Programme: M.Sc. (Biochemistry)

Course Code: BCO 101

Title of the Course: HORMONES

Number of Credits: 2

Effective from Academic Year: 2018-19

Prerequisites	Basic knowledge on cell signaling in animal systems.	
Objective:	To develop a robust knowledge on human endocrine system including it's role in physiology, mechanism of actions, regulation and clinical disorders.	
Content:		
1.		**(12)**
1.1	Introduction: History, endocrine glands, chemical messengers	
1.2	Classification of hormones	
1.3	Receptor type, Intracellular receptors - Steroid hormone receptors, Thyroid hormone receptors, sensitization & desensitization of receptors	
1.4	Stimulus of hormones, regulation of biosynthesis and release, feedback mechanism.	
1.5	Cell signaling and Mechanism of secretion of hormone, physiological and biochemical actions, pathophysiology – hyper- and hypo- secretion. 1. Hypothalamic Hormones - CRH, TRH, GnRH, PRL/PRIH, GHRH/GHRIH. 2. Pituitary Hormones - Anterior Pituitary hormones - Growth hormone, Prolactin, POMC peptide family, LH, FSH, TSH; Posterior Pituitary - Vasopressin, Oxytocin. 3. Pancreatic Hormones - Insulin, Glucagon. 4. GI tract Hormones - Gastrin, Secretin, CCK, GIP, Ghrelin.	
2.		**(12)**
2.1	Adrenal Cortex Hormones - Aldosterone (renin angiotensin system) & cortisol; Pathophysiology - Addisons disease, Conn's syndrome, Cushings syndrome; Hormones of Adrenal Medulla, Epinephrine and norepinephrine.	
2.2	Hormones regulating Ca2+ Homeostasis - PTH, Vit D, Calcitonin; Pathophysiology - Rickets, Osteomalacia, Osteoporosis.	
2.3	Reproductive Hormones - Male and female Sex hormones, interplay of hormones during reproductive cycle, Pregnancy, Parturition and Lactation; Oral Contraceptives.	
2.4	Endocrine disorders: Gigantism, Acromegaly, dwarfs; Pathophysiology - Diabetes insipidus, Thyroid Hormone (include biosynthesis) - Goiter, Graves' disease, Cretinism, Myxedema, Hashimoto's disease.	
2.5	Other organs with endocrine function - Heart (ANP), Kidney (erythropoietin), Liver(Angiotensinogen, IGF-1), Adipose tissue (Leptin, adiponectin); Growth factors: PDGF, EGF, IGF-I,II.	

Pedagogy:	Lectures/ tutorials/ assignments/ students' seminars/ interactive learning/ self-study.	
References/ Readings	Berg, J.M, Tymoczko, J. L., Stryer, L., Biochemistry.	
	Mathews, C.K., van Holde, K.E. & Ahern, K.G. Biochemistry.	
	Nelson, C., Lehningers Principles of Biochemistry.	
	Norman A. W., Gerald Litwack. 1997. Hormones	
	David, G. & Dolores, S., Greenspan's Basic and Clinical Endocrinology	
	Moore, T.C. Biochemistry and Physiology of Plant Hormones	
Learning Outcomes	At the end of the course the students will have a thorough knowledge and understanding of chemical signaling through different hormones occurring in human system.	