



SOLAPUR UNIVERSITY, SOLAPUR

Syllabus for B.Sc. I Zoology
Syllabus to be implemented from June 2010 onwards

SEMESTER- I THEORY

Paper	Title of the paper	Marks
I	Animal Diversity I,	50
II	Cell Biology and Genetics	50

SEMESTER- II THEORY

Paper	Title of the paper	Marks
III	Animal Diversity –II	50
IV	Ecology, Ethology Evolution and Applied Zoology	50

PRACTICAL TO BE TAKEN AT THE END OF SEMESTER-II

Practical	Title of the practical	Marks
I	Practical Based on Theory Papers I, II, III and IV	100

SOLAPUR UNIVERSITY, SOLAPUR

SYLABUS B.Sc. I ZOOLOGY

W.E.F. from June 2010

SEMESTER - I

Paper- I

Animal Diversity I

- 1) Principles of Classification -Salient features and classification up to classes with the following non chordate phyla with suitable examples – Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematelminthes and Annelida. [5]
 - 2) Protozoa – Type Study – Paramecium : Morphology, Locomotion, Nutrition Osmoregulation, Reproduction (Binary fission and conjugation) [6]
 - 3) Porifera –Study of cell types and canal system with reference to Sycon [4]
 - 4) Coelenterata – Type Study – Hydra: Morphology (including cell types), Locomotion, Nutrition and Reproduction [5]
 - 5) Platyhelminthes – Study of tape worm with reference to Morphology, life cycle and Parasitic adaptations [3]
 - 6) Annelida – Type study – Earthworm (Pheretima posthuma) Morphology Coelom, Digestive system, Circulatory system, excretory system, Reproductive system and Nervous system [12]
- Total Periods: [35]
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SEMESTER –I

Paper – II

Cell Biology and Genetics

- 1) Methods in Cell Biology :Electron microscopy principals, limitations are expected.[2]
 - 2) Ultrastructure of Prokaryotic and Eukaryotic cells [2]
 - 3) Nuclear and extra nuclear organization of the cell. [15]
 - a) Study of Nucleus with reference to Nuclear membrane, Nucleoplasm, Chromatin and nucleolus.
 - b) Study of Ultra structure and functions of the following
 - i) Plasma membrane (Fluid Mosaic Model)
 - ii) Mitochondria
 - iii) Endoplasmic reticulum
 - iv) Golgi complex
 - v) Lysosome
 - vi) Ribosomes
 - vii) Giant chromosomes and lamp brush chromosome
 - 4) Mendelian inheritance pattern and laws of dominance, segregation and independent assortment [5]
 - 5) Co dominance and incomplete dominance [2]
 - 6) Multiple alleles – Blood group inheritance ABO and Rh [3]
 - 7) Human genetics [6]
 - a) Phenyl keton uric imbecility
 - b) Sickle cell anemia
- Total Periods: [35]

List of Recommended Books:

- 1) Hyman, L. H. – The invertebrates, Vol. I (McGraw Hill)
- 2) Hyman L.H. – The invertebrates, Vo. II (McGraw Hill)
- 3) Barnes R. D. – Invertebrate Zoology (W.B. Saunders Co.)
- 4) Pearse / Buchschaum – Living invertebrates, Blackwell Scientific Publications, California
- 5) Parker and Haswell – A Text Book of Zoology – Invertebrates Vol. I Edited by Marshall and Williams, C.B.S. Publishers and Distributors, New Delhi.
- 6) P. S. Dhama and J.K. Dhama – Invertebrates, S. Chand and Company. New Delhi
- 7) De Robertis EDP and De Robertis EME – Cell and Molecular Biology
- 8) C.B. Powar – Cell Biology, Himalaya Pub. House
- 9) Verma P. S. and Agarwal V. K. – Genetics, S. Chand and Company
- 10) Strickberger – Genetics. C Millian Publications
- 11) Winchester – Genetics, Oxford Publication
- 12) E. L. Jordan & P. S. Varma – Invertebrate Zoology
- 13) Genetics by P.P. Meyyan
- 14) A Text Book of Invertebrates – N. C. Nair, N. Soundara Pandian, S. Leelavathy, T. Murugan
- 15) R. L. Kotpal – Modern Text Book of Zoology, Invertebrates
- 16) Cell Biology – Dr. N. Arumugam
- 17) P. S. Varma & V. K. Agarwal – Cell Biology, Genetics, Molecular Biology, Evolution and Ecology
- 18) R. P. Meyyan, N, Arumugam – Genetics & Evolution
- 19) P. K. Gupta – Cell and Molecular Biology
- 20) Search engine- www.wikipedia.org

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SEMESTER –II
Paper –III
Animal Diversity –II

- 1) Classification: General organization and classification of chordates up to the following with suitable examples [5]
- a) Urochordata
 - b) Cephalochordata
 - c) Agnatha
 - d) Fishes
 - e) Amphibia
- This topic may be taught in practical class
- 2) Cyclostomata: General Characters, Ammocoetus larva [2]
- 3) Fishes
- a) Scales in fishes
 - b) Structure of gills in cartilaginous and bony fish
 - c) Mechanism of gill respiration [6]
- 4) Amphibia: Type Study – Frog (*Rana tigrina*) [22]
- a) Morphology
 - b) Histological structure of skin
 - c) Digestive system and physiology of digestion
 - d) Respiratory system and mechanism of respiration
 - e) Blood vascular system
 - f) Excretory and Reproductive system
 - g) Nervous system and sense organs Eye and Ear.
 - h) Embryology of frog up to three germ layers.
 - h) Skeleton- Appendicular skeleton and vertebrae [May be taught in practical]
- Total periods: [35]

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Semester II
Paper – IV
Ecology, Ethology, Evolution and Applied Zoology

- Ecology** [15]
- 1. Introduction, aim and scope of Ecology
 - 2. Brief idea of ecosystem in following aspects
 - a) Biotic and Abiotic factors
 - b) Biosphere
 - c) Energy flow in grass land and pond ecosystems
 - d) Food chain and Ecological pyramids
 - 3) Ecological succession
 - a) Primary and secondary succession
 - b) Processes of formation of succession
- Ethology** [6]
- 1. Mimicry and Camouflage
 - b) Courtship behavior in birds
 - c) Social behavior in Honey bees: Casts, swarmings, Nuptial flight and communication
- Evolution** [8]
- a) Organic evolution concepts
 - b) Paleontological evidences
 - c) Anatomical evidences

Applied Zoology

[6]

1. Vermitechnology
2. Vermiculture
3. Vermicomposting
4. Vermiwash

Total Periods:[35]

List of Recommended Books:

- 1) Evolution & Biostatistics – by N. Arumugam & R. P. Meyyan.
- 2) Environmental Studies – Based on UGC syllabus – N. Arumugam & V. Kumaresan
- 3) Organic Evolution – N. Arumugam
- 4) Chordate Zoology – A. Thangamani, S. Prasanna Kumar, N. Arumugam, L. M. Narayanan
- 5) Ecology – By E. P. Odum
- 6) The Protochordates – by S. H. Bhamrah and Kavita Juneja – Anmol Publications, New Delhi
- 7) Introduction to Protochordata – S. H. Bhamrah and Kavita Juneja – Anmol Publications, New Delhi
- 8) Chordate Zoology – S. Chand Company, New Delhi
- 9) Text Book of Zoology – Vertebrates, Vol. II – T. J. Parker and W. A. Haswell Edited by Marshall and Williams, CBS Publications and Distributors, New Delhi.
- 10) E. L. Jordan – Chordate Zoology, S. Chand and Company, New Delhi.
- 11) Odum – Ecology (Amerind)
- 12) Fundamentals of Ecology – Odum – (Saunders)
- 13) Ecology – Rickelfs (W.H. Freeman)
- 14) Economic Zoology – Venkitraman (Sudarshana Publishers)
- 15) The Foundations of Ethology (Spinger Verlag)
- 16) Economic Zoology – Shukla and Upadhyaya – Rastogi Publications
- 17) Immelamann – Introduction of Ethology (Plenum Press)
- 18) A Text Book of Chordates – A. Thangamani, L. M. Narayan, S. Prasannakumar, N. Arumugam
- 19) R. L. Kotpal – Modern Text Book of Zoology, Vertebrates
- 20) A. Arumugam, J. Johnson Rajeshwar, S. Arumuam, R. Ram Prabhu – Applied Zoology

**Practical Course in Zoology for B. Sc. I
Semester I and II
[To be taken at the end of Semester II]**

1. Animal Classification – Non chordates up to classes

- a) Protozoa – Amoeba, Paramoecium, Euglena, Trypanosoma
- b) Porifera – Sycon, Spongilla, Hyalonema
- c) Coelenterata – Hydra, obelia, Aurelia, Sea anemone and coral
- d) Platyhelminthes – Planaria, Liverfluke, Taenia
- e) Nemathelminthes – Ascaris
- f) Annelia- Neris, Earthworm, Leech

2. Animal Classification- Chordates up to orders

- a) Urochordata - Herdmania, Salpa, Doliolum
- b) Cephalochordata - Amphioxus
- c) Cyclostomata – Petromyzon, Myxine, Ammocoetus larva
- d) Pisces – Dogfish, Sting ray/ Electric ray, Flying fish, Sea horse, Eel, Labeo
- e) Amphibia – Ichthyophis, Frog, Toad, Salamander

3. Earthworm

- Dissection of
- i) Digestive System
 - ii) Reproductive system
 - iii) Nervous system
- Mounting of Septal nephridia, Setae, Spermatheca, Ovary,
Sections of Earthworm Passing through Pharynx, Gizzard, Typhsole
region, study of cocoon

4. Study of the following

- a) Paramoecium - Binary fission and conjugation
 - b) Sycon Spicules and T.S. and L. S. of Sycon
 - c) Hydra – Whole mount, budding . sections through body Ovary and Testis
 - d) Taenia: Scolex, Mature and Gravid proglottids, Hexacanth larva
 - e) Scales and Fins- Placoid, cycloid scales, types of fins - Homocercal & Heterocercal tail
 - f) Gills of cartilaginous and bony fishes
- 5. Frog** - Demonstration of Heart, Digestive system, Lungs, Kidneys, Ovaries, Testis, Blood and Brain, Vertebrae and Appendicular skeleton
- 6. Stained preparation of Mitochondria using Janus green B from any suitable material**
- 7. Polytene Chromosome – Stained preparation of Polytene chromosome in chironomous larva/ Drosophila larva.**
- 8. Examples in Genetics** – Examples based on Monohybrid, Dihybrid and blood group genetics (10 examples are to be solved)
- 9. Mimicry**- Any suitable example stick insect, leaf insect, chameleon
- 10. Honey bee** - Observation of casts, Bee hive.
- 11. Study Tour** – Visit to sea shore or any other suitable place of Zoological interest up to four days.

Scheme of Marking for Practical

Q.1. Dissection	Marks 12
Q.2. Temporary stained preparation	Marks 5
Q.3. Genetics example	Marks 5
Q.4. Cytological preparation	Marks 8
Q.5. Spotting	Marks 10
Q.6. Tour Report	Marks 5
Q.7. Laboratory Record	Marks 5
	Total Marks [50]



Solapur University, Solapur
Nature of Question Paper For Semester Pattern
• **Faculty of Science**
(w.e.f. June 2010)

Time :- 2 hrs.

Total Marks-50

- Q.No.1) Multiple choice questions. (10)**
1) -----
a) b) c) d)
- 2)
3)
4)
5)
6)
7)
8)
9)
10)
- Q.No.2) Answer any Five of the following (10)**
i)
ii)
iii)
iv)
v)
vi)
- Q.No.3) A) Answer any Two of the following (06)**
i)
ii)
iii)
B) Write the Answer/Solve/Problem/Note (04)
- Q.No.4) Answer any Two of the following (10)**
i)
ii)
iii)
- Q.No.5) Answer any One of the following (10)**
i)
ii)

1. Structure of the courses :-

- A) Each paper of every subject for Arts, Social Sciences & Commerce Faculty shall be of 50 marks as resolved by the respective faculties and Academic Council.
- B) For Science Faculty subjects each paper shall be of 50 marks and practical for every subject shall be of 50 Marks as resolved in the faculty and Academic Council.
- C) For B. Pharmacy also the paper shall be of 50 marks for University examination. Internal marks will be given in the form of grades.
- D) For courses which were in semester pattern will have their original distribution already of marks for each paper.
- E) For the faculties of Education, Law, Engineering the course structure shall be as per the resolutions of the respective faculties and Academic Council.

2. Nature of question paper:

A) Nature of questions.

“20% Marks - objectives question” **(One mark each and multiple choice questions)**

“40% Marks - Short notes / Short answer type questions / Short Mathematical type questions/ Problems. **(2 to 5 Marks each)**

“40% Marks - Descriptive type questions / Long Mathematical type questions / Problems. **(6 to 10 Marks each)**

- B) Objective type question will be of multiple choice (MCQ) with four alternatives. This answer book will be collected in first 15 minutes for 10 marks and in first 30 minutes for 20 marks. Each objective question will carry one mark **each**.
 - C) Questions on any topic may be set in any type of question. All questions should be set in such a way that there should be permutation and combination of questions on all topics from the syllabus. As far as possible it should cover entire syllabus.
 - D) There will be only five questions in the question paper. All questions will be compulsory. There will be internal option **(30%)** and not overall option. **for questions 2 to 5.**
3. Practical Examination for B. Sc. I. will be conducted at the end of second semester.
4. Examination fees for semester Examination will be decided in the Board of Examinations.

The structures of all courses in all Faculties were approved and placed before the Academic Council. After considered deliberations and discussion it was decided not to convene a meeting of the Academic Council for the same matter as there is no deviation from any decision taken by Faculties and Academic Council. Nature of Question Paper approved by Hon. Vice Chancellor on behalf of the Academic Council.