I. Basic Immunology
   A. Immune Mechanisms
      1. Innate versus adaptive immunity
         a. Natural Antimicrobial Agents
            i. Releasable granule proteins
      2. Immunogenetics – gene rearrangements in the generation of immune system diversity
      3. Gell and Coombs Classification of Immune Responses
      4. T cell mediated immunity
         a. T cell mediated immune response – participating cells. Properties and functions of antigen presenting cells
      5. B cell mediated immunity
         a. Maturation of the antibody response
         b. Biologic process initiated by antibody: opsonization, complement fixation, antibody dependent cell mediated cytotoxicity
         c. IgE mediated immediate and late phase reactions
      6. Other immune and inflammatory mechanisms
         a. Lymphokine activated killer cells and their effects
   B. Immunoregulatory Mechanisms
      1. Tolerance
      2. Apoptosis
      3. Anergy
   C. Laboratory Measurements
      1. Methodology and interpretation: measurements of immunoglobulin levels, immunoglobulin classes and subclasses
         a. Serologic testing
            i. RAST inhibition techniques
         b. Genetic techniques including TREC's, PCR and use of probes
         c. Hybridoma and monoclonal antibody technology

II. Anatomy and Physiology
    A. Normal Anatomy and Physiology
       1. Lower airway
    B. Pathology of Primary Atopic Disorders
       1. Rhinitis and rhinosinusitis
          a. Allergic
       2. Early and late responses to allergen challenge
          a. Nasal challenge
          b. Bronchial challenge

III. Pharmacology
    A. Allergenic Proteins and Extracts for Diagnosis and Treatment
       1. Allergen extract preparation and standardization methods

IV. Research Principles
    A. Research Ethics

V. Clinical Sciences
    A. Allergic Diseases and Related Disorders
       1. Upper airway disease
a. Clinical skills and interpretive strategies for diagnosis of upper airway diseases: skin testing (epicutaneous and intracutaneous); cytology of nasal secretions; understanding of indications for and methodology of nasal challenges; rhinoscopy; nasal and ear examination; gross assessment of upper airway imaging studies
   i. Skin testing
2. Lower respiratory tract disease
   a. Specific skills and practical management: chest exam, interpretation of pulmonary function testing, bronchial challenges, sputum and exhaled breath analysis, and gross interpretation of imaging studies.
      i. Long acting beta agonists
      ii. Genetic polymorphisms and beta agonists
3. Drug allergy (see dermatologic disorders and anaphylaxis)
   a. General reviews and susceptibility states
4. Anaphylaxis and anaphylactoid reactions
5. Insect hypersensitivity
   a. Skin prick, intradermal and in vitro testing to stinging insects
   b. Predictive value of clinical history and testing for adult and pediatric population
   c. Venoms, formulation, schedule and duration of immunotherapy
B. Transplantation Medicine
   1. GVHD: acute and chronic
C. Immune System Related Malignancies and Cellular Disorders
   1. B cell and plasma cell neoplasms
   2. T cell neoplasms
   3. Mast cell dyscrasias
   4. Eosinophilic disorders
   5. Cryopathies and amyloid
D. Established and Evolving Immune-based Treatment Modalities
   1. Glucocorticoids and immunosuppressants
   2. Nucleic acid based therapies (DNA vaccines, CpG, gene insertion, antisense nucleotides)
   3. Cytokine receptors and receptor antagonists (IFN, antiTNF, etc)
   4. Probiotics