SECOND YEAR CURRICULUM: COURSES AND COURSE OBJECTIVES

CARDIOVASCULAR SYSTEM

Course Chair: Luis Santana, santana@uw.edu  
Fendley Stewart, fstewart@uw.edu  
Credits: 6

An interdisciplinary approach to cardiovascular medicine, including anatomy, physiology, radiology, pathology, medicine and surgery. The central theme of this course is the function of the cardiovascular system in health and disease.

OBJECTIVES:

- Identify and describe heart failure based on an understanding of cardiac preload and afterload.
- Identify and describe valvular heart disease based on an understanding of the events of cardiac cycle.
- Identify and describe ischemic heart disease based on an understanding of the underlying pathophysiology.
- Interpret simple ECG’s based on an understanding of membrane potentials and electrical wave propagation in the heart.

CASES IN CLINICAL ETHICS

Course Chair: Diane Timberlake, dtimberl@uw.edu  
Kelly Edwards, edwards@uw.edu  
Credits: 1

Provides exposure to key issues in clinical ethics as well as the tools for ethical reasoning and critical thinking that support the student’s current and future work.

OBJECTIVES:

- Recognize ethical dimensions of clinical problems in a variety of clinical settings.
- Reason through ethical dilemmas and challenges posed in clinical practice.
- Discuss the doctor’s historical and contextual responsibilities towards patients.
- Justify a course of action.

CLINICAL EPIDEMIOLOGY AND EVIDENCE-BASED MEDICINE

Course Chairs: Bryan Kestenbaum, brk@uw.edu  
Credits: 2

Introduction to principles of epidemiology and biostatistics, emphasizing application to clinical medicine. Three broad topics: 1) Health and disease in the community, including assessment of disease risk and mechanisms of epidemic detection, spread, and control; 2) Interpretation of research results, including fundamentals of research design, data analysis and sources of bias; 3) Clinical epidemiology, including evaluation and application of diagnostic tests, natural history of disease, and quantitative aids for clinical decision making.

OBJECTIVES:

- Learn fundamental concepts of epidemiology and biostatistics and apply these concepts to the interpretation of modern clinical research articles.
- Understand general principles of epidemiology: study design, misclassification, confounding, and effect modification.
- Understand general principles of biostatistics: inference, hypothesis testing, regression, and survival data.
• Understand general principles of screening and diagnostic testing.

GASTROINTESTINAL SYSTEM

Course Chair: Bruce Silverstein, bruce@wattsilver.com  Credits: 4

Anatomy of gastrointestinal system; physiology and pathology of digestion and hepatic function; physical and laboratory examination.

OBJECTIVES:

• Outline an algorithm for the differential diagnosis of difficulty with swallowing.
• Explain the regulation of gastric acid secretion and how your explanation relates to the treatment of peptic ulcer disease.
• Describe the autoregulation of pancreatic endocrine, and exocrine secretion during the digestion of a meal.
• Give a description of normal fat absorption, and the derangements, which lead to fat malabsorption.
• Identify the principles of water and electrolyte absorption so that you can describe the abnormalities in normal absorption, which leads to diarrhea.
• Explain how cirrhosis of the liver can lead to esophageal variceal bleeding, ascites, and encephalopathy.
• Formulate a differential diagnosis of jaundice.
• Explain how cholesterol gallstones form.

GENETICS

Course Chairs: Jay Shendure, shendure@uw.edu  Credits: 2
Heather Mefford, hmefford@uw.edu

The primary aim of the course is to review basic genetic principles in the context of their applications in clinical medicine. Topics include human chromosomal disorders, pathogenesis of hereditary disease, patterns of inheritance, genetic counseling, amniocentesis, monogenic and multifactorial pathogenesis, role of genetics in common diseases, behavioral genetics, drug-gene interactions (pharmacogenetics), and prevention and treatment of genetic diseases including prenatal diagnosis and population screening.

OBJECTIVES:

• Describe what genes are, how they are organized and controlled, what they do and how they segregate.
• Describe the nature of mutations and permutations and how they contribute to human variability and to disease.
• Identify and describe the patterns of inheritance characteristics of autosomal dominant, autosomal recess, sex-linked recessive traits, and mitochondrial inheritance.
• Describe how genes are organized into chromosomes, how chromosomes replicate in mitosis and meiosis, and how they are transmitted from parent to child.
• Identify and describe the clinical manifestations of common numeric, structural, and mosaic chromosomal anomalies.
• Describe how polymorphism, gene linkage, and human gene mapping are used in medicine.
• Describe the multifactorial nature of most human traits, both normal and abnormal, and how multifactorial inheritance works.
• Describe the role of genetics in the pathogenesis of neoplasms and in the predisposition of malignancies.
• Identify common molecular and cytogenetic diagnostic techniques and how they are applied to genetic disorders.
• Describe the procedures available for prenatal genetic diagnosis and the kind soft diseases that can be detected prenatally.
• Identify and describe the approaches to treatment of genetic diseases.
• Describe the procedures available for prenatal genetic diagnosis and the kind soft diseases that can be detected prenatally.
• Identify and describe the approaches to treatment of genetic diseases.
- Students will be able to elicit a comprehensive medical genetic history and construct an appropriate pedigree.
- Students will be able to demonstrate sympathy, a non-judgmental and non-directive attitude, recognize their own limitations, seek consultation whenever necessary, and become life-long self-motivated learners.

HEMATOLOGY

**Course Chair:** Robert Richard,  [rrichard@uw.edu](mailto:rrichard@uw.edu)  
**Credits:** 3

Familiarizes students with the basic pathophysiologic mechanisms leading to disturbances of red cell, white cell and platelet production as well as abnormalities of hemostasis presenting clinical problems. Pathophysiology, rather than minute details of individual disease, is stressed. Problem-based learning sessions are a significant portion of this course as well as in the musculoskeletal course.

**OBJECTIVES:**
- Describe the normal development, function and turnover of red blood cells, white blood cells, and platelets.
- Describe the pathophysiology of the different types of disorders of red blood cells and iron homeostasis.
- Describe the cellular and biochemical mechanisms of blood clotting and testing of these systems.
- Describe the pathophysiology of disorders of hemostasis and thrombosis.
- Describe the pathophysiology of benign and malignant disorders of white blood cells.
- Perform appropriate diagnostic evaluation of patients with blood disorders.
- Propose possible treatment options for patients with different types of blood disorders.
- Describe blood typing, blood component preparation, indications, and potential risks and complications of transfusions.

HORMONES AND NUTRIENTS

**Course Chair:** Anthony DeSantis,  [ad29@uw.edu](mailto:ad29@uw.edu)  
Brad Anawalt,  [banawalt@uw.edu](mailto:banawalt@uw.edu)  
**Credits:** 4

Introduction to principles of human endocrinology, metabolism and nutrition. The physiology and pathophysiology of endocrine systems, glucose and lipid metabolism, and fluid and salt balance. The importance of proper nutrition in certain disease states. Clinical and scientific reasoning taught in lecture and small group format.

**OBJECTIVES**
- In the small group sessions and the mid-term and final exams, the student will be able to recite the anatomy of major endocrine organs and the normal physiological effects of the major classes of hormones.
- In the small group sessions and the mid-term and final exams, the student will be able to describe the regulation (including the principal negative and positive feedback loops) of hormone production and secretion from the major endocrine organs.
- In the small group sessions and the mid-term and final exams, the student will be able to identify and describe the pathology and pathophysiology of the major endocrine diseases including the common endocrine tumors and the syndromes of hormone deficiency and excess.
- In small group sessions and the mid-term and final exams, the student will be able to describe the basic epidemiology and clinical manifestations of the major endocrine diseases.
- On the website practice exam, mid-term and final exam, the student will determine the best (e.g., most accurate, safest or least expensive) method of diagnosing and treating specific endocrine diseases in hypothetical patient cases.
- On the website practice exam, mid-term and final exam, the student will demonstrate the ability to solve hypothetical patient cases; these solutions may include the design of novel diagnostic tools or therapies for endocrine diseases.
• Describe the role of nutrients in normal growth and development.
• Give examples of the use of nutrition in the management of chronic diseases.
• Cover examples of how diet and nutrient therapies can be incorporated into their clinical practices to promote health and wellness.
• Illustrate how nutrient intakes are compromised in illness.

INTRODUCTION TO CLINICAL MEDICINE II

Course Chair: Karen McDonough, kmcdonou@uw.edu
Credits: AU & WI & SP 4/4/5 – Total:13

Advanced instruction in interview techniques, history taking and physical examination, with emphasis upon detection of abnormalities. The ICM teaching in this year focuses on the history and physical exam of the specific areas of the body such as heart, lung, abdomen, mental status, etc. Topics such as human sexuality, geriatrics, and death and dying are covered in the small group format. Emphasis upon identification of problems and correlation of findings with pathophysiological mechanisms, and introduction to clinical and laboratory diagnosis will also be covered.

OBJECTIVES:

• Medical Interviewing
  o Review basic interviewing skills
  o Learn advanced interviewing skills
  o Alcohol and substance use history
  o Interviewing with an interpreter
  o Sexual history
  o Problem-focused interviewing

• Physical Exam
  o Review the basic physical exam
  o Learn the advanced physical exam for: vital signs, skin (in Dermatology), HEENT and neck, chest and lungs, breast, cardiovascular, abdomen, pelvic, musculoskeletal, neurologic, psychiatric, male genital and rectal

• Documentation
  o Review format for recording the medical database
  o Problem list
  o Complete medical database – complete H & P
  o Focused (SOAP) notes
  o Review the organization of the inpatient and outpatient medical record

• Clinical Reasoning
  o Review principles of clinical reasoning
  o Learn clinical reasoning tools
  o Differential diagnosis
  o Branching diagrams
  o Application of clinical epidemiology
  o Learn to integrate clinical reasoning with data gathering and case presentation

• Oral Case Presentations
  o Learn the organization and content of the full oral case presentation
  o Learn other types of case presentations
  o Problem focused case presentation (e.g. clinic visit)
  o Very brief case presentation (e.g. consultation request)
• **Professional Development**
  o Review core professional values – altruism, reliability, excellence, scholarship, and commitment to self-directed learning, honor and integrity, compassion, leadership, respect for patients and for colleagues
  o Learn about the impact of uncertainty and mistakes in medical practice
  o Review the principles of medical ethics Review the professional boundaries between patients and physicians
  o Learn how to care for yourself as you care for patients

• **Special Topics**
  o Care of patients with disabilities
  o Care of patients of different cultural and ethnic backgrounds
  o Complementary and alternative medicine
  o Health issues related to human sexuality
  o Caring for patients with life-threatening and terminal illness
  o Pediatric communication

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**MEDICINE, HEALTH, AND SOCIETY**

**Course Chairs:** Freddy Chen, fchen@uw.edu  
David Masuda, dmasuda@uw.edu

Credits: 3

Addresses interrelationships between provision of medical care and non-biological factors that influence health. Issues include relative importance of society, environment and individual choice in determining health status; impact of organizational, economic, and political influences on medical practice and choice; measurement of costs, risks, benefits and efficacy of diagnostic and therapeutic technologies; importance of these concepts in responsible and scientific decision making. Interdisciplinary course including medical, pharmacy, nursing, and other allied health care students.

**OBJECTIVES:**

• Discuss access to health care and the factors, including race, ethnicity, and social class, that influence access.
• Outline the major factors related to the financing of health care, with topics including employer-based health insurance, Medicare, Medicaid and safety-net systems for the uninsured.
• Outline the major factors related to the quality of health care, with topics including medical errors, performance measurement, and systems approaches to improving quality.
• Discuss the roles of risk behaviors in illness prevention.
• Discuss the roles of clinical preventive services in illness prevention.
• Analyze the roles of social determinants of health in illness prevention.
• Make a persuasive oral presentation on a health policy topic.

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**MIND, BRAIN, AND BEHAVIOR**

**Course Chairs:** Marcella Pascualy, marcella.pascualy@va.gov  
Credits: 6

Major psychiatric disorders are defined and described and a systematic approach to differential diagnosis is presented. Conceptual development, pathogenesis, epidemiology, nomenclature and the terminology used in psychiatry are discussed.

**OBJECTIVES:**

• List the components of the Mental Status Exam.
• Begin to develop skills on how to conduct a psychiatric interview.
• Discuss how to assess and manage a suicidal patient.
• Define and distinguish affective disorders.
• Define and distinguish psychotic disorders.
• Define and distinguish anxiety disorders.
• Define and distinguish personality disorders.
• Demonstrate an understanding of the principles of psychotherapy.
• Demonstrate a general understanding of the biological basis of psychiatry.

PATHOLOGY II

Course Chairs: Mara Rendi, mararend@uw.edu
Credits: AU & WI & SP 5/2/3 – Total: 10

Patterns of cell and tissue response to injury. Mechanisms of cell injury, the inflammatory process, immunology, immunopathology, thrombosis, normal and abnormal growth, neoplasia, and clinicopathological correlation. A multidisciplinary approach to some diseases which effect more than one organ system including cardiovascular, renal and respiratory and covers molecular changes in response to environmental exposure to pollution, radiation and physical injury.

OBJECTIVES:
• Describe the basics of normal and abnormal cell growth.
• Explain the primary mechanisms of cell injury.
• Describe the basics of the inflammatory process.
• Describe basic level abnormalities caused by inflammation.
• Describe basic level abnormalities of the vascular system.
• Describe basic level abnormalities caused by neoplasia.
• Describe the sequelae of thrombosis.
• Give the definitions and basic features of the most common neoplasms.
• Describe the classification schemes of the most common neoplasms (except for leukemia and lymphoma).
• Describe the natural history of the most common neoplasms (except for leukemia and lymphoma).
• Describe the clinical management (including staging and treatment) of the most common neoplasms (except for leukemia and lymphoma).
• Describe the morphologic aspects of the more common infections and other non-neoplastic diseases that affect the major organs.
• Discuss the role of diagnostic pathology in clinical medicine, particularly with regard to diagnosis, prognosis, and choice of therapy.
• Discuss the role of tissue biopsy and interpretation in clinical medicine, particularly with regard to diagnosis, prognosis, and choice of therapy.

PRINCIPLES OF PHARMACOLOGY

Course Chairs: Stan McKnight, mcknight@uw.edu
Neil Nathanson, nathanso@uw.edu
Credits: 5

Includes general principles of pharmacology and the specific pharmacology of major drugs acting on the autonomic and cardiovascular systems.

OBJECTIVES:
• Enumerate and begin developing skills to interpret information on absorption, distribution, metabolism, and excretion of drugs and apply such information in solving problems.
• Enumerate, in general, how drugs interact with receptors and the general consequences of such interactions.
• Identify the major factors influencing the effects of drugs in humans and their interactions with one another.
• Identify the major classes of and mechanisms of action of antibiotic, anti-cancer, autonomic and cardiovascular drugs and the primary characteristics of major prototype drugs in each class.
• Identify the major effects and common adverse reactions of major antibiotics and of prototype drugs acting on the autonomic and cardiovascular systems.
• Identify common indications, contra–indications and limitations, including major adverse reactions, of a number of classes of clinically important drugs
• Describe and appreciate the implications of the placebo effect in human medicine and research

REPRODUCTION

Course Chairs: Robert Steiner, steiner@uw.edu  
John Amory, jamory@uw.edu

Traces normal development of reproductive function in human beings including formation and maturation of ova and sperm, gamete transport, fertilization, menstruation, implantation, physiology and endocrinology of placenta, intrauterine development and nutritional requirements of growing fetus, normal pregnancy, parturition, lactation and adaptation of newborns to extrauterine life. Provides information concerning infertility problems, family planning techniques and demography of human population.

OBJECTIVES

• Describe the genetic, molecular and physiological basis for sexual differentiation of the developing human and to recognize the major genetic and phenotypic abnormalities of sexual development and their etiology
• Describe the process of gametogenesis in the male and female, including the process of meiosis in developing male and female germ cells, spermatogenesis, and oogenesis, and describe how genetic abnormalities can occur during these processes. Understand the process of implantation and placentation
• Describe the physiological regulation of the menstrual cycle, its pathophysiology and potential treatments for its primary disorders
• Describe the physiological mechanisms that govern pubertal development, and recognize normal and abnormal benchmarks of progression
• Describe the physiological regulation of normal testicular function, including the control of spermatogenesis and testosterone secretion by the gonadotropins, and recognize problems related to impaired reproductive function in men
• Identify the available forms of hormonal, barrier, and chemical contraception for the female and male, understand their limitations, risks, benefits and contraindications. Understand the benefits of family planning for parents, families, society, and environmental stewardship. Describe the methods, procedures, and complications associated with medical and surgical abortions
• Recognize the common disorders of fertility in males and females
• Describe the logical work-up of an infertile couple and identify the most common therapeutic strategies for its treatment, along with their limitations, risks, and relative costs
• Describe the normal physiological adaptations to pregnancy, and know its major pathophysiology, including gestational diabetes and preeclampsia. Describe the progression and time-course of normal labor and delivery and recognize the signature events (including timing) the might herald problems for either the baby or mother - before, during, and after delivery

RHEUMATOLOGY

Course Chairs: Helen Emery, emeryh@uw.edu

RESPIRATORY SYSTEM

Course Chairs: Andrew Luks, aluks@uw.edu

An interdisciplinary approach to the respiratory system, including anatomy of thorax and lungs, ventilation mechanics, blood gas transport, gas exchange, acid-base balance and the physiology and pathology of obstructive, restrictive and pulmonary-vascular diseases.

OBJECTIVES

• Describe the anatomy of the thorax and lungs.
• Demonstrate an understanding of the fundamental principles of ventilation mechanics.
• Demonstrate an understanding of the processes of exchange of oxygen and carbon dioxide between air and blood and the transport of gases in the blood.
• Demonstrate an understanding of the fundamental principles of acid-base balance, the primary acid-base disorders and compensatory responses.
• Describe the basic pathology and demonstrate an understanding of the pathophysiology of obstructive, restrictive and pulmonary vascular diseases.
• Identify typical features and natural history of important pulmonary diseases including COPD, Asthma, Cystic Fibrosis, Interstitial Lung Diseases, Sarcoidosis, Tuberculosis, Lung Cancer, Pulmonary Hypertension, Pulmonary Embolism, ARDS, Obstructive Sleep Apnea.
• Describe how the physiology of the respiratory system is applied to pulmonary function testing, mechanical ventilation, response to exercise and adaptation to altitude.

SKIN SYSTEM
Course Chairs: Jay Vary, jvary@uw.edu
Credits: 2
Gross and microscopic anatomy. Physiology, protection, temperature control, pigmentation and photosensitivity. Pathology and genetics of skin abnormalities including tumors. Introduction to clinical evaluation, including physical examination and illustrating examples of inflammatory, vascular, immunological (including drug hypersensitivity) and neoplastic diseases.

OBJECTIVES:
• Apply the knowledge of skin biology to understanding the pathomechanisms of real skin diseases and their management or potential management
• Thoroughly and sensitively conduct a physical examination of the skin
• Competently and confidently describe skin lesion morphology in vivo
• Experience through the patient’s perspective the impact of skin disease on health and well-being
• Identify, describe, and differentiate the more common skin cancers

URINARY SYSTEM
Course Chairs: J. Ashley Jefferson, jashleyj@uw.edu
Credits: 4
Anatomy, physiology and pathology of the kidney, ureter, bladder and prostate; pathophysiology and treatment of common fluid and electrolyte problems; renal pharmacology; major clinical urinary system syndromes with current diagnostic approaches and therapy.

OBJECTIVES:
• Describe the anatomy, physiology and pathology of the kidney, ureter, bladder and prostate
• Describe the pathophysiology of common fluid and electrolyte problems
• Describe the treatment of common fluid and electrolyte problems
• Identify common clinical approaches to renal pharmacology
• Describe the major clinical urinary system syndromes
• Describe current diagnostic approaches and therapies for major clinical urinary system syndromes