



**Course Title:** Endocrinology

**Credit:** 4 (L-4, T-0, P-0)

**Course code:**

**Contact Hrs/Week:** 4 Hrs

**Course Outcomes**

This course shall impart extensive information to the post-graduate students about the different systems within human physiology with special emphasis on their structure and their related functions.

**Course Learning Outcomes (CLO):** The students will be able to understand:

1. Mode of action of hormones in invertebrates and vertebrates.
2. Physiological actions and regulation of pituitary hormones.
3. Physiological actions of medullary hormones.
4. Mechanisms of action thyroid and parathyroid hormones and regulations.
5. Hormonal control of feeding and regulations gastrointestinal.

**Unit I**

Concept of Endocrinology, Introduction to the endocrine system, Classes of hormones, Modes of hormone secretion. Evolution of endocrine system and its physiology - in Nemertean, Annelids, Molluscs. In Insects: Types of hormones and their release sites, Prothoracicotropic hormone, Ecdysteroids, Juvenile hormone, Neuropeptides, Vertebrate-type hormones, Endocrine physiology of Arthropods. In Crustaceans: X-organ, Y-organ and associated neurohemal organs.

**Unit II**

Comparative aspects of endocrine physiology in vertebrates, Evolution of pituitary gland. Physiological actions of pituitary hormones. Adenohypophyseal hormones: Somatotropin and prolactin, Glycoprotein hormones (FSH, LH, and TSH), Pro-opiomelanocortin. Neurohypophyseal hormones: Oxytocin and vasopressin.

**Unit III**

Evolution of discrete adrenal gland: Synthesis of corticosteroid, Structural diversity of glucocorticoids among vertebrates, Role of glucocorticoid in gluconeogenesis. Evolution of renin-angiotensin system - Hormonal control of water and electrolyte balance. Catecholamine biosynthesis, its storage and release mechanism, Physiological actions of adrenal medullary hormones.

**Unit IV**

Evolution of thyroid gland: Thyroid hormone synthesis and its regulation. A comparative account of parathyroid gland and ultimobranchial body/C cells. Synthesis of parathyroid hormone. Calcitonin and vitamin D3. Hormonal regulation of calcium and phosphate homeostasis.

**Unit V**

Hormonal control of feeding behaviour and gastrointestinal tract functioning including acid release, gall bladder contraction, relaxation, pancreatic enzyme secretion. GI tract motility. Pancreatic hormones and glucose homeostasis.





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Rahya-Suchani (Bagla), District- Samba, 181143, Jammu (Jammu and Kashmir), India

**Suggested Readings:**

1. G.D. Charles and N.J. Marshall (2001) Essential Endocrinology, 4th edition. Blackwell Science, London.
2. Hadley, M.E. (2000): Endocrinology (5th Ed.), Prentice Hall International Inc.
3. Norman, W.A and Liotwack. G. (1997) Hormones, 2nd ed. Academic Press.
4. Wilson J.D. and Foster, D.W. (2005): William's Textbook of Endocrinology (10th ed.). W.B. Saunders Company Philadelphia.
5. Norris and Lopez. (2011). Vertebrate Endocrinology (5<sup>th</sup>. ed). Academic press.
6. Bolander (2006). Molecular Endocrinology (3rd ed), Elsevier.

**Course Title:** Endocrinology Lab.

**Credit:** 2 (L-0, T-0, P-4)

**Course code:**

**Contact Hrs/Week:** 4 Hrs

Lab component

1. Histological study of Endocrine glands (Thyroid, Adrenal, Testis and Ovary).
2. Study of estrous cycle in mouse /rat.
3. Videos of surgical ablation of endocrine glands in rat/mouse/fish.
4. Survey of endocrine glands and reproductive organs in fish and rat
5. Surgical ablation of testis, ovary and adrenal in fishes/mouse/ rat.
6. Hypothalamic centres (SON, PVN, ARC) anatomical observation in brain slices.