474. **Advanced Clinical Hematology and Body Fluids**
Fall, Spring, Summer. 1 credit.
C: MT 473. R: Open only to seniors in Clinical Laboratory Sciences.
Theoretical aspects of advanced hematology, hemostasis and body fluid analysis. Integration of cognitive material with test results.

475. **Advanced Clinical Immunology and Immunohematology Laboratory**
Fall, Spring, Summer. 2 credits.
C: MT 476. R: Open only to seniors in Clinical Laboratory Sciences.
Application of immunology and immunohematology principles.

476. **Advanced Clinical Immunology and Immunohematology**
Fall, Spring, Summer. 1 credit.
C: MT 478. R: Open only to seniors in Clinical Laboratory Sciences.
Theory of clinical microbiology. Faculty directed study including assigned readings, material and interpretation of test results.

477. **Advanced Clinical Microbiology Laboratory**
Fall, Spring, Summer. 3 credits.
C: MT 478. R: Open only to seniors in Clinical Laboratory Sciences.
Application of clinical microbiology.

478. **Advanced Clinical Microbiology**
Fall, Spring, Summer. 1 credit.
C: MT 477. R: Open only to seniors in Clinical Laboratory Sciences.
Theory of clinical microbiology. Integration of cognitive material with laboratory results.

498. **Directed Study**
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to Clinical Laboratory Science and Medical Technology majors.
Faculty directed study including assigned readings, reviews of appropriate scientific periodicals, and research laboratory experience.

801. **Medical Technology Seminar**
Spring. 1-1(0) A student may earn a maximum of 2 credits in all enrollments for this course.
R: Open only to graduate-professional students in College of Human Medicine.
Current research topics in clinical laboratory sciences.

810. **Research Planning in the Clinical Laboratory Sciences**
Fall of odd-numbered years. 2(2-0) A student may earn a maximum of 24 credits in all enrollments for this course.
R: Open only to graduate-professional students in Clinical Laboratory Sciences.
Directed reading and discussions on research methodology and research funding. Written and oral proposal presentations.

812. **Advanced Clinical Chemistry**
Spring of even-numbered years. 2(2-0) Interdepartmental with Pathology.
P: BCH 462, MT 414, MT 116.
Biochemical basis of selected pathologic conditions including inborn errors of metabolism, endocrine and other genetic disorders. Emphasis on current diagnostic techniques.

820. **Advanced Human Hematology**
Fall of even-numbered years. 2(2-0) Interdepartmental with Pathology.
P: MT 492.
Selected topics in hematology including pathogenesis, mechanisms and morphological pictures. Emphasis on laboratory tests and interpretation of results.

830. **Concepts in Molecular Biology**
Spring of odd-numbered years. 2(2-0) Interdepartmental with Pathology.
P: One course in Biochemistry or concurrently.
Techniques and theories of molecular biology, nucleic acid synthesis and isolation, enzymatic digestion and modification, electrophoresis, hybridization, amplification, library construction, and cloning.

840. **Advanced Hemostasis**
Fall of odd-numbered years. 2(2-0) Interdepartmental with Pathology.
P: BCH 462, MT 422.
Physiology, pathophysiology, and laboratory evaluation of hemostatic disorders.

860. **Clinical Laboratory Diagnosis of Infectious Diseases**
Spring of even-numbered years. 2(2-0) Interdepartmental with Pathology.
P: MIC 451, 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.

880. **Concepts in Medicine**
Fall of odd-numbered years. 2 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
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.

901. **Nephrology Clerkship**
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: 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.

910. **Clinical Laboratory Science**
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: 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 catheterization, phonocardiography, echocardiography, and electrocardiography.

912. **Dermatology Clerkship**
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608. R: Open only to graduate-professional students in College of Human Medicine.

913. **Gastroenterology Clerkship**
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608. R: Open only to graduate-professional students in College of Human Medicine.
Experience in a gastroenterologist's office to develop clinical, observational, and diagnostic skills in dermatology.

914. **Pulmonary Clerkship**
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608. R: Open only to graduate-professional students in College of Human Medicine.

915. **Gastroenterology Clerkship**
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: 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.
### Descriptions — Medicine of Courses

<table>
<thead>
<tr>
<th>Course Number</th>
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<tbody>
<tr>
<td>616.</td>
<td>Allergy Clerkship</td>
<td>Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.</td>
<td>P: MED 628. 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.</td>
</tr>
<tr>
<td>617.</td>
<td>Neurology Clerkship</td>
<td>Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.</td>
<td>P: MED 608. R: Open only to graduate-professional students in College of Human Medicine. Office and inpatient experience. Evaluation and management of neurological disease.</td>
</tr>
<tr>
<td>618.</td>
<td>Infectious Diseases Clerkship</td>
<td>Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.</td>
<td>P: 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.</td>
</tr>
<tr>
<td>619.</td>
<td>Ambulatory Care Clerkship</td>
<td>Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 15 credits in all enrollments for this course.</td>
<td>Interdepartmental with Family Practice and Pediatrics. Administered by Family Practice. P: FMP 622. Open only to graduate-professional students in College of Human Medicine. Continuous and comprehensive patient care under supervision of appropriate physicians.</td>
</tr>
<tr>
<td>620.</td>
<td>Endocrinology and Metabolism Clerkship</td>
<td>Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.</td>
<td>P: MED 608. R: Open only to graduate-professional students in College of Human Medicine. Clinical and/or clinical-research clerkship: endocrine diseases, electrolyte abnormalities, endocrine hypertension, or diabetes mellitus.</td>
</tr>
<tr>
<td>621.</td>
<td>Advanced Medicine</td>
<td>Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course.</td>
<td>P: MED 608. R: Open only to graduate-professional students in College of Human Medicine. Hospital-based clinical experience in diagnosing and managing acutely ill patients with non-surgical problems.</td>
</tr>
<tr>
<td>622.</td>
<td>Physical Medicine and Rehabilitation Clerkship</td>
<td>Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.</td>
<td>P: 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.</td>
</tr>
<tr>
<td>623.</td>
<td>Rheumatology Clerkship</td>
<td>Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.</td>
<td>P: 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.</td>
</tr>
<tr>
<td>624.</td>
<td>Advanced Internal Medicine</td>
<td>Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.</td>
<td>P: 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.</td>
</tr>
<tr>
<td>625.</td>
<td>Emergency Medicine Clerkship</td>
<td>Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.</td>
<td>P: 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.</td>
</tr>
<tr>
<td>626.</td>
<td>Therapeutics Clerkship</td>
<td>Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.</td>
<td>P: 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.</td>
</tr>
<tr>
<td>627.</td>
<td>Core Competencies I</td>
<td>Fall. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course.</td>
<td>Interdepartmental with Human Medicine and Family Practice. Administered by Human Medicine. P: 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.</td>
</tr>
<tr>
<td>628.</td>
<td>Core Competencies II</td>
<td>Spring. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course.</td>
<td>Interdepartmental with Human Medicine and Family Practice. Administered by Human Medicine. P: 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.</td>
</tr>
<tr>
<td>629.</td>
<td>Core Competencies III</td>
<td>Spring, Summer. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course.</td>
<td>Interdepartmental with Human Medicine, Pediatrics and Development. Administered by Human Medicine. P: 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.</td>
</tr>
</tbody>
</table>

### MICROBIOLOGY

**Department of Microbiology**

- **College of Human Medicine**
- **College of Natural Science**
- **College of Osteopathic Science**
- **College of Veterinary Medicine**

<table>
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<tr>
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<tr>
<td>101.</td>
<td>Precise of Microbiology</td>
<td>Fall. 1(0-0)</td>
<td>R: Open only to freshmen and sophomores. Not open to students with credit in a microbiology course. Overview of modern microbiology, emphasizing impact on society.</td>
</tr>
<tr>
<td>105.</td>
<td>Microbes in Everyday Life</td>
<td>Spring. 3(0-0)</td>
<td>Role of microorganisms 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.</td>
</tr>
<tr>
<td>205.</td>
<td>Allied Health Microbiology Laboratory</td>
<td>Spring. 1(0-0)</td>
<td>P: MIC 105, MIC 205 or concurrently. Fundamentals of microbiological techniques including microscopy, staining, aseptic technique, culture media, identification, control with disinfectants and antibiotics, and safety in the microbiological laboratory.</td>
</tr>
<tr>
<td>301.</td>
<td>Introductory Microbiology</td>
<td>Spring. 3(3-0)</td>
<td>P: BS 111. P: CMB 251 or concurrently. Fundamentals of microbiology, including microbial structure and function, nutrition and growth, death and control. Importance and applications of major microbial groups.</td>
</tr>
<tr>
<td>302.</td>
<td>Introductory Microbiology Laboratory</td>
<td>Spring. 10(3-0)</td>
<td>P: MIC 501 or concurrently. Methodology of microbiology: microscopy, staining, aseptic techniques, culture media, quantification, and laboratory safety.</td>
</tr>
<tr>
<td>402.</td>
<td>Advanced Microbiology Laboratory (W)</td>
<td>Fall. 3(0-0)</td>
<td>P: MIC 302; MIC 401 or concurrently. R: Open only to Microbiology majors. Completion of Tier I writing requirement. 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.</td>
</tr>
<tr>
<td>403.</td>
<td>Eukaryotic Cell Biology</td>
<td>Spring. 3(3-0)</td>
<td>P: BS 111. Structure and function of nucleated cells. Emphasis on the molecular mechanisms that underlie cell processes.</td>
</tr>
</tbody>
</table>