

# KOLHAN UNIVERSITY, CHAIBASA



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

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## **Examination Framework for B.Sc. (Hons.) Zoology**

<b>Zoology Paper Type</b>	<b>Credits</b>	<b>Full Marks</b>	<b>Pass Marks</b>	<b>Semester Internal Examination</b>	<b>End Semester Examination</b>
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 60 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 I mark each. Question No. 2 & 3 will be short answer type of 5 marks. Group B will contain descriptive type five questions of fifteen marks each, out of which any three 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) |