

**Swami Ramanand Teerth Marathwada University,
Nanded**



स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड.

SYLLABUS

B.Sc. First Year

ZOOLOGY

SEMESTER PATTERN

(2013-2014)

**SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY,
NANDED VISHNUPURI, NANDED (M.S.)**

Board of Studies in Zoology

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INTRODUCTION - ZOOLOGY CURRICULA

Revising and updating of the curricula is the continuous process to provide an updated education to the students at large. To ensure and have uniform curricula at U.G. and P.G Levels in different Indian Universities, U.G.C developed a model curriculum and forwarded the same all the universities in the country to serve as a base in updating their respective curricula.

The curriculum designing committee of SRTMU Nanded was constituted for zoology at UG and PG levels which consisted all the members of B.O.S. The members are specialist and experts in different areas of zoology.

For developing the final draft of curriculum, the committee took into account the U.G.C Suggestions regarding model curriculum ,total number of teaching days available in the year and guidelines given by faculty of science of SRTMU Nanded. The curriculum designing committee held a couple of meetings In which there were through and critical suggestions on the concern syllabi. After making appropriate corrections and changes,the committee accepted the final draft of syllabus.

The SRTMU Nanded is having B.Sc and M.Sc. Zoology courses designed with semester system pattern. The course content of each theory paper is divided into four units, each having number of topics and subtopics with appropriate titles and subtitles. For each topic, total number of periods required and weightage of marks is mentioned. At the end of each theory paper the list of selected reading material is provided. A list of practical exercise to be completed in the academic year is also given, paperwise question paper models are provided in the syllabus.

Objectives

- 1.) To update curricula by introducing recent advances in the subject and enable the students to face NET , SET and other competitive examination successfully.
- 2.) To create awareness among students about the latest streams of life sciences including biotechnology, tissue culture, genetic engineering.
- 3.) To improve the quality of laboratory and field work for which zoological study tours and excursions have been made compulsory so that the students can become familiar with reality of ecosystem and surrounding study.
- 4.) To prepare students to attract and develop interest in physiology , genetics , cell biology, fisheries science, toxicology so that the students can select zoology as their carrier.

**Board of Studies
Zoology
S.R.T.M.U NANDED**

**SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY,
NANDED**

ZOOLOGY – CURRICULUM

June - 2013

**B.Sc. GENERAL
Semester Pattern
B.Sc. First Year
MCQ Pattern**

An Outline: B. Sc. I

Semester	Paper No. & Title	Period/ Practical	Marks		
			MCQ Exam	Internal Exam	Total
Semester-I	Theory Paper- I : Life and Diversity of Animals- I (Non-Chordata)	45	40	10	50
	Theory Paper- II : Cell Biology	45	40	10	50
Semester-II	Theory Paper- III : Life and Diversity of Animals- II (Chordata)	45	40	10	50
	Theory Paper- IV : Developmental Biology	45	40	10	50
Annual Pattern	Practical Paper- V : Practical Based on theory papers of Semester- I & II	24	-	-	100

Workload:

- 1. Theory :** Per paper per week three periods
- 2. Practical :** Per batch per week one practical (Three Periods)

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B.SC. FIRST YEAR SYLLABUS 2014
ZOOLOGY SEMESTER I
Paper - I
LIFE AND DIVERSITY OF ANIMALS - I
(Non-Chordata)

Marks:-40+10

Periods: 45

UNIT I **11**

1. Introduction of Non-chordates

2. Protozoa:

General Characters and classification up to class level.

Plasmodium vivax-

Structure, Life Cycle, Pathogenicity and Control Measures.

3. Porifera:

General Characters and classification up to class level.

Sycon:

General Morphology, different types of cells.

Economic Importance of Porifera

UNIT II **11**

1. Coelenterata:

General Characters and classification up to class level.

Polymorphism in Coelenterata.

Coral, and Coral reefs, its Economic Importance.

2. Platyhelminthes:

General Characters and classification up to class level.

Taenia solium: Structure and life cycle

3. Nematohelminthes.

Ascaris: Structure and life cycle.

UNIT – III

12

1. Annelida:

General Characters and classification up to class level.

Role of Earthworm in Agriculture.

2. Arthropoda:

General Characters and classification up to class level.

Cockroach :

External Morphology, Digestive system, Respiratory system, Nervous system.

Economic Importance of Insects

UNIT IV

11

1. Mollusca:

General Characters and classification up to class level.

Economic Importance of Mollusca.

2. Echinodermata:

General Characters and Classification up to class level.

Star Fish

External Morphology and Water vascular system.

3. Hemichordata:

General Characters and Affinities.

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**B.SC. FIRST YEAR SYLLABUS 2014
ZOOLOGY SEMESTER I
Paper - II
CELL BIOLOGY**

Marks:-40+10

Periods: 45

UNIT- I

- | | |
|---|-----------|
| 1. Introduction of Cell Biology | 12 |
| 2. Microscopy (An elementary idea) | |
| a) Light microscopy | |
| b) Electron microscopy | |
| 3. Types of cells: | |
| a) Prokaryotic cell structure | |
| b) Eukaryotic cell structure | |
| 4. Plasma membrane: | |
| a) Structure | |
| i) Bimolecular model, | |
| ii) Trilaminar model, | |
| iii) Lattice model, | |
| iv) Fluid mosaic model, | |
| v) Micellar model, | |
| b) Composition | |
| c) Functions. | |

UNIT- II

11

- | | |
|----------------------------------|--|
| 1. Endoplasmic reticulum: | |
| a) Structure | |
| b) Functions | |
| 2. Golgi complex: | |
| a) Structure | |
| b) Functions | |
| 3. Mitochondria: | |
| a) Structure | |
| b) Functions | |

4. Ribosomes:

- a) Structure
- b) Functions

UNIT – III

11

1. Lysosomes:

- a) Structure
- b) Functions

2. Nucleus:

- a) Structure
- b) Functions

3. Nucleolus:

- a) Structure
- b) Functions

4. Chromosome:

- a) Shape – (metacentric, submetacentric ,Acrocentric and Telocentric,)
- b) Structure
- c) Functions
- d) Polytene and Lampbrush chromosomes

UNIT – IV

11

1. Cell cycle:

- a) Phases
- b) Mitosis and its significance
- c) Meiosis and its significance

2. Cytology of cancer:

Malignant and Non-malignant

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**B.SC. FIRST YEAR SYLLABUS 2014
ZOOLOGY SEMESTER II
Paper - III
LIFE AND DIVERSITY OF ANIMALS - II
(CHORDATA)**

Marks:-40+10

Periods: 45

UNIT I 10

1. Introduction of Chordates.

2. Protochordata:

Urochordata:- General characters, concept of retrogressive metamorphosis.

Cephalochordata: General Characters.

3. Agnatha:

Cyclostomata : General characters of cyclostomes.

UNIT II 12

1. Pisces:

General characters and classification of Pisces up to class level.

Scoliodon (Dogfish):

External characters, Digestive system,

Respiratory system, Circulatory System, Nervous system.

Economic Importance of Fishes.

UNIT III 11

1. Amphibia:-

General characters and classification up to order level.

Parental care in amphibians.

Summer and Winter sleep in Frog.

2. Reptilia:

General characters.

Poisonous and Non poisonous snakes.

Importance of snake Venom.

3. Aves:

General characters.

Flight Adaptations in birds.

Migration of birds.

UNITS IV

12

1. Mammals:

General characters and classification up to order level.

2. Rat-

External characters,

Digestive system (Anatomy),

Respiratory system,

Circulatory system.

Nervous system - Brain and spinal cord

Eye and Ear.

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**B.SC. FIRST YEAR SYLLABUS 2014
ZOOLOGY SEMESTER II
Paper - IV
DEVELOPMENTAL BIOLOGY**

Marks:-40+10

Periods: 45

UNIT- I **11**

1. Introduction of Developmental Biology
2. **Gametogenesis:**
 - a) Spermatogenesis
 - b) Oogenesis
3. **Types of eggs**
 - a) On the basis of amount of yolk
 - b) On the basis of distribution of yolk

UNIT- II **11**

1. **Gametes of frog:**
 - a) Structure of sperm
 - b) Structure of ovum
2. **Frog Embryology:**
 - a) Fertilization
 - b) Cleavage
 - c) Blastulation
 - d) Gastrulation
 - e) Formation of three germinal layers
3. **Regeneration in Non- chordates and chordates**

UNIT – III

11

1. Chick Embryology:

(Extra-embryonic membranes)-

- a) Yolk sac, structure and its functions
- b) Amnion, structure and its functions
- c) Chorion, structure and its functions
- d) Allantois ,structure and its functions

2. Placentation in mammals:

Classification on the basis of

- a) Mode of origin
- b) Mode of distribution of villi
- c) Functions of Placenta

UNIT- IV

12

1. Stem Cell:

- a) Sources
- b) Types – Embryonic, Haemopoitic, Adult, Nervous
- c) Role of stem cells in human welfare

2. Embryo Transfer Techniques:

- a) Gamete Intra-Fallopian Transfer (GIFT)
- b) Test tube baby
- c) Infertility in male
- d) Infertility in female

3. Parthenogenesis:

- a) Natural
- b) Artificial

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**B.SC. SECOND YEAR SYLLABUS 2014
PRACTICAL PAPER – V
(PRACTICAL'S BASED ON THEORY PAPERS OF SEMESTER- I & II)**

Marks 100

- 1) Study of at least two museum specimens from Invertebrate Phyla.
(Protozoa to Echinodermata and Hemichordate)
- 2) Study of at least two museum specimens from Protochordata to Mammalia.
- 3) **Demonstration based on Models, Charts and Computer Aided Techniques:**
 - i) Cockroach: Digestive system, Nervous system.
 - ii) Scoliodon: Digestive system, Heart and ventral Aorta, Afferent arteries, Brain
- 4) **Mountings -**
 - i) Mouth parts of Cockroach
 - ii) Trachea of Cockroach
 - iii) Salivary glands of Cockroach
 - iv) Nereis Parapodia
 - v) Mountings of Scales (by Local Available Fishes): Ctenoid and Cycloid.
- 5) **Skeleton of Rat/Rabbit:** Atlas Vertebra, Thoracic Vertebra, Pectoral Girdle, Pelvic Girdle, Humerus, Femur, Tibia-Fibula, Radius-ulna (Models / Charts).
- 6) **Study of permanent slides of mitosis.**
- 7) **Squash preparation of Onion root tips.**
- 8) **Study of permanent slides of meiosis.**
- 9) **Squash preparation of Onion buds.**
- 10) **Study of permanent slides of Frog Embryology (Any Five).**
- 11) **Study of permanent slides of Chick Embryo:** 18 hrs., 24 hrs., 36 hrs., 48 hrs., 72 hrs. stages.
- 12) **Short excursion/ study Tour is compulsory.**

Note: Submission:

- i) Practical record book duly signed by the teacher in charge/Head of the Department.
- ii) Five permanent stained micro preparations.
- iii) Excursion report.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED
FACULTY OF SCIENCE
B.SC. FIRST YEAR
SUB: - ZOOLOGY
(NON CHORDATES, CELL BIOLOGY, CHORDATES AND DEVELOPMENTAL BIOLOGY)
PRACTICAL EXAMINATION
QUESTION PAPER PATTERN
PAPER (V)

Time : 4 Hours

Marks : 100

Center No. :

Batch No. :

Date :

- Q.1 Demonstrate ----- so as to explain its -----System and leave a labelled diagram
(Scoliodon- Digestive System, Heart, Ventral aorta and brain.) 20
- Q.2 Demonstrate ----- so as to explain its -----System and leave a labelled Diagram.
(Cockroach- Digestive System and Nervous System) 10
- Q.3 Spotting : Identify and Describe as per instructions (1 - 10 Spots) 30
(4- invertebrate, 3- vertebrate, 1- Bone,1- Frog Embryo slide ,1- Chick Embryo slide)
- Q.4 Prepare a permanent stained micro preparation of material provided. 10
(Mounting of Scales of local available fishes/ Mouth parts/ Trachea/ Salivary glands of cockroach/ Nereis Parapodia)
- Q.5 Prepare a temporary Squash preparation of Onion Root tips for Mitosis. 10
(Identify, sketch and describe any one stage)
- Q.6 Record Book. 10
- Q.7 Excursion report and submission of slides 10

Note: Demonstration of animals through Models, Charts and Computer Aided Techniques