

**Course Code: ZOO-404**  
**Number of Credits: 2**  
**Effective from AY: 2020 -21**

**Course Title: Endocrinology**

<b>Prerequisite for the Course:</b>	Basic knowledge on animal anatomy, physiology and endocrinology.	
<b>Objectives:</b>	This course develops concepts in molecular level endocrinological events to understand hormones and their crucial role in the animal body. This course also focuses on various approaches to understand hormone action and the receptors involved. Additionally this course reflects on the endocrine glands and the related applications of hormones in the field of cellular pathologies.	
<b>Content:</b>	<p><b>Module1:</b>  Classification of hormones, structure-function relationships in different hormones, transcriptional and post-transcriptional mechanisms of hormone biosynthesis and secretion, regulation of biosynthesis and secretion, inhibitors of hormone biosynthesis and their use, purification and storage of hormones.</p> <p>Nature of hormone receptors; receptors and types- membrane receptors, nuclear receptors; receptor antagonists and their applications, structural requirements for successful hormone-receptor interactions.</p> <p>Nature and mechanism of hormone action, signal discrimination, signal transduction pathways, secondary messengers, signal amplification, molecular mechanisms of regulation, permissive actions of hormones, signal attenuation, termination of hormone action, cross talk between steroid and protein hormone pathways.</p> <p><b>Module 2:</b>  Techniques for quantization of hormones, design and development of hormonal assays.</p> <p>Hormones and diseases, Genetic analysis and clinical management of hormonal disorders.</p> <p>Hormones as therapeutic agents, current developments in design and production of hormonal contraceptives, recombinant protein hormones-production and applications, evolution of chemical communication in animal systems.</p>	<p>4 hrs</p> <p>4 hrs</p> <p>4 hrs</p> <p>3 hrs</p> <p>3 hrs</p> <p>4 hrs</p>
<b>Pedagogy:</b>	Lectures/Tutorials/Videos/Assignments/ Group discussions/Self-study.	

<b>Learning Outcome:</b>	<ol style="list-style-type: none"> <li>1. Essential in depth understanding of the various hormones, molecular synthesis, secretion, receptors and action of hormones along with regulation.</li> <li>2. Vision to understand the endocrine glands with the crucial functioning in the body and the various hormone base disorders with new age aspects of hormones and applications to other fields of cell biology.</li> </ol>
<b>References /Reading:</b>	<ol style="list-style-type: none"> <li>1. Bolander FF (2004): Molecular Endocrinology, Elsevier, UK.</li> <li>2. Hadley ME and Levine JE (2006): Endocrinology, Adeson-Wesley publication, USA.</li> <li>3. Melmed S, Polonsky KS, Reed P et al (1995): William's text book of Endocrinology, Willey Blackwell Publication, UK.</li> <li>4. Darnell J Lodish Hand Baltimore D (1986): Molecular Cell Biology: Scientific American Book, Inc. USA.</li> <li>5. NorrisDO (2013): Vertebrate Endocrinology: Academic Press, New York.</li> <li>6. Freedman LP (1998): Molecular Biology of Steroid and Nuclear Hormone receptors, ed., Birkhauser, Boston, USA.</li> <li>7. Litwack G (1985): Biochemical actions of hormones, Academic press, New York, USA.</li> <li>8. Bentley PJ (1998): Comparative Vertebrate Endocrinology, III edition, Publisher – Cambridge University Press, Cambridge UK.</li> </ol>