

**UCDSOM GRADUATION COMPETENCIES AND EDUCATIONAL PROGRAM OBJECTIVES
LINKED TO COURSE OBJECTIVES FOR
METABOLISM, ENDOCRINOLOGY, REPRODUCTION AND NUTRITION (MERN)**

GRADUATION COMPETENCY I. UCDSOM graduates will provide **patient care** that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

EDUCATIONAL OBJECTIVES RELEVANT TO COURSE OBJECTIVE	COURSE OBJECTIVE	ASSESSMENT OF STUDENT ACHIEVEMENT OF COURSE OBJECTIVE
<p>I. 2. Organize, synthesize, and interpret information obtained from patient records, history and physical examination to construct a rational differential diagnosis and devise a cost-effective, evidence-based plan for management of the patient.</p> <p>I. 6. Employ a systematic approach to clinical reasoning and problem-solving that begins with problem recognition, ends with case resolution, and explicitly acknowledge the degree of uncertainty at each step.</p> <p>I. 8. Incorporate a broad knowledge of the biomedical sciences and an understanding of pathophysiology.</p>	<p>1. Develop the ability to employ clinical reasoning to identify and to understand the basis for pathophysiological processes within the systems associated with metabolism, endocrinology, reproduction and nutrition.</p>	<p><u>Formative assessments and feedback:</u> Track student performances in exams and interactive case- and concept based learning (ICBL) sessions that apply knowledge base. Provide formative feedback to students who are unsatisfactory in meeting this competency.</p> <p><u>Summative assessments:</u> Performance in ICBL sessions and final examination on applied metabolism/endocrine/reproduction/nutrition questions Performance in analyzing case presentations in the final examination requiring deductive reasoning.</p>

GRADUATION COMPETENCY II. UCDSOM graduates will demonstrate **knowledge** about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

EDUCATIONAL OBJECTIVES RELEVANT TO COURSE OBJECTIVE	COURSE OBJECTIVE	ASSESSMENT OF STUDENT ACHIEVEMENT OF COURSE OBJECTIVE
<p>II. 1. Understand the normal human structure and function relevant to the understanding of human disease.</p> <p>II. 2. Describe the etiology, pathogenesis, structural and functional manifestations of representative diseases for all organ systems of the human body.</p> <p>II. 3. Describe the context of specific diseases in terms of prevalence, morbidity and mortality within society and for specific populations.</p>	<p>2. Acquire a solid knowledge base of the basic and pathophysiologic processes involved in metabolic and nutritional regulation and in reproductive and endocrine control systems; be able to integrate information across these systems; and be able to use the integrative knowledge base within the clinical reasoning process to identify and understand perturbations and diseases of the systems.</p> <p align="center">(See detailed <u>Core Course Competency</u> list at the end)</p>	<p><u>Formative assessment:</u> Track student performances in exams and ICBL sessions on facts and concepts in metabolic/endocrine /reproduction/nutrition pathophysiology Provide formative feedback to students who are unsatisfactory in meeting this competency</p> <p><u>Summative assessments:</u> Performance in ICBL sessions and final examination on pathophysiology facts and concepts Performance in analyzing case presentations in the final</p>

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<p>II. 4. Understand pharmacological principles of treatment using drugs and efficacy of therapeutic measures in management and symptom relief.</p>		<p>examination requiring knowledge of facts and concepts combined with deductive reasoning.</p>
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GRADUATION COMPETENCY III. UCDSOM graduates will exhibit **interpersonal and communication** skills that result in effective information exchange and teaming with patients, their patients' families, and professional associates.

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<p>III. 2. Establish and maintain effective, collaborative professional relationships with peers, colleagues, and allied health care professionals.</p> <p>III. 3. Provide constructive feedback to colleagues, and use feedback from multiple sources to improve professional skills.</p> <p>III. 5. Understand and utilize shared decision-making in areas where there is uncertainty.</p>	<p>3. Learn how to effectively communicate basic facts and concepts to each other and to the teacher.</p>	<p>Peer evaluation of communication skills necessary to contribute to the group process in the ICBL sessions.</p> <p>Faculty evaluation of communication skills in ICBL sessions.</p>

GRADUATION COMPETENCY IV. UCDSOM graduates will demonstrate a commitment to **professionalism** in carrying out their responsibilities with adherence to ethical principles, and sensitivity to a diverse patient population.

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<p>IV. 1. Pursue excellence through commitments to professional competence.</p> <p>IV. 4. Recognize personal limits in knowledge, experience, ability, and resources.</p>	<p>4. Develop professional behavior that includes:</p> <ul style="list-style-type: none"> a. Acceptance of responsibility for self-study and preparedness for in-class learning b. Effective communication skills to contribute to the learning of others c. Ability and readiness to challenge facts and concepts presented by another in a collegial manner. 	<p>Peer and faculty evaluation of preparation, participation and contribution to team work in ICBL sessions.</p> <p>Acceptance of formative and summative feedback</p>

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GRADUATION COMPETENCY V. UCDSOM graduates will demonstrate knowledge of **system-based practice**, i.e., responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

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None	None	Not assessed in the course

GRADUATION COMPETENCY VI. UCDSOM graduates will acquire **life-long learning skills**.

EDUCATIONAL OBJECTIVES RELEVANT TO COURSE OBJECTIVE	COURSE OBJECTIVE	ASSESSMENT OF STUDENT ACHIEVEMENT OF COURSE OBJECTIVE
VI.1. Demonstrate an inquisitive nature, information management skills, and critical evaluation framework necessary to sustain life-long learning.	5. Develop abilities for life-long learning: a. Acquire habits of self-study and preparation for in-class learning; identify, access and use resources for the course including library and online teaching tools. b. Understand that the current information base is state-of-the-art but that resolution of the many questions remains for the future. c. Accept feedback on deficits in facts, concepts, problem-solving skills, communication skills or professionalism .	Individual scores and contribution to the team performance in the interactive case- and concept-based learning sessions.

GRADUATION COMPETENCY VII. UCDSOM graduates will learn how to approach **practice-based learning**.

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None	None	Not assessed in the course.

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HOW COURSE COMPETENCIES ARE ASSESSED BEYOND THE COURSE

ON AN ANNUAL BASIS, REVIEW:

- USMLE Step 1 results for combined score for first and second year course materials
- Annual Graduation Questionnaire, combined score for first and second year courses

HOW ASSESSMENT DATA WILL BE USED TO REVISE/IMPROVE COURSES

ON AN ANNUAL BASIS:

- Use student performance data, course evaluations and student self-assessment of competencies to review course content, design, pedagogy, and examinations
- Share the information with the Chair annually and with the CEP when Level 2 Evaluation is called for.

- 1. Develop the ability to employ clinical reasoning to identify and to understand the basis for pathophysiological processes within the systems associated with metabolism, endocrinology, reproduction and nutrition.**

- 2. Acquire a solid knowledge base of the basic and pathophysiologic processes involved in metabolic and nutritional regulation and in reproductive and endocrine control systems; be able to integrate information across these systems; and be able to use the integrative knowledge base within the clinical reasoning process to identify and understand perturbations and diseases of the systems.**

A. *Biochemistry/Metabolism*

- Be familiar with the biochemical principals that govern energy exchange and key metabolic pathways in the body
- Understand the mechanisms by which the body stores and utilizes energy
- Understand how perturbations in metabolic pathways contribute to human disease
- Know the biochemical basis of therapies targeting metabolic pathways
- Acquire a comprehensive knowledge base facilitating the application of key biochemical principles to clinical practice

B. *Endocrinology/Metabolism*

- Hypothalamus and Pituitary
 - understand anterior pituitary hormone production and secretion and regulation by the hypothalamus
 - know the function and regulation of posterior pituitary hormones
 - pituitary tumors: know the clinical manifestations of different pituitary tumors; understand the hormonal and spatial effects; understand the laboratory and clinical diagnostic strategies and treatment options
- Adrenal Gland
 - understand the basis for feedback regulation within the hypothalamo-pituitary-adrenal cortex axis
 - understand the physiologic and pharmacologic actions of glucocorticoids and mineralocorticoids
 - Adrenal Insufficiency: know the pathophysiology and clinical manifestations; understand laboratory and clinical diagnostic strategies; know how to distinguish primary from secondary insufficiency and be familiar with treatment options

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- Cushing's Syndrome: know the pathophysiology and clinical manifestations; understand clinical diagnostic and laboratory strategies; understand the impact of Cushing's syndrome and its relationship to other diseases
- Pheochromocytoma: understand the normal function and regulation of chromaffin cells; know the pathophysiology and clinical manifestations of pheochromocytoma; understand its relationship to other disease states and understand management and treatment options
- Growth Hormone
 - understand the regulation of GH secretion and actions
 - understand role of GH in children and adolescents, its relationship to other growth-regulating hormones, and be able to understand and interpret growth curves
 - understand underlying mechanisms responsible for different types of growth deficiencies and GH excess and be familiar with treatment options
- Metabolism
 - be familiar with the production and secretion regulation of pancreatic hormones
 - understand the mechanisms by which the regulatory and counterregulatory hormones affect metabolic pathways to maintain homeostasis
 - understand lipoprotein synthesis and regulation and know the definitions and clinical manifestations of primary and secondary lipid disorders
 - know the characteristics of metabolic syndrome
 - be familiar with the endocrinology of adipose tissue and its roles in metabolism, inflammation and appetite regulation
- Diabetes Mellitus and Metabolism
 - know the definition, pathophysiology, epidemiology, and differential diagnosis of type 1 diabetes
 - know the definition, pathophysiology, epidemiology, including role of obesity in type 2 diabetes
 - know the clinical manifestations, risk factors, and diagnostic criteria of type 2 diabetes
 - know the prevalence and manifestations of diabetic complications and understand the underlying mechanisms
 - be familiar with treatment options and modalities for type 1 and type 2 diabetes
 - be familiar with prevention guidelines for type 2 diabetes
- Hypothalamo-Pituitary-Thyroid Axis
 - understand the basis for feedback regulation within the hypothalamo-pituitary-thyroid axis
 - understand the physiologic and pharmacologic actions of thyroid hormones
 - hypothyroidism and hyperthyroidism: know their etiology, forms, and prevalence; understand the laboratory and clinical diagnostic strategies; understand treatment options
 - thyroid nodules and thyroid cancer: know the differential diagnosis and algorithm to follow in thyroid nodule work-up; know the different types of thyroid cancer, their prevalence, and how diagnosed; understand the utility and interpretation of fine needle aspiration biopsy
- Mineral Metabolism and Metabolic Bone Disease
 - understand the regulation and actions of calcium, phosphate, PTH, calcitonin, and vitamin D
 - know the etiologies, clinical manifestations, and treatment of hypercalcemia and hypocalcemia
 - metabolic bone disease: understand bone cell biology and the remodeling cycle; know the definitions, clinical manifestations, and diagnosis of osteoporosis, Paget's disease, and osteomalacia; know the guidelines for screening and treatment options for osteoporosis
- Multiple Endocrine Neoplasia Syndromes (MEN)
 - know the classification and genetic basis of MEN syndromes and their clinical manifestations
 - know the differential diagnosis

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C. *Reproduction/Endocrinology*

- Hypothalamo-Pituitary-Gonadal Axis
 - know the basic components and understand the feedback regulation of the hypothalamo-pituitary-ovarian axis and the hypothalamo-pituitary testicular axis
 - know the steroidogenic pathway and its regulation in the ovary and the testis; be familiar with oogenesis and follicular development and its regulation; be familiar with endocrine regulation of spermatogenesis
 - know the reproductive and non-reproductive target tissues and actions of gonadal steroids
 - be familiar with the endocrine basis for infertility in females and in males
- Menstrual Cycle
 - know the menstrual cycle; understand the hormonal interrelationships during a cycle; understand the structural and functional changes in relevant target tissues; know the sequence of events occurring during ovulation
 - be able to define and describe the etiologies of amenorrhea and oligomenorrhea
 - know the evaluation methods, differential diagnosis, treatment options and management of amenorrhea and oligomenorrhea
 - Polycystic Ovarian Syndrome (PCOS): understand the clinical significance, presentation, metabolic perturbations, and differential diagnosis of PCOS; understand the mechanisms underlying treatment options for PCOS
- Human Sexuality
 - understand the physiology of the female and male sexual response cycle
 - understand sexuality across the lifespan
 - be familiar with the physical, psychosocial and societal contributions to female sexual dysfunction
- Contraception
 - know the different types of contraceptive methods and the basis for action for each
 - understand the effectiveness, benefits and risks of each type
 - be familiar with the assessment of appropriateness of different methods of contraception for diverse patient populations
 - understand the benefits and risks of female and male surgical sterilization
- Sexually Transmitted Infections (STIs)
 - know the sex and gender differences in the incidence of and risk factors for sexually transmitted diseases (STDs)
 - know the sex and gender differences in the symptoms and signs of STDs.
 - know the signs and symptoms, physical and clinical findings, and the method of evaluation for the following STIs: Gonorrhoea, Chlamydia, Herpes simplex virus, Human papilloma virus.
 - understand the long-term, sex-specific complications for patients with STDs, including fetal risks and fertility
- Puberty
 - understand the activation of the hypothalamo-pituitary-gonadal axis at puberty and the age at onset for females and males
 - know the metabolic and differentiating effects of gonadal and adrenal steroids on target tissues in the pubertal period
 - understand the mechanisms associated with precocious and delayed puberty and be familiar with the treatment options and the mechanisms involved in these treatments
- Menopause/Andropause
 - know the changes in hypothalamo-pituitary-ovarian axis associated with perimenopause/menopause
 - understand the evaluation and management of common menopausal and perimenopausal symptoms
 - know the changes in the hypothalamo-pituitary-testicular axis associated with andropause and understand the management of andropause symptoms
 - be familiar with long-term changes associated with menopause and andropause
- Abnormal Uterine Bleeding
 - know the definition, etiologies, and common patterns of abnormal and dysfunctional uterine bleeding
 - be familiar with evaluation methods and therapeutic options for abnormal uterine bleeding

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- Normal Pregnancy and Labor
 - know the sequence of events during sperm transport, fertilization, and implantation
 - know the endocrinology of the placenta in each trimester and understand the actions of these hormones
 - know the structural, physiologic, and endocrine changes that occur during pregnancy and understand the adaptive/metabolic roles for these changes; be able to differentiate between normal changes and disease processes that may occur during pregnancy
 - know the diagnostic procedure and the calculation of due date for pregnancy
 - understand the hormonal basis for the onset of labor; know the signs and symptoms and three stage of labor and be able to recognize common abnormalities; know the steps of a vaginal delivery
- Spontaneous Abortion and Ectopic Pregnancy
 - be able to develop a differential diagnosis for first trimester bleeding; understand the management of bleeding and abdominal pain in the first trimester
 - know the etiologies, complications, risk factors, anatomical locations and treatment options for ectopic pregnancy
- Fetal Endocrinology & Sexual Differentiation
 - understand the timing of the development and maturation of the endocrine systems and the roles for these systems in placental function, fetal physiology and adaptation to extrauterine life
 - understand the developmental basis for sexual differentiation; know the mechanisms underlying genotypic differentiation; understand the hormonal basis for phenotypic differentiation; understand the psychosocial aspects of sexual differentiation
 - know the etiologies and differential diagnosis for ambiguous external genitalia
 - be familiar with the incidence, presentation, clinical significance and treatment options for common forms of sexual differentiation disorders: congenital adrenal hyperplasia, Klinefelter syndrome, Turner syndrome, and testicular feminization

D. Nutrition/Metabolism

- Energy Balance and Assessment
 - understand the generation, expenditure and storage of energy at the whole body level
 - be familiar with methodologies and clinical strategies for assessing nutritional status
 - be familiar with dietary reference intake guidelines
- Functions of Dietary Nutrients
 - know the functions of different types of nutrients including essential amino acids, trans-fatty acids, lipids, and glucose
 - be familiar with nutritional approaches used by dietitians for managing diet
 - know nutritional approaches to chronic diseases including liver and kidney diseases and malabsorption syndromes
- Vitamins and Minerals
 - understand the types, roles, and mechanisms of action of vitamins and minerals in metabolism
 - know the pathophysiology, clinical manifestations, and treatment options for different types of vitamin and mineral deficiencies
 - understand the relationship of vitamin or mineral deficiencies to other diseases
- Nutrition across the Lifespan
 - understand the changing profile of nutritional needs across the lifespan including neonatal nutrition, childhood and adolescent nutrition, and nutrition in the aging population
 - be familiar with different assessment techniques for nutritional status across the lifespan
 - know the incidence of nutritional deficiencies associated with the different age groups and be familiar with the treatment and management options
- Obesity and Overweight
 - understand the definition, etiology, diagnosis, and prevalence of obesity
 - be familiar with strategies for behavioral and lifestyle modifications for overweight or obese individuals; be familiar with strategies for dietary modifications, including altered macronutrient composition; be familiar with surgical modifications for treatment of obesity

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- **Malnutrition**
 - understand the clinical strategies for evaluating different types of malnutrition; understand the relationship of malnutrition to different diseases
 - understand the etiologies and diagnosis of eating disorders
 - anorexia nervosa: know the presentation and differential diagnosis; understand the relationship of the nutritional changes on the reproductive, endocrine, and metabolic systems; be familiar with treatment and management options
 - **Parenteral Nutrition and Cancer Cachexia**
 - know the physiologic and metabolic derangements of cancer associated weight loss, including the role of various hormones and cytokines
 - know the clinical manifestations of cancer cachexia
 - know the therapeutic options of cancer cachexia and what role nutritional support has in treatment
 - know the definition of parenteral nutrition and indications for use
 - be familiar with the use of parenteral nutrition in specific disease states
 - know the metabolic effects and clinical complications of parenteral nutrition
- 3. Learn how to effectively communicate basic facts and concepts to each other and to the teacher.**
- 4. Develop professional behavior that includes:**
- A.** Acceptance of responsibility for self-study and preparedness for in-class learning
 - B.** Effective communication skills to contribute to the learning of others
 - C.** Ability and readiness to challenge facts and concepts presented by another in a collegial manner
- 5. Develop abilities for life-long learning:**
- A.** Acquire habits of self-study and preparation for in-class learning; identify and use resources for the course including library and online teaching tools
 - B.** Understand that the current information base is state-of-the-art but that resolution of the many questions remains for the future
 - C.** Accept feedback on deficits in facts, concepts or problem-solving skills as an ongoing part of the course; be able to demonstrate improvements.