831L Molecular Pathology Laboratory
Summer. 2(0-4) P:M: (MT 831 or concurrently)
Equipment operation, DNA extraction and measurement, electrophoresis, hybridization and transfers, amplification and detection including SSOP, ARMS, RFLP and SCP as well as automated sequencing will be covered with specific emphasis on clinical applications.

860 Clinical Laboratory Diagnosis of Infectious Diseases
Spring of even years. 2(2-0) Interdepartmental with Pathology. P:NM: (MIC 451 and MIC 464)
Laboratory techniques for diagnosing infectious diseases in humans. Emphasis on differential diagnosis and correlation of microbiological results with serology, hematology, and clinical chemistry.

890 Selected Problems in Clinical Laboratory Science
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open only to graduate students in Clinical Laboratory Sciences.
Non-thesis research for Plan B master's students.

899 Master's Thesis Research
Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 24 credits in all enrollments for this course. R: Open only to graduate students in Clinical Laboratory Sciences.
Master's thesis research.

MEDICINE MED

Department of Medicine
College of Human Medicine

608 Internal Medicine Clerkship
Fall, Spring, Summer. 2 to 18 credits. A student may earn a maximum of 42 credits in all enrollments for this course. P:NM: (FMP 602) R: Open only to graduate-professional students in College of Human Medicine.
Community hospital clerkship. Interviewing skills, history, physical examination. Problem solving and therapy. Care of the whole patient leading to independence in patient management.

609 Hematology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Data collection, problem solving, and management related to common hematologic disorders of children and adults.

610 Oncology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Data collection, problem solving and management of prevalent cancers in children and adults.

611 Cardiology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Evaluation of patients with cardiac diseases. Special diagnostic procedures including cardiac cuticularization, phonocardiography, echocardiography, and electrocardiography.

612 Nephrology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Integrated concepts of renal physiology and pathophysiology of renal disease. Clinical experience.

613 Dermatology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Experience in a dermatologist's office to develop clinical, observational, and diagnostic skills in dermatology.

614 Pulmonary Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Pulmonary physiology. Evaluation of pulmonary function. Diagnosis and treatment of common pulmonary diseases.

615 Gastroenterology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Experience with gastrointestinal problems in ambulatory and hospital settings. Emphasis on continuity and comprehensive care.

616 Allergy Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Ambulatory and hospital based experience to develop diagnostic skills in allergy. Review of basic therapeutics related to allergic diseases.

618 Infectious Diseases Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Clinical problems in infectious and immunologic diseases. Integrated basic science input is provided in seminars.

619 Ambulatory Care Clerkship
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 15 credits in all enrollments for this course. Interdepartmental with Family Practice; Pediatrics. Administered by Department of Family Practice. P:NM: (FMP 602) R: Open only to graduate-professional students in College of Human Medicine.
Continuous and comprehensive patient care under supervision of appropriate physicians.

622 Endocrinology and Metabolism Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine. SA: MED 620
Clinical and/or clinical-research clerkship: endocrine diseases, electrolyte abnormalities, endocrine hypertension, or diabetes mellitus.

623 Advanced Medicine
Fall, Spring, Summer. 6 to 12 credits. Fall: Lansing-GR-Saginaw-Flint-Kalamazoo-UP. Spring: Lansing-GR-Saginaw-Flint-Kalamazoo-UP. Summer: Lansing-GR-Saginaw-Flint-Kalamazoo-UP. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in the College of Human Medicine.
Hospital-based clinical experience in diagnosing and managing acutely ill patients with non-surgical problems.

626 Physical Medicine and Rehabilitation Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Developing regimens for physical medicine procedures, occupational therapy and rehabilitation skills.

627 Rheumatology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Combined ambulatory and hospital consultative clerkship for diagnostic skills in areas of rheumatic diseases.

628 Advanced Internal Medicine
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Clinical experiences to refine diagnostic and management skills in general internal medicine.

630 Emergency Medicine Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Clinical diagnosis and treatment of emergencies seen in community emergency departments.

632 Occupational Medicine Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: (MED 608) R: Open only to graduate-professional students in College of Human Medicine.
Health problems of chemical and mineral dust, radiation, and repetitive trauma.

633 Extended Clinical Experience
Fall, Spring, Summer. 6(6-0) Fall: All six(6) campuses. Spring: All six(6) campuses. Summer: All six(6) campuses. P:M: (MED 608)
Based in community hospitals and ambulatory sites, this is a 4 week clinical experience emphasizing interviewing skills, history, physical exam, problem solving and therapy.

635 Core Competencies I
Fall. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Human Medicine; Family Practice; Pediatrics and Human Development. Administered by Human Medicine. P:NM: (FMP 602) R: Open only to graduate-professional students in College of Human Medicine.
A weekly seminar addressing core knowledge and skills from an interdisciplinary perspective.

636 Core Competencies II
Spring. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Human Medicine; Family Practice. Administered by Human Medicine. P:NM: (FMP 602) R: Open only to graduate-professional students in College of Human Medicine.
A weekly seminar addressing core knowledge and skills from an interdisciplinary perspective.

637 Core Competencies III
Spring, Summer. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Human Medicine; Family Practice; Obstetrics, Gynecology and Reproductive Biology; Pediatrics and Human Development; Surgery. Administered by Human Medicine. P:NM: (FMP 602) R: Open only to graduate-professional students in College of Human Medicine.
A weekly seminar addressing core knowledge and skills from an interdisciplinary perspective.

645 Primary Health Care in Ecuador
Summer. 6 credits. R: Open only to graduate-professional students in the colleges of Human and Osteopathic Medicine and to graduate students in the College of Nursing.
Special problems and challenges to delivery of primary health care in a developing country. Culture and related health care issues in cities and rural areas.

820 Evidence-Based Medicine
Fall. 3(3-0) Interdepartmental with Epidemiology. Administered by Epidemiology. P:M: (EPI 810 or concurrently and STT 421 or concurrently)
Methodology of clinical epidemiology and health services outcomes research. Linkage of epidemiology with daily clinical problems.

MICROBIOLOGY AND MOLECULAR GENETICS MIC

Department of Microbiology and Molecular Genetics
College of Human Medicine
College of Natural Science
College of Osteopathic Medicine
College of Veterinary Medicine

101 Preview of Microbiology
Fall. 1(1-0) R: Open only to freshmen or sophomores. SA: MPH 101
Overview of modern microbiology, emphasizing impact on society.

103 Frontiers of Microbiology
Spring. 1(2-0) R: Open only to freshmen and sophomores.
Current microbiology research: significance to modern biological science and impact on society.

105 Microbes in Everyday Life
Fall. 3(3-0)
Role of microbes in agriculture, industry, and medicine. Impact on society of infectious diseases of plants and animals, soil fertility, water quality, biotechnology, genetic engineering, and bioremediation. Public health and environmental concerns.

111L Cell and Molecular Biology Laboratory
Fall, Spring, Summer. 2(1-3) Interdepartmental with Biological Science; Botany and Plant Pathology; Zoology. Administered by Natural Science. P:M: (BS111 or concurrently) Not open to students with credit in LBS 159H.
Principles and applications of common techniques used in cell and molecular biology.

205 Allied Health Microbiology
Spring. 3(3-0) SA: MPH 205
Microbial structure, function, growth, death, and control related to medical and public health concerns. Host-parasite relationships, immunology, action of major pathogenic groups. Commercial applications of microbiology.

206 Allied Health Microbiology Laboratory
Spring. 1(0-2) P:M: (MIC 105 or MIC 205 or concurrently) SA: MPH 206
Fundamentals of microbiological techniques including microscopy, staining, aseptic technique, culture media, identification, control with disinfectants and antibiotics, and safety in the microbiological laboratory.

301 Introductory Microbiology
Fall, Spring. 3(3-0) P:M: (BS 111 or LBS 145 or LBS 149H) and (CEM 251 or concurrently or CEM 351 or concurrently or CEM 143) SA: MPH 301
Fundamentals of microbiology, including microbial structure and function, nutrition and growth, death and control. Importance and applications of major microbial groups.

302 Introductory Microbiology Laboratory
Spring. 1(0-3) P:M: (MIC 105 or concurrently or MIC 205 or concurrently or MIC 301 or concurrently) SA: MPH 302
Methodology of microbiology: microscopy, staining, aseptic technique, culture media, quantification, and laboratory safety.

408 Advanced Microbiology Laboratory (W)
Fall. 3(1-6) P:M: (MIC 302 and MIC 431 or concurrently) and completion of Tier I writing requirement. R: Open only to students in the Department of Microbiology or LBS Environmental Biology/Microbiology or Microbiology coordinate major. SA: MPH 408
Microbiological techniques and procedures to study physiology and genetics of bacteria and bacteriophages. Collection and critical assessment of quantitative data and written communication of results.

409 Eukaryotic Cell Biology
Spring. 3(3-0) P:M: (BS 111 or LBS 145 or LBS 149H) and (BMB 401 or concurrently or BMB 462 or concurrently) SA: MIC 403, MPH 403
Structure and function of nucleated cells. Emphasis on the molecular mechanisms that underlie cell processes.

413 Virology
Spring. 3(3-0) Interdepartmental with Botany and Plant Pathology. P:M: (BMB 462 or concurrently) RB: (MIC 409) SA: MPH 403
Viruses and modern molecular biology. Viral replication and gene expression of the major classes of viruses. Virus-cell interactions and viral diseases.

421 Prokaryotic Cell Physiology
Fall. 3(3-0) P:M: (MIC 301 and BMB 461 or concurrently) SA: MIC 401, MPH 401
Prokaryotic cell structure and function. Growth and replication. Macromolecular synthesis and control.

425 Microbial Ecology
Spring. 3(3-0) Interdepartmental with Crop and Soil Sciences. P:NM: (MIC 301) SA: MPH 425
Microbial population and community interactions. Microbial activities in natural systems, including associations with plants or animals.

426 Biogeochemistry
Summer. 3 credits. Given only at W.K. Kellogg Biological Station. Interdepartmental with Crop and Soil Sciences; Geological Sciences; Zoology. P:NM: (BS 110 or LBS 144 or LBS 148H or BS 111 or LBS 145 or LBS 149H) and (CEM 143 or CEM 251) SA: MPH 426
Integration of the principles of ecology, microbiology, geochemistry, and environmental chemistry. Societal applications of research in aquatic and terrestrial habitats.

431 Microbial Genetics
Fall. 3(3-0) P:M: (BMB 461 or concurrently) P:NM: (MIC 301 or ZOL 341) SA: MIC 401, MPH 401
Genetics of bacteria, their viruses, plasmids, and transposons. Emphasis on genetic principles.

433 Microbial Genomics
Spring. 3(2-3) P:M: (MIC 431) RB: (MIC 421 or BMB 461) and (CSE 101)
Structure of microbial genomes and implications for growth and evolution of bacteria and fungi. Computer analysis of genome sequence databases. Applications to gene expression and phylogenetic analysis.