



JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

SYLLABUS

BACHELOR OF SCIENCE B. Sc.(ZBC)

YEAR – 2017

DURATION – 3 YEARS (6 SEMESTERS)

SYLLABUS FOR:
I-II SEMESTERS

FACULTY OF EDUCATION & METHODOLOGY

www.jvwu.ac.in

Books Detail (I Semester)

Sr. No.	Subject Name	Text Book	Author	Publisher
1.	Diversity of Microbes	Diversity of Microbes and Cryptogams	Singh, V., P.C.Pande & D.K.Jain	Rastogi Publications, Meerut
2.	Diversity of Cryptogams	A Textbook of Botany Vol.II	Pandey, Mishra & Trivedi	Rastogi Publications, Meerut
3.	Lower Invertebrates	Modern Textbook of Zoology Invertebrates	R.L. Kotpal	Rastogi Publications, Meerut, 10 th Revised Edition
4.	Higher Invertebrate Diversity	Modern Textbook of Zoology Invertebrates	R.L. Kotpal	Rastogi Publications, Meerut, 10 th Revised Edition
5	Inorganic Chemistry	University Chemistry	Bruce Mahan	-
6.	ORGANIC CHEMISTRY	Organic Chemistry	Morrison and Boyd	-

Program Summary

(B.Sc. Biology I- II Semester)

NATURE OF COURSE (I SEMESTER)	NO. OF CREDITS
BOTANY	11.8
ZOOLOGY	16
CHEMISTRY	21.7
LANGUAGE HINDI AND ENGLISH	4
University compulsory course	2
Total Credit	55.5

NATURE OF COURSE (II SEMESTER)	NO. OF CREDITS
BOTANY	7.3
ZOOLOGY	16
CHEMISTRY	19.9
Computer Science	8
University compulsory course	2
Total Credit	53.2

Program Structure – I Year
1st Year consists of I, II Semester

I Year Motive: This Year will cover the essentials of basic subjects of Biosciences. The main aim is to understand the life Cycles of Various Algae, Fungi, Bryophytes & Pteridophyte as well as Animal Diversity & Systematic leading to the basic concept of living world. Along with this, the students will come to know about the Atomic structure of molecules, Nuclear Chemistry, Chemistry s, p, d and f block elements as well as concept of Organic Chemistry. Students will provide with the basic knowledge of Computers, Hindi and English. It will also provide the students, the platform for quality education.

I SEMESTER					
Nature of Course	Course Name	C	T	P1	P2
Botany	Diversity of Microbes-I: Virus, prion and bacteria	2.9	2.5	0.4	0
Botany	Diversity of Microbes-II: Mycoplasma and Algae	2.6	2	0.6	0
Botany	Diversity of Microbes-III: Fungus and Lichens	1.9	1.5	0.4	0
Botany	Diversity of Cryptogams-I: Bryophyta	1.4	1	0.4	0
Botany	Diversity of Cryptogams-II: Pteridophyta	1.5	1	0.5	0
Botany	Diversity of Cryptogams-III: Geological time scale and Fossils	1.5	1	0.5	0
Zoology	Lower Invertebrate Diversity-I : Animal Classification, Protozoa and Porifera	3	2	1	0
Zoology	Lower Invertebrate Diversity-II : Cnidaria and Acnidaria	2.5	2	0.5	0
Zoology	Lower Invertebrate Diversity-III: Helminthes – Platyhelminthes, Nematelminthes and Annelida	2.5	2	0.5	0
Zoology	Higher Invertebrate Diversity-I: Arthropoda and Onychophora	3	2	1	0
Zoology	Higher Invertebrate Diversity -II: Mollusca and Echinodermata	2.5	2	0.5	0
Zoology	Higher Invertebrate Diversity -III: Chordata – Protochordata and Cyclostomata	2.5	2	0.5	0
Chemistry	Inorganic Chemistry I- Atomic Structure	3.6	3	0.6	0
Chemistry	Inorganic Chemistry II- Periodic Properties and s and p-Block Elements	3.6	3	0.6	0

Note:	Chemistry	Inorganic Chemistry III- Chemical Bonding I	3.8	3	0.8	0
	Chemistry	Organic Chemistry I- Stereochemistry of Organic Compounds	3.8	3	0.8	0
	Chemistry	Organic Chemistry II - Aliphatic Hydrocarbons	3.8	3	0.8	0
	Chemistry	Organic Chemistry III - Aromatic Hydrocarbons	3.1	2.5	0.6	0
	Hindi	Hindi language	2	2	0	0
	English	English language	2	2	0	0
	University compulsory course	Curriculum Training & Exposure	1	0	1	0
	University compulsory course	Community Development Activities	1	0	1	0
	Total Credit	53.5+2=55.5				

- C represents number of credit per course
- T represents number of theory credit per course
- P1 represents number of practical and practice per course
- P2 represents number of seminar, paper presentation and Group discussion

Program summary

NATURE OF COURSE (I SEMESTER)	NO. OF CREDITS
BOTANY	11.8
ZOOLOGY	16
CHEMISTRY	21.7
LANGUAGE HINDI AND ENGLISH	4
University compulsory course	2
Total Credit	55.5

II SEMESTER					
Nature of Course	Course Name	C	T	P1	P2
Botany	REPRODUCTIVE BIOLOGY OF GYMNOSPERMS -I: Introduction to gymnosperms	0.5	0.5	0	0
Botany	Reproduction Biology of Gymnosperm-II: Cycadopsida and Coniferopsida	1.5	1	0.5	0
Botany	Reproduction Biology of Gymnosperms-III: Affinities and evolutionary significance	0.5	0.5	0	0
Botany	REPRODUCTIVE BIOLOGY OF ANGIOSPERMS -I: Male gametophyte	1.5	1	0.5	0
Botany	REPRODUCTIVE BIOLOGY OF ANGIOSPERMS II: Female gametophyte	1.4	1	0.4	0
Botany	REPRODUCTIVE BIOLOGY OF ANGIOSPERMS -III: Angiosperm embryology	1.9	1.5	0.4	0
Zoology	Vertebrate Diversity I: Pisces and Amphibia	3	2	1	0
Zoology	Vertebrate Diversity II: Reptilia and Aves	2.5	2	0.5	0
Zoology	Vertebrate Diversity III: Mammalia	2.5	2	0.5	0
Zoology	Comparative Anatomy Of Vertebrates-I: Type study – Rabbit	3	2	1	0
Zoology	Comparative Anatomy Of Vertebrates- II: Comparative Anatomy-I	2.5	2	0.5	0
Zoology	Comparative Anatomy Of Vertebrates- III: Comparative Anatomy-II	2.5	2	0.5	0
Chemistry	Physical Chemistry I- Gaseous and Solid State	3.6	3	0.6	0
Chemistry	Physical Chemistry II- Liquids and Colloids	3.6	3	0.6	0
Chemistry	Physical Chemistry III- Acids and bases	3.1	2.5	0.6	0
Chemistry	Inorganic Chemistry I- Molecular Orbital theory, boranes and Xenon compounds	3.6	3	0.6	0
Chemistry	Inorganic Chemistry II- Coordination Compounds	3.3	2.5	0.8	0
Chemistry	Inorganic Chemistry III- d-block and f-block elements	2.7	2.5	0.2	0

Note:

Computer Science	Fundamentals of Computers - I : Basics of computer system and Number System	2.6	2	0.6	0
Computer Science	Fundamentals of Computers -II : Boolean Algebra	2	2	0	0
Computer Science	Fundamentals of Computers -III : Software and MS office	3.4	2	1.4	0
University compulsory course	Curriculum Training & Exposure	1	0	1	0
University compulsory course	Community Development Activities	1	0	1	0
	Total Credit	51.2+2=53.2			

- C represents number of credit per course
- T represents number of theory credit per course
- P1 represents number of practical and practice per course
- P2 represents number of seminar, paper presentation and Group discussion

Program summary

NATURE OF COURSE (II SEMESTER)	NO. OF CREDITS
BOTANY	7.3
ZOOLOGY	16
CHEMISTRY	19.9
Computer Science	8
University compulsory course	2
Total Credit	53.2

I SEMESTER

DIVERSITY OF MICROBES

Unit I (Virus, Prion and Bacteria) (2.5-0.4-0)

Theory (2.5 Credits)

Brief account of history, discovery, characteristics of viruses, viroid, virusoid and prions. Structure, types and reproduction of Bacteriophages; A brief account of diseases caused by Virus – yellow mosaic of bean and HIV; Prions – BSE, Cruzefteldt Jacob disease, Kuru disease; Role of viruses in human welfare – a brief account. Brief account of history, discovery, occurrence, ultrastructure, modes of nutrition, reproduction and economic importance. Review of classification based on morphology and flagellation; Role of bacteria in human welfare; Environment – decomposition and bioremediation; Agriculture – biofertilizers (*Rhizobium*), biopesticides (*B. thuringiensis*); Pharmaceuticals – antibiotics and probiotics; industrial – organic acids. Brief account of bacterial diseases of plants (Citrus Canker).

Practical- (0.4 Credit)

Sr. No	Name of practical	Nature	Credit
1.	Gram staining of bacteria.	Practical	0.2
2.	Preparation of bacterial media and culture of bacteria.	Practical	0.2

Unit II (Mycoplasma and Algae) (2-0.6-0)

Theory (2 Credits)

A general account of Mycoplasma (e.g. sandal spike disease) and Rickettsiae. *Cyanobacteria*: General account, occurrence, structure, reproduction and economic importance – nutritive value, biofertilizers (N₂ fixation, role of heterocyst), algal blooms as biological indicators. Study of *Spirulina*, *Nostoc* and *Oscillatoria*.

General account of occurrence, structure, thallus organization, reproduction, economic importance and classification (classification of Fritsch).

Study of the structure, reproduction and life-cycle of the following.

Chlorophyceae : *Oedogonium*, *Chara*

Xanthophyceae : *Vaucharia*

Phaeophyceae : *Sargassum*

Rhodhophyceae : *Polysiphonia*

Bacillariophyceae :

General account, structure and reproduction of pennate diatom, economic importance.

Practical- (0.6 Credit)

Sr. No.	Name of practical	Nature	Credit
1.	Study of genera included in theory under Cyanobacteria, algae and fungi by making temporary micropreparations and using permanent slides.	Practical	0.4

2.	Study of crustose, foliose and fruticose lichens.	Practical	0.2
----	---	------------------	------------

Unit III (Fungus and Lichens) (1.5-0.4-0)

Theory (1.5 Credits)

General characters, thallus organization, reproduction, economic importance and classification (Alexopoulos and Mims), Study of structure, reproduction, life-cycle and phytopathology and/or economic importance of the following: Myxomycetes - *Stemonites* Phycomycetes - *Albugo* Ascomycetes - Yeast, *Penicillium*.

Study of structure, reproduction, life-cycle, phytopathology and economic importance of the following: Basidiomycetes - *Puccinia*, *Agaricus* Deuteromycetes - *Cercospora*, *Colletotrichum* Lichens - General characters, distribution, types, structure, reproduction, economic and ecological importance.

Practical- (0.4 Credit)

Sr. No	Name of practical	Nature	Credit
1.	Observation of disease symptoms in hosts infected by virus, mycoplasma and bacteria.	Practical	0.4

Recommended Text Book:

Singh, V., P.C.Pande & D.K.Jain, 2007, Diversity of Microbes and Cryptogams, Rastogi Publications, Meerut

References books:

Sharma, O.P., 1992, Text book of Thallophytes, TMH Publishing House, New Delhi.
 Pondey, B.P., A Text book of Algae, Sultanchand & Co., New Delhi.
 Sharma, P.D. 2005, The Fungi, Rastogi Publications, Meerut.
 Singh.V., P.C.Pande & D.K.Jain, 2006. A Text book of Botany, Rastogi Publications, Meerut.

DIVERSITY OF CRYPTOGAMS

Unit I (Bryophyta) (1-0.4-0) Theory (1 Credits)

Cryptogams-General characters, distribution, structure, reproduction, alternation of generation, classification and economic importance.

Study of morphology, anatomy and reproduction in Hepaticopsida: *Marchanti*.

Study of morphology, anatomy and reproduction in Anthocerotopsida: *Anthoceros*

Bryopsida: *Funaria*. Origin and affinities of bryophytes – brief account.

Practical- (0.4 Credit)

Sr. No.	Name of practical	Nature	Credit
1.	Study of the morphology, anatomy and reproductive structures of genera included in Bryophytes.	Practical	0.2
2.	Preparation and submission of 2 double-stained slides.	Practical	0.2

Unit II (Pteridophyta) (1-0.5-0) Theory (1 Credits)

General characters, distribution, reproduction, life cycle and classification; Study of morphology, anatomy and reproduction in

Psilopsida: *Psilotum*

Lycopsida: *Lycopodium, Selaginella*

Sphenopsida: *Equisetum*

Study of morphology, anatomy and reproduction in Pteropsida, Marsilea; Evolution of steles in Pteridophytes; Origin and significance of heterospory and seed habit.

Practical- (0.5 Credit)

Sr. No.	Name of practical	Nature	Credit
1.	Study of the morphology, anatomy and reproductive structures of genera included in Pteridophyta.	Practical	0.3
2.	Preparation and submission of 2 double-stained slides.	Practical	0.2

Unit III (Geological time scale and Fossils) (1-0.5-0) Theory (1 Credits)

General account of geological time scale, types of fossils, fossilization; Process, radioactive carbon dating, and importance of fossils; Study of *Rhynia, Lepidodendron, Lepidostrobus*.

Recommended text Book:

Pandey, Mishra & Trivedi, A Textbook of Botany Vol.II, Rastogi Publications, Meerut.

References Books:

. Singh,V., P.C.Pande & D.K.Jain 2006, A Textbook of Botany, Rastogi Publications, Meerut.
Singh V., P.D.Pande & D.K.Jain 2005, Diversity and Systematics of Seed plants, Rastogi Publications, Meerut.

Lower Invertebrate Diversity**Unit I (Animal Classification, Protozoa and Porifera) (2-1-0)****Theory (Credit- 2)**

Principles of classification: Binomial nomenclature and outline classification of animal kingdom; **Protozoa:** General characters and classification of Phylum Protozoa up to classes with examples; Type study: *Entamoeba histolytica* - External morphology, lifecycle and pathogenicity; Nutrition in Protozoa - Holozoic, holophytic, saprozoic and parasitic nutrition; Locomotion in Protozoa - Locomotor organelles and types of movement; Reproduction in Protozoa: Asexual - fission, budding, sporulation; Sexual - conjugation (amphimixis), syngamy and autogamy; **Porifera:** General characters affinities and classification of Phylum Porifera up to classes with examples; Type study: *Sycon* - External morphology and cellular organization; Skeletal system in sponges; Canal system - Ascon, sycon and leucon types; Reproduction in sponges: Budding and gemmule formation, life cycle with reference to Amphiblastula and Parenchymula larvae .

Practical- (Credit- 1)

Sr. No.	Name of practical	Nature	Credit
1.	Study of microscopes: Simple and compound, handling of microscopes, use of Micro-image projection system.	Practical	0.2
2.	Preparation of culture media of <i>Paramoecium</i> .	Practical	0.2
3.	Study of permanent slides of Protozoa: a) <i>Amoeba</i> b) <i>Entamoeba</i> c) <i>Euglena</i> e) <i>Paramoecium</i> conjugation f) <i>Foramenifera</i>	Practical	0.2
		practical	0.1
	Studies on effect of various stimuli on the behaviour of <i>Paramoecium</i> .	Practical	0.1
	Study of specimens and permanent slides of Porifera: a) <i>Sycon</i> b) <i>Spongilla</i> c) Finger sponge (<i>Haliclona</i>) d) <i>Euplectella</i> e) Sponge spicules of various types f) Spongin fibres g) Sponge gemmule h) T.S. and L.S. of <i>Sycon</i> .	Practical	0.2

Unit II (Cnidaria and Acnidaria) (2-0.5-0)**Theory (Credit- 2)**

Cnidaria: General characters and classification of Phylum Cnidaria up to classes with examples; Type study: *Obelia* - External morphology, metagenesis and life cycle; Mesenteries in *Metridium*;

Polymorphism in Cnidaria; Corals and coral reefs, their types, formation, theories and importance; **Acnidaria (Ctenophora)**: General characters and classification of Phylum Acnidaria up to classes with examples; Type study – *Pleurobrachia*, Affinities of Acnidaria .

Practical- (Credit- 0.5)

Sr. No.	Name of practical	Nature	Credit
1.	Preparation of permanent and stained slides: a) <i>Obelia</i> colony b) Sponge spicules c) Sponge gemmules	Practical	0.1
2.	Study of specimens and permanent slides of Cnidaria: a) <i>Hydra</i> b) <i>Obelia</i> colony c) <i>Obelia</i> medusa d) <i>Tubularia</i> e) <i>Pennaria</i> f) <i>Metridium</i> g) T.S. of <i>Metridium</i> h) <i>Aurelia</i> i) Ephyra larva.	Practical	0.2
3.	Study of specimens of Cnidaria: a) <i>Physalia</i> b) <i>Porpita</i> c) <i>Valella</i> d) <i>Pennatula</i> e) <i>Zoanthus</i> f) <i>Alcyonium</i> g) <i>Madrepora</i> h) <i>Meandrina</i> i) <i>Astrea</i> j) <i>Tubipora</i> k) <i>Gorgonia</i> .	Practical	0.2

Unit III (Helminthes – Platyhelminthes, Nemathelminthes and Annelida) (2-0.5-0)

Theory (Credit- 2)

Platyhelminthes: General characters and classification of Phylum Platyhelminthes up to classes with examples; Type study: *Dugesia* – External morphology, digestive system, excretory system and reproductive system – asexual, sexual and regeneration. **Nemathelminthes**: General characters and classification of Phylum Nemathelminthes up to classes with examples; Type study: *Ascaris* – External morphology, digestive system, excretory system, reproductive system and life-cycle; Mode of infection and pathogenicity of i) *Fasciola hepatica*, ii) *Taenia solium*, iii) *Ancylostoma duodenale*, iv) *Trichinella spirallis*; Host parasite relationship and parasitic adaptation in Helminthes ; **Annelida**: General characters and classification of Phylum Annelida up to classes with examples; Type study: *Nereis* – External morphology, coelom, locomotion, digestive system, blood vascular system, excretory system, reproductive system, life-history and regeneration; Comparative study of a) digestive system, b) coelomoduct and nephredia in *Pheretima*, *Nereis* and *Hirudinaria*; Trochopore larva; metamerism in Annelida .

Practical- (Credit- 0.5)

Sr. No.	Name of practical	Nature	Credit
1.	Study of specimens of Helminthes: a) <i>Dugesia</i> b) <i>Fasciola</i> c) <i>Taenia solium</i> d) <i>Ascaris</i> e) <i>Enterobius</i> f) <i>Ancylostoma</i> g) <i>Trichinella</i> .	Practical	0.1
2.	Annelida: i) Dissection of <i>Pheretima</i> (Study of dissected specimens) a) Digestive system b) Nervous system	Practical	0.1

3.	Dissection of <i>Hirudinaria</i> (Study of dissected specimens) a) Digestive b) Reproductive system	Practical	0.2
	Study of specimens and permanent slides of Annelida: a) <i>Pheretima</i> b) <i>Nereis</i> c) <i>Heteronereis</i> d) <i>Hirudinaria</i> e) <i>Aphrodite</i> f) <i>Sipunculus</i> g) T.S. of <i>Pheretima</i> h) T.S. of <i>Nereis</i> i) T.S. of <i>Hirudinaria</i> j) Parapodium of <i>Nereis</i> .	Practical	0.1

Recommended Text Book:

Modern Textbook of Zoology Invertebrates by R.L. Kotpal - (Rastogi Publications, Meerut, 10th Revised Edition).

References books:

Invertebrate Zoology series (Protozoa to Echinodermata) by R.L. Kotpal - (Rastogi Publications, Meerut).
Invertebrate Zoology by E.L. Jordon and P.S. Verma - S. Chand & Co., Delhi).

Higher Invertebrate Diversity

Unit I (Arthropoda and Onychophora) (2-1-0)

Theory (Credit- 2)

a) Arthropoda: General characters and classification of Phylum Arthropoda up to classes with examples; Outline classification of the class Insecta with emphasis on i) Diptera, ii) Coleoptera, iii) Hymenoptera, iv) Lepidoptera and v) Hemiptera; Type study: *Palaemon* – External morphology, digestive system, circulatory system, respiratory system, excretory system and reproductive system; Mouth parts in Insects; Metamorphosis in insects; Crustacean larvae (Nauplius, Zoea, Mysis and Megalopa) and their significance; **b) Onychophora:** Salient features of *Peripatus*, systematic position and phylogeny of Onychophora.

Practical- (Credit- 1)

Sr. No.	Name of practical	Nature	Credit
1.	i) Dissection of <i>Palaemon</i> (study of dissected specimens): a) Digestive system b) Nervous system ii) Mounting of appendages.	Practical	0.2
2.	Study of specimens of Arthropoda and Onychophora: a) <i>Lepas</i> b) <i>Balanus</i> c) <i>Hippa</i> d) <i>Cancer</i> e) <i>Limulus</i> f) <i>Scolopendra</i> g) <i>Spirobolus</i> h) <i>Peripatus</i>	Practical	0.4
3.	i) Study of mouth parts: a) <i>Culex/Anopheles</i> b) <i>Periplaneta</i> c) <i>Apis</i> d) butterfly ii) Study of Crustacean larvae: a) Nauplius b) Zoea c) Mysis d) Megalopa	Practical	0.2
	Preparation of permanent slides of fresh water and marine crustacean specimens.	Practical	0.1
	Identification and classification of any common insects belonging to five different orders.	Practical	0.1

Unit II (Mollusca and Echinodermata) (2-0.5-0)

Theory (Credit- 2)

General characters and classification of Phylum Mollusca up to classes with examples; Type study: *Unio* – External morphology, digestive system, respiratory system and life cycle; Modifications of foot in Mollusca; Comparative account of shells in Mollusca; Torsion and detorsion in Mollusca; **Echinodermata:** General characters and classification of Phylum Echinodermata up to classes

with example; Type study: *Asterias* – External morphology, digestive system, water- vascular system, haemocoelomic system and reproductive system; Life-cycle and metamorphosis; Pedicellaria; Skeletal system in Echinoderm , Echinoderm larvae and their significance.

Practical- (Credit- 0.5)

Sr. No.	Name of practical	Nature	Credit
1.	i) Study of specimens and permanent slides of Mollusca: a) <i>Pila</i> b) <i>Unio</i> c) <i>Sepia</i> d) <i>Octopus</i> e) <i>Chiton</i> f) <i>Dentalium</i> g) Radula of <i>Pila</i> h) T.S. of Ctenidium i) Glochidium	Practical	0.1
2.	Dissection and mounting of <i>Pila</i> a) Nervous system b) radula(Study of dissected specimen or through Model/chart/software)	Practical	0.3
3.	Study of specimens and permanent slides of Echinodermata: a) <i>Astropecten / Asterias</i> b) <i>Ophiothrix</i> c) <i>Echinus</i> d) <i>Holothuria</i> e) <i>Antedon</i> f) Bipinnaria larva g) Ophiopluteus larva h) Echinopluteus larva	Practical	0.1

Unit III (Chordata – Protochordata and Cyclostomata) (2-0.5-0)

Theory (Credit- 2)

a) Chordata: General characters and outline classification of Phylum Chordata up to classes with examples; **b) Protochordata:** i) *Balanoglossus* and its affinities; Tornaria larva ; ii) *Ascidia* – Circulatory system and retrogressive metamorphosis; iii) *Amphioxus* – Digestive system, circulatory system and nervous system; **c) Cyclostomata** : General characters, affinities and classification of Class **Cyclostomata** up to orders with examples; Type study: *Petromyzon* – External morphology, digestive system and respiratory system ; Structure and metamorphosis of Ammocoetes larva; Comparison of organ systems between *Petromyzon* and *Myxine*.

Practical- (Credit- 0.5)

Sr. No.	Name of practical	Nature	Credit
1.	Study of specimens and permanent slides of Protochordata: i) <i>Balanoglossus</i> : a) Entire b) T.S. through proboscis c) T.S. through collar d) T.S. through trunk region ii) <i>Ascidia</i> iii) <i>Doliolum</i> iv) <i>Salpa</i> v) <i>Amphioxus</i> : a) Entire b) T.S. through oral cirri c) T.S. through pharynx d) T.S. through intestine e) T.S. through tail	Practical	0.2

2.	Study of specimens of Cyclostomata: a) <i>Petromyzon</i> b) <i>Myxine</i>	Practical	0.2
3.	Identification of five gastropods and five bivalves using keys for identification.	Practical	0.1

Recommended Text Book:

Modern Textbook of Zoology Invertebrates by R.L. Kotpal - (Rastogi Publications, Meerut, 10th Revised Edition).

References books:

Invertebrate Zoology series (Protozoa to Echinodermata) by R.L. Kotpal - (Rastogi Publications, Meerut).
Invertebrate Zoology by E.L.Jordon and P.S. Verma - S. Chand & Co., Delhi).

Inorganic Chemistry

Unit I: Atomic Structure (2.5-0.6-0)

Theory(2.5 credit)

Black-body radiation- Planck's radiation law, photoelectric effect, heat capacity of solids, Compton effect. Bohr's model of hydrogen atom and its limitations. de Broglie hypothesis and Heisenberg uncertainty principle Schrodinger wave equation and its importance, physical interpretation of the wave function, postulates of quantum mechanics, particle in one dimensional box. Radial wave functions, angular wave functions. Quantum numbers, atomic orbitals and shapes of s, p, d orbitals, Multi-electron atoms, Aufbau and Pauli exclusion principles and Hund's multiplicity rule, effective nuclear charge. Slaters' rule, Energy level diagram for multi-electron atoms.

Practical-

1. Stoichiometry of neutralization reactions of Sulphuric, Hydrochloric and Nitric acids with Sodium Hydroxide
2. Estimation of Sodium Carbonate and Sodium Bicarbonate in a mixture.
3. Estimation of Ammonia in Ammonium Salt by Back Titration.
4. Estimation of Ferrous ions using Potassium Permanganate

Unit II: Periodic Properties and s and p-Block Elements (2.5-0.6-0)

Theory(2.5 credit)

Atomic radius, Covalent, ionic and Vander waal radii, Atomic and ionic radii, ionization energy, electron affinity and electronegativity, trends in periodic table and applications in predicting and explaining the chemical behavior, Electronegativity - Variation in a group and a period, Relationship between Electronegativity, Ionisation Energy and Electron Affinity. Pauling Scale of Electronegativity Comparative study of s-Block Elements, diagonal relationships, alkyls and aryls - salient features of hydrides, Action of Liquid Ammonia, Properties of solutions of alkali metals in Liquid Ammonia, Anomalous properties of Lithium and Beryllium, hydrides, oxides, oxyacids and halides of groups 13-16. tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalides

• Practical-

- 5 Estimation of Oxalic acid using Potassium Permanganate
6. Estimation of Ferrous ions Using Potassium Dichromate with Internal & External Indicators.
- 7 Standardisation of Sodium Thiosulphate using Potassium Dichromate and estimation of Iodine

Unit III: Chemical Bonding I(2-0.8-0)

Theory(2 credit)

Ionic Solids - Ionic structures, radius ratio effect and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy and Born-Haber cycle, solvation energy and solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule, band theories. Weak interactions - Hydrogen bonding, van der Waals forces. Covalent Bond - Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions. Valence shell electron pair repulsion (VSEPR) theory to NH_3 , H_3O^+ , SF_4 , ClF_3

- **Practical-**

1. Estimation of Copper in a Copper salt by Iodimetry
2. Standardisation of EDTA solution using Zinc Sulphate and determination of Mg or Ca
3. Standardization of EDTA and estimating the hardness of water.
4. Determination of Alkali content of antacids.

Recommended Text Books:-

1. University Chemistry : Bruce Mahan
2. Concise Inorganic Chemistry : J D Lee

Reference Books:

1. An Introduction to Inorganic Chemistry : Mackay and Mackay

ORGANIC CHEMISTRY

Unit I: Stereochemistry of Organic Compounds (2-0.8-0)

Theory(2credit)

Optical Isomerism: Elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization and asymmetric synthesis. Relative and absolute configuration, sequence rules, D & L and R & S systems of nomenclature.

Geometric isomerism: Determination of configuration of geometric isomers. Cis - trans and E & Z system of nomenclature,

Conformational isomerism: Difference between configuration and conformation, axial and equatorial bonds, conformation of mono alkyl substituted cyclohexane derivatives.

Practical-1. Calibration of Thermometer using naphthalene / acetanilide / urea

2. Determination of melting point of Benzoic acid / cinnamic acid / m - dinitro benzene / p- dichlorobenzene
3. Determination of boiling point of aniline / nitrobenzene / chlorobenzene
4. Distillation of water - alcohol mixture using water condenser; Distillation of chlorobenzene - nitrobenzene mixture using air-condenser

Unit II: Aliphatic Hydrocarbons (2-0.8-0)

Theory(2 credit)

Alkanes: alkanes. Isomerism in alkanes and industrial source. Methods of formation, physical properties and chemical reactions of alkanes, Mechanism of free radical halogenation of alkanes: orientation, reactivity and selectivity.

Alkenes: Regioselectivity in alcohol dehydration. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes - mechanism of hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration followed by oxidation, oxymercuration - reduction. Epoxidation, ozonolysis, hydration, hydroxylation and oxidation with KMnO_4 . Polymerization of Alkenes. Substitution at the allylic and vinylic positions of alkenes. (alkylation of acetylene and by elimination reactions). Acidity of alkynes. Chemical reactions of alkynes: Mechanism of electrophilic and nucleophilic addition reactions.

Practical- 1.- Crystallization: Benzoic acid from hot water, naphthalene from ethanol

- 2 Sublimation of camphor / phthalic acid / succinic acid
3. Preparation of Iodoform from ethanol / acetone
4. Preparation of m-dinitrobenzene from nitrobenzene by titration

Unit III: Aromatic Hydrocarbons (2-0.6-0)

Theory(2credit)

Factors responsible for the characteristic reactions of Aromatic compounds.
Nomenclature of benzene derivatives. Structure of benzene : molecular formula and Kekule structure. Stability and carbon-carbon bond lengths of benzene, resonance structure, MO picture. Aromaticity : The Huckel rule, aromatic ions. Aromatic electrophilic substitution ,echanism of nitration, halogenation, sulphonation, mercuration and Friedel-Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/ para ratio. Side chain reactions of benzene derivatives. Birch reduction. Methods of formation and chemical reactions of alkylbenzenes, alkynylbenzenes and biphenyl.

Practical-

1. Preparation of *p*-bromoacetanilide from acetanilide by bromination
2. Preparation of 2,4,6-tribromo phenol from phenol / 2,4,6-tribromoaniline from aniline
3. Preparation of Acetanilide from aniline by acetylation

Recommended Text Books:

1. Organic Chemistry : Seyhand N Ege
2. Organic Chemistry : Morrison and Boyd

Reference Books:

1. Organic Chemistry : I L Finar
2. Organic Chemistry : Hendricson, Cram and Hammond
3. Organic Chemistry : Stanley H. Pine

ENGLISH COMMUNICATION

SYLLABUS

Credit : 2

Objective: To enable students to develop Four major skills Reading, Writing, Speaking and Listening in relevance to English culture according to time and venue.

Unit 1: Reading and Listening

- Types of passages, purpose of reading, reading strategies, vocabulary building, antonyms and synonyms and one-word substitution etc.
- Role of Listening, Barriers of Listening, Remedies to remove the barriers. Listening to Narratives, Listening to specific information or data, listening to Conversational contexts etc.

Unit 2: Writing and Speaking

- Subject- Verb Concord, Sentence Pattern (SVOCA), Time and Tenses. Different Letter Writing Formats: Application, Cover Letter, Notice, Report etc. Resume Building.
- Introduction to the sounds of English- Vowels, Diphthongs and Consonants phonetic sounds, Introduction to Stress and Intonation, Situational Dialogues / Role Play 'Just a minute' Sessions (JAM), action verbs (play way method), Describing Objects/ Situations/ People (personality), Debates (current topics), Turn Coat, Telephonic Conversation.

Recommended Books:

- Phonetics by Peter Roach, Oxford University Press 2004.
- Better English Pronunciation by J.D.O'Connor, OUP 2010.
- Accents of English by J.C.Wells, Cambridge University Press.
- English Grammar Today with CD: An A-Z of Spoken and Written
- Grammar by Ronald Carter, Michael Mac Carthy, Geraldine Mark
- Anne O'Keeffe, Cambridge University Press, 2009.
- Alred, Gerald J. . The Business Writers Handbook. 9th ed. Boston:

Bedford/St. Martins, 2009.
- Geeta Jajivan, Kiranmai: Course Listening and Speaking Skills part
1. Foundation Books Pvt Ltd.
- Lorven: Enrich Your Communication in English

II- SEMESTER

REPRODUCTIVE BIOLOGY OF GYMNOSPERMS

Unit I (Introduction to gymnosperms) (0.5-0-0)

Theory (0.5Credits)

General characters, distribution, classification, affinities and economic importance.

Unit II (Cycadopsida and Coniferopsida) (1-0.5-0)

Theory (1 Credits)

Study of morphology, anatomy and reproduction in Cycadopsida: *Cycas*, *Cycadeoidea*;

Study of morphology, anatomy and reproduction in Coniferopsida : *Pinus*; Gnetopsida : *Gnetum*.

Practical- (0.5 Credit)

Sr. No	Name of practical	Nature	Credit
1.	Study of morphology, anatomy and reproductive structures of genera of Gymnosperms included in theory syllabus.	Practical	0.5

Unit III (Affinities and evolutionary significance) (0.5-0-0)

Theory (0.5 Credits)

Affinities and relationship of Gymnosperms, evolutionary significance.

Recommended Text Book:

Chopra G.L.,1972, Gymnosperms, S. Nagin & Co., Jullandar.

Reference Book:

Sporne, K.R.,1974, Morphology of Gymnosperms, Hutchinson & Co., London.

REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

Unit I (Male gametophyte) (1-0.5-0)

Theory (1 Credits)

Flower – Review of structure, morphology, embryological perspective. Microsporangium – Development of wall layers, tapetal types, microsporogenesis, tetrad types. Male gametophyte – Development and structure; vegetative and generative cells; male gametes;

Practical- (0.5 Credit)

Sr. No.	Name of practical	Nature	Credit
1.	Study of structure of anther, microsporogenesis and pollen grains using permanent slides and mounts.	Practical	0.3
2.	Study of structure of ovules and embryosac development (monosporic type) using permanent slides.	Practical	0.2

Unit II (Female gametophyte) (1-0.4-0)

Theory (1 Credits)

Megasporangium (ovule): Development, types, megasporogenesis, tetrad types;
Female gametophyte: Development, ultrastructure, mono, bi and tetrasporic embryo sacs.

Practical- (0.4 Credit)

Sr. No.	Name of practical	Nature	Credit
1.	Examination of a wide range of flowers for study of pollination.	Practical	0.2
2.	<i>In vitro</i> germination of pollen grains.	Practical	0.2

Unit III (Angiosperm embryology) (1.5-0.4-0)

Theory (1.5 Credits)

Pollination and fertilization : Definitions, types of pollination, pollen-pistil interaction, self-incompatibility, double-fertilization; **Endosperm** : Definition, types – cellular, nuclear and helobial; endosperm haustoria; **Embryo** : Classification, types, development of Crucifer type; **Fruit and seed** : Development, structure of monocot and dicot seeds, dispersal

mechanisms, importance; Brief account of apomixis and polyembryony.

Practical- (0.4 Credit)

Sr. No.	Name of practical	Nature	Credit
1.	Preparation of culture medium and familiarization with tissue culture procedure	Practical	0.2
2.	Mounting the endosperm of <i>Cucumis</i> and embryos of <i>Crotalaria</i> .	Practical	0.2

Recommended Text Book:

Bhojwani S S and S P Bhatnagar, The Embryology of Angiosperms, Vikas Publishing House, Delhi.

Reference Book:

1. Gangulee, S.C., Kar and Ashok Kumar, College Botany Vol.II, Central Book Agency, Calcutta.
2. Singh V., P.C.Pande & D K Jain 2006 Diversity and Systematics of Seed Plants, Rastogi Publications, Meerut.
3. Pandey, Mishra and Trivedi, 2000, A Text book of Botany Vol.II

Vertebrate Diversity

Unit I (Pisces and Amphibia) (2-1-0)

Theory (Credit- 2)

Pisces: General Characters and Classification of Superclass Pisces up to classes with examples and comparison of chondrichthyes and osteichthyes; Type study: *Scoliodon* – External morphology, respiratory system, structure of heart and arterial system, structure of brain and lateral line system; Dipnoi, air bladder, migration in fish; **Amphibia:** General characters and classification of class Amphibia, origin of Amphibia, parental care in Amphibia.

Practical- (Credit- 1)

Sr. No.	Name of practical	Nature	Credit
1.	Study of specimens of Chondrichthyes: a) <i>Zygaena</i> b) <i>Pristis</i> c) <i>Narcine</i> d) <i>Trygon</i> e) Skate	Practical	0.2
2.	Study of specimens of Osteichthyes: a) <i>Echeneis</i> b) <i>Clarias</i> c) <i>Hippocampus</i> d) <i>Anguilla</i> e) <i>Belone</i> f) <i>Synaptura</i> g) <i>Tetradon</i> h) <i>Diodon</i>	Practical	0.3
3.	Mounting of fish scales:	Practical	0.2

	a) Placoid scales b) Cycloid scales		
5	Dissection of <i>Scoliodon</i> (Study of dissected specimens): a) Afferent and efferent branchial system. b) Cranial nerves (5th, 7th, 9th and 10th).	Practical	0.2
4	Study of specimens of Amphibians: a) <i>Rana</i> b) <i>Bufo</i> c) <i>Hyla</i> d) <i>Rhachophorus</i> e) <i>Salamander</i> f) <i>Ichthyophis</i> g) Axolotl larva.	Practical	0.1

Unit II (Reptilia and Aves) (2-0.5-0)

Theory (Credit- 2)

Reptilia: General characters and classification of class Reptilia up to orders with examples, arcade and temporal fossae; **Aves:** General characters and classification of class Aves up to orders with examples (5 important orders only), salient features of Archaeornithes and Neornithes, flight adaptation and migration in birds.

Practical- (Credit- 0.5)

Sr. No.	Name of practical	Nature	Credit
1.	Study of specimens of Reptilia: a) Chameleon b) Varanus c) Draco d) Tortoise e) Crocodile	Practical	0.1
2.	Identification of poisonous and non-poisonous snakes: a) Cobra b) Krait c) Rat snake d) Viper e) <i>Dryophis</i> f) <i>Hydrophis</i>	Practical	0.1
3.	Study of specimens of Aves: a) Barn owl b) Water hen c) Wood pecker d) Cattle egret e) Koel f) King fisher	Practical	0.2
4	Local field visit to identify and classify 10 fauna (common birds); submission of report.	Practical	0.1

Unit III (Mammalia) (2-0.5-0)

Theory (Credit- 2)

Mammalia: General characters and classification of class Mammalia up to orders with examples; General characters of Prototheria; Adaptive radiation in Marsupialia and Primates ; Adaptive features of Chiroptera and Cetacea; Dentition in mammals.

Practical- (Credit- 0.5)

Sr. No.	Name of practical	Nature	Credit
1.	Dissection of rat (demonstration): a) Digestive system b) Urinogenital system c) Arterial system	Practical	0.2
2	Microtomy: Fixing, block making, section cutting, staining, mounting and submission of two slides of any organs of Frog.	Practical	0.1
3	(Submission of 2 permanent slides)	Practical	0.1
4	Local field visit to identify and classify 10 fauna (common mammals); submission of report.	Practical	0.1

Recommended Text Book:

Modern Textbook of Zoology: Vertebrates by R.L. Kotpal – Rastogi Publications, Meerut, 3rd edition, 2008.

Reference Books:

A Text Book of Zoology Vol.II by Parkar and Hasswel – (MacMillan).

A Text Book of Zoology Vol.II by R.D.Vidyarthi – (S. Chand & Co., Delhi).

COMPARATIVE ANATOMY OF VERTEBRATES

Unit I (Type study – Rabbit) (2-1-0)

Theory (Credit- 2)

Type study: *Oryctolagus* (Rabbit) – Respiratory system and structure of brain; Sense organs – eye and ear;

Practical- (Credit- 1)

Sr. No.	Name of practical	Nature	Credit
---------	-------------------	--------	--------

1.	Osteology: a) Study of skulls of Frog, Varanus/Calotes, Bird and Rabbit.	Practical	0.5
2.	b) Study of fore and hind limb bones of Frog, Varanus/Calotes, Bird and Rabbit	Practical	0.5
		Practical	0.1
		Practical	0.2
		Practical	0.1

Unit II (Comparative Anatomy-I) (2-0.5-0)

Theory (Credit- 2)

a) Comparative studies in amphibians, reptiles, birds and mammals: i) Digestive system and associated glands ii) Respiratory organs ; **b)** Evolution of heart in vertebrates; **c)** Evolution of aortic arches in vertebrates.

Practical- (Credit- 0.5)

Sr. No.	Name of practical	Nature	Credit
1.	a) Study of different types of vertebrae: b) Study of pectoral and pelvic girdles of Frog, Varanus/Calotes,	Practical	0.2
2.	b) Study of pectoral and pelvic girdles of Bird, Rabbit	Practical	0.3

Unit III (Comparative Anatomy-II) (2-0.5-0)

Theory (Credit- 2)

a) Comparative studies in amphibians, reptiles, birds and mammals:
i) Brain; ii) Eye and ear of birds and mammals; iii) Cranial and spinal nerves, Autonomous nervous system; b) Different types of vertebrae in vertebrates; c) Structure and evolution of kidneys in vertebrates; d) Structure of gonads and gonoducts formation;

Practical- (Credit- 0.5)

Sr. No.	Name of practical	Nature	Credit
1.	Study of stained slides of mammals – T.S. of a) Stomach b) Intestine c) Kidney d) Liver	Practical	0.2
2.	Assignment on fishes: a) Morphological adaptation b) Accessory respiratory organs c) Parental care	Practical	0.3

Recommended Text Book:

Modern Textbook of Zoology: Vertebrates by R.L. Kotpal – Rastogi Publications, Meerut, 3rd edition, 2008.

Reference Books:

A Text Book of Zoology Vol.II by Parkar and Hasswel – (MacMillan).

A Text Book of Zoology Vol.II by R.D.Vidyarthi – (S. Chand & Co., Delhi).

Physical chemistry**Unit I: Gaseous and Solid State (2.0-0.6-0)****Theory(2 credit)**

Explanation of the macroscopic properties of solids in terms of structure, bonding and defects.

Definition of space lattice, unit cell.

Laws of crystallography – (i) Law of constancy of interfacial angles, (ii) Law of rationality of indices, (iii) Law of symmetry. Symmetry elements in crystals.

X-ray diffraction by crystals. Derivation of Bragg equation. Predicting crystal structure. Defects in solids, Dielectric properties. Review a perfect gas connecting temperature with kinetic theory. Postulates of kinetic theory of gases, deviation from ideal behaviour, van der Waals equation of state. Critical Phenomena : P-V isotherms of real gases, continuity of states, the isotherms of van der Waals equation, Derive a relationship between critical constants and van der Waals constants, the law of corresponding states, reduced equation of state.

Molecular Velocities: Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Liquefaction of gases (based on Joule-Thomson effect).

Practical-1. To evolve a scheme of analysis of anions and cations based on solubility products and common ion effect.(Total no 5)

a) classification of anions and cations.

b) Quantitative inorganic analysis of mixtures containing four radicals.

2. Determination of density by specific gravity bottle and viscosity of the given liquid by Ostwald's viscometer

Unit II: Liquids and Colloids ((2-0.6-0)**Theory(2credit)**

Accounting the Isotropic and intermediate behaviour of liquids as a link between solids and gases. Also tracing the role of liquids as solvents and reaction regulators Intermolecular forces, structure of liquids (a qualitative description).

Structural differences between solids, liquids and gases.

Liquid crystals: Difference between liquid crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell. 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 applications of colloids

Practical-1. Determination of density by specific gravity bottle and surface tension of the given liquid by stalagnometer.

2. Measurement of vapour pressure of pure liquids and solutions, finding enthalpy of vapourisation of water

III: Chemical Kinetics

Understanding the factors that influence a chemical reaction and rationalising them on the basis of known theories of reaction rates. Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction – concentration, temperature, pressure, solvent, light, catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions – zero order, first order, second order, pseudo order, half life and mean life. Determination of the order of reaction – differential method, method of integration, method of half-life period and isolation method. Radioactive decay as a first order phenomenon.

Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy, 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

Recommended Text Books :

1. Sl.nos 1 to 6 of I Semester.
2. Principles of Physical Chemistry : Marron and Prutton

Reference Books:

3. Elements of Physical Chemistry : Samuel Glasstone and Lewis
4. Physical Chemistry : P W Atkins

Inorganic chemistry

Unit I: Periodic Properties

Periodic table as an expression of regularity as a basis for organising information. Atomic radius, Covalent, ionic and Vander waal radii-explanation with examples. Atomic and ionic radii, ionization energy, electron affinity and electronegativity – definition, methods of determination or evaluation, trends in periodic table and applications in predicting and explaining the chemical behaviour. Factors influencing ionization energy in a group and a period. Electronegativity – Variation in a group and a period, Relationship between Electronegativity, Ionisation Energy and Electron Affinity. Pauling Scale of Electronegativity.

Practical-

1. Iodination of Acetone by titration and Colorimetry.
2. Acid Hydrolysis of Ester.

UNIT-II s and p-Block Elements

Comparative study of s-Block Elements, diagonal relationships, an introduction to alkyls and aryls –salient features of hydrides, Action of Liquid Ammonia, Properties of solutions of alkali metals in Liquid Ammonia, Anomalous properties of Lithium and Beryllium.

To appreciate the wide variety in Physical and Chemical characteristics of p-Block elements and

their compounds. Comparative study (including diagonal relationships) of groups 13-17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13-16. tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalides.

- Practical-**
1. Reaction between Potassium Peroxydisulphate and Potassium Iodide.
 2. Base Hydrolysis of an Ester by Titration and Conductometry
 3. Iodine clock reaction
 4. Solvolysis of Tertiary Butyl Chloride by Titrimetry, conductometry and pH metry

Unit-III Molecular Orbital theory, boranes and Xenon compounds

Approaches to understand the properties and stabilities of molecules as viewed by different theories of bonding. Molecular orbital theory, basic ideas - criteria for forming M.O. from A.O., construction of M.O's by LCAO - H_2 ion, calculation of

- Practical-** 1. Inversion of Cane Sugar

Recommended Text Books:-

1. University Chemistry : Bruce Mahan
2. Concise Inorganic Chemistry : J D Lee

Reference Books:

1. An Introduction to Inorganic Chemistry : Mackay and Mackay

Fundamentals of Computers

UNIT – I (Basics of computer System and Number System) (2-0.6-0)

Theory (2 Credits)

Introduction to Computer System and functions of its components, evaluation of Computers and their classification, hardware and software; Number System: Decimal, Binary, Octal and Hexadecimal and their inter conversions. Representation of integer and real numbers, characters and codes (BCD, ASCII and EBCDIC), error detecting and correcting codes (Parity, Gray and Hamming codes), binary and floating point arithmetic (addition and subtraction).

Practicals: (0.3 credit)

Sr. no.	Name of practical	Nature	Credit
1	Demonstration of different Hardware and software components of computers.	Practical	0.1
2	Description of assembly of computer system hardware	Practical	0.1
3	Description of the functionalities of different types of system software and application software.	Practical	0.1
4.	Practice of number systems and codes (BCD, ASCII and EBCDIC).	Practice	0.3

UNIT – II (Boolean Algebra) (2-0-0)

Theory (2 Credits)

Basic concepts of Boolean algebra and their electronic implementation through various logic gates, simplification of Boolean expressions (Boolean algebra and Karnaugh map method). Hard Devices and software device, CPU, Memory disks and its types.

UNIT – III (Software and MS office) (2-1.4-0)

Theory (2 Credits)

Network Basics and Internet, Concept of System software and application software, Office Automation (MS-Word, Excel and Power Point). Introduction to Data Bases, concept and architecture, Tables, Query and Report generation (MS- Access).

Practicals: (1.4 credit)

Sr. no.	Name of practical	Nature	Credit
Word Processing:			
1	Document creation & formatting of that document,	Practical	0.1
2	Create a word document and grammar & spelling checking in that document,	Practical	0.1
3	Table creation in a word document and table handling handling,	Practical	0.1
4	Find & Replace function in Microsoft word,	Practical	0.1
5	Mail Merge, Macro functions in Microsoft word,	Practical	0.1
6	Document with multiple columns, Templates	Practical	0.1
Spreadsheet:			
1	Creation of Workbook, entering data in multiple sheets, Cell referencing, charts,	Practical	0.2
2	Functions-Date & Time, Mathematical, Statistical, Look up and text.	Practical	0.2
Presentation:			
1	Creation of Presentation and formatting, different views of presentation,	Practical	0.2
2	layouts and templates, Master slides, Animation, Transition.	Practical	0.2

Recommended text Books:

1. Computer Fundamentals, Architecture & Organization, B.RAM, New Age International, New Delhi, 2000
2. Fundamental of computer, V. Rajaraman, Prentice Hall India Pvt., Limited.

References:

1. Microsoft Office 2000 for Windows, S. Sagman, Berkeley Peachpit Press, 1999