School of Education

Year: 2021-22

B.Sc. B.Ed.

PROGRAM OUTCOME:

The Integrated B.Sc. B.Ed. program aims at developing the understanding and competencies required by practicing teachers for effective scientific teaching-learning process at the school level. This program prepares prospective teachers to understand the psychological and sociological aspects of the child's development and understand his behavior under different conditions. Also, to learn the various methodologies and technologies of teaching learning processes of the Science domain. The Program structure combined with theoretical and rigorous practice-teaching which prepares teacher trainees to become the master the art of teaching and the ability to deal with students based on their individual differences in various classroom situations.

PROGRAM SPECIFIC OUTCOME:

- To provide opportunities to teacher trainees that enable learning experiences to make subject matter meaningful at secondary level.
- To make the student teachers understand how children learn and develop, how they differ in their approaches to learning and create learning opportunities that benefit diverse learners and learning contexts.
- To develop the skills of student teachers to plan learning experiences in and outside the classroom that are based on learners' existing proficiency, interests, experiences and knowledge, and enable them to understand how students come to view, develop, learn and make sense of subject matter contained in the curriculum.
- To develop the capacity among student teachers to use knowledge of effective verbal, non-verbal and media communication techniques to foster active enquiry, collaboration, and supportive interaction in the classroom.

B. SC. Biology

Course Outcomes:

Course code	Course name	Course outcomes
SC 111	Botany-I Biodiversity (Microbes, Algae, Fungi and	CO.1 To create an understanding regarding plant taxonomy
		CO.2 To explain plant diversity and morphology of microbes.
		CO.3 To develop concept of Archegoniate

	Archegoniatae)	
SC 113	Chemistry-I (Fundamentals of Chemistry-I)	CO.1 Students will be able to explain basics of atomic structure and chemical bonding.
		CO.2 Students will be able to apply fundamentals of stereochemistry.
		CO.3 Student will be able to understand chemistry of alkanes and alkenes.
SC115	Zoology-I Systematics and Animal Diversity	CO.1 To apply the concept of zoological species and its diversity.
		CO.2 To gain knowledge and skill in the fundamentals of animal sciences
		CO.3 To understand the complex interactions among various living organisms.
SC 116	Botany-II Plant Anatomy and Embryology	CO.1 To understand the scope & importance of Anatomy and Embryology.
		CO.2 To explain various tissue systems.
		CO.3 To understand the normal and anomalous secondary growth in plants and their causes.
		CO.4 To perform the techniques in anatomy
SC 114	Chemistry-II (Fundamentals of chemistry-II)	CO.1 To apply the basic concepts of chemical thermodynamics.
		CO.2 To explain chemical behavior of aliphatic and aromatic hydrocarbons.
		CO.3 To solve problems of chemical equilibrium.
SC 118	Zoology-II Animal Physiology and Biochemistry	CO.1 To create an understanding regarding the Protein, Lipids and Carbohydrates
		CO.2 To gain knowledge about Nerve and muscle.
		CO.3 To explain respiratory, digestive, excretory, cardiovascular and reproduction systems.
SC 225	Botany III-Bryophyta and Pteridophyta	CO.1 To create an understanding regarding the Bryophytes
		CO.2 To gain knowledge about Pteridophyta.
		CO.3 To explain structural, economic and ecological characteristics of Lichens.
SC 221	Chemistry –III (Inorganic Chemistry – I)	CO.1 To provide a deep understanding of s- and p- block elements.
		CO.2 To develop concepts of oxidation-reduction process and organometallic compounds.
		CO.3 To explain fundamentals of Ionic solids.
SC 223	Chemistry –IV (Organic chemistry - I)	CO.1 To evaluate applications of NMR spectroscopy.
		CO.2 To explain chemistry of heterocyclic compound and enolates.
		CO.3 To apply concepts of biomolecules, synthetic dyes and polymers.
SC 227	Zoology III-Genetics and Evolutionary	CO.1 Understands the complex evolutionary processes and behavior of animals
		CO.2 Correlates the physiological processes of animals

	Biology	and relationship of organ systems
		CO.3 Understanding of environmental conservation processes and its importance, pollution control and biodiversity and protection of endangered species
SC 229	Zoology IV- Endocrinology and Ethology	CO.1 To create an understanding regarding the Endocrinology
		CO.2 To gain knowledge about hormone regulation
		CO.3 To have understanding about the ethology, Able to understand MRI and CT scan
SC 236	Botany IV- Gymnosperm and Angiosperms	CO.1 Learn about the structure, pigmentation, food reserves and methods of reproduction of Algae
		CO.2 Learn about the structure, pigmentation, food reserves and methods of reproduction of Fungi
		CO.3 Know about the Economic importance of algae, Fungi and lichen
		CO.4 Studied some plant diseases with special reference to the causative agents, symptoms, etiology and control measures.
SC 238	Botany V (Cell Biology and Genetics)	CO.1 To create an understanding regarding the structure and function of cell organelles.
		CO.2 To gain knowledge about recombination and tools used in molecular Biology.
		CO.3 To have understanding about application of genetics in botany.
SC 234	Chemistry- V (Physical Chemistry-I)	CO.1 To solve problems related to chemical kinetics and thermodynamics.
		CO.2 To explain concepts related to colloidal state chemistry.
		CO.3 To apply principles of electrochemistry.
SC 240	Zoology-V Comparative Anatomy and Developmental Biology of Vertebrate	CO.1 To conceptualize about cloning of animal, Able to understand biology of ageing.
		CO.2 To understand the detailed concept of developmental biology.
		CO.3 To explain comparative anatomy.
SC 319	Botany VI (Analytical Techniques in Plant Sciences)	CO.1 To learn Spectrophotometry and Chromatography
		CO.2 To understand the ccharacterization of proteins and nucleic acid.
		CO.3 To learn basic principles of biostatistics.
SC 315	Chemistry –VI (Inorganic Chemistry-II)	CO.1 To compare chemical properties of transition and inner transition elements.
		CO.2 To explain recent advances in inorganic chemistry.
		CO.3 To develop basic concepts of coordination chemistry.
SC 321	Zoology VI (Environmental Biology)	CO.1 To understand the concept of ecology and habitat ecology.
		CO.2 To explain relationship between man and environment.

		CO.3 To explain different waste management technologies and diseases.
SC 323	Zoology VII (Microbiology)	CO.1 To understand history and classification of microbiology.
		CO.2 To explain microbial cell organization and genes.
		CO.3 To apply concepts of microbiology in food industry.
SC 342	Botany VII- (Plant Physiology)	CO.1 Learn and understand about mineral nutrition in plants.
		CO.2 Understand the growth and developmental processes in plants.
		CO.3 Know about Photosynthesis and Respiration in plants.
SC 344	Botany VIII- (Biotechnology and Utilization of Plants)	CO.1 To learn and understand basics of biotechnology and genetic engineering.
		CO.2 To explain commercial utilization of plants.
		CO.3 To understand industrial applications of biotechnology.
SC 346	Chemistry- VII (Physical & Misc. Chemistry-II)	CO.1 To solve problems related to colligative properties of solutions and phase equilibrium.
		CO.2 To explain concepts related to soil and environmental biochemistry.
		CO.3 To apply fundamentals of nuclear chemistry and green chemistry.
SC 348	Chemistry- VIII (Organic Chemistry-II)	CO.1 To apply concepts related to aldehydes, ketones, carboxylic acids and conjugated systems.
		CO.2 To understand chemistry of polymers.
		CO.3 To gain knowledge of advanced organic chemistry.
SC 350	Zoology VIII (Applied Zoology)	CO.1 To understand basic principles of aquaculture.
		CO.2 To develop concepts of sericulture, lac culture and apiculture.
		CO.3 To understand pisciculture, aquarium fish keeping and poultry keeping.
		CO.4 To explain economic and medicinal importance of insects.

B.Sc. Mathematics

Course Outcomes:

Course code	Course name	Course outcomes
SC 117	Physics- I (Mechanics & Relativity)	CO.1 To create an understanding the concept of Inertia and Moments.
		CO.2 To explain the concept of relativity and law of energy
		CO.3 To understand the application of Hooke's law
SC 113	Chemistry-I (Fundamentals of Chemistry-I)	CO.1 Students will be able to explain basics of atomic structure and chemical bonding.
		CO.2 Students will be able to apply fundamentals of

		stereochemistry.
		CO.3 Student will be able to understand chemistry of alkanes and alkenes.
SC 119	Mathematics-I (Calculus)	CO.1 To understand the Concept of partial differentiation.
		CO.2 To apply the double and triple integral to find the area and volume of curve.
		CO.3 To find out the the curvature, Asymptotes of curve.
SC 121	Mathematics-II (Three Dimensional geometry and Vector calculus)	CO.1 To understand the concept of 3D shapes like Sphere, Cone and Cylinder.
		CO.2 To understand the concept of vector and get knowledge of Line, Surface integral..
		CO.3 To apply the Green, Stokes and Gauss theorem which have significant role in physical science.
SC 120	Physics II (Mathematical physics and special theory of relativity)	CO.1 Have a deep understanding of theorems and mathematical techniques.
		CO.2 Be able to solve the equations for simple configurations using various methods.
		CO.3 Understand the foundations of mathematical concepts and their applications in physics.
SC 235	Physics-IV (Thermodynamics and statical analysis)	CO.1 Be able to understand the Law's of Thermodynamics.
		CO.2 Be able to understand the Isothermal and adiabatic process of thermodynamics .
		CO.3 Be familiar with important process of engines and Carnot cycle.
		CO.4 to understand the basics of statistical analysis
SC 114	Chemistry-II (Fundamentals of chemistry-II)	CO.1 To apply the basic concepts of chemical thermodynamics.
		CO.2 To explain chemical behaviour of aliphatic and aromatic hydrocarbons.
		CO.3 To solve problems of chemical equilibrium.
SC 124	Mathematics-III (Algebra)	CO.1 To understand the concept of Group and Subgroup.
		CO.2 To gain knowledge about Normal Subgroup and relation with Quotient group
		CO.3 To understand the concept of Ring, Ideal and Integral domain.
SC 126	Mathematics-IV (Differential equation)	CO.1 To understand the Differential equation order and degree.
		CO.2 To solve the Differential equation of higher order with some important methods.
		CO.3 To understand the concept of Partial Differentiation and use to solve Heat and Wave equation.
SC 237	Physics V (Electricity	CO.1 Be able to understand the concept of vector and scalar field.

	and Magnetism)	CO.2 Be able to read, present and/or discussion about the different relation of vectors and their important theorem like Green, Stokes.
		CO.3 Be familiar with important concept of Magnetic force and its application.
SC 221	Chemistry –III (Inorganic Chemistry – I)	CO.1 To provide a deep understanding of s- and p-block elements.
		CO.2 To develop concepts of oxidation-reduction process and organ metallic compounds.
		CO.3 To explain fundamentals of Ionic solids.
SC 223	Chemistry –IV (Organic chemistry - I)	CO.1 To evaluate applications of NMR spectroscopy.
		CO.2 To explain chemistry of heterocyclic compound and enolates.
		CO.3 To apply concepts of bio molecules, synthetic dyes and polymers.
SC 231	Mathematics V- Numerical Analysis and Probability	CO.1 Understands the Interpolation with equal and unequal interval.
		CO.2 To solve the Integration with Numerical method.
		CO.3 Understand the probability, joint probability and probability distribution function.
SC 233	Mathematics VI (Discrete Mathematics)	CO.1 Understands the ordered sets, relation and relation between sets.
		CO.2 To solve the algebra with graph theory
		CO.3 Understand the relation between graph theory and find out the critical path.
SC 248	Physics VII (Solid State Physics)	CO.1 be able to understand elastic properties of solids and lattice vibrations
		CO.2 be able to understand the properties of metals on the basis of the free electron gas models
		CO.3 be able to understand the essence of dielectric properties of materials and super conductivity
SC 246	Physics VI (Electronics and solid state devices)	CO.1 Be able to understand the bipolar junction and hybrid devices.
		CO.2 Be able to understand the working procedure of amplifier.
		CO.3 Be familiar with important application of Oscillator and R-C Oscillator.
SC 234	Chemistry-V (Physical Chemistry-I)	CO.1 To solve problems related to chemical kinetics and thermodynamics.
		CO.2 To explain concepts related to colloidal state chemistry.
		CO.3 To apply principles of electrochemistry.
SC 242	Math -VII (Real Analysis)	CO.1 To understand the concept of limit point and closure of sets.
		CO.2 To understand the detailed concept open and close set. And the concept of Bolzano Weistress theorem.
		CO.3 To explain Metric space, Open and Close Sphere

		and also concept of compactness.
SC 244	Math –VIII (Operation Research)	CO.1 To understand the concept of optimization.
		CO.2 To understand the detailed concept of Linear programming, non-linear programming methods
		CO.3 To explain the queuing method and the model of service FCFS.
SC 122	Physics III (Optics)	CO.1 Be able to understand the concept of light and radiation.
		CO.2 Be able to understand the Coherent series and concept of Newton ring..
		CO.3 Be familiar with working principle of laser.
SC 317	Physics VIII (Nuclear Physics)	CO.1 Be able to understand the concept of Radioactivity and source of radioactive element .
		CO.2 Be able to understand the concept of radioactive reaction.
		CO.3 A working knowledge of p-n and n-p binding of radioactive element.
SC 315	Chemistry –VI (Inorganic Chemistry-II)	CO.1 To compare chemical properties of transition and inner transition elements.
		CO.2 To explain recent advances in inorganic chemistry.
		CO.3 To develop basic concepts of coordination chemistry.
SC 313	Maths X (Complex analysis)	CO.1 To understand the concept complex number as per real number.
		CO.2 To explain the complex function, analytical function and complex integration with Cauchy formula.
		CO.3 To explain the singularities and solution of integration with Residue theorem.
SC 311	Maths IX (Linear Algebra)	CO.1 To understand the concept vector space and subspace.
		CO.2 To explain the Linear transformation, Linear combination and Matrices representation of L.T.
		CO.3 To explain the Matrix Rank, and Eigen values and Eigen vectors properties.
SC 374	Physics IX- (Classical and Quantum Mechanics)	CO.1 Be able to understand the Bohr's law and stability of atom.
		CO.2 Be able to understand the concept of Quanta and plank constant..
		CO.3 Be able to understand the concept of wave equation and Schrodingar equation.
SC 346	Chemistry- VII (Physical & Misc. Chemistry-II)	CO.1 To solve problems related to colligative properties of solutions and phase equilibrium.
		CO.2 To explain concepts related to soil and environmental biochemistry.
		CO.3 To apply fundamentals of nuclear chemistry and green chemistry.

SC 348	Chemistry-VIII (Organic Chemistry-II)	CO.1 To apply concepts related to aldehydes, ketones, carboxylic acids and conjugated systems.
		CO.2 To understand chemistry of polymers.
		CO.3 To gain knowledge of advanced organic chemistry.
SC 312	Mathematics XI (Number Theory)	CO.1 To understand basic division algorithm, and fundamental theorem of arithmetic.
		CO.2 To develop concepts of Linear congruence, Fermat little and Wilson theorem.
		CO.3 To understand the Diophanline equation, and Quadratic formula.
SC 314	Mathematics XII (Statistics and dynamics)	CO.1 To understand basic concept of Inertia and Centre of Gravity.
		CO.2 To find the solution of dynamic rigid body motion equation and momentum of the body.
		CO.3 To understand the concept of Moment of inertia and Kepler's laws.
TP-201	School Internship-III	School Intership Would be a part of the broad curricular area of Engagement with the field and shall be desined to lead to development of a broad repertoire of perspective, professional capacities, teacher sensibilities and skills.
ED-408	Major Concerns and Issues in Indian Education	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.
ED-410	Creating an Inclusive School	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 and responsibilities of all concerned personnel.

		3. Develop critical understanding of the recommendations of various commissions and 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.
ED-414	Learner and learning	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
ED-420	Pedagogy of a School subject Chemistry (Part-I)	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.
ED-418	Pedagogy of a School subject Mathematics (Part-II)	1. To enable pupil teachers to understand and appreciate mathematical structure and their isomorphism with physical realities. 2. To improve their understanding of the basic concepts and make them appreciate their unifying strength and wide of applicability. 3. To enable them to analyses the school syllabus of mathematics in relation to its objectives. 4. To enable them to see meaningfulness of the school

		mathematics programme in relation to life situation
ED-416	Pedagogy of a School subject Physics	1. Understand the modern concept of physics. 2. Understand aims and objectives of teaching physics. 3. Appreciate the contribution of eminent physicists in connection with the development of physics. 4. Plan curriculum at secondary/senior secondary level.
TP-201	School Internship-III	School Intership Would be a part of the broad curricular area of Engagement with the field and shall be desined to lead to development of a broad repertoire of perspective, professional capacities, teacher sensibilities and skills.
ED-420	Pedagogy of a School subject Chemistry	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.
ED-416	Pedagogy of a School subject Physics	1. Understand the modern concept of physics. 2. Understand aims and objectives of teaching physics. 3. Appreciate the contribution of eminent physicists in connection with the development of physics. 4. Plan curriculum at secondary/senior secondary level.
ED -422	ICT- A Tool in Teaching Learning-II	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.
ED-424	Pedagogy of a School subject	1. Understand the nature, scope, values and objectives of teaching science at secondary level.

	General Science	2. Develop competence in teaching different topics of science effectively. 3. Develop scientific temper & provide teaching in scientific method of their student.

SURESH GYAN VIHAR UNIVERSITY
Accredited 'A' Grade by NAAC

SCHOOL OF EDUCATION

SYLLABUS

I, II& III and IV Year

B. Sc. B.Ed.
(Chemistry, Botany and Zoology)

SEMESTER SYSTEM

(Session 2021-25)

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

Teaching and Examination Scheme
To commence from the Academic year: 2021-25

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

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

S.No.	Course Code	Course Name	Type of Course Core/Elective	Credit	Contact Hrs/Wk.			Exam Hours	Weightage (in%)	
					L	T	P		CIE	ESE
1.	EN-103	English Language 1	University Core	2	2	0	0	3	40	60
2.	PC 101	Proficiency in co-curricular activities	University Core	2	0	0	0	0	100	100
3.	CP-105	Elementary Computer	University Core	3	3	0	0	3	40	60
4.	FD102	Foundation Course-I	University Core	1	1	0	0	3	25	75
5.	ES-101	Environmental Studies	University Core	2	2	0	0	3	40	60
6.	BY-111	Botany-I Biodiversity (Microbes, Algae, Fungi and Archegoniatae)	Program Core	4	4	0	0	3	40	60
7.	BY-161	Botany-I Biodiversity (Microbes, Algae, Fungi and Archegoniatae) Lab	Program Core	1	0	0	2	3	60	40
8.	CY-111	Chemistry-I (Fundamentals of Chemistry-I)	Program Core	4	3	1	0	3	40	60
9.	CY-161	Chemistry-I Lab	Program Core	1	0	0	2	3	60	40
10.	ZY-111	Zoology-I Systematics and Animal Diversity	Program Core	4	4	0	0	3	40	60
11.	ZY-161	Zoology-I Animal Diversity Lab	Program Core	1	0	0	2	3	60	40
12.	SM -101	Seminar/Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		TOTAL		27						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

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

Teaching and Examination Scheme

To commence from the Academic year: 2021-25

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

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

S. No.	Course Code	Course Name	Type of Course Core/Elective	Credit	Contact Hrs/Wk.			Exam Hours	Weightage (in%)	
					L	T	P		CIE	ESE
1.	EM 101	Employability Skills	University Core	1	0	0	2	3	60	40
2.	PC 102	Proficiency in co-curricular activities	University Core	2	0	0	0	0	100	100
3.	HUM-102	Human Value s & Ethics	University Core	1	1	0	0	3	40	60
4.	FD104	Foundation Course-II	University Core	1	1	0	0	3	25	75
5.	EN-104	English language II	University Core	3	3	0	0	3	40	60
6.	BY-112	Botany-II Plant Anatomy and Embryology	Program Core	4	4	0	0	3	40	60
7.	BY-162	Botany-II Plant Anatomy and Embryology Lab	Program Core	1	0	0	2	3	60	40
8.	CY-112	Chemistry-II (Fundamentals of chemistry-II)	Program Core	4	3	1	0	3	40	60
9.	CY-162	Chemistry II Lab	Program Core	1	0	0	2	3	60	40
10.	ZY-112	Zoology-II Animal Physiology and Biochemistry	Program Core	4	4	0	0	3	40	60
11.	ZY-162	Zoology-II Physiology and Biochemistry Lab	Program Core	1	0	0	2	3	60	40
12.	SM -102	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		TOTAL		25						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

SURESH GYAN VIHAR UNIVERSITY
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Teaching and Examination Scheme
To commence from the Academic year: 2021-25

Department: School of Education **Year: II**

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

S. No.	Course code	Course Name	Type of Course Core/Elective	Credits	Contact Hrs/Wk.			ExamHrs.	Weightage (in%)	
					L	T/S	P		CE	ESE
1.	PCA 103	Proficiency in Co-curricular	University Core	2	0	0	0	0	100	0
2.	BY-213	Botany III- Bryophyta and Pteridophyta	Programme Core	4	4	0	0	3	40	60
3.	CY-211	Chemistry –III (Inorganic Chemistry – I)	Programme Core	4	3	1	0	3	40	60
4.	CY-213	Chemistry –IV (Organic chemistry -I)	Programme Core	4	3	1	0	3	40	60
5.	ZY-213	Zoology III- Genetics and Evolutionary Biology	Programme Core	4	4	0	0	3	40	60
6.	ZY-215	ZoologyIV-Endocrinology and Ethology	Programme Core	4	4	0	0	3	40	60
7.	BY-263	Botany III-Bryophyta and PteridophytaLab	Programme Core	2	0	0	3	3	60	40
8.	CY-261	Chemistry- III Lab	Programme Core	2	0	0	3	3	60	40
9.	ZY-263	Zoology III- Genetics and Evolutionary Biology Lab	Programme Core	2	0	0	3	3	60	40
10.	ED-207	Basic in Education	Programme Core	4	4	0	0	3	40	60
11.	TP-102	Pre Internship –I A	Program Core	2	0	0	0	0	100	100
12.	SM -103	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		TOTAL		36						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

SURESH GYAN VIHAR UNIVERSITY
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Teaching and Examination Scheme
To commence from the Academic year: 2021-25

Department: School of Education **Year: II**

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

S. No.	Course code	Name of Course	Type of Course Core/Elective	Credits	Contact Hrs/Wk.			Exam Hrs.	Weightage(in %)	
					L	T/S	P		CE	ESE
1.	PCA-104	Proficiency in Co-curricular Activities	University Core	2	0	0	0	0	100	0
2.	EM-204	Employability Skills	University Core	1	0	0	2	3	60	40
3.	BY-214	Botany IV-Gymnosperm and Angiosperms	Programme Core	4	4	0	0	3	40	60
4.	BY-216	Botany V (Cell Biology and Genetics)	Programme Core	4	4	0	0	3	40	60
5.	CY-212	Chemistry- V (Physical-I)	Programme Core	4	3	1	0	3	40	60
6.	ZY-216	Zoology-V Comparative Anatomy and Developmental Biology of Vertebrate	Programme Core	4	4	0	0	3	40	60
7.	BY-264	Botany IV-(Gymnosperm and Angiosperms) Lab	Programme Core	2	0	0	3	3	60	40
8.	ZY-264	Zoology-IV Comparative Anatomy and Developmental Biology of Vertebrate Lab	Programme Core	2	0	0	3	3	60	40
9.	CY-262	Chemistry -IV Lab	Programme Core	2	0	0	3	3	60	40
10.	ED-254	Contemporary India and Education	Program Core	4	4	0	0	3	60	40
11.	TP-102	Pre Internship –I B	Program Core	2	0	0	0	0	100	100
12.	SM -104	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		Total		33						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

SURESH GYAN VIHAR UNIVERSITY
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Teaching and Examination Scheme

To commence from the Academic year: 2021-25

Department: School of Education **Year: III**

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

S. No.	Course code	Course Name	Type of Course Core/Elective	Credits	Cont actHrs/Wk.			ExamHrs.	Weightage(in%)	
					L	T/S	P		CIE	ESE
1.	PC 301	Proficiency in Co-curricular Activities- V	University Core	2	0	0	0	0	100	0
2.	EM 301	Employability Skills – IV	University Core	1	0	0	2	3	60	40
3.	BY-311	Botany VI (Analytical Techniques in Plant Sciences)	Programme Core	4	4	0	0	3	40	60
4.	CY-311	Chemistry –VI (Inorganic Chemistry-II)	Programme Core	4	4	0	0	3	40	60
5.	ZY-311	Zoology VI (Environmental Biology)	Programme Core	4	4	0	0	3	40	60
6.	ZY-313	Zoology VII (Microbiology)	Programme Core	4	4	0	0	3	40	60
7.	BY-363	Botany V (Analytical Techniques in Plant Sciences) Lab	Programme Core	2	0	0	3	3	60	40
8.	ZY-361	Zoology V (Environmental Biology) Lab	Programme Core	2	0	0	3	3	60	40
9.	CY-361	Chemistry –V Lab	Programme Core	2	0	0	3	3	60	40
10.	ED-301	Curriculum and School	Programme Core	4	4	0	0	3	40	60
11.	ED-303	ICT-A Tool in teaching learning-I	Programme Core	2	2	0	0	3	40	60
12	ED-313	Understanding a discipline Science	Programme Core	3	3	0	0	3	40	60
13	TP-103	Pre Internship –II A	Program Core	2	0	0	0	0	100	100
14	SM -105	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		Total		38						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS**_____

Signature of Member Secretary

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

Teaching and Examination Scheme

To commence from the Academic year: 2021-25

Department: School of Education **Year: III**

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

S. No.	Course code	Course Name	Type of Course Core/Elective	Credits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
					L	T/S	P		CE	ESE
1.	BY-312	Botany VII- (Plant Physiology)	Programme Core	4	4	0	0	3	40	60
2.	BY-314	Botany VIII- (Biotechnology and Utilization of Plants)	Programme Core	4	4	0	0	3	40	60
3.	CY-312	Chemistry- VII (Physical&Misc Chemistry-II)	Programme Core	4	4	0	0	3	40	60
4.	CY-314	Chemistry- VIII (Organic Chemistry-II)	Programme Core	4	4	0	0	3	40	60
5.	ZY-312	Zoology VIII (Applied Zoology)	Programme Core	4	4	0	0	3	40	60
6.	BY-362	Botany VI- (Plant Physiology and Biochemistry) Lab	Programme Core	2	0	0	3	4	60	40
7.	CY-362	Chemistry- VI Lab	Programme Core	2	0	0	3	3	60	40
8.	ZY-362	Zoology VI-(Applied Zoology) Lab	Programme Core	2	0	0	3	4	60	40
9.	ED-302	Yoga Education	Programme Core	2	2	0	0	3	40	60
10.	ED-310	Pedagogy of a school Subject (Part-II) General Science -I	Programme Core	3	3	0	0	3	40	60
11.	ED-308	Pedagogy of a school Subject (Part-II) Chemistry - I	Programme Core	3	3	0	0	3	40	60
12.	TP-103	Pre Internship –II B	Program Core	2	0	0	0	0	100	100
13.	SM -105	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		Total		38						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

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

Teaching and Examination Scheme
To commence from the Academic year: 2021-25

Department: School of Education **Year: IV**

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

S.No.	Course Code	Course Name	Credit	Contact Hrs/Wk.			Exam Hours	Weightage (in%)	
				L	T	P		CIE	ESE
		(C)Program Core:							
1.	TP-201	School Internship-III	18	-	-	36		60	40
2.	TP-203	Research Based Project	1	-	-	2		100	-
3.	TP-205	Understanding the self	1	-	-	2		100	-
		Total	20						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

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

Teaching and Examination Scheme

To commence from the Academic year: 2021-25

Department: School of Education **Year: IV**

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

S. No.	Course code	Course Name	Type of Course Core/Elective	Creits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
					L	T/S	P		CE	ESE
1	ED-408	Creating an Inclusive School	Programme Core	4	4	0	0	3	40	60
2	ED-410	Major Concerns and issues in Indian Education	Programme Core	4	4	0	0	3	40	60
3	ED-412	Assessment of learning	Programme Core	4	4	0	0	3	40	60
4	ED-414	Learning and learning	Programme Core	4	4	0	0	3	40	60
5	EM -202	Employability Skill -II	University code	1	1	0	0	0	100	0
6	ED-424	Pedagogy of a school Subject (Part-II) General Science -II	Programme Core	3	3	0	0	3	40	60
7	ED-420	Pedagogy of a school Subject (Part-II) Chemistry - II	Programme Core	3	3	0	0	3	40	60
8	ED-422	ICT – A Tool in teaching Learning-II	Programme Core	2	0	0	4	3	60	40
9	TP-202	Post Internship	Program Core	4	0	0	8	0	100	100
		Total		29						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

SURESH GYAN VIHAR UNIVERSITY
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DETAILED SYLLABUS

2021-25

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 :		

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DETAILED SYLLABUS

2021-25

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

2021-25

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

2021-25

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**
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,	7

.

	Alternaria (Ascomycota), Puccinia, Agaricus (Basidiomycota); Symbiotic Associations-Lichens: General account, reproduction and significance; Mycorrhiza: ectomycorrhiza and enclomycorrhiza and their signiticance	
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

2021-25

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	06

	Huckel's rule	
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

2021-25

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

2021-25

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).
11. Jordon, E.L. :Vertebate Zoology, (S.Chand and Co., New Delhi.).

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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 $\Delta G\theta$, 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	8

	formation. Williamson's ether synthesis: Elimination and substitution.	
V	**Aliphatic and Aromatic Hydroxy Compounds** (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,	8
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
2021-2025

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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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25

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. 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 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

Recommended 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. Langfor, Oxford.
5. Inorganic Chemistry, W.W. Porterfield Addison Wesley.

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25

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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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25

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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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25

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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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25

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,	12

	4. Forms of education (formal, informal, and non- formal) 5. Agencies in education: family, community, school, state and religious institutions.	
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, 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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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,	7

	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, 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.
- Plant Cell & Tissue Culture for the production of Food Ingredients, T-J Fu, G. Singh and W.R. Curtis, Kluwer Academic/Plenum Press

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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.

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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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2021-25

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

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. 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.	7

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)

2021-25
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.

DETAILED SYLLABUS
2021-25

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	12

	DIET. 4. Central agencies: NCERT, NCTE, CBSE.	
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
DETAILED SYLLABUS
2021-25

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:** 1. Basic features of Windows	12

	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.

5. Balamurali, Savitha ; An introduction to Computer Science, Vikas Publishing House, Pvt. Ltd. New Delhi.
6. Computer an introduction; Payal Lotia and Pradeep Nair, BPB Publication, New Delhi-110001.

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25

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. d) Objectives of teaching Biology at secondary and senior secondary level. e) Main discoveries and development in Biology.	9

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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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25

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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DETAILED SYLLABUS
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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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DETAILED SYLLABUS
2021-25

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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DETAILED SYLLABUS
2021-25

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
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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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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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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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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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2021-25

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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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

2021-25

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	12

	students.	
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. 5. Single teacher school.	12
	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
11	Challenges in Teacher Education	Dr. M.S. Singh	Astha publication
12	Models of teaching	M.H. Siddequi	APH publishing Corp.,

			New Delhi
13	Teacher education	Y.K. Singh	APH publishing Corp., New Delhi
14	Teacher Education in India	Mohanty, J. (2000)	
15	NCTE Documents	NCTE 1998	Published by member secretary, NCTE
16	Teacher education	Panda, B.N. Tiwari AD (1997)	APH publishing Corp., New Delhi
17	Teacher education and the teachers	LC Singh, Sharma P.C. (1995)	Vikas Publishing Home P. Ltd., New Delhi
18	Professional education of teacher	Vashisth S.R. (1993)	Mangal deep publishers

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2021-25

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. 5. Mode of response: oral, written, practical.	12
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, Bombay

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2021-25

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.
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SURESH GYAN VIHAR UNIVERSITY

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2021-25

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

SURESH GYAN VIHAR UNIVERSITY
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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2021-25

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. 10. Recent trends in teaching aids.	**9**
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.

SURESH GYAN VIHAR UNIVERSITY
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SCHOOL OF EDUCATION

DETAILED SYLLABUS

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, tables, mail merge & commands of MS-Word	6
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	6

	subjects.(content based)	
	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

SURESH GYAN VIHAR UNIVERSITY

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

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	

SURESH GYAN VIHAR UNIVERSITY
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Teaching and Examination Scheme

To commence from the Academic year: 2021-2025

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

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

S. No.	Course Code	Course Name	Type of Course Core/Elective	Credits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
					L	T/S	P		CE	ESE
1.	EN-103	English Language – I	University Core	2	2	-	-	3	40	60
2.	CP-105	Elementary Computers	University Core	3	3	-	-	3	40	60
3.	PC 101	Proficiency in co-curricular activities	University Core	2	0	0	0	0	100	0
4.	FD102	Foundation Course-I	University Core	1	1	0	0	3	25	75
6.	ES-101	Environmental Studies	University Core	2	2	0	0	3	40	60
7	CY-111	Chemistry-I (Fundamentals of Chemistry-I)	Program Core	4	3	1	-	-	40	60
8.	PY-111	Physics-I(Mechanics)	Program Core	4	3	1	-	3	40	60
9.	MA-111	Mathematics-I(Calculus)	Program Core	4	3	1	-	3	40	60
10.	MA-113	Mathematics-II (Three Dimensional Coordinate Geometry and Vector Calculus	Program Core	4	3	1	-	3	40	60
11.	CY-161	Chemistry-I Lab		2	-	-	2	3	60	40
12.	PY-161	Physics-I Lab		2	-	-	2	3	60	40
13.	SM -101	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		Total		32						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

SURESH GYAN VIHAR UNIVERSITY
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Teaching and Examination Scheme

To commence from the Academic year: 2021-2025

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

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

S. No.	Course Code	Course Name	Type of Course Core/Elective	Credits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
					L	T/S	P		CE	ESE
1.	EM 102	Employability Skills	University Core	1	1	0	0	0	60	40
2.	PC 102	Proficiency in co-curricular activities	University Core	2	0	0	0	0	60	40
3.	EN-104	English Language – II	University Core	2	2	-	-	3	40	60
4.	HUM-102	Human Ethics and values	University Core	1	1	0	0		40	60
5.	FD-104	Foundation Course-II	University Core	1	1	0	0	3	25	75
6.	CY-112	Chemistry-II (Fundamentals of chemistry-II)	Program Core	4	3	1	-	-	40	60
7.	PY-112	Physics-II(Mathematical Physics and Special theory of relativity)	Program Core	4	3	1	-	3	40	60
8.	PY-114	Physics-III (Optics)	Program Core	4	3	1	-	3	40	60
9.	MA-112	Mathematics-III (Algebra)	Program Core	4	3	1	-	3	40	60
10.	MA-114	Mathematics-IV (Differential Equations		4	3	1	-	3	40	60
11.	CY-162	Chemistry-II Lab		2	-	-	2	3	60	40
12.	PY-162	Physics-II Lab		2	-	-	2	3	60	40
13.	SM -102	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		Total		33						

L – Lecture
T – Tutorial
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ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

SURESH GYAN VIHAR UNIVERSITY
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Teaching and Examination Scheme
To commence from the Academic year: 2021-2025

Department: School of Education **Year: II**

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

S. No.	Course Code	Course Name	Type of Course Core/Elective	Credits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
					L	T/S	P		CE	ESE
1.	EM-201	Employability Skills-II	University Core	1	1	0	0	0	60	40
2.	PC 201	Proficiency in Co-curricular Activities -III	University Core	2	0	0	0	0	100	0
3	MA-211	Mathematics –V (Numerical Analysis and	Program Core	4	3	1	0	3	40	60
4.	MA-213	Mathematics –VI (Discrete Mathematics)	Program Core	4	3	0	0	3	40	60
5.	CY-211	Chemistry –III (Inorganic Chemistry – I)	Program Core	4	3	1	0	3	40	60
6.	CY-213	Chemistry –IV (Organic chemistry -I)	Program Core	4	3	1	0	3	40	60
7.	PY-211	Physics - IV(Thermodynamics and Statistical Physics)	Program Core	4	3	1	0	3	40	60
8.	PY-213	Physics-V (Electricity and Magnetism)	Program Core	4	3	1	0	3	40	60
9.	ED-207	Basic in Education	Program Core	4	4	0	0	3	40	60
10.	TP-102	Pre Internship –I A	Program Core	2	0	0	0	0	100	100
11.	SM -103	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
12.	CY-261	Chemistry- III Lab		2	0	0	2	3	60	40
13.	PY-261	Physics Lab- III		2	0	0	2	3	60	40
		Total		39						

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SURESH GYAN VIHAR UNIVERSITY
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Teaching and Examination Scheme

To commence from the Academic year: 2021-2025

Department: School of Education **Year: II**

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

S. No.	Course Code	Course Name	Type of Course Core/Elective	Credits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
					L	T/S	P		CE	ESE
1	EM 202	Employability Skills-III	University Core	1	1	0	0	2	60	40
2	PC 202	Proficiency in Co-curricular Activities-IV	University Core	2	0	0	0	0	100	0
3.	MA-212	Mathematics -VII (Real Analysis)	Program Core	4	3	1	0	3	40	60
4.	MA-214	Mathematics -VIII (Operation Research)	Program Core	4	3	1	0	3	40	60
5.	CY-212	Chemistry- V (Physical Chemistry-I)	Program Core	4	3	1	0	3	40	60
6.	PY-212	Physics –VI (Electronics and Solid-State Devices)	Program Core	4	3	1	0	3	40	60
7.	PY-214	Physics- VII (Solid State Physics)	Program Core	4	3	1	0	3	40	60
8.	ED-254	Contemporary India and Education	Program Core	4	4	0	0	3	60	40
9.	TP-102	Pre Internship –I B	Program Core	2	0	0	0	0	100	100
10.	SM -104	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
11.	PY-262	Physics Lab- IV		2	0	0	2	3	40	60
12.	CY-262	Chemistry -IV Lab		2	0	0	2	3	60	40
		Total		35		-	-	-	-	-

L – Lecture
T – Tutorial
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ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS**_____

Signature of Member Secretary

SURESH GYAN VIHAR UNIVERSITY

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Teaching and Examination Scheme

To commence from the Academic year: 2021-2025

Department: School of Education **Year: III**

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

S.N.	Course Code	Course Name	Type of Course Core/Elective	Credit	Contact Hrs/Wk.			Exam Hours	Weightage (in%)	
					L	T	P		CIE	ESE
1.	EM 301	Employability Skills-IV	University Core	1	1	0	0	3	60	40
2.	PC 301	Proficiency in Co-curricular Activities-V	University Core	2	0	0	0	0	100	0
3.	MA-311	Mathematics –IX (Linear Algebra)	Program Elective	4	3	1	0	3	40	60
4.	MA-313	Mathematics –X (Complex Analysis)	Program Elective	4	3	1	0	3	40	60
5.	CY-311	Chemistry VI (Inorganic Chemistry-II)	Program Elective	4	3	1	0	3	40	60
6.	PY-311	Physics-VIII (Nuclear Physics)	Program Elective	4	3	1	0	3	40	60
7.	CY-361	Chemistry -V Lab	Program Elective	1	0	0	2	3	60	40
8.	PY-361	Physics-V Lab: Project	Program Elective	1	0	0	2	3	60	40
9.	ED-301	Curriculum and School	Program Core	4	4	0	0	3	40	60
10.	ED-303	ICT-A Tool in teaching learning-I	Program Core	2	2	0	0	3	40	60
11.	ED-305	Understanding a discipline Maths	Program Elective	3	3	0	0	3	40	60
12.	TP-103	Pre Internship –II A	Program Core	2	0	0	0	0	100	100
13.	SM -105	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		Total		34						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS**_____

Signature of Member Secretary

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

Teaching and Examination Scheme

To commence from the Academic year: 2021-2025

Department: School of Education **Year: III**

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

S.N.	Course Code	Course Name	Type of Course Core/Elective	Credit	Contact Hrs/Wk.			Exam Hours	Weightage (in%)	
					L	T	P		CIE	ESE
1.	MA-312	Mathematics –XI (Number Theory)	Program Core	4	3	1	0	3	40	60
2.	MA-314	Mathematics –XII (Statics and Dynamics)	Program Core	4	3	1	0	3	40	60
3.	CY-312	Chemistry VII (Physical & Misc Chemistry-II)	Program Core	4	3	1	0	3	40	60
4.	CY-314	Chemistry VIII (Organic Chemistry-II)	Program Core	4	3	1	0	3	40	60
5.	PY-312	Physics-IX (Classical &Quantum Mechanics)	Program Core	4	3	1	0	3	40	60
6.	CY-362	Chemistry -VI Lab	Elective Core	1	0	0	2	3	60	40
7.	PY-362	Physics-VI Lab: Project	Elective Core	1	0	0	2	3	60	40
8.	ED-302	Yoga Education	Program Core	2	2	0	0	3	40	60
9.	ED-304	Pedagogy of a school Subject (Part-II) Physics -I	Elective Core	3	3	0	0	3	40	60
10.	ED-306	Pedagogy of a school Subject (Part-II) Mathematics - I	Elective Core	3	3	0	0	3	40	60
11.	ED-308	Pedagogy of a school Subject (Part-II) Chemistry- I	Elective Core	3	3	0	0	3	40	60
12.	TP-103	Pre Internship –II B	Program Core	2	0	0	0	0	100	100
13	SM -105	Workshop /Tutorial	Program Core	2	0	0	0	0	100	100
		Total		37						

L – Lecture
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ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS**_____

Signature of Member Secretary

SURESH GYAN VIHAR UNIVERSITY
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Teaching and Examination Scheme

To commence from the Academic year: 2021-2025

Department: School of Education **Year: IV**

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

S.No.	Course Code	Course Name	Credit	Contact Hrs/Wk.			Exam Hours	Weightage (in%)	
				L	T	P		CIE	ESE
		(C)Program Core:							
1.	TP-201	School Internship-III	18	-	-	36		60	40
2.	TP-203	Research Based Project	1	-	-	2		100	-
3.	TP-205	Understanding the self	1	-	-	2		100	-
		Total	20						

L – Lecture
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ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS_____**

Signature of Member Secretary

SURESH GYAN VIHAR UNIVERSITY
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Teaching and Examination Scheme

To commence from the Academic year: 2021-25

Department: School of Education **Year: IV**

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

S. No.	Course code	Course Name	Type of Course Core/Elective	Creits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
					L	T/S	P		CE	ESE
1.	ED-408	Creating an Inclusive School	Programme Core	4	4	0	0	3	40	60
2.	ED-410	Major Concerns and issues in Indian Education	Programme Core	4	4	0	0	3	40	60
3.	ED-412	Assessment of learning	Programme Core	4	4	0	0	3	40	60
4.	ED-414	Learning and learning	Programme Core	4	4	0	0	3	40	60
5.	EM-202	Employability Skill -II	University core	1	1	0	0	0	100	0
6.	ED-416	Pedagogy of a school Subject (Part-II) Physics -II	Programme Core	3	3	0	0	3	40	60
7.	ED-418	Pedagogy of a school Subject (Part-II) Mathematics - II	Programme Core	3	3	0	0	3	40	60
8.	ED-420	Pedagogy of a school Subject (Part-II) Chemistry - II	Programme Core	3	3	0	0	3	40	60
9.	ED-422	ICT – A Tool in teaching Learning-II	Programme Core	2	0	0	4	3	60	40
10.	TP-202	Post Internship	Program Core	4	0	0	8	0	100	100
		Total		32						

L – Lecture
T – Tutorial
P – Practical

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Signature of Concerned Teacher **Signature of Convener-BoS**_____

Signature of Member Secretary

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

DETAILED SYLLABUS
2021-25

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 :		

SURESH GYAN VIHAR UNIVERSITY
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DETAILED SYLLABUS

2021-25

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
2021-25

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
2021-25

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
2021-2025

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

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

Physics-I (Mechanics)	**[PY-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:

- The students will introduce about the forces, angular momentum and knowledge about the Constraint.
- The course will give knowledge about the general parameter like velocity, acceleration.
- The course provide the students about the knowledge of M.I.
- The course provide the students about the knowledge of hollow cylinder and solid Cylinder.

Unit	**Contents of the Subject**	**No. of Teaching Hrs required**
1	**Work and Energy Theorem** Work and Kinetic Energy Theorem. Conservative and Non-Conservative Forces. Potential Energy. Energy Diagram. Stable and Unstable Equilibrium. Gravitational Potential Energy. Elastic Potential Energy. Force as Gradient of Potential Energy. Work and Potential energy. Work done by Non-conservative Forces. Law of Conservation of Energy. Elastic and Inelastic Collisions between particles. Centre of Mass and Laboratory Frames..	07
2	**Rotational Dynamics** : Angular Momentum of a Particle and System of Particles. Torque. Conservation of Angular Momentum. Rotation about a Fixed Axis. Moment of Inertia. Calculation of Moment of Inertia for Rectangular, Cylindrical, and Spherical Bodies. Kinetic Energy of Rotation. Motion involving both Translation and Rotation	08
3	**Elasticity :** Hooke's law- Stress-strain diagram - Elastic moduli-Relation between elastic constants- Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants- Work done in stretching & work done in twisting a wire- Twisting couple on a cylinder- Determination of Rigidity modulus by static torsion- Torsional pendulum-Determination of Rigidity modulus and moment ofinertia - q, η &□ by Searles method.	06

4	**Gravitation :** Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications.	07
5	**Inertial and non-Inertial systems** : Reference Frames: Inertial Frames and Galilean Transformations. Galilean Invariance and Conservation Laws. Non-inertial Frames and Fictitious Forces. Uniformly Rotating Frame. Physics Laws in Rotating Coordinate Systems. Centrifugal forces: Coriolis Force and its Applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems	08
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

1. Daniel Kleppner, Robert J. Kolenkow: An introduction to mechanics, McGraw-Hill, 1973.
2. Charles Kittel,Walter Knight: Malvin Ruderman,Carl Helmholz, Burton Moyer, Mechanics Berkeley physics course.
3. D. S. Mathur: Mechanics, S. Chand & Company Limited, 2000.

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-2025

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

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

Physics-I Lab	**[EDBSC-117]**

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

LIST OF EXPERIMENTS

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.
2. To determine the height of a building using a Sextant.
3. To study the Motion of Spring and calculate (a) Spring constant, (b) g and (c)Modulus of rigidity.
4. To determine the Moment of Inertia of a Flywheel.
5. To determine g and velocity for a freely falling body using Digital Timing Technique.
6. To determine Coefficient of Viscosity of water by Capillary Flow Method(Poiseuille's method).
7. To determine the Young's Modulus of a Wire by Optical Lever Method.
8. To determine the Modulus of Rigidity of a Wire by Maxwell's needle.
9. To determine the elastic Constants of a wire by Searle's method.
10. To determine the value of g using Bar Pendulum

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-2025

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

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

MATHEMATICS-I (Calculus)	**[MA-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 give exposure to computational techniques and applications of differentiation and integration.
- To develop a competent working knowledge of the main concepts and methods introduced.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Differential Calculus:** Derivative of length of an arc. Pedal equations,Curvature (various formulae), Centre of curvature and Chord of curvature .Envelopes.	7
2	**Differential Calculus:** Partial differentiation, Total differential coefficient, Change of variables, Euler's theorem for homogeneous functions.Maxima and Minima of functions of two variables. Lagrange's method of undermined multipliers.	7
3	**Differential Calculus:** Asymptotes.Multiple points. Curve tracing of standard curves (Cartesian and Polar curves)	
4	**Integral Calculus:** Rectification, Areas.Volumes and Surfaces of solids of revolution.	8
5	**Integral Calculus:** Double integrals in Cartesian and Polar coordinates, Change of order of integration. Triple integration. Application of double and triple in integrals in finding areas and volumes. Dirichlet's integral.	7
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Elements of Differential Calculus by Sharma, Gokhroo, Saini
- Elements of Integral Calculus by Gokhroo, Saini, Agrawal
- Differential Calculus by Gorakh Prasad..
- Integral Calculus by Gorakh Prasad.
- Mathematical Analysis by Gabriel Klambauer.
- Differential Calculus: RBD Publication.
- Integral Calculus: RBD Publication.

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-2025

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

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

Mathematics-II (Three Dimensional Coordinate Geometry and Vector Calculus)	**[MA-113]**

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:

The objective is to develop a competent working knowledge of the main concepts and methods introduced.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Dimensional Coordinate Geometry:** **Calculus:** Sphere, Plane section of a sphere, Tangent plane. Pole and Polar plane. Orthogonal spheres. Radical plane and Radical Centre.	7
2	**Dimensional Coordinate Geometry:** Cone, Reciprocal Cone, Right-circular cone, Enveloping cone.Cylinder, Right circular cylinder, Enveloping cylinder.	7
3	**Dimensional Coordinate Geometry:Central Conchoids:** Ellipsoid ,Tangent plane, Condition of tangency for a plane, Director Sphere, Polar planes, Polar lines, Section with a given centre. Normal's, Conjugate diameters and Diametral planes and their properties.	8
4	**Vector Calculus:** Scalar point function, Vector point function. Differentiation and Integration of vector point function.Directional derivative. Gradient, Divergence and Curl. Line, Surface and Volume integrals.	7
5	**Vector Calculus:** Theorem of Gauss, Green, Stokes (without proofs) and problems based on these theorems.	7

	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Analytical solid Geometry by Golas,Tandon,Bhargava.
- A Text Book of Vector Calculus by Gaur ,Mathur , GoyalDifferential Calculus by Gorakh Prasad..
- Analytical Solid Geometry by Shanti Narain.
- Elementary Treatise on coordinate Geometry of three dimensions by R.J.T. Bell.
- Elements of Coordinate Solid Geometry by Gupta ,Bansal.
- Coordinator Geometry (3D) : RBD Publication
- Vector Analysis byChatterjee (PHI Learning)

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-2025

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.

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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-I (Autumn)**

Physics-I Lab	**[PY-161]**

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

LIST OF EXPERIMENTS

10. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.
11. To determine the height of a building using a Sextant.
12. To study the Motion of Spring and calculate (a) Spring constant, (b) g and (c)Modulus of rigidity.
13. To determine the Moment of Inertia of a Flywheel.
14. To determine g and velocity for a freely falling body using Digital Timing Technique.
15. To determine Coefficient of Viscosity of water by Capillary Flow Method(Poiseuille's method).
16. To determine the Young's Modulus of a Wire by Optical Lever Method.
17. To determine the Modulus of Rigidity of a Wire by Maxwell's needle.
18. To determine the elastic Constants of a wire by Searle's method.
10. To determine the value of g using Bar Pendulum

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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	**6**

	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	
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)**

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
2021-25

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 ΔGɵ, Le	7

	Chatelier's principle. Relationships between Kp, Kc and Kx for reactions involving ideal gases.	
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** (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,	8
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)**

Physics-II (Mathematical Physics and Special theory of relativity)	**[** PY-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 acquaint pupil teacher with the:

- To understand the linear equations, vector spaces, matrices, linear transformations, determinants, eigen value, eigenvectors, etc.
- To Learn to use Laplace transform methods to solve differential equations.
- To introduce the Fourier series and its application to the solution of partial differential equations.

  To understand the special theory of relativity.

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

1	**Curvilinear Coordinate system and Tensor** : Curvilinear coordinate system; orthogonal curvilinear coordinate system and scale factor; gradient of scalar field; divergence and curl of a vector field; Relations among all three coordinate systems; Jacobian; Tensor: Invariant, contravariant, covariant and mixed tensor, Metric tensor, Fundamental operations of tensors.	07
2	**Special Theory of Relativity :** Dirac Delta Function; Fourier Series; Michelson Morley Experiment; General and special theory of relativity; Lorentz transformation and its consequences and geometrical interpretation; World line, space time interval, space like and time like vectors and macrocasuality; Relativistic Doppler's effect.	08
3	**Relativistic dynamics and electrodynamics** : Four vector formulation; four velocity, four momentum and four force vectors; Four momentum conservation; Transformation between laboratory and centre of mass frame of reference; Transformation of C frame to L frame of reference; Kinematics of decay products of unstable particles; threshold reaction energy; pair production; Compton effect; Law of conservation of charge and equation of continuity; Lorentz transformation of charge and current densities; Lorentz transformation of four potentials; Lorentz transformation of an electric field and magnetic field.	06
4	**Differential equations of second order and special functions :** Differential equation; Linear differential equation with variable coefficients and series solution method; Legendre differential equation; Rodrigue's formula; orthogonality relation of Legendre equation; Bessel differentia lequation; Hermite differential equation; Laguerre differential equation.	07
5	**Partial differential equation and boundary value problems :** Laplace equation in two and three dimensional cartesian coordinates; Laplace equation in spherical coordinate system; Helmholtz equation in circular cylindrical coordinates; wave equation in spherical coordinates.	08
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

1. Mathematical Physics & Special Theory of relativity by P. Dashora and D. Bhatnagar, RBD pub.
2. Mathematical physics by M.P. Saxena, S.S. Rawat, P.R. Singh, CBH publishing.
3. Mathematical Physis by H.K. Dass, Rama Verma, S.Chand Publication

SURESH GYAN VIHAR UNIVERSITY
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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)**

Physics-III (Optics)	[PY-114**]**
II-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 Tutorial -1 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

- To understand basic concepts and principles of geometrical, physical and modern optics.
- To help students understanding the nature of light, its propagation and interaction with matter.
- To help students in handling and aligning the optical elements and operate the devices and equipment.

To help students in applying the fundamental concepts of optics in lasers, fiber optics, holography etc.

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

1	**Nature and Behaviour of Light: Wave Theory**: Introduction and History; Four important theories to explain the nature of light: Corpuscular Theory, Wave Theory, Electromagnetic theory, Quantum Theory; Basic Properties of light: Reflection, Refraction, Dispersion, Velocity of light, refractive index, optical path, dual nature; Fermat's principle of least time: deduction of laws of reflection and refraction; Introduction to wave optics: Oscillations and waves, travelling waves, wavefront and wave surface; Mathematical presentation of travelling wave; General wave equation; Complex representation of a plane wave; Wave packet and bandwidth; Fourier series and transforms; Group and Phase velocity; Maxwell's equation; Wave equation for free space; Uniform plane waves; Boundary conditions for light waves: normal incidence and oblique incidence.	07
2	**Interference** :Superposition of Waves; Interference; Young's Double slit experiment – Wavefront division; Coherence; Conditions for Interference; Fresnel Biprism; Interference due to transmitted light; Haidinger Fringes; Newton's rings: Determination of wavelength of monochromatic light; Michelson Interferometer: Construction and working. Determination of wavelength of light and wavelength separation of two nearby wavelengths.	08
3	**Diffraction :Fresnel Diffraction**. Huygens-Fresnel Theory; Fresnel's Assumptions; Distinction between Interference and Diffraction; Diffraction at Circular Aperture; Diffraction at an Opaque circular disc; Diffraction pattern due to straight edge and narrow slit.**Fraunhoffer Diffraction**. Fraunhoffer diffraction at single slit; Fraunhoffer diffraction at a circular aperture; Fraunhoffer diffraction at double slit; Plane diffraction grating.	06
4	**Polarization** : Preferential direction in wave; Polarized light; Types of polarized light; Production of linearly polarized light; Superposition of waves linearly polarized at right angles; Retarders or wave plates; Production of elliptically polarized light; production of circularly polarized light, Analysis of polarized light; Polarizer and analyzer.	07
5	**LASER, Holographyand Optical Fiber : LASER**. Attenuation of light in an optical medium; Interaction of light with matter; Spontaneous and stimulated Emission; Population Inversion; LASER Principle- Einstein's coefficients, Types of LASER- He-Ne LASER, Ruby LASER. Application of lasers.**Holography**. Principle of Holography: Theory; Important properties of Hologram; Advances; Applications. **Optical Fiber**. Total Internal reflection; Optical Fiber; Propagation of light through optical fiber; Fractional refractive index change; Numerical aperture; Modes of propagation; Classifications of optical fibers; Merits of optical fiber	08
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Optics by Ajoy Ghatak, The Mc Graw Hill Companies
- Optics by Subrahmanyam and BrijLal, S. Chand & Co.
- Fundamentals of Optics by Jenkin's A. Francis & White E Harvey, Mc Graw Hill Inc

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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)**

Mathematics-III (Algebra)	**[** MA-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:

The objective of this course is to develop the learning capabilities and problem solving skills of talented students at the mathematically deeper and more rigorous level.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Groups** Definition and simple properties of groups, Order of an element of a group. Cyclic group, Permutation group.	7

2	**Subgroups :**Subgroups, Cosets. Lagrange's theorem on order of subgroups of a finite order group..	7
3	**Homomorphism and Isomorphism :** Homomorphism and Isomorphism, Cayley's theorem. Normal subgroups and Quotient groups. Fundamental theorem on homomorphism.	7
4	**Rings , Integral domains and Fields :** Definition and simple properties of Rings, Subrings, homomorphism of rings. Embedding rings. Integral domains and Fields. Characteristics of an integral domain and field.	7
5	**Ideals and Quotient Rings :** Ideals and Quotient Ring. Maximal ideal and Prime ideal. Principal Ideal domain. Field of quotient's of an integral domain. Prime fields.	8
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Elements of Abstract Algebra by Sharma, Gokhroo, Saini
- Topics is Algebra by N. Herstain.
- Basic Algebra (Vol. I & II) by N.Jacobson.
- Modern Algebra by S. Singh.

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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)**

Mathematics-IV (Differential Equations)	**[EDBSC-114]**

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 develop a competent working knowledge of the main concepts and methods introduced.

To develop a competent working knowledge of the main concepts and methods introduced.

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

1	**Differential Equations :**Linear differential equations and equations reducible to linear form. Exact differential equations and equations, which can be made exact. First order but higher degree differential equations solvable for x, y and p. Clairauts form and Singular solutions.	7
2	**Differential Equations :**Linear differential equations with constant coefficients. Homogeneous linear differential equations. Simultaneous differential equations.	7
3	**Differential Equations :**Linear differential equations of second order with variable coefficients. Solution by transforming the equation by changing the dependent variable and independent variable . Method of variation of parameters.Normal's, Conjugate diameters and Diametral planes and their properties.	8
4	**Differential Equations :**Partial differential equations of first order. Lagrange's form. Standard forms. Charpits method.	7
5	**Differential Equations :**Homogeneous and non-homogeneous linear partial differential equations with constant coefficients.Equationsreducible to equations with constant coefficient's.	7
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Differential Equations Vol. I byBansal,Dhami.
- Differential Equations Vol. II byBansal,Dhami.
- Introductory course in Differential Equations by D.A. Murray.
- An Introduction to Ordinary Differential Equations by E.A. Codington.
- Elements of Differential Equations by Gokhroo, Saini, Agrawal.
- Differential Equations (Vol. I & II) : RBD Publications
- Introduction to Partial Differential Equations byFolland (PHI Learning)

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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
2021-2025

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

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

Physics-II (Mathematical Physics and Special theory of relativity)	**[** PY-162 **]**

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:

- To understand the linear equations, vector spaces, matrices, linear transformations, determinants, eigen value, eigenvectors, etc.
- To Learn to use Laplace transform methods to solve differential equations.
- To introduce the Fourier series and its application to the solution of partial differential equations.

  To understand the special theory of relativity.

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

1	**Curvilinear Coordinate system and Tensor** : Curvilinear coordinate system; orthogonal curvilinear coordinate system and scale factor; gradient of scalar field; divergence and curl of a vector field; Relations among all three coordinate systems; Jacobian; Tensor: Invariant, contravariant, covariant and mixed tensor, Metric tensor, Fundamental operations of tensors.	07
2	**Special Theory of Relativity :** Dirac Delta Function; Fourier Series; Michelson Morley Experiment; General and special theory of relativity; Lorentz transformation and its consequences and geometrical interpretation; World line, space time interval, space like and time like vectors and macrocasuality; Relativistic Doppler's effect.	08
3	**Relativistic dynamics and electrodynamics** : Four vector formulation; four velocity, four momentum and four force vectors; Four momentum conservation; Transformation between laboratory and centre of mass frame of reference; Transformation of C frame to L frame of reference; Kinematics of decay products of unstable particles; threshold reaction energy; pair production; Compton effect; Law of conservation of charge and equation of continuity; Lorentz transformation of charge and current densities; Lorentz transformation of four potentials; Lorentz transformation of an electric field and magnetic field.	06
4	**Differential equations of second order and special functions :** Differential equation; Linear differential equation with variable coefficients and series solution method; Legendre differential equation; Rodrigue's formula; orthogonality relation of Legendre equation; Bessel differentia lequation; Hermite differential equation; Laguerre differential equation.	07
5	**Partial differential equation and boundary value problems :** Laplace equation in two and three dimensional cartesian coordinates; Laplace equation in spherical coordinate system; Helmholtz equation in circular cylindrical coordinates; wave equation in spherical coordinates.	08
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

1. Mathematical Physics & Special Theory of relativity by P. Dashora and D. Bhatnagar, RBD pub.
4. Mathematical physics by M.P. Saxena, S.S. Rawat, P.R. Singh, CBH publishing.
5. Mathematical Physis by H.K. Dass, Rama Verma, S.Chand Publication

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25

Mathematics-V (Numerical Analysis and Theory of Probability)	**[MA-211]**

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:

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	Finite Differences and Interpolation Differences. Relation between differences and derivatives. Newton`s formulae for forward and backward interpolation. Divided differences. Newton`s divided difference. Interpolation formulae . Lagrange`s interpolation formula.	7
2	Central differences , Numerical Differentiation and Integration Central differences. Gauss`s Stirling`s and Bessel`s interpolation formulae. Numerical Differentiation. Derivatives from interpolation formula. Numerical integration. Newton-Cote`s formula. Trapazodial rule, Simpson`s one-third, Simpson`s three-eight and Gass quadrature formula	7
3	Numerical solutions : Numerical solution of algebraic and transcendental equations. Bisection Method. Regula-Falsi method. Method of iteration. Newton-Raphson method. Gauss eliminationand Iterative methods for	8

	solving system of linear algebraic simultaneous equations. Solution of ordinary differential equations of first order with initial and boundary conditions using Picard`s and modified Euler`s method.	
4	Theory of Probability :Mathematical definition of probability. Addition and Multiplication theorems of Probability. Probability of atleast one event. Conditional probability. Baye`s theorem. Random variable, Mathematical expectation, Mean, Variance and Moment Generating Functions.	7
5	Discrete and Continuous Probability Distribution: Discrete Probability Distribution : Binomial and Poisson`s distribution. Mean , Variance and M.G.F. of Binomial and Poisson`s distribution. Continuous Probability Distribution : Rectangular and Normal distribution. Mean and Variance of Normal distribution. Area under Normal curve.	7
	Total	36

Note: Scheme of CIE

Class tests : 10marks

Graded Assignments : 10marks

Two Mid Terms : 20marks

40marks

Recommended Books:

Numerical Analysis by J.L.Bansal and J.P.N.Ojha

Elements of Mathematical Statistics by D.C.Gokhroo, S.L.Bhargava, S.M.Agrawal

Numerical Analysis by P.C.Biswal

Numerical Methods for scientists and Engineers by Sankara Rao

Numerical Methods for scientific and Engg. Comp. by M.K.Jain, S.R.K.Iyengar ,R.K.Jain

Mathematics-VI(Discrete Mathematics)	**[**MA-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:

Discrete mathematics is a bridge connecting mathematics with various branches of Computer Science.

Discrete mathematics is of genuine use in Computer Science and hence a study of this branch of mathematics is of great importance to the students of Computer Science.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Sets and Propositions , Relations and Functions :** Cardinality,Principal of inclusion and exclusion. Mathematical Induction.Binary relations, Equivalence relations and Partitions. Partial ordered relations and Lattices.	6
2	**Algebraic Structures , Boolean Algebra :** Groups, Rings, Integral domains. Fields (Definitions, simple examples and elementary properties only) Lattices and Algebraic structure, Duality, Distributive and Complemented Lattices. Boolean Lattices.	8
3	**Computability and Formal Languages** Ordered sets, Languages, Phrase, Structure, Grammars, Types of Grammars and Languages. Discrete numeric functions and Generating functions . Recurrence relations and Recursive Algorithms, Linear Recurrence relation with constant coefficients. Homogeneous solutions. Particular solution, Total solution.	8
4	**Graphs** Basic terminology, Multigraphs, Weighted graphs, Paths and Circuits, Shortest paths , Eulerian paths and circuits. Travelling Salesman problem. Union, Join, Product and composition of graphs.	7

5	**Trees , Digraphs :** Properties, Spanning tree, Binary and Rotted tree **:** Simple digraph, Asymmetric digraphs. Symmetric digraphs and complete digraphs. Digraph and Binary relations. Matrix representation of graphs and digraphs.	7
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Discrete Mathematics by Chauhan and Pandey
- Graph Theory by G.N.Purohit
- Discrete Mathematics by N.Chandrasekaran&M.Umaparvathi
- Discrete Mathematics and Graph Theory by P.C.Biswal
- Discrete Mathematics with Graph Theory by Goodaire& Parmenter 4. Graph Theory with Applications by C.Vasudev (New Age Pub.)

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2021-25

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 teachingKnowledge 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. 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 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

Recommended 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. Langfor, Oxford.
5. Inorganic Chemistry, W.W. Porterfield Addison Wesley.

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DETAILED SYLLABUS

2021-25

Chemistry –IV(organic Chemistry-I)	**[CY 213]**
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:

To create an understanding regarding principle of spectroscopy,

To gain knowledge about heterocyclic compound,

To have understanding about bimolecular, able to understand polymer.

Unit	Contents of the Subject	No. of Teaching Hrs required
1	**NMR Spectroscopy :**Proton magnetic resonance spectroscopy (1H-NMR): Nuclear Shielding and Deshielding, Chemical shift and molecular, spin-spin splitting and coupling constants, Interpretation of NMR spectra, of simple organic molecules such as ethyl bromide, ethanol, acetaldehyde, ethyl acetate, toluene, and acetophenone.	**09**
2	**HeterocyclicCompounds :**Introduction, MO Picture, Aromatic Characteristics, Methods for preparation and chemical reactions of Pyrrole, furan, and thiophene, with particular emphasis on the mechanism of electrophilic substitution. Diels-Alder reaction of furan. Pyridine: synthesis and Mechanism of its Nucleophilic substitution reactions.	07
3	**Organic Synthesis via Enolates :**Organic Synthesis via Enolates: Acidity of alpha Hydrogen in reactive methylene compounds, Alkylation of diethyl Malonate and ethyl acetate. Synthetic applications of ethyl acetoacetate and malonic ester. Claisen condensation and keto-enol tautomerism.	06
4	**Biomolecules :**Carbohydrates: Classification and Nomenclature and structure and synthesis of Glucose and fructose. Ribose and Deoxyribose, Interconversion of mannose, glucose and fructose. Classification of Amino Acids. Peptides, Proteins and Nucleic Acids: Structure and nomenclature of Peptides and Proteins, Constituents of Nucleic Acids.	07
5	**Synthetic polymer and Synthetic Dyes :**Synthetic Polymers: Addition and chain growth polymerization. Free radical and ionic polymerization. Condensation and step growth polymerization. Polyester, polyamides, Phenol-formaldehyde resins, urea formaldehyde resins. Natural and synthetic rubber. Ziegler-Natta Catalyst. Synthetic Dyes: Classification Color and constitution (electronic concept). Classification of dyes. Chemistry and synthesis of Methyl orange, Congo red and Malachite green, phenolphthalein, fluorescein, alizarin and indigo.	07
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

1. I. L. Finar : Organic Chemistry (Vol. I & II), E. L. B. S.
2. R. T. Morrison & R. N. Boyd : Organic Chemistry, Prentice Hall.
3. Arun Bahl and B. S. Bahl : Advanced Organic Chemistry, S. Chand
4. Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
5. Jonathan Clayden, Nick Geeves, Stuart Warren, organic chemistry, Oxford University Press

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25

Physics-IV (Thermodynamics and statistical Physics)	**[** PY-211**]**
III-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 Tutorial -1 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

- To understand basic concepts and principles of geometrical, physical and modern optics.
- To help students understanding the nature of light, its propagation and interaction with matter.

- To help students in handling and aligning the optical elements and operate the devices and equipment.

To help students in applying the fundamental concepts of optics in lasers, fiber optics, holography etc..

Unit	Contents of the Subject	No. of Teaching Hrs required
1	**Kinetic Theory of Matter** : Matter and its states; Postulates of Kinetic theory of gases. Ideal Gas and its equation; Expression for the pressure exerted by a gas; Derivation of gas equation; Derivation of gas laws: Boyle's law, Charles law, Regnault's law; Avogadro's hypothesis; Grahm's law of diffusion; Brownian motion; Degree of freedom; Maxwell's law partition of energy; Adiabatic expansion of ideal gas. Difference between real and ideal gas; Change of state and continuity; Andrew's experiment on carbon dioxide: Critical constants; Bahaviour of gases at high pressure; Boyle Temperature; Van der Waals equation of state; Critical coefficient. Expression for mean free path; Transport phenomena and the governing laws; coefficient of each transport phenomena and their inter-relation.	09
2	**Thermodynamics-I**: Thermodynamic system and its types; Zeroth law of thermodynamics; 1st law of thermodynamics; specific heat of gases; Applications of first law: specific heat of gas, isochoric process, isobaric process, adiabatic process; Reversible and irreversible process; Heat engine; Carnot's cycle and heat engine; Second law of thermodynamics; Carnot's theorem and its proof; Entropy, Physical concept of entropy; Change of entropy in reversible and irreversible cycle; T-S diagram; Entropy of perfect gas.	07
3	**Thermodynamics-II** Thermodynamic Variables and their types; Maxwell's thermodynamic relations; Thermodynamic potentials and their significance; Relation of thermodynamic potentials with their variables; Applications of Maxwell's thermodynamic relations: specific heat equation, Clausius-Clapeyron's equation, Joule Thomson Cooling; T.dS equations. Concept of absolute zero; Different methods of liquefaction: Method of freezing mixture, Evaporation of liquid under reduced pressure, adiabatic expansion of gas, Joule Thomson expansion, regenerative cooling, Adiabatic demagnetization of a paramagnetic salt; Third law of thermodynamics: Nernst's theorem.	06
4	**Radiation** :Radiation and Thermal Radiation; Pervost's theory of heat exchange; Blackbody; Kirchoff's law; Pressure of radiation; Stefan Boltzman's law, Distribution of Energy in Black body spectrum; Wien's displacement law; Rayleigh-Jeans law; The failure of classical theory; Planck's Quantum Postulates. Planck's radiation law and deduction of Stefan's law, Wien's law and Rayleigh-Jeans law; Pyrometer; Solar constant; Temperature of the Sun; Pyrheliometer.	07

5	**Statistical Physics** : Statistical basis of thermodynamics; Probability; Principle of equal a priori probability; Some basic rules of probability theory; Permutations and Combinations; Macrostate and microstate; Thermodynamic probability; Constraints on a system; Accessible states; Static and dynamic systems; Most probable state; Degree of freedom; Position, momentum and phase space; Mu and Gamma space; Fundamental postulates of statistical mechanics; Statistical ensembles; Equilibrium between two systems in thermal contact; Boltzmann's entropy probability relation; Boltzmann's Canonical Distribution law; Partition function; Relation between partition function and thermodynamic quantities; Three kinds of particle; Maxwell-Boltzmann statistics applicable to ideal gas; Maxwell-Boltzmaan Energy Distribution law; Applications of Maxwell-Boltzmann Energy Distribution law; Mean, RMS and Most Probable Speeds; Limitations of Maxwell-Boltzmann Method; Gibbs Paradox; Bose-Einstein Statistics; Fermi-Dirac Statistics	07
	Total	**60**

Note: Scheme of CIE

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

40marks

Recommended Books:

l. Heat and Thermodynamics: K.W. Zeemansky.
2. Thermal Physics: B.K. Agarwal.
3. Heat and Thermodynamics: Brij Lal and N. Subramanyam.
4. Heat and Thermodynamics: Dayal, Verma and Pandey.

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2021-25

Physics-V (Electricity and Magnetism)	PY-213
III-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 Tutorial -1 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

- Gain deeper understanding of Electricity and Magnetism.
- Advance skills and capability for formulating and solving problems.
- Increase mathematical and computational sophistication

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

1	**Electrostatics**: Electric charge; Conservation of Charge; Coulomb's law; Charge distributions; Flux; Gauss's law; Field of spherical charge distribution; Electric Potential: Line integral of electric field; Potential difference and potential function; Potential of charge distribution; Gradient of a scalar function; divergence of a vector function; The Laplacian, Laplace equation; Curl of a vector function; Stokes' theorem	07
2	**Electric field and electric currents** :Conductors and insulators; Conductors in electrostatic field; Capacitance and Capacitors; Energy stored in a capacitor; Electric current and current density; Steady current and charge conservation; Electrical conductivity and Ohm's law; Electromotive force and the voltaic cell; Variable currents in capacitors and resistors; Alternating current; alternating current networks; Admittance and impedance; Power and energy in alternating circuits	08
3	**Magnetic force and field**: Magnetic forces; Measurement of charge in motion; Force on a moving charge; Definition and properties of Magnetic field; Field of any current carrying wire; Fields of rings and coils; Change in B at a current sheet; Electric conduction in a magnetic field: Hall effect. .	06
4	**Electric field and magnetic field in matter** :Dielectrics; The moments of a charge distribution; The potential and field of dipole; The torque and the force on a dipole in an external field; Atomic and molecular dipoles; Induced dipole moment; permanent dipole moment; A dielectric sphere in a uniform field. Response of various substances to a magnetic field; The absence of a magnetic charge; the field of current loop; the force on a dipole in an external field; Electronic spin and magnetic moment; Magnetic susceptibility; The magnetic field caused by magnetized matter; the field of a permanent magnet; di, para and Ferromagnetism.	07
5	**Electromagnetic induction :**Faraday's discovery; conducting rod moving through a uniform magnetic field, Loop moving through a nonuniform magnetic field; stationary loop with the field source moving; Universal law of induction; Mutual inductance; Reciprocity theorem; Self inductance; Energy stored in a magnetic field.	08
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

l. Electricity and Magnetism: Purcell and Morin, Cambridge University press.
2. Electricity and Magnetism: Brij Lal and N. Subrahmanyam, S.Chand Publications.
3. Electricity and Magnetism: R. Murugeshan, S. Chand Publications.

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DETAILED SYLLABUS
2021-25

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:

1. Concept, need, scope and aims of education.
2. Forms of education and role of agencies.
3. Philosophical basis of education- in Indian and Western context.
4. Relationship between education, society and culture.
5. 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,	12

	4. Forms of education (formal, informal, and non- formal) 5. Agencies in education: family, community, school, state and religious institutions.	
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 (2 weeks)	**[TP- 102]**

II-SEM. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK PRACTICAL-4 CREDITS-2	EXAMINATION TIME = (3) HOURS [CIE (100)]

S. No.	**Pre-preparation of teaching practice**	**Internal/ External Assessment**
1.	Preparation of lesson plans -2 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.	Conduction of art and craft, dance and music, drawing and painting classes in the school and preparation of detail report of these activities.	

1. **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

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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III-SEM. B.Sc. B.Ed.

Chemistry- III LabCY-261

EVALUATION

SCHEDULE PER WEEK

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:

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

Physics-III Lab	**[**PY-261**]**

SCHEDULE PER WEEK

CREDITS-2

Practical -3

LIST OF EXPERIMENTS

1. To verify the zeroth law of thermodynamics and to calculate the point of equilibrium.
2. To measure Stefan's constant using blackbody radiation method.
3. To study the dependency of resistance of a semiconductor on temperature by four probe method.
4. Thermal conductivity of a good conductor by Searle's method.
5. Determination of thermal conductivity of a card-board by Lee's disc method.
6. Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances, and (e) Checking electrical fuses.
7. To study the characteristics of a series RC Circuit.
8. To determine an unknown Low Resistance using Potentiometer.
9. To determine Ballistic constant K of a moving coil BG with a standard condenser of known capacity.
10. To determine the high resistance by method of leakage of a condenser with the help of BG.

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Mathematics –VII (Real Analysis)	**[**MA-212**]**

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:

In the recent years the set theoretic concepts, the terminology and symbols associated with it are widely used in almost all branches of mathematics. So much so that one who is not familiar with these concepts, terminology and symbols cannot make any headway into the study of recently developed branches of mathematics, so called modern mathematics

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Real Numbers :** Real numbers as complete ordered field, Limit point , Bolzano-Weierstrasstheorem.Closed and Open sets. Union and intersection of such sets. Concept of compactness. Heine-Borel theorem. Real sequences, limit and convergence of a sequence. Monotonic sequences. Real sequences, limit and convergence of a sequence. Monotonic sequences. Real numbers as complete ordered field, Limit point , Bolzano-Weierstrass theorem. Closed and Open sets. Union and intersection of such sets. Concept of compactness. Heine-Borel theorem. Rea l sequences, limit and convergence of a sequence. Monotonic sequences.	7
2	**Cauchy`s sequence ,Darboux`s and Rolle`s theorem.** Cauchy`s sequences. Subsequences, Cauchy`s general principle of convergence. Properties of continuous functions on closed intervals. Properties of derivable functions. Darboux`s and Rolle`s theorem.	7
3	**Riemann integration :** Riemann integration, Lower and Upper Riemann integrals, Riemann integrability.Mean value theorem of integral calculus. Fundamental theorem of integral calculus.	7

4	**Sequence and series of functions :** Sequence and series of functions, Pointwise and Uniform convergence. Cauchy`s criterion, Weierstrass M-test, Abel`s test, Dirichlet`s test for uniform convergence of series of functions. Term by term differentiation and integration.	7
5	**Matric space :**Definition and examples. Subspace of a metric space, Product space, Continuous mappings, Sequence in a matric space. Cauchy`s sequence, Complete matric space, Baire`s theorem. Compact sets and Compact spaces, connected metric spaces.	8
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Elementary Real Analysis by D.C.Gokhroo, S.R.Saini, J.P.N.Ojha
- Real Analysis by Dipak Chatterjee
- Real Analysis byH.L.Royden
- Principals of Real Analysis byS.C.Malik

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Mathematics –VIII (Operation Research)	**[**MA-214**]**

IV SEM. B.Sc-B.Ed.	**EVALUATION**

SCHEDULE PER WEEK	EXAMINATION TIME = (3) HOURS
LECTURES-4	MAX. MARKS = 100
CREDITS-4	[CIE (40) & ESE (60)]

Objectives:

All the engineers in industry and business organizations are being continuously pressed for improving production and sales in reducing human efforts and to lower production costs to with stand increasing competation. This requires the use of rigorous methods of decision making, such as optimization techniques which result into more efficient and economical activities.

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Linear Programming :** The Linear Programming problem. Graphical solution of Linear Programming problems. Basic solution. Some basic properties of convex sets. Theorems based on convex sets. Fundamental theorem of L.P.P. Application of Simplex Method for solution of a L.P.P. to simple problems.	8
2	**Duality of L.P.P. :** Duality. Fundamental theorem of duality. Properties and simple problems of duality. Transportation problems. Transportation algorithm for minimization problem.	7
3	**Assignment Models , Theory of Games** Assignment Models : Mathematical formulation. Hungarian method. Variations of the assignment problem. Travelling salesman problem. Theory of Games : Basic definitions, Minimax(Maximin) criterion and optimal strategy, Saddle point, Minimax-Maximin principle for mixed strategy games. Fundamental theorem of Game theory. Two-by-two games without saddle point. Arithmetic method for 2x2 games.	7
4	**Inventory Models :** Inventory Models :Definition, types of inventory models. Classification of inventory models. Economic ordering quantity(EOQ). EOQ models without shortage, EOQ models with shortage. EOQ models with constraints.	7

5	**Queueing Theory ::** Introduction, Probability distributions in queueing systems. Models : Erlang model, general Erlang model, Model III (M/M/I) : (N/FCFS).	7
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Elements of Linear Programming by D.C.Gokhroo, S.L. Bhargava, S.R.Saini
- Optimization Techniques by S.K.Jain, D.M.Mehta
- Operations Research:Methods and Practice by C.K.Mustafi
- Mathematical Methods by Dr.S.Sivaiah
- Mathematical Techniques by Jordan, Smith

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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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2021-25

Physics-VI(Electronics and Solid-State Devices)	**[**PY-214**]**
IVSEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 Tutorial -1 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

- To allow students for the understanding how physics grounds and affects the electronics and vice versa
- To help students understanding the importance of electronics in our daily life.
- To allow students understanding the basic concepts and working of electronics.
- To understand the wonder world of Semiconductors and their applications.

Unit	Contents of the Subject	No. of Teaching Hrs required
1	**Circuit analysis and theorems** : Networks-some important definitions; loop and nodal equations based on DC and AC circuits (Kirchhoff Laws);Ampere- volt conventions; open, close and hybrid parameters of any four terminal networks; Input, output and mutual impendence for an active four terminal network;Superposition Theorem; Thevenin Theorem; Norton Theorem.	07
2	**Semiconductors**: Basic information about Semiconductors; Mass Action law; Charge densities in N and P materials; Conduction by drift and diffusion of charge carriers, P-N Junction; PN diode; V-I characteristics of PN junction diode; capacitance effects.	08
3	**Rectifiers and Filters**: Rectifiers: Half-wave, full wave and bridge rectifier; calculation of ripple factor; efficiency and regulation; Filters: Series inductor, shunt capacitor, L section and π section filters; Voltage regulation: Voltage regulation and voltage stabilization by Zener diode; voltage multiplier.	06
4	**Transistors** :Transistor and transistor bias circuits: Notations and volt-ampere; Characteristics for bipolar junctions transistor; Concept of load line and operating point; Hybrid parameters. Transistor as amplifier: CB; CE, CC configurations; Analysis of transistor amplifiers using hybrid parameters and its gain-frequency response.	07
5	**Solid state Devices :Amplifiers:**Cascade amplifiers, basic idea of direct coupled and R-C coupled amplifiers; "Differential amplifiers. Need of bias and stability of Q point: stability factors, various types of bias circuits for thermal bias stability: fixed bias, collector to base feedback bias and four resistor bias; Amplifier with feedback: Concept of feed back, positive and negative feedback, voltage and current feed back circuits. Advantages of negative feed back: Stabilization of gain, effect of negative feed back on output and input resistance, reduction of nonlinear distortion, effect on gain – frequency response. **Oscillators:** Oscillators: Criteria for self excited and self sustained oscillations, circuit requirement for build-up of oscillation; Basic transistor oscillator circuit and its analysis: Colpitfs and Hartely oscillators, R.C Oscillators, crystal oscillators and its advantages. **Field effect transistors**: Junction field effect transistor (JFET) and metal oxide semiconductor field effect transistor (MOSFET): circuit symbols, biasing and volt-ampere characteristics, source follower operation of	08

	JFET, FET as variable voltage resister	
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Jacob Millman and ChristoscHailkias, Integrated Electronics.Analog and Digital Circuits and systems: McGraw-Hill Ltd.(1-972)
- Basic Electronics, B.L. Theraja, S. Chand Publication.

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2021-25

Physics-VII (Solid State Physics)	**[**PY-214**]**
IV-SEM. B.Sc. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 Tutorial -1 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

To introduce solid state physics to the student and enable them to employ classical and quantum mechanical theories needed to understand the physical properties of solids.

To understand how solid state physics contribute to the existence of a number of important technological developments of importance in our lives now and in the future.

Unit	Contents of the Subject	No. of Teaching Hrs required
1	Crystal Structure : Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis – Central and Non-Central Elements. Unit Cell. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Types of Bonds. Ionic Bond. Covalent Bond. Van der Waals Bond. Diffraction of x-rays by Crystals. Bragg's Law	07
2	**Elementary Lattice Dynamics:**:Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Einstein and Debye Theories of Specific Heat of Solids. T3 Law	08
3	**Dielectric Properties of Materials:** Dielectric Polarization. Local Electric Field at an Atom. Depolarization Field. Dielectric Constant. Electric Susceptibility. Polarizability. Classical Theory of Electric Polarizability. Clausius- Mosotti Equation. Normal and Anomalous Dispersion. Complex Dielectric Constant.	06
4	**Electrical Properties of Materials:**:Elementary Band Theory of Solids. Bloch Theorm. Kronig-Penney Model. Effective Mass of Electron. Concept of Holes. Band Gaps. Energy Band Diagram and Classification of Solids. Law of Mass Action. Insulators, and Semiconductors. Direct and Indirect Band Gap. Intrinsic and Extrinsic Semiconductors. p- and n- Type Semiconductors. Conductivity in Semiconductors. Hall Effect in Semiconductors (Qualitative Discussion Only)	07
5	**Superconductivity:** Experimental Results; Critical Temperature; Critical magnetic field; Meissner effect; Type I and type II Superconductors; London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation): Cooper Pair and Coherence length; Variation of Superconducting Energy Gap with Temperature; Experimental Evidence of Phonons; Josephson Effect.	08
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

1. Charles Kittel: Introduction to Solid State Physics, 7th Edition, John Wiley and Sons, Inc.
2. A. J. Dekkar: Solid State Physics, Macmillan India Limited, 2000.
3. J. S. Blackmore: Solid State Physics, Cambridge University Press, Cambridge.

4. N. W. Ascroft and N. D. Mermin: Solid State Physics, (Harcourt Asia, Singapore 2003).

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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 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. Impact ofliberalization, Globalization, Privatizationon education 3. Education for marginalized groups and socially deprived children.	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]**

II-SEM. B.Ed.	**EVALUATION**
SCHEDULE PER WEEK PRACTICAL-4 CREDITS-2	EXAMINATION TIME = (3) HOURS [CIE (100)]

S. No.	**Pre-preparation of teaching practice**	**Internal/ External Assessment**
1.	Preparation of lesson plans -2 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.	Conduction of art and craft, dance and music, drawing and painting classes in the school and preparation of detail report of these activities.	

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Physics-IV Lab	**[**PY-262**]**

SCHEDULE PER WEEK

CREDITS-2
Practical -2

1. Study and plot P-N diode band gap.
2. Study P-N junction diode characteristics.
3. Study of various combinational circuits based on AND/NAND and OR/NOR logic blocks.
4. To study characteristics of a given transistor PNP/NPN (common base & common emitter).
5. To study the frequency response of voltage gain of a RC-coupled transistor amplifier.
6. To verify Kirchhoff's Current and Voltage laws- KCL and KVL.
7. Study of Half wave and Full wave rectifiers and calculate Ripple factor.
8. To Study characteristics of a Field Effect transistor.
9. To study the V-I characteristics of a Zener diode and its use as voltage regulator.
10. To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.

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EVALUATION SCHEDULE PER WEEK Practical -3 CREDITS-2

1. Analysis of mixture containing Lead sulphate and Copper chloride
2. Analysis of mixture containing Copper chloride and Cadmium sulphate
3. Analysis of mixture containing Iron sulphideand Aluminum.chloride
4. Analysis of mixture containing Zinc carbonate and Manganese bromide
5. Analysis of mixture containing Cobalt trioxalate and Nickel chloride
6. Analysis of mixture containing Barium chloride and Calcium carbonate
7. Analysis of mixture containing Barium Nitrate and Magnesium fluoride
8. Analysis of mixture containing Lead sulphate and Aluminum chloride
9. Analysis of mixture containing Iron sulphide and Nickel chloride
10. Analysis of mixture containing ammonium nitrate and magnesium chloride

15. **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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Mathematics –IX (Linear Algebra)	**[MA-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:

- The objective of this course is to develop the learning capabilities and hone the problem solving skills of talented students at a mathematically deeper and more rigorous level.
- System of liner equations appear in numerous applications of Mathematics studying solution of sets to such system leads to the abstract notions of a vector space and a linear transformation.
- Matrices can be used to represent linear transformation and to do concrete calculations.

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Linear Transformations :** Linear Transformations, Operators, Properties of Linear Transformations. Range space and Null space of Linear Transformations. Properties of Linear Transformations.	7
2	**Representation of Transformations by Matrices :** Representation of Transformations by Matrices, Matrices of Identity and Zero Transformations. Matrix of an Inverse Transformation, Change of Basis. Traces of a Linear Transformations of a Finite Dimensional Vector Space.	8
3	**Characteristic Values and Vectors :** Characteristic Values and Characteristic Vectors of Linear Transformation. Cayley- Hamilton Theorem, Diagonalizable Transformations.	7
4	**Inner Product Spaces :** Inner Product Spaces, Cauchy-Schwarz`s inequality. Orthogonal Vectors, Orthogonal Basis, Bessel`s inequality. Gram-Schmidt Orthogonalization process.	7
5	**Bilinear forms :** Bilinear forms, Vector Space of Bilinear forms, Matrices of Bilinear forms, Vector Space and Subspce, Properties of Subspace and direct sum of space. Symmetric Bilinear forms, Skew-symmetric Bilinear forms, Linear combination, basis , linear span.	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks

- Two Mid Terms : 20marks

40marks

Recommended Books:

- Linear Algebra by S. D. Sharma, KedarNath Ram Nath& Co.
- Matrix and Linear Algebra by K.B.Datta, Prentice Hall of India Pvt. Ltd.
- Basic Algebra Vol. I & II by N.Jacobson, Hindustan Publishing Company.
- Linear Algebra by K.Hoffman and R.Kunze, Prentice Hall of India Pvt. Ltd.

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Mathematics –X (Complex Analysis)	**[MA-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:

The students will learn the basic theory and techniques of complex analysis as well as some of its applications. Students will also learn computation of improper integrals.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Complex plane :** Complex plane. Curves and Regions in Complex plane, Jorden curve theorem (Statement only). Extended Complex plane. Stereographic projection. Limits, Continuity and Differentiability of complex functions. Analytic functions, Cauchy-Riemann equations..	7

2	**Complex Integration :** Complex Integration, Complex line integrals, Cauchy Integral theorem, Indefinite integral. Fundamental theorem of Integral calculus for complex functions. Cauchy Integral Formula. Analyticity of the derivative of an analytic function, Morera`s theorem.	8
3	**Theorems and Power Series :** Taylor`s theorem , Laurent`s theorem, Maximum modulus theorem. Power series-Absolute convergence ,Able`s theorem. Cauchy-Hadamardtheorem , Circle and Radius of convergence.	7
4	**Singularities of an analytic function :** Singularities of an analytic function , Branch point, Meromorphic and Entire functions. Riemann`s theorem. Residue at a singularity, Cauchy`s residue theorem. Rouche`s theorem, Fundamental theorem of Algebra.	7
5	**Conformal mapping :**. Conformal mapping. Bilinear transformation and its properties. Elementary mappings :$w(z) = \frac{1}{2}\left(z + \frac{1}{z}\right), z^2, e^z, \sin z, \cos z.$ Evaluation of a real definite integral by contour integration.	7
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Complex Analysis by G.N. Purohit and S.P. Goyal, Jaipur Publishing House.
- Theory of Functions of a Complex Variable by S. Chand & Co. , New Delhi.
- Complex Variables and Applications by R.V.Churchil&J.Brown, McGraw-Hill. New York.
- Complex Variables: Intro. and Application by Marh J.,Ablowitz&A.S.Fokas, Cambridge Uni. Press.

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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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Physics-VIII (Nuclear Physics)	**[PY-311]**
B.Sc. B.Ed.- Semester-V (Autumn)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 Tutorial -1 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

- Impart the knowledge and understanding of Nuclear Physics.
- Apply the basic theory and principles of nuclear physics to the applications.
- To help students in understanding of nuclear reactions such as fission and fusion.
- To explore the interior of nucleus and interaction between nucleons.

Unit	**Contents of the Subject**	**No. of Teaching Hrs required**
1	**Nuclear Structure and Properties :** Thomson Plum Pudding model and its failure; Rutherford Scattering and planetary model; Discovery of Proton and Neutron; Proton-Electron and Proton-Neutron Hypothesis of Nuclei; Classification of Nuclei; Mass of Nuclei and Atomic Mass, Mass defect, Mass excess, Packing Fraction; Binding Energy; Size of Nucleus; Nuclear Spin and angular momentum; Parity of Nuclear states; Nuclear Magnetic Moment and Schmidt lines; Nuclear electrical quadrupole moment; Nuclear Isospin.	09
2	**Nuclear Force and Models :** Properties of Nuclear forces; Meson theory of Nuclear force; Nuclear Potential; Segre Chart: Nuclear stability and N/Z ratio; Liquid drop model; Semi-empirical mass formula; Fermi Gas model; Magic numbers; Evidence of shell structure; Shell model of nucleus; Succes and limitation of shell model.	07
3	**Nuclear Reactions and Reactor :** Basic classification of Nuclear reactions; Types of nuclear reactions; Conservation laws for nuclear reactions; Mass-energy balance and Q-value; The Q-equation (kinematics of nuclear reaction); Nuclear Fusion; Energy released in nuclear fusion; Controlled fusion and its problems. Nuclear Fission; Mechanism (Bohr-Wheeler) of Nuclear Fission; Nuclear reactor; classification of nuclear reactor.	06
4	**Radioactive Decay:** Radioactive decay (one substance); Statistical nature of radioactive decay; Radioactive equilibrium; Radioactive decay (more than one substance); Radioactive series; Applications of radioactivity; Alpha decay: characteristics, kinematics; Geiger Nuttall law; Gamow theory of alpha decay; Beta decay and its spectrum; Pauli' neutrino	07

	hypothesis; Kinematics of beta decay; Gamma decay: emission and kinematics.	
5	**Radiation Detectors :** Energy loss by heavy charged particles, fast electrons and gamma rays in matter; Detectors: Gas-filled detectors, Ionisation chamber, Proportional Counter, Geiger Muller Counter, Scintillation Counter.	07
	Total	**36**

Practicum/ Graded Assignments:

Note: Scheme of CIE

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

40marks

Recommended Books:

1. Nuclear Physics by D. C. Tayal, Himalaya Publishing House
2. Nuclear Physics by S.N., Ghoshal, S.Chand Publication.

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SCHOOL OF EDUCATION
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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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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:** 1. Basic features of Windows 2. Windows and it's accessories a) Explorer b) File Manager	12

	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.
5. Balamurali, Savitha ; An introduction to Computer Science, Vikas Publishing House, Pvt. Ltd. New Delhi.
6. Computer an introduction; Payal Lotia and Pradeep Nair, BPB Publication, New Delhi-11000

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2021-25

UNDERSTANDING A DISCIPLINE MATHEMATICS	**[ED-305]**

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: To acquaint the pupil teacher with the:

1. Nature, scope, need and importance of mathematics.
2. Contribution of mathematician.
3. Different areas in teaching Mathematics at school level**.**
4. Aims and objectives of teaching Mathematics and developing skills in maths teachers**.**
5. Concepts of Diagnostic and Remedial program and set theories and its functions.

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Nature and scope of Mathematics:** a) Mathematics: its meaning, definition, nature and importance. b) Scope and need of Mathematics. c) Need of innovation and creativity in Mathematics. d) History of Mathematics teaching. e) Contribution of Mathematician in: Arya Bhatt, Ramanujan, Euclid, Pythagorous.	9
2	**Different areas in Mathematics teaching at school level:** a) Arithmetic. b) Algebra. c) Trigonometry. d) Geometry. e) Statistics and probability.	9
3	**Aims and objectives of teaching Mathematics:** a) Aims and objectives of teaching Mathematics at secondary level. b) Introduction to Bloom's Taxonomy. c) General and specific objectives. d) Writing instructional objectives of teaching mathematics in behavioral terms. e) Writing instructional objectives of teaching mathematics by giving some suitable examples.	9
4	**Learning in Mathematics Education:** a) Motivating students to learn concepts, concepts formation and concept assimilation. b) Developing logical thinking and scientific temper/attitude in students. c) Involving learners in teaching learning process: Projects, Group Discussions, Investigatory Approach, and Experimental Learning, Problem solving, Riddles, Puzzles. d) Developing skills in Maths teacher.	9
5	**Enrichment Programme:** Diagnostic, Remedial and enrichment programme with respect to the following content areas prescribed in secondary classes of RBSE and CBSE a. Set theory and mathematical structures -Sets, Relations and Functions. b. Statistics-Graphical representation of the statistical data, measures of central tendency, dispersion and coefficient of correlation. c. Axiomatic development of Geometry. Concepts of ray, line segment, angle of a triangle, interior and exterior angles of a triangle.	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 Mathematics teaching.

Note: Scheme of CIE

• Class tests	:	10marks
• Graded Assignments	:	10marks
• Two Mid Terms	:	20marks
		40marks

Recommended Books:

1. Agarwal S.M; Teaching of Modern mathematics, Dhanpat Rai and Sons, Delhi.
2. Ryangar and Kuppuswami,N.A.; Teaching of mathematics in the new education, Universal Publication, Delhi.
3. Jagadguru Swami; Sri Bhari Krisna Turthji Vedic mathematics, Moti lal Banarsi das Publisher Delhi.
4. Kapur J.N; Modern mathematics for teachers, Arya Book Depot,New Delhi.
5. Shrivastava and Bhatnagar; Maths Education, Ramesh Book Depot, Jaipur.

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Mathematics –XI (Number Theory)	**[MA-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:

The security of our Phone calls, Bank transfers etc. all rely one area of Mathematics i.e. Number Theory.

Unit	**Contents of the Subject**	**No. of Teaching Periods required**
1	**Divisibility :** Divisibility—Division Algorithm, g.c.d. the Euclidean Algorithm. l.c.m,.Prime, Infinitude of primes, Fundamental theorem of Arithmetic. Fibonacci sequence..	7
2	**Congruence :** Congruence—Linear congruence, Fermat, Little and Wilson`s theorems.Chinese remainder theorem. Fermat`s last theorem.Euler`s factorization, Mersenne`s factorization.	8
3	**Functions :** Number theoretic functions, π and σ-functions.The Mobius function, Greatest integer function.Euler Phi function and the properties of Phi function.	7

4	**Diophantine equations :** Diophantine equations—$ax + by = c,\ ax + by + cz = d,\ x^2 + y^2 = z^2,\ x^4 + y^4 = z^4$. General Integers solution of the equation $x^2 + y^2 + z^2 = w^2 (x, y, z, w = 1)$	7
5	**Quadratics**: Quadratic residues, Quadratic reciprocity. Quadratic congruence.Primitive roots for primes, Composite numbers having primitive roots. Theory of indices.	7
	Total	**36**

Note: Scheme of CIE

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

40marks

Recommended Books:

- Elementary Number Theory by David M. Burton, Wm. C. Brown Publishers.
- Elementary Number Theory by G.A.Jones and J.M.Jones, Springer—Verlag.
- Elementary Theory of Numbers by W.Sierpinski, North-Holland,Ireland.
- An Intro. to the Theory of Numbers by Niven, S.H.Zuckerman and L.H.Montgomery, John Wiley

Mathematics –XII (Statics and Dynamics)	[MA-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:

The objective of this course is to develop the learning capabilities and hone the problem solving skills of talented students at a mathematically deeper and more rigorous level.

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Statics :** General Conditions of Equilibrium when more than three forces act on a rigid body. Virtual work, Principle of virtual work for a system of coplanar forces acting on a particle. Principle of virtual work for a system of coplanar forces acting at different points of a rigid body.	8
2	**Statics :** Centre of Gravity. C.G. of an arc, C.G. of a plane area. C.G. of a solid of revolution, C.G. of a surface of revolution, C.G. when the density varies.	7
3	**Dynamics :** Velocity and Acceleration—along radial and transverse directions, along tangential and normal directions. S.H.M., Hooke`s Law. Motion along horizontal and vertical elastic strings.	7
4	**Dynamics :** Motion in resisting medium—Resistance varies as velocity and square of velocity. Motion on a smooth curve in a vertical plane. Motion on the inside and outside of a smooth vertical circle.	7
5	**Dynamics :** Central Orbits—p-r equations, Apses. Time in an orbit, Kepler`s Law of planetary motion. Moment of Inertia—M.I. of rods, Circular rings, Circular disks, Solid and Hollow spheres, Rectangular lamina, Ellipse and Triangle.	7
	Total	**36**

Note: Scheme of CIE

- Class tests : 10marks
- Graded Assignments : 10marks

- Two Mid Terms : 20marks

40marks

Recommended Books:

- Elements of Statics by K.C.Sharma, D.C.Gokhroo, S.R.Saini, J.P.H., Jaipur.
- Dynamics byY.N.Gaur, A.K.Mathur, M.C.Goyal, Ramesh Book Depot, Jaipur.
- A Text Book of Statics byR.S.Verma, PothishalaPvt. Ltd., Allahabad
- Principles of Mechanics by J.L.Synge& Griffith, Tata McGraw-Hill.

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SCHOOL OF EDUCATION
DETAILED SYLLABUS
2021-25
SEMESTER :VI

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
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2021-25

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
2021-2025

Physics-IX (Classical and Quantum Mechanics)	**[PY-312]**
B.Sc. B.Ed.- Semester-VI (Spring)	**EVALUATION**
SCHEDULE PER WEEK LECTURES-4 Tutorial -1 CREDITS-4	EXAMINATION TIME = (3) HOURS MAX. MARKS = 100 [CIE (40) & ESE (60)]

Objectives: To acquaint pupil teacher with the:

- To acquire the knowledge about the drawbacks of classical mechanics and the origin of quantum mechanics.
- To enable student's understanding about the postulates of quantum mechanics.
- To allow students understanding the basic definitions related to wave function.
  To understand Schrodinger equation and its applications.

Unit	**Contents of the Subject**	**No. of Teaching Hrs required**
1	**Basic concept of classical mechanics :** Mechanics of particle, Mechanics of system of particles, Constraints, Holonomic and non-Holonomic constraints, Virtual work, Alembert's principle, Lagrange's equation, Simple applications of Lagrange's formulation-Linear Harmonic Oscillator, Simple pendulum.	07
2	**Failure of Classical Physics and evolution of new concepts :** Spectral radiation; Planck Law; Photo Electric Effect-Einstein's Photo Electric Equation; Compton's Effect; Stability of an atom- Bohr's Atomic theory; de- Broglie hypothesis- wavelength of matter waves; Properties of matter waves; Phase and group velocities; Davisson's & Germer Experiment; Double slit Experiment; Standing de-Broglie waves of electron in Bohr's or	08
3	**Schrodinger Equation :** Limitations of old theory; Wave function, properties and significance; Postulates of Quantum Mechanics; Operators, Eigen function, Eigen values and expected values; Schrodinger time independent and time dependent wave equation;	07
4	**Applications of Schrodinger wave equation** : Application of Schrodinger wave equation to particle in one and three dimensional boxes; Potential step and Potential barriers; Quantum Phenomenon of Tunneling: Tunnel Effect. Tunnel Diode	07

5	**Bound State Problems:** General Features of a Bound Particle System, (1) One DimensionalSimple Harmonic Oscillator: Energy Levels and Wave Functions. Zero Point Energy, (2) Quantum Theory of Hydrogen Atom: Particle in a Spherically Symmetric Potential. Schrodinger Equation. Separation of Variables. Radial Solutions and Principal Quantum. Number, Orbital and Magnetic Quantum Numbers	07
	Total	**36**

Practicum/ Graded Assignments:

Note: Scheme of CIE

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

40marks

Recommended Books:

1. Nuclear Physics by D. C. Tayal, Himalaya Publishing House
2. Nuclear Physics by S.N., Ghoshal, S.Chand Publication.

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2021-25

B.Sc. B.Ed.- Semester-VI (Spring)

Chemistry -VI Lab	CY-362

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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DETAILED SYLLABUS
2021-25

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 PHYSICS (Part – II)	**[ED-304]**

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:

1. Understand the modern concept of physics.
2. Understand aims and objectives of teaching physics.
3. Appreciate the contribution of eminent physicists in connection with the development of physics.
4. Plan curriculum at secondary/senior secondary level.

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

1	**Curriculum planning and critical appraisal:** 1. Concept and meaning of physics curriculum at secondary and senior secondary level. 2. Analysis of curriculum and syllabus of physics of Rajasthan board and CBSE board at school level. 3. Need and importance of physics 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. Physics labs and experimental work. 2. Establishment of physics 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 physics teaching of school level. 3. Need and importance in present context. 4. New trends in teaching physics 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. Hesis, Oburn and Hoffman; Modern Science, The Macmillan Company" New York
2. Thurber W. and A Collette; Teaching Science in Today' ssecondary schools, Boston Allyan and Bacon Inc. New York
3. Magal S.K; Sadharan Science Siksha, Aray book Depot,New Delhi Vaiday,N.

4. The impact of science Teaching; Oxford and IBH Publication Company, New Delhi 1971
5. Richardson S; Science Teaching in Secondary School, Prentice Hall USA
6. Sharma,R.C. and Sukla; Modern Science Teaching', Dhanpat Rai and sons Delhi
7. Taygi S.K. Bhotik; Science Education, Sahitay pakashan,agra.

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2021-2025

PEDAGOGY OF A SCHOOL SUBJECT MATHEMATICS (Part – II)	**[ED-306]**

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:

1. To enable pupil teachers to understand and appreciate mathematical structure and their isomorphism with physical realities.
2. To improve their understanding of the basic concepts and make them appreciate their unifying strength and wide of applicability.
3. To enable them to analyses the school syllabus of mathematics in relation to its objectives.
4. To enable them to see meaningfulness of the school mathematics programme in relation to life situation

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

1	**Curriculum planning and critical appraisal:** 1. Concept and meaning of Mathematics curriculum at secondary and senior secondary level. 2. Analysis of curriculum and syllabus of Mathematics of Rajasthan board and CBSE board at school level. 3. Need and importance of Mathematics 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. Maths lab and experimental work. 2. Establishment of maths lab at secondary and senior secondary level. 3. Organization of fairs and exhibition related to Maths. 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 Mathematics teaching of school level. 3. Need and importance in present context. 4. New trends in teaching Mathematics 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. Agarwal S.M; Teaching of Modern mathematics, Dhanpat Rai and Sons, Delhi
2. Ryangar and Kuppuswami,N.A.; Teaching of mathematics in the new education, Universal Publication.
3. Butler and Wren; The teaching of Secondary mathematics, McGraw Hill Book company.

4. Jagadguru Swami; Sri Bhari Krisna Turthji Vedic mathematics, Moti lal Banarsidas Publisher Delhi .
5. Kapur J.N; Modern mathematics for teachers, Arya Book Depot,New Delhi.
6. Mangal,S.K.; Teaching of mathematics, Prakash Brother Ludhiana.
7. Kapoor and Saxena; Mathematical Statistic, mS. Chand & Co. New Delhi.
8. Sidha,K.S; Teaching of mathematics, Streling pub.Pvt.Ltd,New Delhi.
9. ShriVastov and Bhatnagar; Maths Edcuation, Ramesh Book Depot, Jaipur.
10. Modern Abstract Algebra; Shanti Narayan, S. Chand & Co. New Delhi.

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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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DETAILED SYLLABUS

2021-25

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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2021-25

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

2021-25

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

VIII-SEM. B.Sc. B.Ed.	**EVALUATION**

SCHEDULE PER WEEK	EXAMINATION TIME = (3) HOURS
LECTURES-4	MAX. MARKS = 100
CREDITS-4	[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. 5. Single teacher school.	12
	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
11	Challenges in Teacher Education	Dr. M.S. Singh	Astha publication
12	Models of teaching	M.H. Siddequi	APH publishing Corp., New Delhi
13	Teacher education	Y.K. Singh	APH publishing Corp., New Delhi
14	Teacher Education in India	Mohanty, J. (2000)	
15	NCTE Documents	NCTE 1998	Published by member secretary, NCTE
16	Teacher education	Panda, B.N. Tiwari AD (1997)	APH publishing Corp., New Delhi
17	Teacher education and the teachers	LC Singh, Sharma P.C. (1995)	Vikas Publishing Home P. Ltd., New Delhi
18	Professional education of teacher	Vashisth S.R. (1993)	Mangal deep publishers

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SCHOOL OF EDUCATION

DETAILED SYLLABUS

2021-25

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

VIII-SEM. B.Sc. B.Ed.	**EVALUATION**

SCHEDULE PER WEEK	EXAMINATION TIME = (3) HOURS
LECTURES-4	MAX. MARKS = 100
CREDITS-4	[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. 5. Mode of response: oral, written, practical.	12
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, Bombay

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DETAILED SYLLABUS

2021-25

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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2021-25

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:

5. Understand the modern concept of physics.
6. Understand aims and objectives of teaching physics.
7. Appreciate the contribution of eminent physicists in connection with the development of physics.
8. Plan curriculum at secondary/senior secondary level.

Unit	Contents of the Subject	No. of Teaching Periods required
1	**Curriculum planning and critical appraisal:** 6. Concept and meaning of physics curriculum at secondary and senior secondary level. 7. Analysis of curriculum and syllabus of physics of Rajasthan board and CBSE board at school level. 8. Need and importance of physics 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. Physics labs and experimental work. 7. Establishment of physics labs at secondary and senior secondary level. 8. Organization of science 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 physics teaching of school level. 7. Need and importance in present context. 8. New trends in teaching physics 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. Hesis, Oburn and Hoffman; Modern Science, The Macmillan Company" New York
9. Thurber W. and A Collette; Teaching Science in Today' ssecondary schools, Boston Allyan and Bacon Inc. New York
10. Magal S.K; Sadharan Science Siksha, Aray book Depot,New Delhi Vaiday,N.
11. The impact of science Teaching; Oxford and IBH Publication Company, New Delhi 1971
12. Richardson S; Science Teaching in Secondary School, Prentice Hall USA
13. Sharma,R.C. and Sukla; Modern Science Teaching', Dhanpat Rai and sons Delhi
14. Taygi S.K. Bhotik; Science Education, Sahitay pakashan,agra.

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DETAILED SYLLABUS

2021-25

PEDAGOGY OF A SCHOOL SUBJECT MATHEMATICS (Part – II)	**[ED-418]**

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:

5. To enable pupil teachers to understand and appreciate mathematical structure and their isomorphism with physical realities.
6. To improve their understanding of the basic concepts and make them appreciate their unifying strength and wide of applicability.
7. To enable them to analyses the school syllabus of mathematics in relation to its objectives.
8. To enable them to see meaningfulness of the school mathematics programme in relation to life situation

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

		Periods required
1	**Curriculum planning and critical appraisal:** 6. Concept and meaning of Mathematics curriculum at secondary and senior secondary level. 7. Analysis of curriculum and syllabus of Mathematics of Rajasthan board and CBSE board at school level. 8. Need and importance of Mathematics 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. Maths lab and experimental work. 7. Establishment of maths lab at secondary and senior secondary level. 8. Organization of fairs and exhibition related to Maths. 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 Mathematics teaching of school level. 7. Need and importance in present context. 8. New trends in teaching Mathematics 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:

11. Agarwal S.M; Teaching of Modern mathematics, Dhanpat Rai and Sons, Delhi
12. Ryangar and Kuppuswami,N.A.; Teaching of mathematics in the new education, Universal Publication.
13. Butler and Wren; The teaching of Secondary mathematics, McGraw Hill Book company.
14. Jagadguru Swami; Sri Bhari Krisna Turthji Vedic mathematics, Moti lal Banarsidas Publisher Delhi .
15. Kapur J.N; Modern mathematics for teachers, Arya Book Depot,New Delhi.
16. Mangal,S.K.; Teaching of mathematics, Prakash Brother Ludhiana.
17. Kapoor and Saxena; Mathematical Statistic, mS. Chand & Co. New Delhi.
18. Sidha,K.S; Teaching of mathematics, Streling pub.Pvt.Ltd,New Delhi.
19. ShriVastov and Bhatnagar; Maths Edcuation, Ramesh Book Depot, Jaipur.
20. Modern Abstract Algebra; Shanti Narayan, S. Chand & Co. New Delhi.

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DETAILED SYLLABUS

2021-25

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. 10. Recent trends in teaching aids.	9
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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DETAILED SYLLABUS

2021-25

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, tables, mail merge & commands of MS-Word	**6**
3	**MS-Office-II** MS-Excel- Preparation of Table, Chart, formulas, Marks Sheet	**6**

	Preparation & commands of MS-Excel	
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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DETAILED SYLLABUS

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	