



# Yogoda Satsanga Mahavidyalaya

JAGANNATHPUR, DHURWA, RANCHI – 834004

Email address: [ysmranchi4@gmail.com](mailto:ysmranchi4@gmail.com)

(NAAC Accredited, Grade: B++, CGPA: 2.89)

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## Course plan

**NAME OF THE DEPARTMENT:** Zoology

**NAME OF THE FACULTY:** Dr. Indumati Thakur

Dr. Anjana Verma

Dr. Rakhee Lohia

**ACADEMIC SESSION:** August 2022

**YEAR:** 2022

**PROGRAM:** B. Sc.

**SEMESTER:** V

**COURSE TYPE:** DSE I

**COURSE:** BIOLOGY OF INSECTA

**COURSE CODE:** DSE I

**TOTAL CREDIT:** 6 = (5 Theory, 01 Practical)

### Program Outcomes (POs):

Student should be able to,

**PO1-** Apply the knowledge and concepts of biology and its fundamental principles and to identify, analyze and find solutions to various biological problems.

**PO2-** Identify, hypothesize, and review available research literature, and analyze complex biological issues reaching substantiated conclusions using knowledge of biodiversity, environment, and biological functioning.

**PO3-** Develop scientific temperament, an ability to merge, interconnect and extrapolate information and knowledge across various streams.

**PO4-** Ability to decide appropriate technology and tools to solve problems. Understand the availability, of resources, their judicious use, and the execution of the project in sustainable way.

**PO5-** Design solutions for complex scientific problems and design processes that meet the specified needs with appropriate consideration for public health & safety, cultural, societal, legal, constitutional and environmental considerations.

**PO6-** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.



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**PO7-** Communicate effectively on complex scientific activities with the science community and with society at large, such as, being able to comprehend and write effective reports and design documents, make effective presentations, and give and receive clear instructions.

**PO8-** Demonstrate knowledge and understanding of the scientific principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO9-** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of scientific developments, technological advancements and global changes.

**PO10-** Value and foster Physical, Physiological and Psychological well-being through personal practice and conduct. Ability to apply the learnings for a lifelong commitment to ethics in fulfilment of professional and social obligations.

**PO11-** Apply academic learning to promote higher studies, sustainable living through employment, and initiation of entrepreneurial advent to create opportunities and wealth for self and society.

**PO12-** Value and support social causes and rural development through service and philanthropic activities.

## **PROGRAM-SPECIFIC OUTCOMES (PSOs):**

**Student should be able to,**

**PSO1:** An ability to demonstrate in-depth knowledge and understanding of the fundamental concepts, principles, and processes underlying the academic field of Zoology and its different subfields like animal diversity, principles of ecology, comparative anatomy and developmental biology of vertebrates, physiology, endocrinology, biochemistry, genetics, and evolutionary biology, animal biotechnology, applied Zoology, aquatic biology, immunology, reproductive biology, parasitology, entomology, apiculture, aquarium fish keeping, medical diagnostics, and sericulture.

**PSO2:** Development of procedural knowledge and merging it with the advanced techniques available to create different types of professionals in the field of Zoology and related fields such as Apiculture, Fisheries, Medical Diagnostics, Sericulture, Paleozoology, Ornithology, Herpetology, Forensics, Bioinformatics, and Arachnology.

**PSO3:** Understand and appreciate the complexity of life processes, their molecular, cellular, and physiological processes, their genetics, evolution, and behavior, and their interrelationships with the environment.

## **COURSE OUTCOMES (Cos):**

**CO1:** Understanding the types of cells, different types of cellular organization, and their complexities.

**CO2:** Aware of cellular compartmentalization, its functions, and its biological significance.

**CO3:** Understanding of cell division and its role in maintaining a stable genetic constituency, associated disease in cancer.



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**CO4:** Ability to distinguish between different types of cellular cross-talk and their role in structural and functional coordination.

**CO5:** They develop an appreciation for the biological functions at the cellular level and gets aware of their role in their day-to-day lives.

**CO6:** Aware of the associated diseases due to impaired physiology and able to design a healthy lifestyle for themselves and their loved ones.

## Correlation between Pos and Cos

| Pos →<br>Cos ↓ | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1            | 3   | 2   | 2   | 2   | -   | 1   | -   | -   | -   | -    | 3    | 3    | -    | -    |
| CO2            | 3   | 2   | 2   | 2   | -   | 1   | -   | -   | -   | 3    | 3    | 3    | -    | -    |
| CO3            | 3   | 3   | 3   | 3   | -   | 2   | 1   | -   | 2   | 2    | 3    | 3    | 3    | 1    |
| CO4            | 3   | 2   | 2   | 2   | -   | 2   | -   | 2   | -   | 3    | 1    | 2    | 1    | -    |
| CO5            | -   | -   | -   | -   | -   | 2   | -   | -   | -   | 3    | -    | 2    | 2    | -    |
| CO6            | 2   | -   | -   | -   | -   | -   | -   | -   | 3   | 3    | -    | 2    | 2    | 2    |

1. Weak

2. Moderate

3. Strong

## Course teaching and learning activities

### B. PEDAGOGY

- Whiteboard
- Flipped Class
- PPT
- Debate
- Group Discussions

### B. COURSE COMPLETION PLAN

| UNIT | NO. OF LECTURES |           |          | TEST | QUIZ | ASSIGNMENT |
|------|-----------------|-----------|----------|------|------|------------|
|      | THEORY          | PRACTICAL | TUTORIAL |      |      |            |
| 1    | 7               | 7         | -        | 1    | 1    | -          |
| 2    | 14              | 14        | -        | 1    | 1    | -          |
| 3    | 10              | 10        | -        | 1    | 1    | -          |
| 4    | 8               | 8         | -        | 1    | 1    | -          |
| 5    | 13              | 13        | -        | 1    | 1    | -          |
| 6    | 7               | 7         | -        | 1    | 1    | -          |
| 7    | 2               | 2         | -        | 1    | 1    | -          |
| 8    | 6               | 6         | -        | 1    | 1    | -          |
| 9    | 2               | 2         | -        | -    | -    | -          |



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## COURSE DELIVERY PLAN:

| UNIT | TOPIC/SUBTOPIC  | LECTURE REQUIRED | CO ADDRESSED  | ASSIGNMENT/ TEST/QUIZ |
|------|---|------------------|---------------|-----------------------|
| 1    | <b>Introduction</b><br>General Features of Insects Distribution and Success of Insects on the Earth   | 4                | CO 1          | 1                     |
| 2    | <b>Insect Taxonomy</b><br>Basis of insect classification;<br>Classification of insects up to orders   | 4                | CO 1, 2, 4, 5 | 2                     |
| 3    | <b>General Morphology of Insects</b><br>External Features; Head – Eyes, Types of antennae, Mouth parts w.r.t. feeding habits Thorax: Wings and wing articulation, Types of Legs adapted to diverse habitat Abdominal appendages and genitalia | 8                | CO 2, 4, 5, 6 | 1                     |
| 4    | <b>Physiology of Insects</b><br>Structure and physiology of Insect body systems - Integumentary, digestive, excretory, circulatory, respiratory, endocrine, reproductive, and nervous system Sensory receptors Growth and metamorphosis       | 28               | CO 5, 6       | 2                     |
| 5    | <b>Insect Society</b><br>Group of social insects and their social life Social organization and social behaviour (w.r.t. any one example)  | 6                | CO 1, 2, 3    | 1                     |
| 6.   | <b>Insect Plant Interaction</b> Theory of co-evolution, role of allelochemicals in host plant mediation Host-plant selection by phytophagous insects, Insects as plant pests  | 4                | CO 1, 2, 3    | 2                     |
| 7.   | <b>Insects as Vectors</b><br>Insects as mechanical and Biological vectors, Brief discussion on houseflies and mosquitoes as important insect vectors  | 6                | CO 3,4,5,6    | 4                     |

### A. COURSE OUTCOME ASSESSMENT PLAN

#### a. DIRECT ASSESSMENT

(Please tick the appropriate column)

| COURSE OUTCOME | ASSESSMENT |      |              |              | REMARKS |
|----------------|------------|------|--------------|--------------|---------|
|                | QUIZ       | TEST | MID SEMESTER | END SEMESTER |         |
| CO1            | ✓          | ✓    | ✓            |              |         |
| CO2            | ✓          | ✓    | ✓            |              |         |
| CO3            | ✓          | ✓    | ✓            |              |         |
| CO4            | ✓          | ✓    | ✓            |              |         |
| CO5            | ✓          | ✓    | ✓            |              |         |



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## b. INDIRECT ASSESSMENT (STUDENT SURVEY)

|  |
|--|
| <b>Name of the Student:</b>                |
| <b>University Roll no/ Class roll no.:</b> |
| <b>Name of the Programme:</b>              |
| <b>Semester and Session:</b>               |
| <b>Course and Course Code:</b>             |

Rate the following aspects of course outcomes. Use the scale 1-3

| S. No | Course Outcome | 1 | 2 | 3 |
|-------|----------------|---|---|---|
| 1.    | CO1            |   |   |   |
| 2.    | CO2            |   |   |   |
| 3.    | CO3            |   |   |   |
| 4.    | CO4            |   |   |   |
| 5.    | CO5            |   |   |   |

1. Average
2. Good
3. Very Good

## B. REMEDIAL CLASSES

| S.NO. | ROLL. NO. & SESSION | NAME OF THE STUDENT | MARKS OF MID SEM/CLASS TEST | REMEDIAL CLASSES HELD |      |      | END SEM EXAM | IMPROVEMENT (Y/S) |
|-------|---------------------|---------------------|-----------------------------|-----------------------|------|------|--------------|-------------------|
|       |                     |                     |                             | DATE                  | TIME | MODE |              |                   |
|       |                     |                     |                             |                       |      |      |              |                   |
|       |                     |                     |                             |                       |      |      |              |                   |
|       |                     |                     |                             |                       |      |      |              |                   |

## C. SUGGESTED READINGS

### a. TEXT BOOKS

### b. REFERENCE BOOKS

- i. A general text book of entomology, Imms , A. D., Chapman & Hall, UK
- ii. The Insects: Structure and function, Chapman, R. F., Cambridge University Press, UK
- iii. Principles of Insect Morphology, Snodgrass, R. E., Cornell Univ. Press, USA
- iv. Introduction to the study of insects, Borror, D. J., Triplehorn, C. A., and Johnson, N. F., M Saunders College Publication, USA
- v. The Insect Societies, Wilson, E. O., Harward Univ. Press, UK
- vi. Host Selection by Phytophagous insects, Bernays, E. A., and Chapman, R. F., Chapman and Hall, New York, USA
- vii. Physiological system in Insects, Klowden, M. J., Academic Press, USA
- viii. The Insects, An outline of Entomology, Gullan, P. J. , and Cranston, P. S., Wiley Blackwell, UK
- ix. Insect Physiology and Biochemistry, Nation, J. L., CRC Press, USA.



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- c. VIDEO RESOURCE
  - d. WEB RESOURCES:-
  - e. E-RESOURCES