Unified Syllabus of Zoology for U.P.State Universities
(B.Sc. I, II, & III year)

Following Major title of papers of B.Sc. I, II, and III were finalized with their contents:

Theory Paper's duration is of Three hours and duration of practicals is Four hours

B.Sc. I

Papers	Title of paper	Max. Marks
Paper I	Lower Non Chordata *(Protozoa- Helminths)*	50
Paper II	Higher Non Chordata *(Annelida-Echinodermata)*	50
Paper III	Cell Biology and Genetics	50
Practical	Practical Syllabus based on theory papers	50

B.Sc. II

Papers	Title of paper	Max. Marks
Paper I	Chordata	50
Paper II	Animal distribution, Evolution and Developmental Biology	50
Paper III	Physiology and Biochemistry	50
Practical	Practical Syllabus based on theory papers	50

B.Sc. III

Papers	Title of paper	Max. Marks
Paper I	Applied and Economic Zoology	75
Paper II	Biotechnology, Immunology, Biological Tools & Techniques and Biostatistics	75
Paper III	Ecology, Microbiology, Animal Behavior, Pollution and Toxicology	75
Practical	Practical Syllabus based on theory papers	75

Unified Syllabus of Zoology for U.P.State Universities
Subject- Zoology
B.Sc. - First Year
Practical

1-	Dissection (Major)	12 Marks
2-	Dissection (Minor)	05 Marks
3-	One Temporary Mount	03 Marks
4-	One Permanent Mount	05 Marks
5-	Cytology & Genetics Preparation/Prepared slides	05 Marks
5-	Identify and Comment upon spots (1-10)	10 Marks
6-	*Viva-Voce*	05 Marks
7-	Practical class record	05 Marks
	Total	**50**

Marks

Unified Syllabus of Zoology for U.P.State Universities

Unified Syllabus of Zoology for U.P. State Universities
B.Sc. Part I, II & III

There will be three written papers and one practical examination.

Question No. 1 in each class will be compulsory & comprehensive based on units I to IV and of short Answer type. This will carry 40% of total marks *(i.e. 20 marks in I & II year and 30 marks in III year).* There will be two questions from each unit carrying 60% of the marks, of which one question from each unit has to be attempted.

B.Sc. Part I

Paper I- Lower Non Chordata (*Protozoa to Helminths*)

The habits, morphology, physiology, reproduction, development (in outline) and classification of the following groups of animals including a detailed study of the types given in each:

Unit-I

Protozoa - *Euglena*, *Monocystis* and *Paramecium.*

Unit-II

Porifera - *Sycon*

Unit-III

Coelenterata - *Obelia* and *Aurelia*
Ctenophora - Salient features

Unit-IV

Platyhelminthes - *Fasciola* (liver fluke) and *Taenia* (tape worm)
Nematehelminthes - *Ancylostoma* (hook worm)

Paper II- Higher Non Chordata (*Annelida to Echinodermata*)

The habits, morphology, physiology, reproduction, development (in outline) and classification of the following groups of animals including a detailed study of the types given in each:

Unit-I

Annelida - *Nereis*

Unit-II

Arthropoda - *Palaemon* (prawn)

Unit-III

Mollusca -*Pila* (apple-snail)

Unit-IV

Echinodermata -*Pentaceros* (excluding development)

Paper III- Cell Biology & Genetics

Unit-I

Cell Biology I: Structure and function of cell, Ultra structure of Plasma membrane

Unit-II

Cell Biology II: Structure and function of cell organelles with special emphasis on mitochondria, golgi bodies, nucleus, ribosome and endoplasmic reticulum.

Unit-III

Genetics-I: Structure of Chromosomes, Watson & Crick Model of DNA, Differences between DNA & RNA, Cell Division: Mitosis and Meiosis. Mendel's principles of heredity on chromosomal basis, Monohybrid cross, test cross, dihybrid cross, back cross incomplete dominance, Multiple Alleles, Blood group inheritance. Linkage and crossing over, interaction of genes. The role of DNA in heredity.

Unit-IV

Genetics II: Sex determination, sex differentiation, prenatal detection of genetic diseases (amniocentesis), Sex-linked characters, Genetic diseases and abnormalities, chromosomal aberrations, Eugenics.

B.Sc. Part I
ZOOLOGY PRACTICAL SYLLABUS

PROTOZOA

(a) **Amoeba :** Examination of culture. Prepared Slide *Amoeba proteus* and *A. verrucosa.*

(b) **Euglena :** Culture examination for *Euglena.* Prepared slides.

(c) **Monocystis** : Examination of contents of seminal vesicles of *Pheretima* or *Eutyphoeus* for different life- history stages and permanent preparation. Prepared slides.

(d) **Plasmodium :** Preparation of blood film (Leishmen's stain). Prepared slides showing the parasites.

(e) **Paramecium**
Culture examination.

(f) Demonstration of ciliary movements in *Paramecium.*
Addition to mucilage to restrain active movement. Treatment with Methyl green for staining. Feeding experiment with Congo Red and Yeast. Trichocysts (discharged), Prepared slides for structure, binary division and conjugation.

(g) Examination of pond water for different kinds of protozoa with special reference to *Arcella* and *Vorticella.*

(h) Study of prepared slides :
Polystomella, Gregarina, Trypanosoma and Noctiluca.

(i) Examination of rectal protozoans *Opalina, Balantidium* and *Nyctotherus.*

PORIFERA

(a) **Sycon**

General characters

Spicules glycerine preparation.

Transverse and longitudinal sections-prepared slides.

(b) Gemmule of *Spongilla* permanent preparation.

(c) Different kinds of spnge spicules and sponging fibres of *Euspongia*-prepared slides.

(d) *Euplectella* (Venus,s flower-basket) *Spongilla* (fresh-water sponge), *Euspongia* (bath sponge).

COELENTERATA

(a) **Hydra**
Live specimens.
Prepared slides of entire specimens.
Longitudinal and transverse sections-prepared slides.

(b) **Obelia**
Clolony-prepared slide.
Medusa-prepared slide.

(c) **Aurelia**
General morphology.
Tentaculocyst-prepared slide.
Prepared slides and models of life-history stages.

(d) ***Physalia*** (Portguese man of war), *Corallium* (red coral), *Fungia* (Mushroom coral), *Madrepora* (staghom coral), *Pennatula* (sea pen), *Sagartia* of *Metridium* (sea anaemone)

PLATHYHELMINTHES :

(a) **Fasciola**
Specimens *in situ* and prepared slides.
Transverse sections and prepared slides.
Larval forms-prepared slides.

(b) ***Taenia*** **:** Prepared slides of scolex, mature and gravid proglottids and transverse section of mature proglottid.

(c) *Planaria, Polystomum, Paramphistomum, Schistosma, Echinococcus* and *Dipylidium* Cysticercus (Bladder worm) and Cysticercoid.

(d) Examination of type worms of pigeon of fowl *in situ*

(e) Permanent preparation of mature and gravid proglottids of *Cotugnia* and *Raellietina.* **:**

NEMATHELMINTHES

(a) ***Ascaris***

External characters.
Dissected specimens of male of female.
Transverse section of male and female-prepared slides.

(b) *Ascaris lumbricoides* (from man) specimens *Enterobius vermicularisi* (from man).
Ancylostoma duodenale *(from man)* prepared slides.

ANNELIDA

(a) ***Nereis***

External characters.
Dissected specimens.
Parapodium-permanent preparation.
Transverse sections-prepared slides.

(b) ***Pheretima***

External characters.
Dissection.
Glycerine preparations of setae *in situ* and brain.
Permanent preparations of ovary and septal nephridia.
Prepared slides of transverse section through various regions.

(c) *Heteronereis, Arenicola, Aphrodite, Eutypoeus, Dero, Branchellion, Haemadipsa, Bonellia* (female).

ARTHROPODA

(a) ***Palaemon***

External characters; Examination of appendages.
Dissections.
Glycerine preparation of hastate plate.
Permanent and glycerine preparations of statocysts.

(b) ***Periplaneta***

External characters. Differences between nmale and female.
Dissections.
Cirulation of blood in the wing of cockroach.
Glycerine preparation of mouth appendages, salivary glands and trachea.
Permanent preparations of salivary glands, Malpighian tubules, ovaries and testes.

(c) ***Anopheles* and *Cules***

Glycerine preparation of mouth parts of male and female. Wings-prepared slides.
Life history-prepared slides.
Difference between *Anopheles* and *Culex*

(d) ***Musca***

External characters.
Glycerine preparation of proboscis

(e) *Daphnia, Cyclops, Balanus, Eupagurus* (hermit crab) *Scylla* (crab), *Sacculina* (on crab). Larval forms Nauplius, Zoaea), *Lepisma* (Silver fish), *Schistocerca* (locust), *Odontotermes*
(white ant), Cimex (bed bug), Pediculus (louse), *Papilio* (butterfly), *Bombyx* (Silk moth), *Apis* (honey- bee), Polistes (wasp), *Camponotus* (Black ant), *Xenopsylla* (rat flea), or *Ctenocephalus* (dog flea), *Thyroglutus* (millipede), *Scolopendra* (centipede). Lycosa (wolf-spider), *Lxodes* (trick), *Limulus* (King carb).

MOLLUSCA

(a) ***Lamellidens***

External characters
Dissection
Permanent preparations of gill lamella.
Transverse section through middle region of body-prepared slides.
Glochidium (larva) prepared slides.

(b) ***Pila***

External characters.
Dissection.
Permanent preparations of gill lamella and osphradium.

(c) Chiton, *Teredo, Turbinellai* (Shankh), *Laevicaulis* (slug), *Doris, Aplysia, Dentalium Nautilus, Sepia* and *Margaritifera* (Pearl Oyster).

ECHINODERMATA

(a) ***Pentaceros:***

External characters
Dissected specimens.
Pedicellaria-prepared slides.
Transverse section of arm-prepared slide.

(b) ***Echinus*** (Sea urchin), *Ophiothrix* (brittle star), *Holothuria* (sea cucumber) and *Antedon* (feather star).

CYTOLOGY

(a) Cell-Structure – Prepared slides

(b) Cell Division – Prepared slides

(c) Preparation of giant chromosomes

(d) Preparation of onion root tip for the stages of mitosis