

HORMONAL BIOCHEMISTRY

Sem	Sub. Code	Category	Lecture		Theory		Practical		Credit
			Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	
III	21CPBC3A	Core	4	60	4	60	-	-	4

COURSE OBJECTIVES

The course is designed such that the biochemists get an accurate information about the process of cellular communication including signal reception, transduction, amplification and response. It also imparts different endocrine factors, functions, mechanism of action of various hormones.

COURSE OUTCOMES

After the completion of this course, the student will be able to

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	Understand the basic terminologies of hormones, classification of hormones, mechanism of action of hormones based on receptors, different types of secondary messengers and regulation of hormones action by feedback mechanism.	K1
CO2	Understand the synthesis, mechanism and disorders of hypothalamic and pituitary hormones.	K2
CO3	Learn about the synthesis, mechanism and disorders of thyroid, calcium regulating hormones and pancreatic hormones.	K2
CO4	Demonstrate the biological function of adrenal hormones and GI hormones.	K2
CO5	Understand the role of sex hormones.	K2

(*CO-Course Outcomes

Knowledge Level: K1-Remember; K2-Understand; K3-Apply; K4-Analyze).

MAPPING WITH PROGRAMME OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	L	S	L	M	S	S
CO2	S	S	L	S	S	S
CO3	S	S	L	S	S	S
CO4	S	S	L	S	S	S
CO5	S	S	L	S	S	S

(S- Strong; M-Medium; L-Low)

UNIT – I

Classification and mechanism of action of hormones

15 Hours

Hormones – definition, classification, biosynthesis, circulation, modification and degradation, Receptor – structure and function. Mechanism of hormone action - signal transduction of peptide and steroid hormones. Role of G-protein in signal transduction, secondary messengers in hormonal action – cAMP, cGMP, IP3 and calcium. Feedback regulation of hormone secretion.

UNIT II

Hormones of Hypothalamus and Pituitary gland

10 Hours

Relation of Hypothalamus to Pituitary gland, Hypothalamic hormones which control anterior pituitary gland. Pituitary gland – hormones of anterior and posterior pituitary. Synthesis, mechanism of action, functions and disorders of oxytocin, vasopressin, prolactin and growth hormones.

UNIT III

Hormones of Thyroid, Parathyroid and Pancreatic gland

10 Hours

Thyroid Hormones – synthesis and secretion, transport, metabolic fate and biological action. Disorders of thyroid hormone – hypo and hyperthyroidism.

Hormones concerned with calcium homeostasis – Biosynthesis and biological action of Parathormone(PTH), Calcitonin and Vitamin D. Disorders of parathyroid hormones- rickets and osteomalacia.

Biosynthesis and biological actions of pancreatic hormones- Insulin and Glucagon. Disorders of pancreas – Diabetes mellitus.

UNIT IV

Hormones of adrenal Gland and GI hormones

15 Hours

Biosynthesis and biological role of adrenal medullary hormones—Catecholamine's (Epinephrine and Nor-epinephrine). Biosynthesis and biological role of adrenal cortical hormones—Mineralocorticoids (aldosterone) and Glucocorticoids (cortisol). Disorders of adrenal medulla and cortex -Addison's disease, Cushing's syndrome, Conn's syndrome and Pheochromocytoma.

GI hormones (secretin, gastrin, somatostatin and CCK) and its role.

UNIT V

Gonadal Hormones

10 Hours

Gonadal Hormones- Biosynthesis and biological role of male sex hormones - androgens (Testosterone), female sex hormone - oestrogens and progesterone, Menstrual Cycle. Physiology of Pregnancy, Parturition and Lactation.

DISTRIBUTION OF MARKS: Theory – 100% and Problems - Nil

TEACHING METHODOLOGY

- Lectures and demonstration by audio visual aids
- Classical chalk and board
- Learning through group discussions
- Tutorials
- Assignments
- Students seminars
- Interactive learning
- Self-study

TEXT BOOKS

S.No	Author Name	Title of the Book	Publisher	Year
1.	Prakash. S. Lohar	Endocrinology	MJP Publishers	2005
2.	R.Radheshyam	Textbook of Endocrinology	Neha Publishers	2012
3.	Hadely, M. amndLevine .J.E	Endocrinology	6 th Edition, Benjamin Cummings	2006
4.	Smith, E. et al.,	Principles of Biochemistry	7 th Edition. McGraw Hill International Book Co	1983

REFERENCE BOOKS:

S.No	Author Name	Title of the Book	Publisher	Year
1.	Guyton, A.C. and Hall., J.E.	Text Book of Medical Physiology	12 th Edition, Saunders Publishers	2010
2.	ShlomoMelmed Kenneth Polonsky P. Reed Larson Henry Kronenberg,	William's Endocrinology	13 th Edn Elsevier publishers	2015
3.	Hadley, M.C. and Levine, J.E	Endocrinology	6 th ed., Pearson Education (New Delhi),	2007
4.	Larson <i>et al.</i> ,:	Williams Textbook of Endocrinology,	10 th ed., Elseiver.	2003
5.	R.Radheshyam	Behavior endocrinology	Neha Publishers	2013
6.	Melmedet <i>al.</i> ,	Williams Text Book of Endocrinology	13 th Edition, Saun	2015

WEB SOURCES:

- www.biologydiscussion.com/hormones/classification-hormones/classification-of-hormones-5-categories/18429
- www.vivo.colostate.edu/hbooks/pathphys/endocrine/hypopit/overview.html
- www.hopkinsmedicine.org/health/conditions-and-diseases/hormones-and-the-endocrine-system
- www.livescience.com/59039-adrenal-glands.html
- www.slideshare.net/specialclass/gonadal-hormones-and-inhibitors

SYLLABUS DESIGNER:

- Dr.V. Prabha, Head & Assistant Professor of Bio-Chemistry
- Dr. S. Asha, Assistant Professor of Bio-Chemistry