Syllabus for

B.SC. ZOOLOGY

(SEMESTER PATTERN)
(For Candidates admitted in the Colleges affiliated to Periyar University from 2017-2018 onwards)
DEFINITION

PROGRAMME:

“Programme” means core degrees offered in various disciplines.

COURSE:

“Course” refers to the courses offered under the degree programme spread over the complete Programme of study as under.

Part I - means “Tamil/other languages” offered under the programme.

Part II - means “English” language offered under the programme.

Part III - means “the core subjects” related to the programme concerned including Practicals.

Part III Allied - means “Allied subjects” offered as allied, which is interdisciplinary in nature but related to the programme.

Part III Electives - means “Elective subjects” related to the core subjects of the programme concerned.

Part IV (i) - “Tamil” means basic orientation in Tamil language for those students who have not studied Tamil upto 12th standard.

(ii) - “Advanced Tamil” means, the subject is meant for students who have studied Tamil language upto 12th standard and chosen other languages in college but would like to advance their Tamil language skills.

(iii) - “Non-Major Electives” means option is being given to students who do not come under the above two categories (i & ii).

(iv) - Skill based subject means the courses offered under the programme related to Advanced Skill acquisition for industrial application for which a separate Diploma will be awarded along with the Degree.

(iv) - “Foundation Course” means courses offered as

1) Environmental Studies (1st year)

2) Value Education - Human Rights /Women's Rights (2nd year)

Part V - “Extension Activities” means all those activities which form part of NSS/NCC/Sports/YRC and other co and extracurricular activities.
B.Sc. ZOOLOGY

A detailed explanation of the above with relevant credits are given under “Scheme of Examination along with Distribution of Marks and Credits”

Duration:

Means the stipulated years of study to complete a programme as prescribed by the University time to time. Currently for the undergraduate programme the duration of study is THREE years. These regulations apply to the regular course of study in approved institutions of the University.

Credits:

Means the weightage given to each course of study (subjects) attributed by the experts of the Board of Studies concerned.

Credit System:

Means, the course of study under this pattern, where weightage of credits are spread over to different semesters during the period of study and the Cumulative Grade Point Average will be awarded based on the credits earned by the students. The following are the total credit points:

For Undergraduate Programme (Three years) : 140

AIM AND SCOPE OF THE COURSE:

1. To acquire knowledge in different areas of animal science.
2. The topics included in different units of different papers would enable the students to develop technical skills in Zoological and applied branches.
3. Skill based subjects like Poultry Science, Dairy Science, Human health and hygiene, Sericulture, Apiculture, Aquaculture, Biotechnology and Clinical Nutrition have been included in order to provide opportunities in employment and research in Government and Private Organizations.
4. There is also scope for self employment for the students.
5. Practicals included in the syllabus will improve the skills of the students in Microscopy, Observations, Drawing and Laboratory techniques.

ELIGIBILITY FOR ADMISSION:

Candidate for admission to the first year of the degree of Bachelor of Science Course shall be required to have passed the Higher secondary examination (Academic or Vocational Stream) conducted by the Government of Tamil Nadu or an Examination accepted by the Syndicate, Subject to such conditions may be prescribed therefore shall be permitted to appear and qualify for B.Sc degree examination in Zoology.

DURATION OF THE COURSE:
The course for the degree of Bachelor of Science shall consist of three academic years divided into six semesters. Each semester consists of 90 working days.

PASSING MINIMUM:

The candidate shall be declared to have passed the examinations if he/she secures not less than 40 marks.

DISTRIBUTION OF MARKS:

**THEORY**

- University examination = 75 marks
- Internal assessment = 25 marks

**INTERNAL ASSESSMENT STRUCTURE:**

- Test = 15 marks
- Assignments = 05 marks
- Attendance = 05 marks

Passing minimum for Internal Assessment = 10 marks

Passing minimum of University examinations = 30 marks

**PRACTICALS**

- University examinations = 60 marks
- Internal Assessment = 40 marks

**INTERNAL ASSESSMENT STRUCTURE:**

- Test = 15 marks
- Observation record = 10 marks
- Regularity in Practical = 15 marks

Passing minimum for internal assessment = 10 marks

Passing minimum for University examinations = 30 marks

**CLASSIFICATION OF SUCCESSFUL CANDIDATES:**

- Candidates who secure not less than 60% of the aggregate marks in the whole examinations shall be declared to have passed the examinations in First class.
- Candidates who secure above 50% and below 60% shall be declared to have passed the examinations in Second class.
- Other successful candidates who secure below 50% shall be declared to have passed the examination in Third class.
## COURSE OF THE STUDY AND SCHEME OF EXAMINATIONS

<table>
<thead>
<tr>
<th>Part</th>
<th>Paper Code</th>
<th>Subject Title</th>
<th>Hours</th>
<th>Credits</th>
<th>Theory</th>
<th>Practicals</th>
<th>Internal (25%)</th>
<th>External (75%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Theory</td>
<td>Practicals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Language</td>
<td>Tamil I</td>
<td>6</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Language</td>
<td>English I</td>
<td>6</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core-I</td>
<td>Invertebrata-I</td>
<td>5</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core-I</td>
<td>Invertebrata - Practical</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Allied I</td>
<td>Chemistry / Botany</td>
<td>4</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Allied I</td>
<td>Botany / Chemistry</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Value education</td>
<td>Yoga</td>
<td>2</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Language</td>
<td>Tamil II</td>
<td>6</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Language</td>
<td>English II</td>
<td>6</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core-II</td>
<td>Invertebrata-II</td>
<td>5</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core-I</td>
<td>Invertebrata - Practical</td>
<td>-</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Allied II</td>
<td>Botany / Chemistry</td>
<td>4</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Allied I</td>
<td>Botany / Chemistry</td>
<td>-</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>EVS</td>
<td>Environmental studies</td>
<td>1</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>SBEC-I</td>
<td>Sericulture</td>
<td>2</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part</td>
<td>Paper Code</td>
<td>Subject Title</td>
<td>Theory</td>
<td>Practicals</td>
<td>Credits</td>
<td>Internal (25%)</td>
<td>External (75%)</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
<td>----------------------------------</td>
<td>--------</td>
<td>------------</td>
<td>---------</td>
<td>---------------</td>
<td>---------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>SEMESTER III</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Language</td>
<td>Tamil III</td>
<td>6</td>
<td>-</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Language</td>
<td>English III</td>
<td>6</td>
<td>-</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core-III</td>
<td>Chordata</td>
<td>4</td>
<td>-</td>
<td>5</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core</td>
<td>Cell Biology and Chordata</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Practical-III</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Allied III</td>
<td>Chemistry / Botany</td>
<td>4</td>
<td>-</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Allied</td>
<td>Practical</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>SBEC- II</td>
<td>Aquaculture</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>NMEC-I</td>
<td>Human health and hygiene</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>SEMESTER IV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Language</td>
<td>Tamil IV</td>
<td>6</td>
<td>-</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Language</td>
<td>English IV</td>
<td>6</td>
<td>-</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core-IV</td>
<td>Cell Biology</td>
<td>6</td>
<td>-</td>
<td>5</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core</td>
<td>Cell Biology and Chordata</td>
<td>-</td>
<td>3</td>
<td>4</td>
<td>40</td>
<td>60</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Practical-II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Allied IV</td>
<td>Botany</td>
<td>4</td>
<td>-</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Allied</td>
<td>Practical - II</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>NMEC- II</td>
<td>Wild life management</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
### B.Sc. ZOOLOGY

<table>
<thead>
<tr>
<th>Part</th>
<th>Paper Code</th>
<th>Subject Title</th>
<th>Hours</th>
<th>Theory</th>
<th>Credits</th>
<th>University Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Practicals</td>
<td></td>
<td>Internal (25%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core V</td>
<td>Genetics</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>III</td>
<td>Core VI</td>
<td>Animal Physiology</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>III</td>
<td>Elective I</td>
<td>Medical Laboratory Techniques</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>III</td>
<td>Elective II</td>
<td>Biostatistics and Computer Applications</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>III</td>
<td>SBEC III</td>
<td>Biotechnology</td>
<td>2</td>
<td>2</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>IV</td>
<td>SBEC IV</td>
<td>Poultry Science</td>
<td>2</td>
<td>2</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Core VII</td>
<td>Developmental Biology</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>III</td>
<td>Core VIII</td>
<td>Ecology</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>III</td>
<td>Core IX</td>
<td>Evolution</td>
<td>5</td>
<td>3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>III</td>
<td>Elective III</td>
<td>Clinical Nutrition</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>III</td>
<td>SBEC-V</td>
<td>VermiTechnology</td>
<td>2</td>
<td>2</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>IV</td>
<td>SBEC VI</td>
<td>Dairy Science</td>
<td>2</td>
<td>2</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>IV</td>
<td>Core</td>
<td>Genetics and Animal Physiology</td>
<td>-</td>
<td>3</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Practical-III</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Core</td>
<td>Practical-IV</td>
<td>-</td>
<td>3</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extension activities</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL CREDITS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
UNIT I
A brief introduction and nomenclature - Level of Organization and Classification up to order level.

**Phylum Protozoa**: General characters - Classifications. Type study-Paramecium-Structure, Locomotion, Nutrition and Reproduction.

**General Topic**: Protozoan Diseases.

UNIT II

**Phylum Porifera**: General characters - Classification -Type study- Ascon- Cellular structure, Skeleton, Nutrition and Reproduction.

**General Topic**: Canal System in Sponges

UNIT III

**Phylum Coelenterata**: General characters - Classification- Type study- Aurelia- Structure and life history.

**General Topic**: Polymorphism in Coelenterates.

UNIT IV

**Phylum Platyhelmenthes**: General Characters- Classification- Type study- Liver fluke-Structure, Reproduction and Life History.

**General Topic**: Parasitic adaptation of Helminths.

UNIT V

**Phylum Annelida**: General characters and Classification - Type study- Earthworm- External morphology, Digestive system and reproduction.

**General Topic**: Excretion in Annelids.

REFERENCES:
UNIT I

Phylum Arthropoda I: General characters and Classification-Type Study- Penaeus- External morphology, Appendages, Nervous system and reproduction.

General Topic: Larval form of Crustacea

UNIT II

Phylum Arthropoda II: Type study – Cockroach - External morphology, Digestive system, Nervous and Reproductive system.

General Topic: Mouth parts of Insects- Beneficial Insects.

UNIT III

Phylum Mollusca I: General characters and Classification - Type study- Freshwater mussel - External morphology, Digestive system and Reproductive system.

General Topic: Respiration in molluscs

UNIT IV

Phylum Mollusca II: General characters and Classification - Type study- Sepia - External morphology, Digestive system, Respiratory system and Sense organ.

General Topic: Economic importance of Molluscs

UNIT V

Phylum Echinodermata: General characters and Classification - Type study- Starfish (Asterias rubens) - External morphology, Water vascular system in Star Fish.

General Topic: Larval forms of Echinoderms

REFERENCES

B.Sc. ZOOLOGY

SEMESTER I & II

CORE PRACTICAL I- INVERTEBRATA

I. Major Practicals:

Cockroach—Nervous, digestive, Reproductive system

Prawn—Nervous system

II. Minor Practicals:

Prawn—Appendeges

Mouth parts—Honey Bee, Mosquito, and Cockroach.

III. Spottors:

a) Classify and giving reations:

*Entamoeba*, Paramecium, Leucosolenia, Hyalonema, Aurelia, Obeila, Taenia, Ascaris, Earthworm, Nereis, Cockroach, Prawn, Freshwater mussel, Starfish,

b) Draw Labelled Sketch:

T.S. of Taenia , T.S. of Fasciola , Ephyra larva , Nauplius larva and Zoea larva.

c) Biological Significance:

Sponge—Gemmule, Spicules, Physalia, Leech, Limulus, Peripatus, Bipinnaria,

d) Relate structure and function

Taenia—Scolex, Earthworm—Body setae, Nereis—Parapodium, Peneus—Petasma, Star fish—Tube feet.

Submission of Practical record
B.Sc. ZOOLOGY

B.Sc. ZOOLOGY

SEMESTER II

SKILL BASED ELECTIVE COURSE (SBEC) I

SERICULTURE

UNIT I
Types of silk worms – Tasar, Muga, and Eri. Morphology and life cycle of silk worm (*Bombyx mori*).

UNIT II
Mulberry cultivation in India - Selection of land and cultivation of mulberry – Mulberry varietie Different methods of planting – Organic and in organic manure application.

UNIT III
Disinfection of rearing houses and appliances - Egg transportation and incubation – Egg handling – Hatching – Brushing – Silk worm rearing techniques.

UNIT IV

UNIT V
Reeling methods – Reeling and Re-reeling – Silk examination, cleaning, lacing, bookmaking and grading of silk.
Field visit to silk worm rearing centre and reeling industry.

REFERENCES:
B.SC. ZOOLOGY
SEMESTER III
CORE III - CHORDATA

UNIT I

Introduction - Prochordates - General Characters and classification Type Study: Amphioxus- external characters, digestive, excretory and circulatory systems.

Class: Pisces, General characters and classification – Type Study: Scoliodon-External characters, Digestive, Respiratory, Circulatory and Urinogenital Systems.

General Topic: Migration of fishes.

UNIT II


General Topic: Parental care in Amphibians.

UNIT III

Class: Reptelia: General characters and classification - Type study –Calotes- External characters- Digestive, Respiratory, Circulatory and Urinogenital Systems.

General Topic: Identification of Poisonous and Non- Poisonous snakes and Extinct Reptiles.

UNIT IV

Class: Aves- General characters and classification - Type Study-Pigeon- External characters -Digestive, Respiratory, Circulatory and Urinogenital Systems.

General Topic: Flight adaptations in Birds and migration of birds.

UNIT V

Class: Mammalia – General Characters and classification –Type Study- Rabbit –External Characters – Digestive, Respiratory, Circulatory, Excretory and Reproductive systems.

General Topic: Dentition in mammals.

REFERENCES:


3) Newman H.H., Chordata, McMilan publishers.

B.Sc. ZOOLOGY

B.Sc. ZOOLOGY

SEMESTER III

SKILL BASED ELECTIVE COURSE (SBEC) II

AQUACULTURE

UNIT I

Definition of aquaculture – Principles of site selection for fish farms, water, soil, types and other parameters.

UNIT II

Types of aquaculture - Monoculture, Poly culture, Integrated farming, Pond culture, Pen and Cage culture, Raft culture, Race way culture, Warm and cold water fish culture.

UNIT III

Criteria for selection of variety – Seed procurement and stocking management. Water quality management.

UNIT IV

Nutritional requirements and formulation of artificial diets. Breeding and culture of fresh water fishes – Catla, Mrigala, Rohu and Tilapia.

UNIT V

Mari culture – Culture of edible oyster, pearl oyster, mussels, clams, sea urchins, sea cucumbers

REFERENCES:

1. Fish and Fisheries in India, Jhingran, V.G., 1982, Hindustan Publishing Corporation, New Delhi
UNIT I
Introduction to food. Composition and nutritive value of Cereals (Rice, Wheat, Millets, Ragi, Pearl millet). Nutritional deficiency disease – Anaemia, Scurvy

Unit II
Composition and medical value of Ginger, Black pepper and Turmeric. Dental Care and eye care.

Unit III
Communicable diseases – Dengue fever, Malaria, Amoebiasis, Viral fever and AIDS.

Unit IV
Non-communicable diseases – Stroke, Diabetes, Obesity and Cancer.

Unit V
Awareness on Diarrhea, Alcoholism, Smoking, Tobacco chewing, Ulcer and Jaundice.
B.Sc. ZOOLOGY

SEMESTER IV

CORE IV - CELL BIOLOGY

UNIT I

UNIT II
Endoplasmic reticulum: Morphology, Ultra structure, chemical composition and functions.
Golgi complex: Ultra structure, chemical composition and functions.

UNIT III
Lysosomes: Ultra structure and polymorphism- chemical composition and functions: Peroxisomes and glyoxysomes.

UNIT IV
Ribosomes: Ultra structure-types- chemical composition - functions.
Nucleus and Nucleolus: Ultra structure and functions.

UNIT V
Chromosomes: Ultra structure of Chromosomes, Special types of Chromosomes and functions, Cell division- mitosis and meiosis.
Cancer biology - Types of Cancer, Oncogenes, and Treatments.

REFERENCES:
2. Cell Biology, Power.
I. Major Practical

Total Counting of RBC and WBC.

Study of mitotic division in onion root tips.

II. Minor Practical

Blood Smear Preparation.

Buccal smear preparation.

Human blood grouping

IV. SPOTTERS

A) Classify and giving reasons:

Amphioxus, Balanoglossus, Shark, Hippocampus, Bufo, Hyla, Naja Naja (Cobra), Pigeon, Rabbit

B) Draw and Labeled Sketch:

Frog-Pectoral Girdle, Pelvic girdle and, Fore Limb, Hind Limb, Hyoid apparatus, Quill Feather, Carapace, Plastron and Draco

C) Biological Significance:

Balanoglossus, Petromyzon, Echeneis, Narcine, Ichthyophis, Axolotyl larva, Chameleon and Bat

D) Comment on dentition of the following

Skull of Rabbit and Dog

V. SUBMISSION OF PRACTICAL RECORD
**B.Sc. ZOOLOGY**

**SEMESTER IV**

**NMEC II - WILDLIFE MANAGEMENT**

**UNIT I**

Wildlife management – Definition and Aim – Himalayan mountain system – Peninsular region – Western Ghats.

**UNIT II**


**UNIT III**

Sanctuaries and National parks in India – Wildlife census.

**UNIT IV**

Indian endangered fauna, Special projects for endangered species (Tiger, Lion and Elephant).

**UNIT V**

Indian Board of wildlife (IBWL) – Biosphere – Nilgiri, Wildlife Protection act.

**REFERENCES:**

B.Sc. ZOOLOGY

SEMESTER V

CORE PAPER V - GENETICS

UNIT I


UNIT II

Linkage and crossing over –Types, theories and significance – Chromosomal Map.

Sex linked inheritance (Haemophilia, Colour blindness and Drosophila eye colour). Sex limited and sex influenced genes.

UNIT III

Sex determination in man and Drosophila, Chromosomal Theory and Gynandromophs

Mutations: Types, Chromosomal aberrations, Aneuploidy and Euploidy.

UNIT IV

Inbreeding and out breeding – significance, merits and demerits.

 Syndromes (Down syndrome and Turners syndrome, Twins in man).

UNIT V

Human genome project – Pedigree analysis - Gene structure and functions – Genetic Engineering Recombinant DNA technology.

REFERENCES:

B.Sc. ZOOLOGY

B.Sc. ZOOLOGY
SEMMESTER V
CORE VI - ANIMAL PHYSIOLOGY

UNIT I

Nutrition – Food types, Vitamins and Minerals.


UNIT II

Circulation - blood composition, origin and conduction of heart beat in man – blood pressure.

Excretion – Excretory products, Classification – structure of the mammalian kidney and urine formation.

UNIT III

Osmoregulation in Fishes, Osmoconfirmers, Osmoregulators.

Metabolism – Protein metabolism – Deamenaent and Ornithine cycle, Carbohydrate – Glycogenesis, Glycolysis, Fat – β Oxidation.

UNIT IV

Nervous Coordination - Neuron, - Types – Conduction of nerve impulse - synaptic transmission – Neuro muscular junction - reflex action.

Effectors – Muscles - Types of muscles – ultra structure of skeletal muscle – Chemical composition and Physiology of Muscle contraction – Kymograph, actin and myosin.

UNIT V


REFERENCES:


B.Sc. ZOOLOGY

ELECTIVE I

MEDICAL LABORATORY TECHNIQUES (MLT) I

UNIT I

General and personal care in the laboratory.

**Laboratory instruments:** Autoclave, hot air oven, incubators, water bath, Centrifuge, Refrigerator, Colorimeter, pH meter, Heamoglobinometer.

UNIT II

Preparation and uses of reagents – normal saline, Turkey's fluid, Hayem's fluid, Leishamn's stain, Wright stain, Carnoy's fluid and Bovin's fluid - Acetocalamine.

UNIT III

RBC, WBC, Total count and Erythrocyte Sedimentation rate (ESR), platelet count, clotting time, bleeding time.

Blood pressure apparatus, ECG,

UNIT IV


UNIT V

Examination of parasites - Malarial parasites, Plasmodium, *Endameba histolytica*, *Ascaris lumbricoids*, *Taenia solium*.

REFERENCES:


UNIT I
Introduction - Types of Data – primary and secondary – Collection and tabulation of data – diagrammatic and graphical representation – Bar diagram, Pi diagram, Column graph, Histogram.

UNIT II
Mean, Mode and Median, Standard deviation, Standard error and Coefficient of variance.

UNIT III
Simple Correlation, Simple Regression, Chi square test, student's – t- test, ANNOVA.

UNIT IV
Classification of Computers organization, Input devices, Central Processing Unit, output devices, Secondary storage devices, software.

UNIT V
Internet – Types, Applications and uses, WWW, E-Mail, Computer application in biology.

REFERENCES:
4. Introduction to Biostatistics by Pranab kumar, S.Chand company Ltd. New Delhi.
UNIT I
Scope of Biotechnology. Biotechnology in India, Methods of Genetic engineering.

UNIT II
Gene cloning, vectors - plasmid, Cosmids, Phage vectors – Lamda.

UNIT III
Enzymes for genetic engineering - Endonucleases – DNA ligases, alkaline phosphates.

UNIT IV
Polymerase Chain Reaction (PCR), Blotting techniques (Southern)

UNIT V
Application of Biotechnology in Agriculture, Industries, Health.

REFERENCES:
1. Biotechnology by V. Kumarasan, Saras Publication.
B.Sc. ZOOLOGY

SKILL BASED ELECTIVE COURSE (SBEC) IV

POULTRY SCIENCE

UNIT I
Introduction to poultry keeping – Poultry Industry in India – Important breeds of Poultry – Desi, – Chittagong and Leghorn.

UNIT II
Construction of poultry house – Types - Layer house and Broiler house

UNIT III
Poultry feeds – Essential nutrients – Ration for Chick and Broiler.

UNIT IV
Hatchery, Nutritional value of egg, Marketing of egg and By products of poultry.

UNIT V
Common diseases of poultry – Raniket, Coccidiosis and Coryza, Vaccination programme.

REFERENCES:
3. Poultry keeping in India. Naidu P.M.N. Indian Council of Agricultural Research, New Delhi
UNIT I
Spermatogenesis – definition – Development and structure of mammalian sperm.

UNIT II
Parthenogenesis – definition and significance – types of parthenogenesis.
Cleavage- Definition – Patterns – Morula and Blastulation.
Cleavage in Frog, and Chick

UNIT III
Fate maps – Natural and Artificial Marking in eggs.
Gastrulation Definition and process in Frog and Chick. Exogastrulation.

UNIT IV
Organogenesis – Tubulation, Development of brain and eye in frog.
Foetal membranes in chick,
Organizer, Placenta in mammals.

UNIT V
Metamorphosis – Definition and Significance. Hormonal control of metamorphosis in amphibians.
Regeneration – Definition, Types of Regeneration, Events in Regeneration, Physiological changes, Wolffian Regeneration

REFERENCES:
B.Sc. ZOOLOGY

B.Sc. ZOOLOGY

SEMESTER VI

CORE VIII – ECOLOGY

UNIT I

Man and the Environment - Limiting factors - Temperature, Light, Soil, Water sources and biological effects.

Biotic factors of the environment - Animal relationship.

UNIT II


Community - structure, stratification, components, Ecotone and edge effect, Ecological niche, Food chain and Food web.

UNIT III

Ecosystem - Pond as an ecosystem - Energy flow and ecological succession.


UNIT IV


UNIT V

Natural resources- renewable and non renewable. Forest resources- Protection – Chipko movement- Aforestation. Wild life management- Biodiversity, Wild life sanctuaries and National Parks.

TEXT BOOKS

B.Sc. ZOOLOGY

SEMESTER VI

CORE IX - EVOLUTION

UNIT I

UNIT II
Evidences from Paleontology - Comparative anatomy, Embryology, Physiology and Biochemical. Biogeography – Distribution of animals - Continuous and discontinuous distribution.

UNIT III
Lamarckism and Neo Lamarckism, Darwinism and Neo Darwinism. Modern synthetic theory, Salient features and principles.

UNIT IV
Natural selection Theory - Species and Speciation. Isolating mechanism, mutation and genetic drift.

UNIT V
Adaptation and adaptive radiation.

Colouration-mimicry-Darwin's finches.


REFERENCES:
1) Rostogi, V.B. Organic Evolution, Kedernath, Ramnath publishers, Meerut.
3) Introduction to evolution-Dodson-Evolution: process and product.
UNIT I

Introduction, Principles of Healthy Nutrition, Therapeutic diet – types and qualities.

UNIT II

Weight Management and Eating Disorders - Obesity and Underweight, causes and dietary management.

UNIT III

Nutrition and Anaemias

UNIT IV

Diabetes - Types, Symptoms, Causes and dietary management.

UNIT V

Hypertension and Cardiovascular Diseases, Symptoms and Dietary management.

UNIT V

Diseases of gastro Intestinal tract- Gastric and duodenal Ulcer, Diarrhea, Constipation and dietary management.

UNIT V

Typhoid, Jaundice, Malaria, dengue, Chikungunya – symptoms and dietary management.

REFERENCES:

1. Srilakshmi, B. Dietetics, New Age International (P).

UNIT I

UNIT II
Vermicomposting materials and their classification – Feeding habits and food for composting worms.

UNIT III
Vermicomposting methods - Small scale and large scale pit methods, heap method, window method etc.,
Factors affecting vermicomposting such as Temperature, pH, moisture etc.,

UNIT IV
Vermicomposting in Homes, Maintenance of vermicomposting beds. Harvesting the worms. Earth worm predators, parasites and pathogens.

UNIT V
Application of vermicomposting in Agriculture and Horticultural practices. Advantages of vermicomposting.

REFERENCE:
B.Sc. ZOOLOGY

SEMESTER VI

SKILL BASED ELECTIVE COURSE (SBEC-VI)

DAIRY SCIENCE

UNIT I

Dairy farming – Definition – Scope – Role of Co-operative societies in milk production and marketing.

UNIT II


UNIT III

Common cattle feed and their nutritive value – Balanced ration for cattle.

UNIT IV


UNIT V

Bacterial diseases – Anthrax, Mastitis, Viral diseases – Foot and mouth disease, Non-contagious disease, Milk fever.

REFERENCES:

1. Ibraheem Kutty C. and Sheeba Khamer, Milk Production and processing, Daya publishing House, Delhi, 2014.


4. Hand book of Dairy farming to produce milk with packaging. EIRI
B.Sc. ZOOLOGY

SEMESTER VI

CORE PRACTICAL -III

GENETICS AND ANIMAL PHYSIOLOGY

I Major Practical:
- Qualitative analysis of digestive enzymes in cockroach.
- Estimation of the rate of $O_2$ consumption in fish/crab with reference to body weight.
- Qualitative analysis of carbohydrates, proteins, and fats.

II Minor Practical:
- Qualitative analysis of Ammonia, Urea and Uric acid in the given sample.
- Study of human salivary activity in relation to temperature.
- Ciliary activity in fresh water mussels (Q10)

III Spotters
- Observation of common mutants of drosophila
- Monohybrid and Dihybrid and Test cross (Diagrammatic representation)
- Kymograph – simple twitch, Trappe, Fatigue, Tetanus
- Sphygmomanometer, pH meter, Colorimeter, Haemometer,

Submission of record.
MAJOR PRACTICALS:

- Estimation of dissolved oxygen content in the given water sample (*Winkler Method*).
- Estimation of salinity in given water sample.
- Study of Marine/Freshwater Planktons

MINOR PRACTICALS:

- Estimation of urine sugar.
- Bleeding time.
- Clotting time.
- Calculation of Mean, median, mode for the given data.

**Spotters:**

- Slides of different developmental stages of chick embryos (24, 48, 72, 96 hrs)
- Slides of blastula and gastrula of frog (morula, early gastrula, yolk plug stage, late gastrula) Placenta of Sheep / Pig/ Rat.
- Fossils any two
- Description and uses of autoclave, Hot air oven, Incubator, Centrifuge, pH meter, Colori meter.
- Computer applications - Hardware of computer, storage device, mouse.

**Submission of Field Visit Report.**

**Submission of Practical Record.**
B.Sc. ZOOLOGY

SEMESTER I

ALLIED ZOOLOGY

ALLIED PAPER I- INVERTEBATE & CHORDATE ZOOLOGY

UNIT I

Protozoa: Paramecium-structure and conjugation
Porifera: Leucosolenia- Structure
Coelenterata: Aurelia- Structure and its life history
General Topics: Protozoan Parasites- Plasmodium, Trypanosoma, Entamoeba

UNIT II

Platyhelminthes: Fasciola hepatica- Structure and life cycle.
Annelida: Leech- Structure and Digestive system.
General Topic: Human Helminth Parasites- Taenia and wuchereria

UNIT III

Arthropoda: Cockroach - External Morphology and digestive system.
Mouth parts of Honey bee and Mosquito.
Mollusca: Fresh water mussel - External characters and Digestive system.
Echinodermata: Starfish –External characters.

UNIT IV

Chordata - Cephalochordata: Amphioxus - External characters and digestive system.
Pisces: Shark - External characters and digestive system.
Amphibia: Frog - External characters and respiratory system.

UNIT V

Aves: Pigeon- External characters and respiratory system.
UNIT I

**Cell Biology:** Structure of Animal cell - Structure and functions of Plasma membrane and Mitochondria.

**Genetics:** Mendelian laws of inheritance.

UNIT II

**Developmental Biology:** Types of eggs, Cleavage Blastulation and Gastrulation in frog.

UNIT III

**Physiology:** Digestion and Excretion in man.

UNIT IV

**Ecology:** Pond as an Ecosystem, Animal association, Pollution (Air, Water & Noise.)

UNIT V

**Evolution:** Lamarckism and Neo - Lamarckism, Darwinism and Neo – Darwinism.

REFERENCES:

B.Sc. ZOOLOGY

ALLIED ZOOLOGY - PRACTICAL I

MAJOR PRACTICALS

Cockroach – Digestive, Nervous and Reproductive systems.

MINOR PRACTICALS:

Mouth parts of Honey Bee.

Mouth parts of Mosquito.

SPOTTERS


Sea anemone Hermit crab, Star fish, Redia, Cercaria, Nauplius and Mysis larva.

Amphioxus, Shark, Cobra, Pigeon, Blastula of frog, 24hours Chick embryo.

Submission of Practical Record.
B.SC. DEGREE EXAMINATION
SEMESTER IV, OCTOBER-2017

ZOOLOGY

Cell Biology

Time: 3 hrs  
Maximum: 75 marks

Section-A (10x2=20)

Answer all questions

1. Active transport
2. Sarcoplasmic reticulum
3. Peroxisomes
4. Oxidative phosphorylation
5. Genetic codes
6. Satellite
7. Malignant tumour
8. Cell cycle
9. Microtomes
10. Cell fractionation

Section-B (5x5=25 marks)

Answer all questions

11. (a) Give an account on the types of Endoplasmic reticulum.

(Or)

(b) Discuss the various functions of Golgi complex in the cells.

12. (a) Explain the structure of Mitochondria with a note on their function.

(Or)

(b) Give a detailed account of polymorphism in lysosomes.
12. (a) Describe the ultra structure of Nucleus.

(Or)

(b) Describe the Watson and Crick's structural model of DNA.

14. (a) Explain the structure and functions of chromosomes.

(Or)

(b) Briefly explain the events occur during mitosis.

15. (a) Briefly explain the fixation technique.

(Or)

(b) Give an account on tissue culture.

Section-C (3x10=30 marks)

Answer any THREE questions

16. Describe the Ultra structure and functions of plasma membrane,

17. Describe the ultra structure and functions of lysosomes.

18. Describe the role of ribosomes in protein synthesis,

19. Describe in detail the giant chromosomes.

20. Describe the different types of electrophoresis and their applications.
B.Sc. ZOOLOGY

B.SC., DEGREE PRACTICAL EXAMINATIONS, MARCH - 2018
B.SC., ZOOLOGY, SEMESTER – IV

PRACTICAL - II, CELL BIOLOGY AND CHORDATA

Time: 3 Hrs

Max marks: 60

1. Calculate/Demonstrate the required data with suitable experiment. Write the procedure and comment on your results. (20)

2. Using the given material to make a neat squash/slide preparation. (10)

3. Identify, Draw and comment on A, B, C and D (4x5=20)

4. Practical record (10)

Keys:

1. Total RBC counting
2. Squash preparation of Onion root tip
3. A. Amphioxus
   B. Draco
   C. Bat
   D. Skull of Rabbit