FIRST YEAR CURRICULUM: COURSES AND COURSE OBJECTIVES

ANATOMY AND EMBRYOLOGY

Course Chair: John Clark, clarkij@uw.edu
Credits: 13

Provides a broad understanding of the structural organization of the human body at the macroscopic level to provide a foundation for physical examination and functional assessment of the human organism. Integrates embryological development with study of the cadaver and examination of the normal living body. Concentrates on exploration of the thoracic, abdomen, and pelvis and the viscera they contain. There is an emphasis on three-dimensional interrelationships and the general principles of blood and nerve supply rather than detailed anatomy of individual organs. Gross anatomy of skull, pharynx, larynx are presented. Physiological concepts and clinical evaluation related to hearing and balance are covered. Maxillofacial disorders, diseases of nasal passages, nasopharynx, oropharynx and accessory sinuses are introduced. The anatomy of the limbs is presented during the second year. Embryology and general anatomical concepts are presented in lecture format, but most learning takes place in the dissecting laboratory.

OBJECTIVES:
- Describe basic principles of embryology and general anatomical concepts.
- Develop a broad understanding of the structural organization of the human body at the macroscopic level.
- Develop a foundation for physical examination and functional assessment of the human organism.
- Describe the thoracic, abdomen, and pelvis cavities and the viscera they contain.
- Describe the three-dimensional interrelationships & the general principles of blood & nerve supply.
- Describe the gross anatomy of skull, head and neck.
- Provide anatomical basis for cross sectional and 3D digital imaging.

BIOCHEMISTRY

Course Chair: Nancy Maizels, maizels@uw.edu
John Saari, jsaari@uw.edu
Credits: AU & WI 4/4 – Total: 8

This course covers classical molecular and cellular biochemistry, cellular physiology, and molecular genetics. Metabolic interrelationships as they occur in the individual will be stressed and related to disturbances in disease states.

OBJECTIVES:
- At the conclusion of this course, students should be able to:
  - Solve problems in diagnosis and treatment of human disease by application of biochemical principles.
  - Use the primary medical and scientific literature as a resource for learning and problem-solving.
  - Define, describe and contrast functions of genes and macromolecules in normal and pathologic contexts.
  - Define and describe systemic metabolic biochemistry in terms of genes and molecules.
  - Deduce therapeutic mechanisms from established molecular mechanisms.
  - Interpret new medical discoveries in terms of fundamental principles of biochemistry
  - Explain the molecular basis of diseases that affect cellular function or development.
Instruction in communication skills and interview techniques to form the basis for the doctor-patient relationship and the skills of communicating with patients are introduced. The patient profile will be obtained. There will be attention to developing comfort in the physician role. The medical history will be introduced and instruction in data collection will begin. There will be further experience in conducting medical interviews with patients for the purpose of obtaining the medical history and patient profile. Special problems related to interviewing will be addressed. The adult screening physical examination will be taught through the use of lectures, audio/visual aids, and small group tutorials where students in supervised settings practice the physical exam on one another.

**OBJECTIVES:**

- **Professionalism**
  - Develop and practice standards of professional conduct in medicine including: sensitivity and caring towards patients, ethical conduct (especially regarding confidentiality and personal integrity), conscientious self-directed learning, appropriate appearance and demeanor in clinical settings, responsible performance in commitments, and appointments and record keeping.
  - Identify and discuss issues of professional development including adjustment to the demands and privileges of being a medical student.
  - Describe the meaning of the doctor/patient relationship.
  - Discuss and apply some ethical principles in discussion of ethical cases.
  - Describe the meaning and value of continuity of care.

- **Medical Interviewing**
  - Demonstrate an understanding of the purpose and function of the medical interview.
  - Develop and practice interpersonal communication skills and effective interview methods involving questioning, listening, and observational skills.
  - Demonstrate an understanding of the concept of the patient’s narrative and its importance in patient-centered interviewing.
  - Demonstrate an ability to respond to and deal with patients’ emotions.
  - Develop questioning skills in relation to specific populations and situations including: pediatric patients, adolescent patients, geriatric patients, difficult interviews, human sexuality/sexual minorities, HIV/AIDS, substance abuse, diversity/culture in medicine

- **Medical database/Documentation**
  - Identify the elements of the complete medical database
  - Organize and write-up the medical database clearly and concisely at a basic level by completing 7 patient interviews (with incremental increase in data gathered over the course of the year).
  - Demonstrate an ability to construct a problem list and demonstrate an understanding of its function in the Problem Oriented Medical Record (POMR).

- **Physical Exam Skills**
  - Perform a standardized basic physical examination and demonstrate an understanding of the rationale for that examination.
  - Demonstrate the correct use of the medical instruments in the performance of the physical examination.
  - Develop a systematic approach to recording the basic physical examination.

- **Case Presentation and Clinical Reasoning**
  - Develop a basic understanding of the systematic approach to the verbal presentation of the medical history.
- Demonstrate a basic understanding of the clinical reasoning process by contributing to small group discussion and submitting write-ups that demonstrate an ability to perform the first step of the clinical reasoning process, the reporting of patient data.

**INTRODUCTION TO IMMUNOLOGY**

**Course Chair:** Michael Gale, Jr.  [mgale@uw.edu](mailto:mgale@uw.edu)

**Credits:** 2

Topics covered include: basic concepts such as antigens; antibodies; complement; B-and T-lymphocyte function, including interactions with each other and with accessory cells; immunological tolerance; major histocompatibility complex and role of these basic concepts in immunopathology (immunodeficiencies, hypersensitivities, autoimmunity, blood transfusion, and transplantation).

**OBJECTIVES:**

- Describe the components of the innate immune response and the basic principles by which it functions.
- Describe how T and B cells develop at a cellular and molecular level and explain how they recognize and respond to antigens.
- Explain how dendritic cells act as a bridge or gateway between innate and adaptive immune responses and describe the molecules and mechanisms involved.
- Apply the concepts acquired from objectives 1-3 to explain the immunological basis for defense against infection.
- Begin developing a conceptual and working knowledge of immunodeficiency and immunological barriers to transplantation.
- Describe immune-mediated pathology and the immunological, genetic and environmental factors involved in allergy and autoimmunity.
- Describe common beneficial therapies to modulate the immune response, including immunization and immunosuppression, and illustrate the immunological basis for their efficacy.

**MECHANISMS IN CELL PHYSIOLOGY**

**Course Chair:** Peter Detwiler,  [Detwiler@uw.edu](mailto:Detwiler@uw.edu)

**Credits:** 5

Fundamental cellular events underlying the following topics are presented: physiology of the cell membrane including ionic and electrical potential gradients, active transport, excitability and action potentials; biophysics of sensory receptors; neuromuscular transmission; muscle energetics and contractility; spinal reflexes and central synaptic transmission; autonomic nervous system; energy metabolism and temperature regulation; epithelial transport; gastrointestinal motility and secretions.

**OBJECTIVES:**

- Describe the physiology of the cell membrane including ionic and electrical potential gradients, active transport, excitability and action potentials.
- Describe the biophysics of sensory receptors.
- Describe the principles of neuromuscular transmission.
- Describe skeletal muscle excitation-contraction coupling and contractility.
- Describe the spinal reflexes and central synaptic transmission.
- Describe the basic mechanisms by which the autonomic nervous system controls arteriolar smooth muscle and the heart.
- Describe the mechanisms of contractility in cardiac and smooth muscle.
- Describe the basic principles of epithelial transport.
MEDICAL INFORMATION FOR DECISION MAKING

Objectives:

- Describe the value of high quality medical information for clinical care (e.g., issues of safety, cost, quality of care)
- Describe the range of factors that influence the clinical decision making process (e.g., evidence, guidelines, customs, experience, biases, personal & organizational values, patient factors/values)
- Translate a clinical situation/scenario into a searchable question
- Describe advantages and limitations of various medical information resources (e.g., Pubmed or UpToDate) and types of documents (e.g., systematic review or consensus guideline)
- Find candidate documents from one or more medical information resource(s) that may address the clinical situation
- Assess systematically the relevance and validity of a given document with respect to the clinical situation
- Compare relevance and validity across two documents

MICROBIOLOGY AND INFECTIOUS DISEASE

Objectives:

- Compare and contrast essential features of viruses, the prokaryotic cell, the fungal cell, and the mammalian cell.
- Describe essential features of bacterial structure, metabolism, genetics, and classification.
- Describe essential features of fungal morphology and growth.
- Describe essential features of viral structure, genetics, and growth.
- Compare and contrast distinguishing features of parasite classes, including the life cycles of major parasitic pathogens.
- Describe the major classes of antibiotics, including anti-bacterial, anti-fungal, anti-viral, and anti-parasitic drugs, and describe their mechanisms of action, and mechanisms of acquired resistance.
- For selected infectious diseases and syndromes:
  - Identify the pathogens of major importance
  - Describe the affected populations and modes of transmission
  - Describe the major clinical manifestations of disease
  - Explain the mechanisms of pathogenesis
  - Explain the principles of diagnosis, therapy, and prevention
MICROSCOPIC ANATOMY: HISTOLOGY

Course Chair: Olivia Bermingham-McDonogh, oliviab@uw.edu  Credits: 6
Lectures and laboratories in microscopic anatomy are designed to provide the principles and concepts of histology, to define the morphological characteristics of the cells, tissues, and organs of the human body, and to relate this information to functional processes studied in concurrent and subsequent courses.

OBJECTIVES:

• Present comprehensive definitions, descriptions and knowledge of locations of the structural components of cells, tissues and organs. Relate the structure of these components to their function.
• Demonstrate an ability to recognize the general characteristics & specific features of normal cells, tissues & organs as viewed by light microscopy. Name, compare and contrast different tissue types.
• Develop the ability to interpret microscopic images and to relate these two-dimensional images to the three-dimensional features of tissues and organs.

MUSCULOSKELETAL SYSTEM

Course Chairs: Greg Schmale, gschmale@uw.edu  Barry Goldstein, bgolds@uw.edu  Credits: 4
Gross, surface, applied and X-ray anatomy of system including entire spine but excluding head and neck. Histology of bone, cartilage, tendon-myotendinal junction and joints. Musculoskeletal trauma and healing. Pathology and clinical manifestations of other degenerative, inflammatory, metabolic, nutritional and congenital disorders. Physical examinations.

OBJECTIVES:

• Describe the origins, insertions, actions, and innervations of the muscles of the upper and lower limbs.
• Understand anatomical, physiological, and pathological bases of normal and abnormal physical signs in the musculoskeletal system.
• Demonstrate proficiency in finding key musculoskeletal anatomic landmarks on the living human subject.
• Recognize how the musculoskeletal system is affected by aging.
• Describe common traumatic conditions of the musculoskeletal system, including musculoskeletal emergencies.
• Compare and contrast the characteristics of the common arthritic conditions.
• Describe common congenital and perinatal pathologies that may affect the musculoskeletal system.
• Distinguish musculoskeletal pathologic processes from normal on plain radiographs.

NERVOUS SYSTEM

Course Chairs: Kate Mulligan, kmull@uw.edu  Dennis Dacey, dmd@uw.edu  Credits: 8
Integrated approach to the normal structure and function of the nervous system, including the eye. Neuropathological examples are presented as well as clinical manifestations of neurological disease.
OBJECTIVES:

- Communicate effectively with colleagues using correct discipline-specific terminology.
- Identify gross anatomical features of the brain and cord, meningeal layers and blood supply in wet specimens and in MRIs.
- Describe the blood vessels of the brain and the territories supplied by each.
- Describe the formation, circulation and absorption of cerebrospinal fluid.
- Interpret 2D and 3D clinical images based on an understanding of the 3D structural organization of the CNS.
- Describe common research techniques in neuroscience.
- Relate the developmental sequence of the nervous system to adult form and to common congenital conditions.
- Describe in detail the somatosensory, auditory, visual, taste, olfactory and motor pathways and the results of lesions in them at each level of the neuraxis.
- Describe the thalamus and cerebral cortex in terms of connections, functions, and effects of damage on sensory, motor and higher cognitive function.
- Describe the hypothalamus and limbic system and their role in homeostasis and in the regulation and expression of drive-related, emotional and cognitive functions.
- Recognize the common signs and symptoms that indicate a disorder in nervous system function.
- Relate some common pathologies of nervous system to disturbance, damage or dysfunction of specific structures, connections and/or physiology of neurons.
- Determine the site of a neurological lesion based on an interpretation of signs and symptoms in motor and sensory pathways or in cognitive behavior, and conversely, given the location of a lesion, predict the likely signs and symptoms the patient will exhibit.
- Read with understanding about clinically relevant advances in the rapidly advancing field of neuroscience.

SYSTEMS OF HUMAN BEHAVIOR

Course Chairs: David Harrison, davidh77@uw.edu  
Credits: 5

Selected overview of contributions from behavioral sciences to the clinical practice of primary care physicians. Sensitizes students to the impact of such factors as emotional and physical development, cultural backgrounds, social roles, families, sexual identities, and belief systems upon their effectiveness as physicians. Encourages appreciation of the role of behavioral factors in major management problems faced in medical practice; covers physical and psychological development of the individual from infancy through old age; teaches skills in analyzing behavior, defining behavioral objectives, and designing precise treatment strategies to attain these objectives.

OBJECTIVES:

- Apply knowledge of normal biopsychosocial development across the lifespan to clinical scenarios.
- Recognize and identify behavioral and developmental factors in primary care.
- Recognize and identify psychosocial mediators of biological and behavioral factors in health and illness.
- Identify major health risk behaviors and common principles of behavior change.
- Describe the impact of psychosocial stressors on illness, patients, and families.
- Recognize and describe the impact of culture, development, and patient and physician responses in the doctor-patient relationship.