

HORMONAL BIOCHEMISTRY

Sem	Sub Code	Category	Lecture		Theory		Practical		Credit
			Per week	Per sem.	Per week	Per sem.	Per week	Per sem.	
V	21CBC5E	Elective	3	45	3	45	-	-	3

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.

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 thyroid and parathyroid hormones	K2
CO3	Learn various functions of pancreatic hormones.	K2
CO4	Demonstrate the various mechanism of action of steroid 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)

Total Hours :45

UNIT - I

Introduction to Hormones

10 Hours

Definition of a hormone, classification of hormones, chemical signalling – endocrine, paracrine, autocrine and neuroendocrine mechanisms. Mechanism of action of peptide and steroid hormones. G protein coupled receptors, signal transduction, role of secondary messengers in hormonal action – cAMP, cGMP, IP3 and calcium. Feedback mechanism of hormone.

Unit II

Hormones of Hypothalamus and Pituitary gland

10 Hours

Relation between Hypothalamus and Pituitary, hormones released by hypothalamus, Pituitary hormones-Oxytocin, Vasopressin, Growth hormone.

Hormones of Thyroid and Parathyroid gland

Biosynthesis and biological action of thyroid hormones. Hypo and hyper thyroidism- cretinism, myxoedema, Grave's diseases and Goiter. Biosynthesis and biological action of parathyroid hormones (PTH). Disorders of parathyroid hormones- rickets and osteomalacia.

Unit III

Hormones of Pancreatic Gland

7 Hours

Biosynthesis and biological actions of pancreatic hormones- Insulin and Glucagon. Disorders of pancreas – Diabetes mellitus. GI hormones (secretin, gastrin, somatostatin and CCK) and its role.

Unit IV

Hormones of Adrenal Gland

10 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.

Unit V

Gonadal Hormones

8 Hours

Gonadal Hormones- Biosynthesis and biological role of male sex hormones - androgens (Testosterone), female sex hormone - oestrogens and progesterone. Menstrual Cycle – phases.

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.Radhesyam	Textbook of Endocrinology	Neha Publishers	2012
3.	Hadely, M. amnd Levine .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.	Shlomo Melmed 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.	Melmed <i>et al.</i> ,	Williams Text Book of Endocrinology	13 th Edition, Saun	2015

WEB SOURCES:

- www.pathwaymedicine.org/hormone-biochemistry
- www2.centralcatholics.com/APbiologysite/Hormone/more%20hormone%20notes.PDF.

SYLLABUS DESIGNER:

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