General Biology II (101-HTK) Endocrine System
Concepts and Learning Outcomes

Topic	Concept	Learning Outcomes
Classes of chemical signals	1. There are 6 major categories of chemical signals: autocrine, paracrine, endocrine (hormones), neural, neuroendocrine, and pheromones.	1. Identify and compare the 6 main chemical groups of chemical signals in terms of mode of action, mode of release, and target cells
Hormones: definition and classification	2. Hormones are organic compounds that are produced and secreted by endocrine cells into the circulation. Hormones are released in small amounts and act on distant target cells. 3. There are 3 major classes of hormones: peptides, amino acid derivatives, and steroids.	2. Define hormone and compare the 3 ain classes of hormones in terms of chemical nature and cellular receptor location
What hormones do: regulation of homeostasis, response to environmental changes, and growth and development	4. Hormones regulate metabolic activities in target cells, and by doing so they regulate 3 major physiologic functions in the body: (1) homeostasis, (2) response to environmental changes, and (3) growth, development, and reproduction.	3. Identify the 3 main effects of hormones on mammalian organisms and give 2 different examples of hormones for each type of effect
Regulation of hormone production and secretion	5. Hormone production and secretion is regulated by the nervous system through the hypothalamus and the pituitary gland. 6. The hypothalamus monitors internal organs and regulates the activities of the pituitary gland. The posterior pituitary stores and secretes hormones produced by the hypothalamus (ADH and oxytocin), while the anterior pituitary produces and secretes several hormones (eg, TSH, ACTH, FSH, LH, PRL, and GH) in response to signals from the hypothalamus. 7. Control of hormone production and secretion by	4. Describe the mechanism by which the hypothalamus and the pituitary gland integrate regulatory functions of the endocrine system in mammals 5. Summarize the regulation of the endocrine function by negative feedback systems 6. Identify and describe the function of the main hormones produced and secreted by the anterior pituitary and posterior pituitary

	endocrine glands involves a hypothalamus-pituitary-endocrine axis (chain of command) in which multiple feedback loops regulate the secretion of hypothalamic releasing hormones, pituitary hormones, and hormones produced by effector endocrine glands.	
Human endocrine system	8. Glands involved in homeostasis include: hypothalamus (ADH), thyroid (TH, calcitonin), parathyroid gland (PTH), kidney (EPO), pancreas (insulin, glucagon), and adrenal gland (aldosterone). 9. Glands involved in responses to environmental changes include: adrenal cortex (glucocorticoids, and adrenal medulla (epinephrine). 10. Glands involved in development, growth, and reproduction: hypothalamus (GnRH, GHRH, etc), pituitary (GH, TSH, FSH, LH), thyroid (TH, calcitonin), testes (testosterone), and ovaries (estrogens, progesterones).	7. Identify and classify the main endocrine glands of the human body based on the type of physiologic function they regulate (homeostasis, response to changes in environment, and development/growth/reproduction) 8. Describe the action of the principal hormones produced by the main endocrine glands of the human body