

## TROPICAL MEDICINE (TRMD)

---

### **TRMD 6010 Biol Basis of Disease (3 Credit Hours)**

This course provides a foundation of knowledge about the human body in health and disease. It gives an overview of important concepts of the biological mechanisms of disease at the cellular, individual, and societal levels. At the cellular level, the course summarized DNA and cellular function, genomics, immunology, and vaccination. At the individual and societal levels, the course addresses the most important infectious and non-infectious causes of death worldwide, providing background on their pathophysiology, clinical aspects, and patterns of disease occurrence, risk factors, and methods of prevention.

### **TRMD 6030 Multi dis app gl hlth & soc ju (3 Credit Hours)**

### **TRMD 6050 Medical Helminthology (2 Credit Hours)**

This course covers the parasitic worms with special reference to those causing disease in humans. In lecture, the student becomes acquainted with the different taxonomic groups of helminths, their phylogenetic and zoological relationships, morphological and structural characteristics, geographical distributions, methods of transmission, vectors, reservoir hosts, pathology including location and tissue damage in the human body and including aspects of the molecular pathogenesis, anthelmintic chemotherapy including modes of action of anti-parasitic medications, parasitological diagnosis of helminth infections, aspects of the immunology of helminth infections, methods of helminth parasite control and other public health implications, and other tropical issues.

### **TRMD 6060 Medical Entomology (3 Credit Hours)**

This course is designed to provide the fundamental information necessary for understanding and evaluating both the role of arthropods in transmission of pathogens causing human disease, and the role of arthropods in directly causing human disease. Following a brief overview of the general anatomy, physiology, and classification of arthropods, individual groups of medical importance are considered in detail with regard to the recognition of important species, the epidemiology and pathogenesis of associated diseases, and the principles and methods of vector control.

### **TRMD 6070 Medical Protozoology (2 Credit Hours)**

The basic biology of protozoa capable of infecting humans as well as the clinical manifestations of the diseases they cause will be covered. This is a comprehensive course covering all aspects of medically important protozoa and the diseases they cause. Topics covered will include life cycles, morphological features, host-parasite interactions, geographical distribution, reservoir hosts, methods of transmission and control, pathology, clinical features, and immunological aspects. The biological and clinical perspectives gained in this course will assist students in the practical recognition, evaluation, and management of problems in public health or clinical practice involving protozoa that infect humans

### **TRMD 6080 Medical Protozoology Lab (1 Credit Hour)**

The identification of medically important parasites relies heavily upon macroscopic and microscopic examination of clinical specimens. In this course students will learn the basic principles of identifying parasitic helminthes and protozoa in blood, feces, and tissue specimens. Prepared specimens of the major helminth and protozoan pathogens of humans will be provided for macroscopic and microscopic examination. Students will learn the basic operations of the microscope and how to identify and distinguish the various helminthes and protozoa. Samples demonstrating the pathological features of the disease will also be provided. The techniques for preparing diagnostic specimens of parasites in blood and feces will be reviewed

### **TRMD 6090 Parasitology Laboratory (1 Credit Hour)**

The identification of medically important parasites relies heavily upon macroscopic and microscopic examination of clinical specimens. In this course students will learn the basic principles of identifying parasitic helminthes and protozoa in blood, feces, and tissue specimens. Prepared specimens of the major helminth and protozoan pathogens of humans will be provided for macroscopic and microscopic examination. Students will learn the basic operations of the microscope and how to identify and distinguish the various helminthes and protozoa. Samples demonstrating the pathological features of the disease will also be provided. The techniques for preparing diagnostic specimens of parasites in blood and feces will be reviewed.

### **TRMD 6100 Health and Human Rights (1 Credit Hour)**

This course is designed to provide a forum for discussion of pertinent issues in global health and human rights and to motivate students to become active advocates for their resolution. Students will participate in weekly discussions with local and national experts in public health, clinical medicine, and health sciences research who are also strong advocates for human rights. The speakers will stress the importance of addressing the underlying social, political, and economic factors influencing health. Speakers will give examples from their background and the motivations for their career choices and discuss the skills and strategies necessary to become effective advocates for health and human rights.

### **TRMD 6170 Immunology (3 Credit Hours)**

This course is designed for students of public health and the basic biomedical sciences who are interested in a current overview of immunology.

This course is a comprehensive introduction to immunity and immunopathogenesis as it relates to health and disease. Following a thorough consideration of cells and tissues of the immune system, attention is given to immune recognition and regulation of immune responses, with special emphasis on the role of cytokines in immunity. Finally, clinical concepts are presented with current knowledge of basic immune mechanisms for each: autoimmunity and autoimmune disease, transplant rejection, immunity to tumors, primary immunodeficiency diseases, and immunity to infectious agents including viruses and parasites, and immunopathogenesis of HIV/AIDS.

**TRMD 6200 Impact Evaluation in GH (3 Credit Hours)**

This course provides students with basic concepts, principles, and practices for the evaluation of public health programs and interventions. The course is intended to 1) introduce students to impact evaluation, 2) provide a solid grounding in study designs relevant in field settings; 3) develop students' skills in designing evaluation plans, and 4) serve as a foundation for more specialized program evaluation classes as well as for courses on data analysis, sampling, epidemiology, and operations research

**TRMD 6240 Molecular Biol Meth Ph (2 Credit Hours)****TRMD 6250 Biomedical Research Methods (3 Credit Hours)**

Students will be able to apply the basic biomedical methods used in public health and tropical medicine research or practice, and summarize the principle and the theoretical basis. They will be able to analyze the strengths and weaknesses of the different methods, and design hypothesis-driven studies to address public health and tropical medicine problems, applying the appropriate methods. Students will also assess scientific papers and critically appraise their relative merit in the field of public health research and practice

**TRMD 6310 Clinical Trop Medicine (2 Credit Hours)**

Clinical Tropical Medicine is designed to offer to an overview of topics of clinical importance in tropical medicine. In most cases, topics are presented in syndromic fashion. The course is expected to complement the other course offerings from the Tropical Medicine Department for the MPHTM and Diploma curricula. Participants should have some experience in clinical medicine and should either have experience or be in the process of learning about diseases of the tropics.

**TRMD 6320 Preventive Trop Med (2 Credit Hours)****TRMD 6330 Microbial Disease of Trp (2 Credit Hours)**

This course introduces students to the most important bacterial, viral, and mycotic pathogens in the tropics and to clinical features of the associated diseases. The course will focus on topics not ordinarily covered in depth in U.S. medical schools, such as cholera, tuberculosis, leprosy, arboviral infections, and hemorrhagic fevers, among others. The course will be team taught by both microbiologists and clinicians. Topics covered will include geographic distribution, transmission, and pathogenesis, clinical features of relevant diseases, immunologic considerations, laboratory diagnosis, treatment, and control.

**TRMD 6340 Diagnostic Meth/Microbio (2 Credit Hours)**

This laboratory course parallels topics presented in TRMD 6330. The course is designed to teach students how to perform basic laboratory tests using simple techniques applicable to developing countries. Most of these will be diagnostic tests for infectious diseases, although some clinically relevant non-diagnostic techniques will also be taught (e.g., complete blood counts). The bulk of the course consists of hands-on laboratory experience conducting laboratory tests with clinical specimens and analyzing prepared teaching specimens. Procedures for organism isolation and identification and rapid diagnostic kits will be covered.

**TRMD 6350 Disease Prev and Control (2 Credit Hours)**

This course is designed for students enrolled in the diploma in tropical medicine and traveler's health program to prepare them to recognize and contribute effectively to the public health needs of communities in developing countries. The course focuses on disease prevention and control strategies with special reference to developing countries; assessment of community needs, and provision of basic preventive services; control of important endemic diseases such as malaria, tuberculosis, and HIV/AIDS; and other topics such as outbreak investigation, emerging infectious diseases, immunization programs, and disease eradication programs.

**TRMD 6360 Clinical Case Presentats (1 Credit Hour)**

Students, faculty and visiting professors will present clinical cases pertaining to issues in tropical medicine, wilderness medicine and travel medicine. There will be active class participation.

**TRMD 6420 Tropical Virology (3 Credit Hours)**

This course covers broad concepts of, and important interventions for, major viral diseases. The course places emphasis on viruses that are found in tropical countries and/or are considered recently emergent pathogens. Students enrolled in the course should come with a basic understanding of communicable disease concepts.

**TRMD 6450 Tb Global Trends & Inter (2 Credit Hours)**

Students, faculty and visiting professors will present clinical cases pertaining to issues in tropical medicine, wilderness medicine and travel medicine. There will be active class participation.

**TRMD 6780 Genomics In Public Hlth (2 Credit Hours)****TRMD 6800 Emerging Pathogens (2 Credit Hours)****TRMD 7000 Tropical Medicine Semin (1 Credit Hour)**

Tropical Medicine Seminar is designed as a journal club, with the specific goal of training students to develop skills in critically evaluating and effectively presenting relevant scientific literature. Each student is expected to present at least one article to the class from recent tropical medicine literature, and to attend and actively participate during presentation delivered by other students

**TRMD 7020 Infectious Disease Seminar (1 Credit Hour)**

The seminar experience is intended to stimulate a critical reading of the current literature and to ensure that each student learns to present important and potentially controversial data in a rigorous and careful fashion.

**TRMD 7180 Immunoparasitology (2 Credit Hours)**

**Prerequisite(s):** TRMD 6170.

**TRMD 7300 Mechanisms of Pathogen Intervention (2 Credit Hours)**

This course provides an advanced foundation of knowledge about the selection and mechanisms of action of different interventions against important viruses, bacteria and unicellular parasites of public health significance. The course describes how drugs, vaccines and other intervention agents reach their cellular targets and how they act in harmony with the host immune system to control or eradicate the pathogen, inside the human or the arthropod hosts.

**Prerequisite(s):** TRMD 6170.

**TRMD 7330 Advanced Topics in Host Pathogen (2 Credit Hours)**

**Prerequisite(s):** TRMD 6170, 6070 and 6330.

**TRMD 7420 Population Based Malaria Prevention and Control (3 Credit Hours)**

This course introduces the principles of prevention and control of malaria infection and disease, as well as population based methods for evaluating the success of control programs or new interventions. This course investigates how culture, society, and the environment influence disease transmission, risk factors, and health status. Students will analyze data and integrate information using a monitoring and evaluation framework to inform prevention and control policy. Topics covered will include vector ecology, malaria epidemiology, malaria control strategies, malaria monitoring and evaluation, issues around cost-effectiveness, and prospects for elimination.

**Prerequisite(s):** (EPID 6030 or SPHL 6060).

**TRMD 7440 Household Sampling Approaches in Developing (3 Credit Hours)**

The use of scientific household surveys to obtain population-level data for research and program-related needs in developing countries without adequate health information systems has become increasingly common in the international health, population and nutrition sectors. This is attested to by the proliferation of standardized survey protocols in these sectors. In order to take full advantage of recent developments in survey methodologies, professionals working in these sectors need to have a solid understanding of the intended uses and limitations of various standard sampling protocols, as well as the underlying principles of survey measurement.

**Prerequisite(s):** (BIOS 6030\* or SPHL 6050\* and EPID 6030\* or SPHL 6060\*).

\* May be taken concurrently.

**TRMD 7800 Advanced Medical Entomology (2 Credit Hours)**

This is an advanced course that challenges students to consider basic principles in medical entomology relating to the ecology, epidemiology, and control of pathogen transmission. Lectures and corresponding laboratories cover topics such as vector behavior, physiology, genetics, immune response, molecular biology, vector-pathogen interaction and vector-borne disease surveillance and diagnostics. This material provides a foundation for understanding vector ecology and the dynamics of pathogen transmission. Students will learn how current research in medical entomology offers new prospects for the control of vector-borne diseases. They will also learn about and work through the process of grant preparation and submission to obtain funding for vector-borne disease research.

**Prerequisite(s):** TRMD 6060.

**TRMD 7820 Malaria (2 Credit Hours)**

This is an advanced course which provides a rigorous approach to both the basic and applied issues related to malaria and malaria control. Areas covered in detail include cell biology and biochemistry of the parasite-red cell integration, antimalarial drug action and resistance mechanisms, parasite genetics and cell biology and the immunologic aspects of malaria, including asexual and sexual stage candidate vaccine antigens. At the conclusion of the semester, students are expected to critically review current malaria control and research strategies and to suggest and defend appropriate alternatives.

**TRMD 7990 Special Studies (1-3 Credit Hours)**

Masters students and advisor select a topic for independent study and develop learning objectives and the expected written final product.

**TRMD 8100 Laboratory Rotation (2 Credit Hours)****TRMD 8800 Essentials in Research Readiness Skills (2 Credit Hours)****TRMD 8990 Doctoral Independent Study (1-3 Credit Hours)**

Doctoral students and advisor select a topic for independent study and develop learning objectives and the expected final written product.

**TRMD 9970 Dissertation (0 Credit Hours)**

Doctoral candidates who have defended their prospectus and are engaged in research.

**TRMD 9980 Master's Thesis Research (0 Credit Hours)**

MS students engaging in thesis research

**TRMD 9990 Dissertation Research (2 Credit Hours)**

Doctoral students who have completed course work but not defended their prospectus.