

KOLHAN UNIVERSITY, CHAIBASA



Proposed Syllabus for FYUGP, NEP-2020 B.Sc. (Hons.) Zoology (Effective from Academic Year 2022-23 onwards)

Draft Prepared by:

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EXAMINATION FRAMEWORK FOR M.Sc. ZOOLOGY

Zoology Paper Type	Credits	Full Marks	Pass Marks	Semester Internal Examination	End Semester Examination
Major (Theory)	3	75	30	15	60
Major (Practical)	1	25	10	--	25
Minor (Theory)	3	75	30	15	60
Minor (Practical)	1	25	10	--	25

SEMESTER INTERNAL EXAMINATION (SIE):

- For Semester Internal Examination (SIE 15 marks), 15 Marks in Theory Examination will include 10 Marks questions from Written Examination/Assignment/Project/Tutorial wherever applicable whereas 5 marks will be awarded on the attendance/overall class performance in the semester. Range for conversion of attendance into marks is as follows: Attendance upto 45%, 1 mark; 45%<Attd.<55%, 2 marks; 55%<Attd.<65%, 3 marks; 65%<Attd. <75%, 4 marks; 75%<Attd, 5 marks.
- For Semester Internal Examination (SIE 10 marks, 1Hr Exam), there will be two group of questions. Question No.1 will be very short answer type in Group A consisting of five questions of 1 mark each. Group B will contain descriptive type two questions of five marks each, out of which any one to answer.

END SEMESTER UNIVERSITY EXAMINATION (ESE):

- For End Semester Examination (ESE 75 marks, 3Hrs Exam), there will be two group of questions. Group A is compulsory which will contain three questions. Question No.1 will be very short answer type consisting of five questions of 1 mark each. Question No. 2 & 3 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to answer.

Semester I

Major Paper 1 (MJ 1) : Diversity of Life- Protists to Echinoderms

Credits: Theory: 03

Practical: 01

Total: 04

Theory (03 Credits): **45 hours**

UNIT I: Introduction to Animalia **2 hours**

General Characteristics of Kingdom Animalia and Basis of Classification

UNIT II: Protista **4 hours**

Protista: General characteristics and Classification up to classes; Locomotion and Reproduction in Protista

UNIT III: Porifera **4 hours**

Porifera: Introduction to Parazoa; General characteristics and Classification up to classes; Canal system in sponges

UNIT IV: Cnidaria **5 hours**

Evolution of Metazoa, Cnidaria: General characteristics and Classification up to classes; Polymorphism in Cnidaria.

UNIT V: Ctenophora **3 hours**

Ctenophora: General characteristics and evolutionary significance

UNIT VI: Helminthes **5 hours**

Platyhelminthes and Nematelminthes: General characteristics and Classification up to classes; Parasitic adaptations in helminthes.

UNIT VII: Annelida **4 hours**

Annelida: General characteristics and Classification up to classes; Role of Nephridia in excretion among Annelids.

UNIT VIII: Arthropoda**6 hours**

Arthropoda: General characteristics and Classification up to classes, Vision and Respiration in Arthropoda

UNIT IX: Onychophora**2 hours**

Onychophora: General characteristics and Evolutionary significance.

UNIT X: Mollusca**5 hours**

Mollusca: General characteristics and Classification up to classes; Torsion and detorsion in Gastropoda.

UNIT XI: Echinodermata**5 hours**

Echinodermata: General characteristics and Classification up to classes; Water-vascular system in Echinoderms.

Recommended Readings:

- Barnes, R.D. (2006) Invertebrate Zoology. VII Edition, Cengage Learning, India.
- Barnes, R. S. K.; Calow, P.; Olive, P. J. W.; Golding, D. W.; Spicer, J. I. (2002) The Invertebrates: a Synthesis, Blackwell Publishing.
- Pechenik, J. A. (2015) Biology of the Invertebrates. VII Edition, McGraw-Hill Education
- Hickman, C.; Roberts, L.S.; Keen, S.L.; Larson, A. and Eisenhour, D. (2018) Animal Diversity, McGraw-Hill.
- Holland, P. (2011) The Animal Kingdom: A Very Short Introduction, Oxford University Press.
- Barrington, E.J.W. (2012) Invertebrate Structure and Functions. II Edition, EWP Publishers.
- Ruppert, E.E., Fox, R.S., Barnes, R. D. (2003) Invertebrate Zoology: A Functional Evolutionary Approach. VII Edition, Cengage Learning, India.

Practical (01 Credit):

30 hours

1. Study of following permanent slides/ specimens: *Amoeba*, *Paramecium*, *Sycon*, *Obelia*, *Physalia*, *Taenia solium*, Male and female *Ascaris lumbricoides*, *Aphrodite*, *Nereis*, *Pheretima*, *Hirudinaria*, *Palaemon*, *Limulus*, *Palamnaeus*, *Scolopendra*, *Julus*, *Periplaneta*, *Chiton*, *Dentalium*, *Pila*, *Unio*, *Octopus*, *Pentaceros*, *Echinus*, *Cucumaria*.
2. Study of Digestive and Nervous system of Earthworm.
3. Mounting of septal nephridia.
4. Submission of project report on study of animals in nature during a survey of a National Park/ Biodiversity parks/ Zoological Museum.
5. Group discussion or Seminar presentation from any topic from the paper.

Pattern of Examination:

(25 Marks)

1. Spotting (8 Marks)
2. Dissection and mounting (4+3 Marks)
3. Visit Report (4 Marks)
4. Practical record (3 Marks)
5. Viva-voce (3 Marks)

Minor Paper 1A (MN 1A): Food, Nutrition & Health

Credits: Theory:03

Practical: 01

Total: 04

Theory (03 Credits):

UNIT I: Basic concept of food and nutrition

11 hrs

Food components: Major and supplementary components; Concept of a balanced diet, nutrient needs and dietary pattern for various groups- adults, pregnant and nursing mothers, infants, school children, adolescents and elderly.

UNIT II: Nutritional Biochemistry

11 hrs

Carbohydrates, Lipids, Proteins: their dietary source and role; Vitamins: their dietary source and importance; Minerals: their biological functions. Dietary Fibres: definition, their dietary source and nutritional importance. Elementary idea of Probiotics, Prebiotics, Organic Food.

UNIT III: Health

12 hrs

Definition and concept of health, Major nutritional Deficiency diseases- (kwashiorkor and marasmus), Deficiency disorders, their causes, symptoms, treatment, prevention and government programmes, if any. Life style related diseases- hypertension, diabetes mellitus, obesity- their causes and prevention through dietary and lifestyle modifications.

UNIT IV: Food hygiene

11 hrs

Food and Water borne infections; Bacterial infection: Cholera, typhoid fever, dysentery; Viral infection: Hepatitis, Poliomyelitis; Protozoan infection: amoebiasis, giardiasis; Parasitic infection: taeniasis and ascariasis their transmission, causative agent, sources of infection, symptoms and prevention.

Recommended Readings:

- Shashi Goyal & Pooja Gupta. Food, Nutrition and Health (ISBN: 9788121940924)
- Linda Tapsell. Food, Nutrition and Health. I Edition, Oxford (ISBN: 978-0195518344)
- Gibney MJ et al. (eds) (2009) Introduction to Human Nutrition. Wiley-Blackwell A John Wiley & Sons Ltd, Nutritional Society.
- Mann J and Truswell SA, Essentials of Human Nutrition, Oxford University Press
- Yuan Kun Lee and Seppo Salminen: Handbook of Probiotics and Prebiotics, second ed., John Wiley & Sons, Inc.
- James Robinson, Deborah J McCornick, Concepts in Health and Wellness, Delmar Cenage Learning, 1st ed
- Jeremy Hawker, Norman Begg, Iain Blair, Ralf Reintjes, Julius Weinberg, Communicable Disease Control Handbook, 2nd ed
- Clive de W Blackburn, Food Spoilage Microorganisms, Woodhead Publishing Limited, cambridge
- Avantina Sharma. Principles of Therapeutic Nutrition and Dietetics.. CBS Publishers and Distributors Pvt. Ltd.
- Elia M et al. (eds) Clinical Nutrition. Wiley-Blackwell A John Wiley & Sons Ltd.

Practical (01 Credits):**30 hours**

1. To detect adulteration in a) Ghee/Butter b) Sugars c) Tea leaves and d) Turmeric.
2. Ascorbic acid estimation in food by titrimetry.
3. Study of the stored grain pests from slides/photographs (*Sitophilus oryzae*, *Trogoderma granarium*, *Callosobruchus chinensis* and *Tribolium castaneum*): their identification, habitat and food sources, damage caused and control. Preparation of temporary mounts of the above stored grain pests.
4. Report on visit to food testing lab /or any agency of food standards.
5. Group discussion or Seminar presentation from any topic from the paper.

Pattern of Examination:**(25 Marks)**

1. Adulteration Expt. (8 Marks)
2. Estimation Expt./Spotting (7 Marks)
3. Visit Report (4 Marks)
4. Practical record (3 Marks)
5. Viva-voce (3 Marks)