

**SEMESTER-2**

**Detailed syllabus for each course**

**ZOM121T: Animal diversity, physiology and cytology**

<b>Semester: II</b>	<b>Course Title: Animal diversity, physiology and cytology</b>	<b>Credit: 4</b>
<b>Course No.: 121T</b>	<b>Major-3 (T)</b>	<b>Hours: 4/week</b>

Course Outcomes: On successful completion of the course, the learner will be able to:

<b>COs</b>	<b>Cognitive Abilities</b>	<b>Course Outcomes</b>
CO 1	Remembering	Recall the general characteristics, classification, and salient features of invertebrates up to the class level with examples.
CO 2	Understanding	Explain the structural features, adaptations, and functional aspects of invertebrate groups such as Porifera, Coelenterata, and others. Describe the polymorphism in Hydrozoa, types of coral reefs, and functional morphology of Hydra vulgaris.
CO 3	Applying	Analyze the anatomy and histology of the human urinary system, including kidney structure, nephron function, and diseases.
CO 4	Analyzing	Illustrate renal physiology processes such as glomerular filtration, tubular reabsorption, secretion, and micturition reflex.
CO 5	Evaluating	Assess the impact of urinary diseases (e.g., renal stones, renal failure, infections) and evaluate the effectiveness of treatments like dialysis.
CO 6	Creating	Examine mitosis and meiosis processes to evaluate their roles in inheritance, cellular maintenance and overall biological function.

**CO-PO Mapping:**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>	<b>PO 9</b>
<b>CO 1</b>	3	1	1	1	1			1	
<b>CO 2</b>	3			2	1			1	
<b>CO 3</b>	3	2		3	1			2	
<b>CO 4</b>	3	3	2		1			2	
<b>CO 5</b>	3	2	1	3		2		3	1
<b>CO 6</b>	3	3			2	3	2		2

<b>Unit No.</b>	<b>Unit Contents</b>	<b>No. of Hours of Teaching</b>
1	<b>Animal diversity (Non-chordates) Systematics:</b> · General characters, salient features and classification of	15

	<p>Invertebrates, starting from kingdom up to class, giving reasons &amp; suitable examples (as per practical syllabus):</p> <ul style="list-style-type: none"> <li>▪ Porifera</li> <li>▪ Coelenterata</li> <li>▪ Platyhelminthes</li> <li>▪ Aschelminthes</li> </ul>	
2	<p><b>Animal diversity (Non-chordates):</b>  <b>General topics:</b></p> <ul style="list-style-type: none"> <li>· Spicules in porifera</li> <li>· Polymorphism in Coelenterata (Hydrozoa)</li> <li>· Types of coral reefs</li> </ul> <p><b>Type study: Hydra (<i>Hydra vulgaris</i>):</b></p> <ul style="list-style-type: none"> <li>· Systematic position</li> <li>· Habits and habitat</li> <li>· External Morphology</li> <li>· Internal structure (Coelenteron, Body wall)</li> <li>· Locomotion</li> <li>· Nutrition</li> <li>· Respiration</li> <li>· Nervous system</li> <li>· Reproduction (Asexual &amp; Sexual) and Regeneration</li> </ul>	15
3	<p><b>Animal Physiology – Human Urinary System</b>  <b>Anatomy and Histology of the Urinary system</b></p> <ul style="list-style-type: none"> <li>· External and Internal anatomy of the kidneys</li> <li>· Blood supply to kidneys</li> <li>· Overview of kidney functions</li> <li>· The Nephron (Structure and Histology)</li> </ul> <p><b>Renal Physiology</b></p> <ul style="list-style-type: none"> <li>· Glomerular filtration</li> <li>· Tubular reabsorption</li> <li>· Tubular secretion- Counter current mechanism</li> <li>· Micturition reflex</li> <li>· Hormonal regulation in brief (Name of the hormones and their function only)</li> </ul> <p><b>Urinary diseases in brief:</b></p> <ul style="list-style-type: none"> <li>· Renal stones</li> <li>· Renal failure</li> <li>· Urinary tract infection</li> <li>· Bladder infection</li> <li>· Dialysis</li> </ul>	15

4	<p><b>Cytology</b></p> <ul style="list-style-type: none"> <li>· Microscopy – Simple light microscope Compound light microscope (Components and working mechanism)</li> <li>· Classification of chromosomes: <ul style="list-style-type: none"> <li>▪ Based on the location of centromere</li> <li>▪ Based on their functions (i.e. somatic &amp; sex chromosomes)</li> <li>▪ Ultra structure &amp; general functions of Metaphase Chromosome</li> </ul> </li> </ul> <p>Chromatin, Chromatids, Nucleosome, Centromere, Kinetochore, Telomere, Primary and secondary constriction, Euchromatin, Heterochromatin</p> <ul style="list-style-type: none"> <li>· Cell cycle (Mitotic)</li> <li>· Mitosis</li> <li>· Meiosis</li> </ul>	15

**References:**

1. Dhama PS, Dhama JK: Textbook of Invertebrates, 5th ed. New Delhi (DL): S. Chand & Company; 2021
2. George Howard Bell, Donald Emslie-Smith, Colin Ralston Paterson: Textbook of Physiology, 10th illustrated ed.; Churchill Livingstone, 2008
3. John EH, Michael EH: Guyton and Hall Textbook of medical physiology, 14th ed.; Elsevier Pub, 2020
4. Kotpal RL: Textbook of Invertebrates and vertebrates. 12th ed. Meerut (UP): Rastogi Publishers; 2020.
5. Power CB: Cell Biology, 3rd ed. Maharashtra (MH) C. B. Power, Himalaya Publishing House, Maharashtra, 2019
6. Pranab D: Diagnostic Cytology, 3rd ed. New Delhi (DL); Jaypee brothers' medical publishers, 2022
7. Tortora GJ, Brayn D: Principal of Anatomy and Physiology, Global ed. Wiley Pub., 2017
8. Verma PS, Agarval VK: Cytology, Revised ed. Delhi (DL); S. Chand & Co., 1999
9. Wallace AF, Dyson RH: Principles of Animal Taxonomy, George Gaylord Simpson. Columbia University Press, 1961

**ZOM122P: Zoology Major Practical-122**

<b>Semester: II</b>	<b>Course Title: Zoology major practical 122</b>	<b>Credit: 4</b>
<b>Course No.:</b>	<b>Major-4 (P)</b>	<b>Hours:</b>