SARDAR PATEL UNIVERSITY
FOURTH SEMESTER
ZOOLOGY-US04CZ01
INVERTEBRATA, VERTEBRATA AND ANIMAL BEHAVIOR.
EFFECTIVE FROM JUNE 2011.
(THREE CREDITS,3 PERIODS/WEEK)

UNIT -1.
TYPE: LEECH.
ECONOMIC IMPORTANCE OF INSECTS.
HOUSE HOLD INSECTS AND THEIR CONTROL.

UNIT-2
TYPE : PRAWN

UNIT-3
TYPE: PILA
LARVAL FORMS IN ECHINODERMATA.

UNIT-4.
TYPE: CALOTES.
SNAKES: GENERAL ACCOUNT, POISIONOUS AND NON POISIONOUS.

UNIT-5
ANIMAL BEHAVIOR: INNAT AND LEARNT.
SOCIAL BEHAVIOR OF HONEY BEE.
TERRITORIAL BEHAVIOR

UNIT -6. ROLE OF PHEROMONES IN BEHAVIOR
DEFINITION, DIFFERENCE BETWEEN HORMONES AND PHEROMONES, PRODUCTION OF PHEROMONES, TYPES OF PHEROMONES, PHEROMONES AND BEHAVIOR, MODE OF ACTION OF PHEROMONES.

REFERENCES:
MODERN TEXT BOOK OF ZOOLOGY- INVERTEBRATE BY R.L. KOTPAL.
MODERN TEXT BOOK OF ZOOLOGY- VERTEBRATE BY R.L. KOTPAL.
INVERTEBRATE ZOOLOGY BY JORDAN AND VERMA.
CHORDATE ZOOLOGY BY JORDAN AND VERMA.
ANIMAL BEHAVIOUR BY REENA MATHUR.
ZOOLOGY FOR IAS BY SATGURU PRASAD.

SARDAR PATEL UNIVERSITY
FOURTH SEMESTER
ZOOLOGY-US04CZ02
PHYSIOLOGY, ECONOMIC ZOOLOGY, TOXICOLOGY AND WILD LIFE.
EFFECTIVE FROM JUNE 2011.
(THREE CREDITS,3 PERIODS/WEEK)

UNIT-1
HUMAN REPRODUCTION
MALE AND FEMALE REPRODUCTIVE ORGANS.
FEMALE REPRODUCTIVE CYCLE.
FERTILIZATION AND IMPLANTATION OF EMBRYO.
LABOR
METHODS OF BIRTH CONTROL.

UNIT-2
LYMPHATIC SYSTEM OF HUMAN AND STRUCTURE AND FUNCTION OF SPLEEN.

UNIT-3
IMMUNOLOGY.
NON SPECIFIC RESISTANCE TO DISEASES.
SPECIFIC RESISTANCE [IMMUNITY, MATURATION OF T CELL, B-CELL, ANTIGEN, TYPES OF IMMUNE RESPONSE, PATHWAY OF ANTIGEN PROCESS]
CELL MEDIATED AND ANTIBODY MEDIATED IMMUNITY.

UNIT-4
ECONOMIC ZOOLOGY-APICULTURE, LAC CULTURE, SERI CULTURE AND PRAWN CULTURE.

UNIT-5
TOXICOLOGY.
INTRODUCTION , SCOPE, DIVISION AND GOAL OF TOXICOLOGY.
TOXIC CHEMICALS :FERTILIZERS, PESTICIDES, AUTOMOBILE , HEAVY METALS.

UNIT-6
WILD LIFE.
INTRODUCTION, BRIEF HISTORY OF GUJARAT WILD LIFE.
IMPORTANCE OF WILD LIFE.
VANISHING OF WILD LIFE.
CONSERVATION OF WILD LIFE.
SENTUARY AND NATIONAL PARK OF GUJARAT.
CONCEPT OF THRETENED SPECIES.
WILD LIFE ORGANISATION.

REFERENCES:
A TEXT BOOK OF ANIMAL PHYSIOLOGY BY A K BERRY.
ANIMAL PHYSIOLOGY BY M. P. ARORA.
PRINCIPLES OF ANATOMY AND PHYSIOLOGY BY TORTORA GRABOWSKI.
ZOOLOGY FOR IAS BY SATGURU PRASAD.
ANIMAL ECOLOGY BY M.P.ARORA.
ECONOMIC ZOOLOGY BY SHUKLA AND UPADHYAY.
TOXICOLOGY BY P.D. SHARMA.
IMMUNOLOGY BY KUBE

SARDAR PATEL UNIVERSITY
FOURTH SEMESTER
PRACTICAL ZOOLOGY-US04CZ03
EFFECTIVE FROM JUNE 2011.
(THREE CREDITS,6 PERIODS/WEEK)

DISSECTION :
LEECH : EXTERNAL CHARACTERS AND DIGESTIVE SYSTEM,REPRODUCTIVE SYSTEM, NERVOUS SYSTEM.
MOUNTINGS : SALIVARY GLAND, JAWS, TESTICULAR NEPHRIDIA.
PRAWN : EXTERNAL CHARACTERS AND DIGESTIVE SYSTEM,REPRODUCTIVE SYSTEM, NERVOUS SYSTEM.
MOUNTINGS: APPENDAGES,
PILA: EXTERNAL CHARACTERS AND DIGESTIVE SYSTEM, NERVOUS SYSTEM.
MOUNTINGS: REDULA, STATOCYST, OSPHRADIUM.
CALOTES: EXTERNAL CHARACTERS AND DIGESTIVE SYSTEM,REPRODUCTIVE SYSTEM, BRAIN.
MOUNTINGS: MUSCLE FIBRE, NERVE FIBRE.
CLASSIFICATION :
ANNELIDA : APHRIDITE, CHETOPTERUS, TEREBELLA, ARENICOLA, EARTHWORM, LEECH.
ARTHROPODA: PERIPATUS, CYCLOPS, LEPAS, DAPHNIA, PRAWN, CRAB, SILVERFISH, MANTIS, DRAGONFLY, BEETLE,TERMITE, LIMULUS, SCORPION, SPIDER.
MOLLUSCA: CHITON, MUREX, APLYSIA, DENTALIUM, PEARLOYSTER, NAUTILUS, SEPIA, OCTOPUS,.
ECHINODERM: SEASTAR, BRITTLE STAR, FEATHER STAR, SEA URCHIN, SEA CUCUMBER.
HEMICHORDATA: BALANO GLOSSUS.
REPTILIA: TORTOISE, TURTLE, DRACO, PHRYNOSOMA, CHEMELION , VARANUS, COBRA, ALLIGATOR ,
AVES: KITE, PIGEON, CUCKOO, PARROT, WOODPECKER, KINGFISHER,
MAMMALS: HEDGEHOG, SHREW, RAT, BAT, LORIS, PORCUPINE.
STUDY OF LIFE CYCLE OF HONEY BEE, LAC INSECT, SILK INSECT.
ANTIGEN- ANTIBODY REACTION.(WIDAL)
STUDY OF ENDANGERED SPECIES OF GUJARAT.
SUBMISSION .
STUDY TOUR.

REFERENCES:
A MANUAL OF PRACTICAL ZOOLOGY-INVERTEBRATE. BY P.S.VERMA.
A MANUAL OF PRACTICAL ZOOLOGY-CHORDATE BY P.S.VERMA.

SARDAR PATEL UNIVERSITY

SECOND YEAR B.Sc. (FOURH SEMESTER)

BOTANY

US04CBO 01 (Higher Cryptogams, Pharmacognosy and Environmental Biology)

(Three Credit Course, Three hours per week)

(Effective from June – 2011)

(Total Marks-100, Internal-30 marks, External -70 marks)

Unit I

- Bryophyta - Classification , morphology , anatomy and reproduction of *Marchantia, Notothylas, Pellia* and *Pogonatum*

Unit II

- Pteridophyta: Distribution , Morphology,Structure and life history of *Psilotum ,Isoetes,Selaginella and Marsilea*.
- Types and evolution of stele in Pteridophytes

Unit III

- Gymnosperms - Distribution ,morphology ,anatomy and reproduction of *Pinus , Taxus* and *Gnetum*

Unit IV

Basic Pharmacognosy

- Introduction to the parts of medicinal plants
- Classification of crude drugs
- Cultivation , collection and processing of herbal drugs
- Sources, active constituents and uses of *Neem ,Adhatoda , Ashwagandha* and *Plantago*

Unit V

Environmental Biology

- Forest degradation and conservation
- Environmental monitoring and impact assessment
- Environmental challenges in India
- Succession: Definition, causes, types, process, Hydrosere and Xerosere
- Ecological pyramids (Number, Biomass and Energy)

Unit VI

Environmental Biology

- Definition ,scope and applications of plant ecology
- Biotic and Abiotic factors
- Energy flow in Ecosystem
- Environmental adaptation in plants (Hydrophytes, Epiphytes, Xerophytes)

Suggested readings:

1. College Botany Vol 2 : Gangulee and Kar
2. Pharmacognosy : Kokate ,Purohit and Gokhle
3. Ecology and environment : P.D.Sharma
4. Text Book of Pteridophyta by B. R. Vasistha and N. S. Parihar
5. Text book of Gymnosperm by P.C. Vasistha

SARDAR PATEL UNIVERSITY
SECOND YEAR B.Sc. (FOURTH SEMESTER)
BOTANY
US04CBO 02 (Basics and Applications of Plant Science)
(Three Credit Course, Three hours per week)
(Effective from June – 2011)
(Total Marks-100, Internal-30 marks, External -70 marks)

Unit I
Plant anatomy

- Structure of epidermal cell, Structure ,function and types of Stomata
- Structure, distribution ,types and function of Laticifers
- Structure, distribution , function and ecology of Nectaries
- Structure and activity of the Vascular Cambium
- Structure and function of Periderm
- Secondary growth the stem of Leptadenia and Boerhavvia

Unit II
Plant embryology

- Structure of pollen grains
- Structure and development of male and female gametophyte
- Pollination: Self and cross pollination,Pollination in Commelina ,Sunflower and Fig
- Double fertilization
- Endosperm

Unit III
Plant Biotechnology

- Scope and importance of Biotechnology
- Application of Biotechnology in medicine and industry
- Application of biotechnology in agriculture
- Biotechnology in biodiversity conservation.

Unit IV
Plant tissue culture

- Cellular totipotency: a brief account
- M.S. Medium and its preparation
- Sterlization:Technology and importance
- Protoplast culture
- Embryo and pollen culture

Unit V
Genetics

- Mendel experiments and laws
- Incomplete dominance
- Back cross and test cross

Unit VI

Genetics

- Dominant Epistasis(12:3:1),Recessive.epistasis(9:3:4),Supplimentary(9:3:4),Complimentary(9:7)
- Gene interactions
- Mitosis and meiosis
- Linkage and crossing over

Suggested readings:

1.Plant anatomy : A. Fahn
2.College Botany Vol 1 : Gangulee ,Das and Dutta
3.Plant tissue culture and biotechnology :Kavi kishore P.B.
4.Genetics : P.S. Verma and Agarawal
5.Text book of Env. Biotechnology: P.K.Mahapatra

SARDAR PATEL UNIVERSITY
SECOND YEAR B.Sc. (FOURTH SEMESTER)
BOTANY
US04CBO 03
(Three Credit Course, Six hours per week)
(Effective from June – 2011)
(Total Marks-100, Internal-30 marks, External -70 marks)

1. Study of the life history of Notothyllas ,Marchantis and Pellia through permanent slides
2. Study of life history of Psilotum,Isoetes,Selaginella and Marsilea through permanent slides
3. To dissect out the antheridia and archegonia of Pogonatum.
4. Structure and reproduction of Pinus:
   (a)Free hand sections of stem and leaflet
   (b) Reproductive structures through Permanent slides and specimens
5. Free hand sectioning of the stem and leaf of Taxus
6. Free hand sectioning of the stem of Gnetum
7. Free hand sectioning of the stem and leaf of Neem and Tulsi
8. Free hand sectioning of the root of Rauwolfia and Adhatoda
9. Histochemical localization of Tannisa ,gum ,sugar, Mucilage ,starch ,lipids ,Cellulose and proteins
10. Study of types of stele through permanent slides
11. To test the water holding capacity , PH ,carbonate and nitrate of soil samples
12. Ecological adaptations in hydrophytes,xerophytes and epiphytes
13. Study of types of stomata in peeling and imprints
14. Study of laticifers in papaya,euphorbia and calotropis
15. Study of cyathial nectar using free hand sectioning
16. Study of vascular cambium and phloem tissue in TS (freehand sectioning) and maceration
17. Study of secondary tissues in the stem of Leptadenia and Boerhavvia (free hand sectioning)
18. Study of pollen grain germination in Vinca
19. Preparation of M.S. Medium
20. Study of various stages of reduction division in cuscuta/onion flower buds(squash preparation)
21. To dissect out embryo from suitable material
22. To test the % viability of seeds
23. Separation of aminoacids using paper chromatography
24. Demonstration of sample preparation for light microscopy

Note: To provide flexibility up to the maximum of 20% of total experiments can be replaced/ added to the list by the Board Of Studies.

SARDAR PATEL UNIVERSITY
S.Y.B.SC. (SEMESTER – IV)
USO4EZ01
(Chordates, Physiology, Immunology & Ecology)
2hr / week, 2 credit, Total Marks – 100,(External – 70, Internal – 30)
Effective from June 2011

Unit 1 Type Study of

1) Shark (Except Endoskeleton Arterial sys & venous sys)

Unit 2 Human Reproduction:

1) Human male & Female reproductive organs
2) Spermatogenesis
3) Oogenesis
4) Puberty
5) Menstrual Cycle
6) Fertilization
7) Lactation: Mammary gland, lacto genesis and Hormonal Control.

Unit 3 Immunology:

Fundamental concepts, Innate, non specific immunity. Specific immunity

Antibody and cell mediated immune system.

Classes & subclasses of immunoglobulin.

Organization & structure of lymphoid organs

Unit 4 Ecology & Environmental biology :

Ecosystem, Structural components of an ecosystem, Abiotic and biotic factors. (Brief)

Temp. as abiotic factor detail (Temp. range, thermal stratification, temp. tolerance, cold blooded and warm blooded animals, Effects of temp. on animals, Adaptations to meet extreme of temp.

Reference books :

1) Chordate zoology – R.L. Kotpal
2) Chordate zoology – H.C. Nigam
3) Chordate zoology – Jordan & Verma
4) Textbook of physiology – A.K.berry
5) Textbook of physiology – vermal Aggrawal Tyagi
6) Immunology by Qube
7) Animals ecology – M.P.Arora
8) Ecology – Verma, Agarwal
9) Ecology – P.D.Sharma