Immunology
05IMM001  Compare and contrast innate versus adaptive immune responses.
05IMM002  Describe the different cell types involved in an immune response and know their essential functions.
05IMM003  Describe the functions of different Major Histocompatibility Complex (MHC) molecules.
05IMM004  Describe the properties and functions of various cytokines and chemokines.
05IMM005  Describe the mechanisms by which cytokines regulate the development and function of T-cells subsets and their effect on disease processes.
05IMM006  Describe the different mechanisms responsible for developing/maintaining immune tolerance.
05IMM007  Describe the mechanisms involved in, and the pathogenic outcomes of hypersensitivity reactions, I through IV.
05IMM008  Compare and contrast the mechanisms and morphologies of cell and antibody mediated transplantation rejection.
05IMM009  Describe the underlying deficiencies in the major Primary Immunodeficiencies and their outcome in disease states.
05IMM010  Describe the different mechanisms of immunopathogeneses resulting in autoimmune diseases.
05IMM011  Describe the major mediators, mechanisms, and morphologic patterns in acute versus chronic inflammation, including the vascular and the cellular events, and therapeutic mechanisms of glucocorticoids and NSAIDS.
05IMM012  Describe the systemic outcomes of inflammation.

Medical Genetics
05MGE001  Describe the mechanisms of, and the principles of molecular diagnosis for Mendelian, multifactorial inheritance, cytogenetic, and single gene genetic disorders.
05MGE002  Describe the normal human karyotypes.
05MGE003  Describe the modes of action of mutations(s): point mutations, deletions, translocations; and the outcome of a mutation occurring within the coding sequences compared to one occurring within noncoding sequences.
05MGE004 Compare and contrast the pathogenesis and pathophysiology of birth defects caused by the teratogens: alcohol, thalidomide, and cytomegalovirus. Describe the clinical signs and symptoms associated with each.

05MGE005 Describe the clinical signs and symptoms of the chromosomal disorders: 4p deletion; trisomy 18; trisomy 13; 47, XXXY; and 45, X.

05MGE006 Describe the pathogenesis and pathophysiology of more commonly occurring genetic and dysmorphic disorders of the major body systems.

05MGE007 Describe the clinical signs and symptoms of more commonly occurring genetic and dysmorphic disorders of the major body systems.

Microbiology and Virology

05MIV001 Describe the criteria, including methodology and microscopy, used to classify bacteria and the importance of classification to diagnostics.

05MIV002 Understand bacterial structures and their functions and relationship to disease mechanisms.

05MIV003 Know the bacterial life cycle and its impact on treatment of infectious disease.

05MIV004 Describe the genetic mechanisms utilized by bacteria for DNA replication, repair, recombination, plasmid inheritance, and gene transfer between bacterial cells.

05MIV005 Describe the general mechanisms bacteria use for gene regulation and the importance to infectious disease.

05MIV006 Describe the composition, physical characteristics, and classification of viruses.

05MIV007 Describe the different types of capsids and nucleic acids found in viruses, characteristics of the viral envelope, and the function of each of these viral components.

05MIV008 Describe the different steps in the viral life cycle from attachment to egress.

05MIV009 Describe the different outcomes of viral infection and the mechanisms by which viruses cause cell injury.

05MIV010 Describe the immune response to viral infection and explain the advantages and disadvantages of live and killed vaccines.

05MIV011 Describe the action of antiviral agents in the treatment of common viral infections

05MIV012 Describe host defenses to bacterial infection and strategies bacteria utilize to overcome those defenses to invade and spread through the host.

05MIV013 Describe the role of the host defense system in damage due to bacterial infections.

05MIV014 Describe the relationship of normal flora and the immune system in disease prevention.

05MIV015 Describe the definition, classification, and major characteristics of fungi including distinguishing laboratory features.

05MIV016 Describe the basic mechanisms by which bacteria gain resistance to, and are resistant to antibiotics.
05MIV017  Describe the outcome of microbial biofilms on disease and treatment.

**Pharmacology**

05PHR001  Describe the drugs that affect hemostasis and thrombosis, their mechanism of actions and their side effects.

05PHR002  Describe the different classes of antibiotics, their specific members, and their mechanism of action. Discuss the classification of antibiotics, their spectrum of activity, their mechanism of action and their side effects.

05PHR003  Describe the general principles of antimicrobial therapy.

05PHR004  Describe the various bronchial-active drugs and their mechanism action. Discuss bronchodilators and other drugs used to treat asthma and COPD, their mechanism of action and their side effects.

05PHR005  Describe the various antihistamines and their mechanism of action. Discuss antihistamines and other drugs used to treat allergic rhinitis and nasal congestion, their mechanism of action and their side effects.

05PHR006  Describe the various corticosteroids and their mechanism action. Discuss the physiologic effects of glucocorticoids, their pharmacologic actions, and their side effects.

05PHR007  Describe the various antifungals and their mechanism action. Discuss the classification of antifungal agents, their spectrum of activity, their mechanism of action and their side effects.

05PHR008  Describe the classification of antiviral agents, their spectrum of activity, their mechanism of action and their side effects.

**Pathology**

05PTH001  Describe the common causes and mechanisms of reversible and irreversible cell injury and their consequences to energy production, membrane stability and maintenance of cellular gradients.

05PTH002  Describe the morphology and pathogenesis of cell death.

05PTH003  Describe the physiologic forms of cell adaptation (atrophy, hypertrophy, hyperplasia, metaplasia, and dysplasia) and their pathogenesis.

05PTH004  Describe the mechanisms that result in the intracellular accumulation of normal and abnormal endogenous substances as well as abnormal exogenous substances in non-neoplastic cells.

05PTH005  Describe the proposed mechanisms of cell aging including stochastic events, genetic programming, and metabolic events.

05PTH006  Describe the differences between regeneration and repair.

05PTH007  Describe the cell cycle and molecular events in cell growth, being able to distinguish among labile cells, stable cells, and permanent cells.
<table>
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<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>05PTH008</td>
<td>Describe the role of the extracellular matrix and the cell/matrix interaction.</td>
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<tr>
<td>05PTH009</td>
<td>Describe the mechanism that results in edema.</td>
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<tr>
<td>05PTH010</td>
<td>Compare and contrast hyperemia, congestion and hemorrhage.</td>
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<tr>
<td>05PTH011</td>
<td>Describe components and their mechanism(s) of action in the coagulation cascade, and the typical resolution of this event.</td>
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<tr>
<td>05PTH012</td>
<td>Describe the pathogenesis of disseminated intravascular coagulation.</td>
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<tr>
<td>05PTH013</td>
<td>Describe the pathogenesis and consequences of common forms of embolization: pulmonary, systemic, air, fat, amniotic fluid.</td>
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<tr>
<td>05PTH014</td>
<td>Describe the pathogenesis and morphology of an infarct.</td>
</tr>
<tr>
<td>05PTH015</td>
<td>Compare and contrast cardiogenic shock, hypovolemic shock, septic shock, neurogenic shock and anaphylactic shock in respect to etiology, pathogenesis and clinical course.</td>
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<tr>
<td>05PTH016</td>
<td>Describe the pathogenesis and morphology of amyloidosis.</td>
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<tr>
<td>05PTH017</td>
<td>Compare and contrast neoplasms based on their parenchymal and stromal structure, and know the appropriate nomenclature for each neoplasm.</td>
</tr>
<tr>
<td>05PTH018</td>
<td>Describe the development and transmission of drug resistance in both microorganisms and tumors.</td>
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<tr>
<td>05PTH019</td>
<td>Describe the criteria for classifying neoplasms as benign or malignant.</td>
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<tr>
<td>05PTH020</td>
<td>Describe the principles of grading and staging neoplasms.</td>
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<tr>
<td>05PTH021</td>
<td>Describe the mechanisms of metastasis by a malignant neoplasm.</td>
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<tr>
<td>05PTH022</td>
<td>Describe the cell cycle kinetics and tumor angiogenesis involved in the growth of cancers.</td>
</tr>
<tr>
<td>05PTH023</td>
<td>Describe the following molecular events: oncogenes; tumor suppresser genes, mutator genes, telomerase, and inherited cancer syndromes; in the development of cancer:.</td>
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<tr>
<td>05PTH024</td>
<td>Describe evidence for the clonal origin of cancer.</td>
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<tr>
<td>05PTH025</td>
<td>Describe the mechanisms involved in viral carcinogenesis.</td>
</tr>
<tr>
<td>05PTH026</td>
<td>Describe the basic principles of ionizing radiation as a cancer treatment modality.</td>
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</table>

**Biostatistics/Epidemiology**

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<tr>
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<tr>
<td>05BST001</td>
<td>Distinguish between different scales of measurement: mean, median, mode, variance, range, and probability.</td>
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<tr>
<td>05BST002</td>
<td>Distinguish between different types of variables: nominal, dichotomous, ordinal, and continuous.</td>
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<tr>
<td>05BST003</td>
<td>Define epidemiologic concepts of incidence, prevalence, fatality rates, and rate adjustment.</td>
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<tr>
<td>05BST004</td>
<td>Define criteria for inferring causality.</td>
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<tr>
<td>05BST005</td>
<td>Recognize differences in study design for both observational and experimental studies including randomized trials, community intervention trials, cohort studies, case-control,</td>
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</table>
cross-sectional, case-series, and community surveys. Discuss briefly the strengths and weaknesses of each and the application of appropriate statistics for each study type.

05BST006   Estimate risk using odds ratio, relative risk, and absolute risk. Define and recognize types of biases related to study design.

05BST007   Explain the difference between statistical and clinical significance, type I and type II error, and define power analysis.

05BST008   Explain the use of and define markers to evaluate the strength of evidence, including absolute and relative risk reduction, number needed to treat, and confidence intervals.

05BST009   Define concepts relating to diagnostic tests including sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV), ROC curves, and likelihood ratios; calculate sensitivity, specificity, PPV, NPV.

**Clinical Skills**

05CSK001   Be able to perform the Tier One and Tier Two level exam on each of these organ systems (HEENT, Cranial Nerves, Neck Exam) and pass a summative evaluation at the end of the block (passing grade > 80%).

  a. Verbalize your performance during each part of the exam

  b. Demonstrate appropriate use of exam instruments during the exams

  c. Appropriately drape the patient to protect privacy for patient

  d. Demonstrate professionalism and appropriate communication skills

**Patient Wrap-Up**

PWU-SEI001   Observe and reflect on the patient’s experience with disease and the ways in which disease impacted the patient’s occupation, finances, and family.

PWU-SEI002   Observe and reflect on patient’s experience with the healthcare system.

PWU-SEI003   Observe and reflect on the coping skills used by the patient.

PWU-DPR001   Observe and evaluate the professional values exhibited by the physician.

PWU-DPR002   Observe and evaluate the communication skills of the physician.

PWU-DPR003   Observe and evaluate the patient-centeredness exhibited by the physician.

PWU-CSK001   Observe and evaluate the clinical reasoning skills exhibited by the physician.

PWU-CSK002   Apply basic science concepts to patient diagnoses and treatment.

**Patient-Centered Learning (PCL)**

PCL-CSK001   Demonstrate the ability to define and solve clinical problems based on a patient case.

PCL-CSK002   Demonstrate the ability to apply knowledge of basic sciences to clinical manifestations and presentation in a patient case.
PCL-CSK003 Demonstrate the ability to generate hypotheses based on the clinical presentation and underlying pathogenesis of disease in a patient case.

PCL-PTE001 Demonstrate the ability to actively listen to and reflect on information presented or discussed in learning objectives by other students.

PCL-PTE002 Demonstrate the ability to deliver concise, clear, scientifically-based presentations or discussions of learning objective topics.

PCL-PTE003 Demonstrate the ability to display knowledge of subject area in learning objective presentation that is beyond information covered in presentation or discussion.

PCL-PIF001 Demonstrate the ability to generate learning objectives based on deficiencies in the student's understanding of a patient case.

PCL-PIF002 Demonstrate the ability to gather evidence-based information from multiple resources that is relevant and sufficient to address learning issues generated from a patient case.

PCL-PIF003 Demonstrate responsibility to team through leadership and fulfillment of group duties.

PCL-PIF004 Demonstrate ability to assess learning needs, strengths, and limitations.

PCL-PIF005 Demonstrate ability to respond appropriately to feedback.

PCL-PIF006 Demonstrate ability to treat others in team with respect, show openness to different views, and discuss differences non-judgmentally.

PCL-PIF007 Demonstrate effort to continuously strive for excellence in all activities.