#### **Course Color Codes:**

Anatomy, Behavioral Sc, Biochemistry, Cell Biology, Epidemiology, Genetics, Histology, Immunology, Introd. Clinical Medicine, Introd. Physical Diagnosis, Medical Ethics, Microbiology, Neuroscience, Pathology, Pharmacology, Physiology

#### **01.** General Principles

## 01. Biochemistry and molecular biology

- A. gene expression: DNA structure, replication, exchange, and epigenetics
- B. gene expression: transcription
- C. gene expression: translation, post-translational processing, modifications, and disposition of proteins (degradation), including protein/glycoprotein synthesis, intra/extracellular sorting, and processes/functions related to Golgi complex and rough endoplasmic reticulum
- D. structure and function of proteins and enzymes
- E. energy metabolism

## 02. Biology of cells

- A. adaptive cell responses and cellular homeostasis
- B. intracellular accumulations
- C. mechanisms of injury and necrosis
- D. apoptosis
- E. mechanisms of dysregulation
  - A. cell biology of cancer, including genetics of cancer
  - B. general principles of invasion and metastasis, including cancer staging
- F. cell/tissue structure, regulation, and function, including cytoskeleton, organelles, glycolipids, channels, gap junctions, extracellular matrix, and receptors

#### 03. Human development and genetics

- A. principles of pedigree analysis
  - A. inheritance patterns
  - B. occurrence and recurrence risk determination
- B. population genetics: Hardy-Weinberg law, founder effects, mutation-selection equilibrium
- C. principles of gene therapy
- D. genetic testing and counseling
- E. genetic mechanisms

#### 04. Biology of tissue response to disease

A. acute inflammatory responses (patterns of response)

- A. acute inflammation and mediator systems
- B. vascular response to injury, including mediators
- C. principles of cell adherence and migration
- D. microbicidal mechanisms and tissue injury
- E. clinical manifestations
- B. chronic inflammatory responses
- C. reparative processes
  - A. wound healing, hemostasis, and repair; thrombosis, granulation tissue, angiogenesis, fibrosis, scar/keloid formation
  - B. regenerative processes

# 05. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

- A. progression through the life cycle, including birth through senescence
  - A. cognitive, language, motor skills, and social and interpersonal development
  - B. sexual development
  - C. influence of developmental stage on physician-patient interview
- B. psychological and social factors influencing patient behavior
  - A. personality traits or coping style, including coping mechanisms
  - B. psychodynamic and behavioral factors, related past experience
  - C. family and cultural factors, including socioeconomic status, ethnicity, and gender
  - D. adaptive behavioral responses to stress and illness
  - E. maladaptive behavioral responses to stress and illness
  - F. interactions between the patient and the physician or the health care system
  - G. patient adherence (general and adolescent)
- C. patient interviewing, consultation, and interactions with the family
  - A. establishing and maintaining rapport
  - B. data gathering
  - C. approaches to patient education
  - D. enticing patients to make lifestyle changes
  - E. communicating bad news
  - F. "difficult" interviews
  - G. multicultural ethnic characteristics
- D. medical ethics, jurisprudence, and professional behavior
  - A. consent and informed consent to treatment
  - B. physician-patient relationships
  - C. death and dying
  - D. birth-related issues
  - E. issues related to patient participation in research
  - F. interactions with other health professionals, including impaired physician and patient safety
  - G. sexuality and the profession; other "boundary" issues

- H. ethics of managed care
- I. organization and cost of health care delivery

## 06. Multisystem processes

#### A. nutrition

- A. generation, expenditure, and storage of energy at the whole-body level
- B. assessment of nutritional status across the life span, including calories, protein, essential nutrients, hypoalimentation
- C. functions of nutrients
- D. protein-calorie malnutrition
- E. vitamin deficiencies and/or toxicities (including megaloblastic anemia with other findings)
- F. mineral deficiencies and toxicities
- B. temperature regulation
- C. adaptation to environmental extremes, including occupational exposures
  - A. physical and associated disorders (including temperature, radiation, burns, decreased atmospheric pressure, high-altitude sickness, increased water pressure)
  - B. chemical (including gases, vapors, smoke inhalation, agricultural hazards, organic solvents, heavy metals, principles of poisoning and therapy)
- D. fluid, electrolyte, and acid-base balance disorders
- E. inherited metabolic disorders, including disorders related to amino acids, purines, porphyrins, carnitine, fatty acids, and carbohydrates

#### 07. Pharmacodynamic and pharmacokinetic processes

#### A. general principles

- A. pharmacokinetics: absorption, distribution, metabolism, excretion, dosage intervals
- B. mechanisms of drug action, structure-activity relationships (including anticancer drugs)
- C. concentration- and dose-effect relationships, types of agonists and antagonists and their actions
- D. individual factors altering pharmacokinetics and pharmacodynamics
- E. mechanisms of drug adverse effects, overdosage, toxicology
- F. mechanisms of drug interactions
- G. regulatory issues
- H. signal transduction, including structure/function of all components of signal transduction pathway such as receptors, ligands
- I. cell cycle/cell cycle regulation

## 08. Microbial biology and infection

- A. microbial identification and classification, including principles, microorganism identification, and nonimmunologic lab diagnosis
- B. bacteria
  - A. structure
  - B. processes, replication, and genetics
  - C. oncogenesis
  - D. antibacterial agents
- C. viruses
  - A. structure
  - B. processes, replication, and genetics
  - C. oncogenesis
  - D. antiviral agents
- D. fungi
  - A. structure
  - B. processes, replication, and genetics
  - C. antifungal agents
- E. parasites
  - A. structure
  - B. processes, replication, and genetics
  - C. antiparasitic agents
- F. prions
- G. epidemiology, outbreaks, and infection control

#### 09. Quantitative methods

- A. fundamental concepts of measurement
  - A. scales of measurement
  - B. distribution, central tendency, variability, probability
  - C. disease prevalence and incidence
  - D. disease outcomes
  - E. associations
  - F. health impact
  - G. sensitivity, specificity, predictive values
- B. fundamental concepts of study design
  - A. types of experimental studies
  - B. types of observational studies
  - C. sampling and sample size
  - D. subject selection and exposure allocation
  - E. outcome assessment
  - F. internal and external validity
- C. fundamental concepts of hypothesis testing and statistical inference
  - A. confidence intervals
  - B. statistical significance and Type I error
  - C. statistical power and Type II error

## **02.** Hematopoietic and Lymphoreticular Systems

## **01. Normal processes**

- A. embryonic development, fetal maturation, and perinatal changes
- B. organ structure and function
- C. cell/tissue structure and function
  - A. production and function of erythrocytes, hemoglobin, O2 and CO2 transport, transport proteins
  - B. production and function of platelets
  - C. production and function of coagulation and fibrinolytic factors

## D. repair, regeneration, and changes associated with stage of life

# **02.** Abnormal processes

- A. infectious, inflammatory, and immunologic disorders
  - A. infections of the blood, reticuloendothelial system, and endothelial cells
  - B. autoimmunity and autoimmune diseases
  - C. anemia of chronic disease
  - D. non-immunologically mediated transfusion complications, transplant rejection
- B. traumatic and mechanical injury
- C. neoplastic disorders (including lymphoma, leukemia, multiple myeloma, dysproteinemias, amyloidosis)
- D. metabolic and regulatory disorders, including acquired
  - A. nutritional anemias
  - B. cythemia
  - C. hemorrhagic and hemostatic disorders
  - D. bleeding secondary to platelet disorders and disorders of primary hemostasis
  - F. vascular and endothelial disorders
  - G. systemic disorders affecting the hematopoietic and lymphoreticular system
  - H. idiopathic disorders
  - I. degenerative disorders
  - J. drug-induced adverse effects on the hematopoietic and lymphoreticular systems
  - K. congenital and genetic disorders affecting the hematopoietic and lymphoreticular systems

## 03. Principles of therapeutics

A. mechanisms of action and use of drugs for treatment of disorders of the hematopoietic system

- A. blood and blood products
- B. treatment of anemia, drugs stimulating erythrocyte production
- C. drugs stimulating leukocyte production
- D. anticoagulants, thrombolytic drugs

E.antiplatelet drugs

F. antimicrobials and antiparasitics

G. antineoplastic and immunosuppressive drugs in the clinical context of disease

### B. other therapeutic modalities

- 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
  - A. emotional and behavioral factors
  - B. influence on person, family, and society
  - C. occupational and other environmental risk factors
  - D. gender and ethnic factors

## 03. Central and Peripheral Nervous Systems

#### **01. Normal processes**

A. embryonic development, fetal maturation, and perinatal changes, including neural tube derivatives, cerebral ventricles, neural crest derivatives

- B. organ structure and function
  - A. spinal cord, including gross anatomy, blood supply, and spinal reflexes
  - B. brain stem
  - C. brain, including gross anatomy and blood supply; cognition, language, memory; hypothalamic function; limbic system and emotional behavior; circadian rhythms and sleep; control of eye movement
  - D. sensory systems, including proprioception, pain, vision, hearing, balance, taste, and olfaction

E.motor systems, including brain and spinal cord, basal ganglia, and cerebellum

F. autonomic nervous system

G. peripheral nerve

- C. cell/tissue structure and function
  - A. axonal transport
  - B. excitable properties of neurons, axons and dendrites, including channels
  - C. synthesis, storage, release, reuptake, and degradation of neurotransmitters and neuromodulators
  - D. pre- and postsynaptic receptor interactions, trophic and growth factors
  - E.brain metabolism
  - F. glia, myelin
  - G. brain homeostasis: blood-brain barrier; cerebrospinal fluid formation and flow; choroid plexus
- D. repair, regeneration, and changes associated with stage of life, including definition of brain death

## 02. Abnormal processes

- A. infectious, inflammatory, and immunologic disorders (including demyelinating disorders, myasthenia gravis and muscle channelopathies, and disorders of the eye and ear)
- B. traumatic and mechanical disorders
- C. neoplastic disorders, including primary and metastatic
- D. metabolic and regulatory disorders
- E. vascular disorders
- F. systemic disorders affecting the nervous system
- G. idiopathic disorders affecting the nervous system
- H. congenital and genetic disorders, including metabolic
- I. degenerative disorders
- J. paroxysmal disorders
- K. disorders of special senses
- L. psychopathologic disorders, processes, and their evaluation
  - A. early-onset disorders
  - B. disorders related to substance use
  - C. schizophrenia and other psychotic disorders
  - D. mood disorders
  - E.anxiety disorders
  - F. somatoform disorders
  - G. personality disorders
  - H. physical and sexual abuse of children, adults, and elders
  - I. other disorders
- M. drug-induced adverse effects on the central and peripheral nervous system
- N. neurologic pain syndromes

## 03. Principles of therapeutics

A, mechanisms of action and use of drugs for treatment of disorders of the nervous system

- A. anesthetics
- B. hypnotic sedatives
- C. psychopharmacologic agents
- D. anticonvulsants

**E.analgesics** 

F. stimulants, amphetamines

- G. antiparkinsonian drugs and drugs for dementia, Alzheimer type; multiple sclerosis; and restless legs syndrome
- H. skeletal muscle relaxants, botulinum toxin
- I. neuromuscular junction agonists and antagonists
- J. antiglaucoma drugs
- K. drugs used to decrease intracranial pressure

L.antimigraine agents

- M. drugs affecting the autonomic nervous system, including all general autonomic pharmacology
- N. antimicrobials, antineoplastic drugs, and antiparasitics
- O. drugs used to treat cerebrovascular disorders
- P. treatment for substance abuse disorders

#### B. other therapeutic modalities

- 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
  - A. emotional and behavioral factors
  - B. influence on person, family, and society
  - C. occupational and other environmental risk factors
  - D. gender and ethnic factors

#### 03. Skin and Related Connective Tissue

#### **01. Normal processes**

- A. embryonic development, fetal maturation, and perinatal changes
- B. organ structure and function
- C. cell/tissue structure and function, including barrier functions, thermal regulation, eccrine function
- D. repair, regeneration, and changes associated with stage of life or ethnicity
- E. skin defense mechanisms and normal flora

#### **02.** Abnormal processes

- A. infectious, inflammatory, and immunologic disorders
  - A. bacterial infections
  - B. viral infections
  - C. fungal infections, including mycoses, dermatophytosis
  - D. parasitic infections, ectoparasitic infestations, and mycobacterial infections
  - E. immune and autoimmune disorders
- B. traumatic and mechanical disorders (including thermal injury, decubitus ulcers, effects of ultraviolet light and radiation)
- C. neoplastic disorders
  - A. keratinocytes
  - B. melanocytes
  - C. vascular neoplasms
  - D. other
- D. metabolic, regulatory, and structural disorders
- E. vascular disorders
- F. systemic disorders affecting the skin
- G. idiopathic disorders
- H. degenerative disorders
- I. drug-induced adverse effects on the skin and related connective tissue
- J. congenital and genetic disorders affecting the skin and related connective tissue

#### 03. Principles of therapeutics

- A. mechanisms of action and use of drugs for treatment of disorders of the skin and connective tissue
  - A. anti-inflammatory agents
  - B. emollients
  - C. sunscreen
  - D. retinoids
  - E. antimicrobial and antiparasitic agents
  - F. cytotoxic and immunologic therapy and antineoplastic drugs
- B. other therapeutic modalities
- 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
  - A. emotional and behavioral factors
  - B. influence on person, family, and society
  - C. occupational and other environmental risk factors

D. gender and ethnic factors

## 05. Musculoskeletal System

## **01. Normal processes**

- A. embryonic development, fetal maturation, and perinatal changes
- B. organ structure and function
- C. cell/tissue structure and function
  - A. biology of bones, joints, tendons, skeletal muscle
  - B. exercise and physical conditioning
- D. repair, regeneration, and changes associated with stage of life

#### **02.** Abnormal processes

- A. infectious, inflammatory, and immunologic disorders
- B. traumatic and mechanical disorders (including fractures, sprains, strains, dislocations, joint injuries, repetitive motion injuries, and impingement syndrome)
- C. neoplastic disorders
- D. metabolic, regulatory, and structural disorders (including osteomalacia, osteoporosis, osteodystrophy, gout, and pseudogout)
- E. vascular disorders
- F. systemic disorders affecting the musculoskeletal system
- G. idiopathic disorders
- H. degenerative disorders
- I. drug-induced adverse effects on the musculoskeletal system
- J. congenital and genetic disorders affecting the musculoskeletal system

## 03. Principles of therapeutics

- A. mechanisms of action and use of drugs for treatment of disorders of the musculoskeletal system
  - A. nonsteroidal anti-inflammatory drugs and analgesics
  - B. muscle relaxants
  - C. antigout therapy
  - D. immunosuppressive and antineoplastic drugs
  - E. drugs affecting bone mineralization
  - F. antimicrobial and antiparasitic agents
- B. other therapeutic modalities

# 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

- A. emotional and behavioral factors
- B. influence on person, family, and society
- C. occupational and other environmental risk factors
- D. gender and ethnic factors

#### **06.** Respiratory System

## **01.** Normal processes

- A. embryonic development, fetal maturation, and perinatal changes
- B. organ structure and function
  - A. airways, including mechanics and regulation of breathing
  - B. lung parenchyma, including ventilation, perfusion, gas exchange
  - C. pleura
  - D. nasopharyx and sinuses
- C. cell/tissue structure and function, including surfactant formation, alveolar structure
- D. repair, regeneration, and changes associated with stage of life
- E. pulmonary defense mechanisms and normal flora

#### **02.** Abnormal processes

- A. infectious, inflammatory, and immunologic disorders
  - a. infectious diseases
    - i. infectious diseases of the upper respiratory tract
    - ii. pyogenic infectious diseases of the lower respiratory tract and pleura, viral infections, and associated complications
    - iii. other infectious diseases of the lower respiratory tract
  - b. immunologic disorders
    - i. allergic and hypersensitivity disorders
    - ii. autoimmune disorders
  - c. inflammatory disorders
    - i. pneumoconioses
    - ii. acute and chronic alveolar injury
    - iii. chronic obstructive pulmonary disease
    - iv. restrictive pulmonary disease
- B. traumatic and mechanical disorders

- C. neoplastic disorders (including upper airway, lower airway and lung parenchyma, pleura, and metastatic tumors)
- D. metabolic, regulatory, and structural disorders
- E. vascular and circulatory disorders (including thromboembolic disease, pulmonary hypertension, pulmonary edema, and pleural effusion)
- F. systemic disorders affecting the respiratory system
- G. idiopathic disorders
- H. degenerative disorders
- I. drug-induced adverse effects on the respiratory system
- J. congenital and genetic disorders affecting the respiratory system

## 03. Principles of therapeutics

- A. mechanisms of action and use of drugs for treatment of disorders of the respiratory system
  - A. decongestants, cough suppressants, expectorants, mucolytics
  - B. bronchodilator drugs
  - C. anti-inflammatory and cytotoxic drugs
  - D. antimicrobial agents and antiparasitic agents
  - E. antineoplastic agents
  - F. pulmonary vasodilators
- B. other therapeutic modalities
- 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
  - A. emotional and behavioral factors
  - B. influence on person, family, and society
  - C. occupational and other environmental risk factors
  - D. gender and ethnic factors

#### 07. Cardiovascular System

#### **01. Normal processes**

- A. embryonic development, fetal maturation, and perinatal changes
- B. organ structure and function
  - A. chambers, valves
  - B. cardiac cycle, mechanics, heart sounds, cardiac conduction
  - C. hemodynamics, including systemic, pulmonary, coronary, and blood volume

## D. circulation in specific vascular beds

#### C. cell/tissue structure and function

- A. heart muscle, metabolism, oxygen consumption, biochemistry, and secretory function
- B. endothelium and secretory function, vascular smooth muscle, microcirculation, and lymph flow (including mechanisms of atherosclerosis)
- C. neural and hormonal regulation of the heart, blood vessels, and blood volume, including responses to change in posture, exercise, and tissue metabolism

## D. repair, regeneration, and changes associated with stage of life

## 02. Abnormal processes

- A. infectious, inflammatory, and immunologic disorders
- B. traumatic and mechanical disorders
- C. neoplastic disorders
- D. metabolic and regulatory disorders (including dysrhythmias, systolic and diastolic dysfunction, low- and high-output heart failure, cor pulmonale, systemic hypertension, ischemic heart disease, myocardial infarction, systemic hypotension and shock, and dyslipidemias)
- E. vascular disorders
- F. systemic diseases affecting the cardiovascular system
- G. congenital and genetic disorders of the heart and central vessels
- H. idiopathic disorders
- I. drug-induced adverse effects on the cardiovascular system
- J. degenerative disorders

# 03. Principles of therapeutics

- A. mechanisms of action and use of drugs for treatment of disorders of the cardiovascular system
  - A. coronary and peripheral vasodilators
  - B. antiarrhythmic drugs
  - C. antihypertensive drugs
  - D. measures used to combat hypotension and shock
  - E. drugs affecting cholesterol and lipid metabolism
  - F. drugs affecting blood coagulation, thrombolytic agents, and antiplatelet agents
  - G. inotropic agents and treatment of heart failure
  - H. immunosuppressive, antimicrobial, antineoplastic, and antiparasitic drugs

- I. drugs to treat peripheral arterial disease
- J. other pharmacotherapy
- B. other therapeutic modalities

# 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

- A. emotional and behavioral factors
- B. influence on person, family, and society
- C. occupational and other environmental risk factors
- D. gender and ethnic factors

#### **08.** Gastrointestinal System

#### **01.** Normal processes

- A. embryonic development, fetal maturation, and perinatal changes
- B. organ structure and function, including alimentary canal, liver and biliary system, salivary glands and exocrine pancreas, motility, and digestion and absorption
- C. cell/tissue structure and function
  - A. endocrine and neural regulatory functions, including GI hormones
  - B. salivary, gastrointestinal, pancreatic, hepatic secretory products, including enzymes, proteins, bile salts, and processes
  - C. synthetic and metabolic functions of hepatocytes
- D. repair, regeneration, and changes associated with stage of life
- E. gastrointestinal defense mechanisms and normal flora

## 02. Abnormal processes

- A. infectious, inflammatory, and immunologic disorders
- B. traumatic and mechanical disorders
  - A. malocclusion
  - B. hiatal hernia
  - C. obstruction
  - D. perforation of hollow viscus and blunt trauma
  - E. inguinal, femoral, and abdominal wall hernias
  - F. esophageal, intestinal, and colonic diverticula

C. neoplastic disorders, including benign and malignant

- D. metabolic and regulatory disorders (including motility disorders, malabsorption, hepatic failure, cholelithiasis, nutritional disorders)
- E. vascular disorders (including portal hypertension, esophageal varices, hemorrhoids, anal fissure, ischemia, angiodysplasia, thromboses, vasculitis)
- F. systemic disorders affecting the gastrointestinal system
- G. idiopathic disorders
- H. degenerative disorders
- I. drug-induced adverse effects on the gastrointestinal system
- J. congenital and genetic disorders affecting the gastrointestinal system

# 03. Principles of therapeutics

- A. mechanisms of action and use of drugs for treatment of disorders of the gastrointestinal system
  - A. treatment and prophylaxis of peptic ulcer disease and gastroesophageal reflux
  - B. drugs to alter gastrointestinal motility
  - C. fluid replacement
  - D. pancreatic replacement therapy and treatment of pancreatitis
  - E. drugs for treatment of hepatic failure and biliary disease
  - F. anti-inflammatory, immunosuppressive, antineoplastic, antimicrobial, and antiparasitic drugs
- B. other therapeutic modalities
- 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
  - A. emotional and behavioral factors
  - B. influence on person, family, and society
  - C. occupational and other environmental risk factors
  - D. gender and ethnic factors

#### 09. Renal/Urinary System

#### **01.** Normal processes

- A. embryonic development, fetal maturation, and perinatal changes
- B. organ structure and function
  - A. kidneys, ureters, bladder, urethra
  - B. glomerular filtration and hemodynamics

- C. tubular reabsorption and secretion, including transport processes and proteins
- D. urinary concentration and dilution
- E. renal mechanisms in acid-base balance
- F. renal mechanisms in body fluid homeostasis
- G. micturition
- C. cell/tissue structure and function, including renal metabolism and oxygen consumption, hormones produced by or acting on the kidney
- D. repair, regeneration, and changes associated with stage of life

#### **02.** Abnormal processes

- A. infectious, inflammatory, and immunologic disorders
  - a. infectious disorders
    - i. upper urinary tract
    - ii. lower urinary tract
  - b. inflammatory and immunologic disorders
    - i. glomerular disorders
    - ii. tubular interstitial disease
- B. traumatic and mechanical disorders
- C. neoplastic disorders, including primary and metastases
- D. metabolic and regulatory disorders
  - a. renal failure, acute and chronic
  - b. tubular and collecting duct disorders
  - c. renal calculi
- E. vascular disorders
- F. systemic diseases affecting the renal system
- G. idiopathic disorders
- H. degenerative disorders
- I. drug-induced adverse effects on the renal/urinary system
- J. congenital and genetic disorders affecting the renal/urinary system

#### 03. Principles of therapeutics

- A. mechanisms of action and use of drugs for treatment of disorders of the renal and urinary system
  - A. diuretics, antidiuretic drugs
  - B. drugs and fluids used to treat volume, electrolyte, and acid-base disorders
  - C. drugs used to enhance renal perfusion
  - D. anti-inflammatory, antimicrobial, immunosuppressive, antineoplastic, and antiparasitic drugs
  - E. drugs used to treat lower urinary tract system

## B. other therapeutic modalities

# 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

- A. emotional and behavioral factors
- B. influence on person, family, and society
- C. occupational and other environmental risk factors
- D. gender and ethnic factors

## 10. Reproductive System

#### **01.** Normal processes

- A. embryonic development, fetal maturation, and perinatal changes, including gametogenesis
- B. organ structure and function
  - A. female structure, including breast
  - B. female function
  - C. male structure
  - D. male function
  - E. intercourse, orgasm
  - F. pregnancy, including ovulation, fertilization, implantation, labor and delivery, the puerperium, lactation, gestational uterus, placenta
- C. cell/tissue structure and function, including hypothalamic-pituitary-gonadal axis, sex steroids, and gestational hormones
- D. reproductive system defense mechanisms and normal flora

#### 02. Abnormal processes

- A. infectious, inflammatory, and immunologic disorders (female and male)
- B. traumatic and mechanical disorders (female and male)
- C. neoplastic disorders (including female reproductive, male reproductive, breast [including fibrocystic changes], trophoblastic disease)
- D. metabolic and regulatory processes (female and male)
- E. prenatal and perinatal counseling and screening
- F. systemic disorders affecting reproductive function
- G. disorders relating to pregnancy, the puerperium, and the postpartum period
  - A. obstetric problems
  - B. complications affecting other organ systems
  - C. disorders associated with the puerperium

- D. antepartum, intrapartum, postpartum disorders of the fetus
- H. idiopathic disorders
- I. drug-induced adverse effects on the reproductive system
- J. degenerative disorders
- K. congenital and genetic disorders affecting the reproductive system

## 03. Principles of therapeutics

- A. mechanisms of action and use of drugs for treatment of disorders of the reproductive system and management of normal reproductive function
  - a. female reproductive tract
    - i. fertility drugs
    - ii. oral contraception, other methods of contraception
    - iii. estrogen, progesterone replacement, treatment of menopause
    - iv. stimulants and inhibitors of labor
    - v. estrogen and progesterone antagonists
    - vi. stimulators and inhibitors of lactation
  - b. male reproductive tract
    - i. fertility drugs
    - ii. androgen replacement and antagonists
  - c. gonadotropin-releasing hormone and gonadotropin replacement, including all gonadotropin-releasing hormone antagonists
  - d. abortifacients
  - e. antimicrobial and antiparasitic agents
  - f. antineoplastics
  - g. restoration of potency
- B. other therapeutic modalities affecting the reproductive system
- 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
  - A. emotional and behavioral factors
  - B. influence on person, family, and society
  - C. occupational and other environmental risk factors
  - D. family planning and pregnancy
  - E. gender identity, sexual orientation, sexuality, libido
  - F. effects of traumatic stress syndrome, violence, rape, child abuse

#### 11. Endocrine System

#### **01. Normal processes**

- A. embryonic development, fetal maturation, and perinatal changes
- B. organ structure and function
  - A. hypothalamus, posterior and anterior pituitary gland
  - B. thyroid gland
  - C. parathyroid glands
  - D. adrenal cortex, adrenal medulla
  - E. pancreatic islets
  - F. ovary and testis
  - G. adipose tissue
- C. cell/tissue structure and function, including hormone synthesis, secretion, action, and metabolism
  - A. peptide hormones
  - B. steroid hormones, including vitamin D
  - C. thyroid hormones
  - D. catecholamine hormones
  - E. renin-angiotensin system
- D. repair, regeneration, and changes associated with stage of life

#### 02. Abnormal processes

- A. infectious, inflammatory, and immunologic disorders
- B. traumatic and mechanical disorders
- C. neoplastic disorders (including pituitary, thyroid, parathyroid, adrenal cortex, pancreatic islets, neural crest, pheochromocytoma)
- D. metabolic and regulatory processes (including diabetes mellitus, pituitary, hypothalamus, thyroid, parathyroid, pancreatic islet disorders, adrenal disorders)
- E. vascular disorders
- F. systemic disorders affecting the endocrine system
- G. idiopathic disorders
- H. degenerative disorders
- I. drug-induced adverse effects on the endocrine system
- J. congenital and genetic disorders affecting the endocrine system

#### 03. Principles of therapeutics

- A. mechanisms of action and use of drugs for treatment of disorders of the endocrine system
  - A. hormones and hormone analogs
  - B. stimulators of hormone production
  - C. inhibitors of hormone production
  - D. hormone antagonists

- E. potentiators of hormone action
- F. antiobesity agents
- G. nonhormonal therapy for endocrine disorders
- H. other treatment for diabetes

### B. other therapeutic modalities

# 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

- A. emotional and behavioral factors
- B. influence on person, family, and society
- C. occupational and other environmental risk factors
- D. gender and ethnic factors

## 12. Immune System

### **01. Normal processes**

- A. development of cells of the adaptive immune response, including positive and negative selection during immune development
- B. structure, production, and function
  - A. granulocytes, natural killer cells, macrophages, mast cells, dendritic cells, cell receptors
  - B. T lymphocytes, including T-lymphocyte receptors, accessory molecules, cell activation and proliferation, cytotoxic T lymphocytes, and memory T lymphocytes
  - C. B lymphocytes and plasma cells, including B-lymphocyte receptors, immunoglobulins, cell activation and proliferation, including development of antibodies and memory B lymphocytes
  - D. structure and function of lymph nodes, host defense mechanisms, host barriers to infection, mucosal immunity
  - E. immunogenetics
  - F. Rh and ABO antigens, including genetics

### C. cellular basis of the immune response and immunologic mediators

- A. antigen processing and presentation in the context of MHC I and MHC II molecules, including distribution of MHC I and MHC II on different cells, mechanism of MHC I and MHC II deficiencies, and the genetics of MHC
- B. regulation of the adaptive immune response
- C. activation, function, and molecular biology of complement

- D. function and molecular biology of cytokines
- D. basis of immunologic diagnosis

#### **02.** Abnormal processes

- A. disorders with alterations in immunologic function
  - A. abnormalities in adaptive immune responses
  - B. deficiencies of phagocytic cells and natural killer cells
  - C. complement deficiency
  - D. HIV infection/AIDS
  - E. Non-HIV infections of lymphocytes
  - F. systemic diseases of immunologic function
  - G. systemic disorders affecting the immune system and the effect of age on the function of components of the immune system
- B. immunologically mediated disorders
  - A. type I, type II, type III hypersensitivity
  - B. type IV hypersensitivity
  - C. transplantation risks and rejection, including transfusion reactions
  - D. isoimmunization, hemolytic disease of the newborn
- C. drug-induced adverse effects on the immune system, including Jarisch-Herxheimer

#### 03. Principles of therapeutics

- A. mechanisms of action and use of drugs that specifically affect immune function
  - A. vaccines (active and passive)
  - B. antiretrovirals
  - C. immunomodulating and antineoplastic drugs
  - D. biologics, including monoclonal and polyclonal antibodies
- B. other therapeutic modalities
- 04. Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
  - A. emotional and behavioral factors
  - B. influence on person, family, and society
  - C. occupational and other environmental risk factors
  - D. gender and ethnic factors

