York.
6. Mangal, S.K. and Mangal, S. (2005); Child Development, Arya book Depo., New Delhi.
7. Mexer, H.W. (1978); Three theories of child development,Harper and Raw Pub., New York.
8. Pareek, M. (2002); Child development and family relationship, Research Pub., Jaipur.
9. Hurluck E.D. (1965); Adolescence development, Mack Grow Co. Learner.
10. Rao Usha (2008); Advance Educational Psychology,Himalaya Pub. House, Mumbai.
11. Sharma, R.K., Sharma M.S. and Tiwati A. (2006); Psychological Foundation of Child Development, Radha Pub. Mandir, Agra.

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2025-2029

PEDAGOGY OF A SCHOOL SUBJECT GENERAL SCIENCE (Part – II)	**[ED-424]**

VIII-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (0) & ESE (0)]

Objectives:

4. Understand the nature, scope, values and objectives of teaching science at secondary level.
5. Develop competence in teaching different topics of science effectively.
6. Develop scientific temper & provide teaching in scientific method of their student.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Curriculum planning and critical appraisal:** 6. Concept and meaning of General Science curriculum at secondary and senior secondary level. 7. Analysis of curriculum and syllabus of General Science of Rajasthan board and CBSE board at school level. 8. Need and importance of General Science text book. 9. Characteristics of good text book. 10. Language across the curriculum.	**9**
2	**Instructional support of systems - I:** 6. Meaning: need and importance of instructional support system. 7. Classification and types of teaching aids. 8. Audio visual aids. 9. Preparation of low cost teaching aids. 10. Recent trends in teaching aids.	**9**

3	**Instructional support of systems - II:** 6. School labs and experimental work. 7. Establishment of good quality labs at secondary and senior secondary level. 8. Organization of science clubs, fairs and exhibitions. 9. Excursion, field trips and educational tour. 10. Use of community resources.	**9**
4	**Co-curricular activities:** 5. Meaning and concept of co - curriculum activity. 6. Need and its importance. 7. Classification and its types at school level. 8. Planning, organization and its execution.	**9**
5	**Innovation and recent trend in TLP:** 5. Concept and meaning of teaching learning process. 6. Innovative method in General Science teaching of school level. 7. Need and importance in present context. 8. New trends in teaching General Science in relation to ICT.	**9**
	Total	**45**

Practicum/ Graded Assignments:

6. Prepare a plan on career avenues related to the subjects.
7. Prepare the chart with pictures of eminent personalities of the subjects.
8. Observation of teacher and learner behavior in the class.
9. Prepare a program institution based plan on nay unit.
10. Survey on teaching methods used by regular teachers in Schools.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

6. Sood, J.K.; Teaching Life Sciences, Kobli Publishers, Chandigarh
7. Sharma, L.M.; Teaching of Science & Life Science, Dhanpat Rai & Sons, Delhi.
9. Kulshersthа, S.P.; Teaching of Biology, Loyal Book Depot, Meerut.
10. Yadav, K.; Teaching of life sciences, Anmol publishers, Daruagaj, Delhi
11. Vadav, M.S.; Modern methods of teaching sciences, Anmol Publisher, Delhi.
12. Singh, U.K. & Nayab, A.K.; Science Education, Common wealth Publishers Daryaganj, New Delhi
13. Venkataih, S.; Science Education in 21st century, Anmol Publishers, Delhi.
14. Yadav, M.S. (Ed); Teaching science at High level, Anmol Publishers, Delhi

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2025-2029

PEDAGOGY OF A SCHOOL SUBJECTCHEMISTRY (Part – II)	**[ED-420]**

VIII-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-3 CREDITS-3	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:To enable the student teacher to:

5. Understand the nature, place, values and objectives of teaching Chemistry at secondary/senior secondary level.
6. Establish its correlation with other subjects.
7. Use various approaches and methods of teaching chemistry.
8. Acquire the ability to develop instructional support system.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Curriculum planning and critical appraisal:** 6. Concept and meaning of chemistry curriculum at secondary and senior secondary level. 7. Analysis of curriculum and syllabus of chemistry of Rajasthan board and CBSE board at school level. 8. Need and importance of chemistry text book. 9. Characteristics of good text book. 10. Language across the curriculum.	**9**
2	**Instructional support of systems - I:** 6. Meaning: need and importance of instructional support system. 7. Classification and types of teaching aids. 8. Audio visual aids. 9. Preparation of low cost teaching aids.	**9**

	10. Recent trends in teaching aids.	
3	**Instructional support of systems - II:** 6. Chemistry labs and experimental work. 7. Establishment of chemistry labs at secondary and senior secondary level. 8. Organization ofscience clubs, fair and exhibition. 9. Excussion field trips and educational tour. 10. Use of community resources.	**9**
4	**Co-curricular activities:** 5. Meaning and concept of co - curriculum activity. 6. Need and its importance. 7. Classification and its types at school level. 8. Planning, organization and its execution.	**9**
5	**Innovation and recent trend in TLP:** 5. Concept and meaning of teaching learning process. 6. Innovative method in chemistry teaching of school level. 7. Need and importance in present context. 8. New trends in teaching chemistry in relation to ICT.	**9**
	Total	**45**

Practicum/ Graded Assignments:

6. Prepare a plan on career avenues related to the subjects.
7. Prepare the chart with pictures of eminent personalities of the subjects.
8. Observation of teacher and learner behavior in the class.
9. Prepare a program institution based plan on nay unit.
10. Survey on teaching methods used by regular teachers in Schools.

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

8. Yadav, M.S.; Teaching of chemistry,Anmol publication, New Delhi.
9. Yadav, M.S.; Teaching science at Higher Level, Anmol Publications, New Delhi.
10. Misra, D.C.; Chemistry Teaching, Sahitya.
11. Kherwadkal, Anjali; Teaching of Chemistry by Modern Method, Sarup&Sons.New Delhi.
12. Das, R.C; Science Teachg in Schools, Sterling Publishers Pvt.Ltd., New Delhi.
13. Venkataih,S.; Science education in 21st Century, Anmol Publishers, New Delhi.
14. Rao,D.B.; World Conference on Science Education,Discovery Publishing House, New Delhi.

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2025-2029

ICT – A TOOL IN TEACHING LEARNING –II	**[ED-422]**

VIII-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK PRACTICAL-4 CREDITS-2	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives:

1. ICT application in class room and professional development and in teaching learning process.
2. Awareness about functioning of computer, concept of hardware and software and education software, computer memory and its unit.
3. Basic features of windows: MS-Office, MS-Excel and preparation of slides.
4. Computer aided instruction concept and modes.
5. Internet and multimedia Concept and its educational uses.
6. Role of computer in education system.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Windows' and its accessories** a) Explorer b) File Manager c) Paint d) Managing Printing	**6**
2	**MS-Office-I** MS-Word-Text Management, Preparation of Resume, Application, Bio-data,	**6**

	tables, mail merge & commands of MS-Word	
3	**MS-Office-II** MS-Excel- Preparation of Table, Chart, formulas, Marks Sheet Preparation & commands of MS-Excel	**6**
4	**MS-Office-III** POWER POINT- Preparation of Slides, Paper Presentation, Lecture Preparation & commands of PowerPoint	**6**
5	**Power Point:** Preparation of Slides, Paper Presentation, Lecture Preparation on related subjects.(content based)	**6**
	Total	**30**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks
- Two Mid Terms : 20marks

40marks

Recommended Books:

S.No.	Name of the Book	Author	Publisher
1.	Macro Computer in Science and Language teaching	Reghavan, S.S	Mysore R.C.E
2.	An Introduction to Micro Computers	Osborne A	Galgolia Book Source, New Delhi
3.	Computer	Koor Harjit	Aatmaram& Sons, New Delhi
4.	Computer ekparichay	Vakatachamal, S.	Pitabar publication company P.Ltd New Delhi
5.	An introduction to Computer Science	Balamurali, Savitha	Vikas Publishing House, Pvt.Ltd.New Delhi
6.	Computer an introduction	PayalLotia and Pradeep Nair	BPB Publication, New Delhi-110001

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SCHOOL OF EDUCATION

2025-2029

Post Internship –III B	**[TP-202]**

VIII-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK PRACTICAL-36 CREDITS-18	EXAMINATION TIME = (3) HOURS [CIE (60) ESE (40)]

S. No.	**Teaching Practice and Practical Work**	**Internal/ External Assessment**
13.	Regular class room teaching delivery of 25 lessons in each subject (25*2 = 50 lessons)	20 credits (Internal+ External)
14.	Participation of co-curricular activities	
15.	Observation of teaching of peers (20 in each discipline and its report preparation)	
16.	Evaluation of lesson plans	
17.	Diagnostic test followed by remedial teaching	
18.	Involvement of student in lesson with the regular teacher in all day to day functioning along with teaching	
19.	2- discussion lessons	
20.	Exhibition of teaching aids	
21.	Organization of school trips	
22.	Research based project (action plan/ survey)	2 credits (Internal)
23.	Understanding the self- Conduction of various activities related to yoga, meditation, life skills, values and peace for school students as per instructions given by schools (EPC)	2 credits (Internal)
24.	2 - final lessons	