Learning in the Biomedical Sciences
Fall. 3 credits. R: Open to sophomores or juniors. SA: MT 285
An introduction to the foundational concepts of the biomedical sciences, including the structure and function of the human body, basic principles of cellular biology, and an overview of the medical laboratory environment. Prerequisite: BLD 145 or BS 159H or BS 143.

Applications of Clinical Laboratory Principles
Fall, Summer. 3 credits. R: Open to sophomores. SA: MT 256
This course covers the principles of clinical laboratory science, including basic laboratory mathematics, quality control, and regulatory compliance. Prerequisite: BLD 324.

Clinical Chemistry
Fall. 3 credits. R: Open to juniors. SA: MT 348
This course focuses on the principles and applications of clinical chemistry, including the analysis of blood and urine samples. Prerequisite: BLD 324.

Clinical Immunology
Fall. 3 credits. R: Open to seniors. SA: MT 453
This course covers the principles of clinical immunology, including the immune system, immunology of infectious disease, and immunologic diagnosis. Prerequisite: BLD 414.

Transfusion and Transplantation Medicine
Spring. 3 credits. R: Open to seniors. SA: MT 435
This course covers the principles and practice of transfusion medicine and organ transplantation, including blood typing, transfusion compatibility testing, and immunologic diagnosis. Prerequisite: BLD 414.

Molecular Diagnostic Laboratory
Spring. 3 credits. R: Open to seniors. SA: MT 437
This course covers the principles and applications of molecular diagnostic testing, including genetic testing and molecular pathology. Prerequisite: BLD 414.

Clinical Immunology and Immunodeficiency
Fall. 3 credits. R: Open to seniors. SA: MT 433
This course covers the principles of clinical immunology and immunodeficiency, including the immune system, immunologic diagnosis, and treatment of immune deficiencies. Prerequisite: BLD 414.

Molecular Immunology
Fall. 3 credits. R: Open to seniors. SA: MT 434
This course covers the principles and applications of molecular immunology, including the immune system, immunologic diagnosis, and treatment of immune deficiencies. Prerequisite: BLD 414.

Clinical Laboratory Testing
Fall. 2 credits. R: Open to seniors. SA: MT 416
This course covers the principles and applications of clinical laboratory testing, including quality control and regulatory compliance. Prerequisite: BLD 414.

Research in the Clinical Laboratory
Spring. 2 credits. R: Open to seniors. SA: MT 417
This course covers research methodologies and design in the clinical laboratory, including the principles of scientific research and the design of clinical studies. Prerequisite: BLD 414.
455 Integrating Clinical Laboratory Science Discipline (W)
Fall, Spring. 2(2-0) P: (BLD 324 or concurrently) or (BLD 417 or concurrently) or (MMG 463 or concurrently) or (BLD 416 or concurrently) or (MMG 463 or concurrently) or (BLD 435 or concurrently) or (CEM 332 or concurrently) or (BLD 436 or concurrently) and completion of Tier I writing requirement R: Open to undergraduate students in the Clinical Laboratory Sciences major and open to undergraduate students in the Medical Microbiology and Molecular Genetics major or in the Biomedical Laboratory Diagnostics Program or in the Department of Microbiology and Molecular Genetics or in the Lyman Briggs Environmental Biology/Genomics and Molecular Genetics major or in the Lyman Briggs Animal Biology major or in the Lyman Briggs Medical Technology major or in the Lyman Briggs Medical Technology and Molecular Genetics major or in the Lyman Briggs Medical Technology and Molecular Genetics major. SA: MT 455

Problem oriented approach integrating topics from biomedical laboratory diagnostics courses with emphasis on writing experience in the major and on critical thinking skills.

463 Medical Microbiology
Fall. 3(3-0) interdepartmental with Microbiology and Molecular Genetics. Administered by Microbiology and Molecular Genetics. P: MMG 301 RB: MMG 451 or BLD 434 R: Open to juniors or seniors in the Biomedical Laboratory Diagnostics Program or in the Department of Microbiology and Molecular Genetics or in the Lyman Briggs Environmental Biology/Microbiology Coordinate Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Human Biology Coordi- nate Major or in the Human Biology major or in the Lyman Briggs Medical Technology Coordinate Major or in the Lyman Briggs Microbiology Coordinate Major or in the Environmental Biology/Microbiology major or in the Genomics and Molecular Genetics major. SA: MIC 463

Properties of pathogenic bacteria and viruses and their mechanisms of pathogenicity and clinical diagnoses.

464 Diagnostic Microbiology Laboratory
Fall. 2(0-4) interdepartmental with Microbiology and Molecular Genetics. Administered by Microbiology and Molecular Genetics. P: MMG 463 or concurrently R: Open to juniors or seniors in the Department of Microbiology and Molecular Genetics or in the Biomedical Laboratory Diagnostics Program or in the Clinical Laboratory Sciences major. SA: MIC 464

Clinical laboratory diagnostic procedures for the identification of pathogenic microbes.

471 Advanced Clinical Chemistry Laboratory
Fall, Spring, Summer. 3 credits. P: CEM 333 R: Open to students in the Clinical Laboratory Sciences major. SA: MT 471

Application and integration of theory and technical skills in clinical chemistry and biochemistry.

472 Advanced Clinical Chemistry
Fall, Spring, Summer. 1 credit. P: BLD 416 and BLD 417 R: Open to seniors in the Clinical Laboratory Sciences major. SA: MT 472 C: BLD 471 concurrently.

Theoretical aspects of clinical chemistry, chemical and biochemical reactions, statistical analysis, and pathophysiologic relationships. Integration of cognitive material with clinical laboratory test results.

473 Advanced Clinical Hematology and Body Fluids Laboratory
Fall, Spring, Summer. 3 credits. P: BLD 424L R: Open to seniors in the Clinical Laboratory Sciences major. SA: MT 473

Application and integration of theory and technical skills in hematology, hemostasis, and body fluid analysis.

474 Advanced Clinical Hematology and Body Fluids
Fall, Spring, Summer. 1 credit. P: BLD 424 R: Open to seniors in the Clinical Laboratory Sciences major. SA: MT 474 C: BLD 473 concurrently.

Theoretical aspects of advanced hematology, hemostasis and body fluid analysis. Integration of cognitive material with clinical laboratory test results.

475 Advanced Clinical Immunology and Immunohematology Laboratory
Fall, Spring, Summer. 2 credits. P: BLD 433 R: Open to seniors in the Clinical Laboratory Sciences major. SA: MT 475

Application and integration of theory and technical skills in immunology and immunohematology.

476 Advanced Clinical Immunology and Immunohematology
Fall, Spring, Summer. 1 credit. P: BLD 435 and BLD 434 R: Open to seniors in the Clinical Laboratory Sciences major. SA: MT 476 C: BLD 475 concurrently.

Theoretical aspects of immunology and immunohema- tology. Integration of cognitive material with clinical laboratory test results.

477 Advanced Clinical Microbiology Laboratory
Fall, Spring, Summer. 3 credits. P: MMG 464 and BLD 450 R: Open to seniors in the Clinical Laboratory Sciences major. SA: MT 477

Application and integration of theory and technical skills in clinical microbiology and infectious disease.

478 Advanced Clinical Microbiology
Fall, Spring, Summer. 1 credit. P: MMG 463 or BLD 450 or BLD 498 R: Open to seniors in the Clinical Laboratory Sciences major. SA: MT 478 C: BLD 477 concurrently.

Theoretical aspects of clinical microbiology and infectious disease. Integration of cognitive material with clinical laboratory test results.

479 Professional Behavior in Clinical Laboratory Science
Fall, Spring, Summer. 1(0-2) P: (BLD 220 and BLD 442) and ((BLD 471 or concurrently) or (BLD 473 or concurrently) or (BLD 475 or concurrently) or (BLD 477 or concurrently) R: Open to students in the Clinical Laboratory Sciences major. SA: MT 479

Application of professional behavior principles to practical experiences in clinical laboratory science.

482 Advanced Diagnostic Molecular Science
Spring. 2 credits. R: Open to students in the Diagnostic Molecular Science major. SA: MT 482 C: BLD 483 concurrently or BLD 484 concurrently or BLD 486 concurrently.

Integration of principles and concepts in diagnostic molecular science with diagnostic laboratory test results.

483 Molecular Diagnostic Experience in Hematopathology and Oncology
Spring. 2 credits. P: BLD 438 R: Open to students in the Diagnostic Molecular Science major. SA: MT 483 C: BLD 482 concurrently.

Clinical experience in molecular diagnostic laboratory- ries with applications in hematopathology and on- cology.

484 Molecular Diagnostic Experience in Infectious Disease
Spring. 2 credits. P: BLD 438 R: Open to students in the Diagnostic Molecular Science major. SA: MT 484 C: BLD 437 concurrently.

Clinical experience in molecular diagnostic laboratory- ries with applications to infectious disease diagno- sis.

485 Molecular Diagnostic Experience in Inherited and Predictive Genetics
Spring. 2 credits. P: BLD 438 R: Open to students in the Diagnostic Molecular Science major. SA: MT 485 C: BLD 482 concurrently.

Clinical experience in molecular diagnostic laboratory- ries with applications in inherited and predictive genetics.

486 Molecular Diagnostic Experience in Genotyping and Individual Identification
Spring. 2 credits. P: BLD 438 R: Open to students in the Diagnostic Molecular Science major. SA: MT 486 C: BLD 482 concurrently.

Clinical experience in molecular diagnostic laboratory- ries with applications to genotyping and identification of individuals.

495 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 to students in the Clinical Laboratory Sciences major or in the Diagnostic Molecular Science major or in the Lyman Briggs School-Medical Technology Coordinate Major or in the Medical Technology major. SA: MT 495

Faculty directed study including assigned readings, reviews of appropriate scientific periodicals, re- search, and laboratory experience.

496 Integrative Correlations in Clinical Laboratory Science I
Fall, Spring. 1(2-0) P: BLD 213 and (BLD 414 or BLD 417) R: Open to juniors or seniors in the Clinical Laboratory Sciences major or in the Diagnostic Molecular Science major or in the Medical Technology major or in the Lyman Briggs Diagnostic Molecular Science Coordinate Major or in the Lyman Briggs Medical Technology Coordinate Major. SA: MT 496

Application of the principles and concepts of clinical laboratory science in a problem-based learning format. Ethics, diagnostic value of laboratory tests, social-economic impact of laboratory tests and their regulation.

Biomedical Laboratory Diagnostics—BLD
497 Integrated Correlations in Clinical Laboratory Science II
Fall, Spring. 1(2-0) P: BLD 496 R: Open to juniors or seniors in the Diagnostic Molar Science major or in the Medical Technology major or in the Lyman Briggs Diagnostic Molecular Science Coordinate Major or in the Lyman Briggs Medical Technology Coordinate Major. SA: MT 497
Continuation of BLD 496.

498 Focused Problems in Clinical Laboratory Science
Spring. 2(1-2) P: (MMG 463 or concurrently) and (MMG 464 or concurrently) and BLD 496 R: Open to students in the Clinical Laboratory Sciences major. SA: MT 454, MT 496
Case study problems of medical microbiology, hematology, and clinical chemistry.

801 Biomedical Laboratory Diagnostics Seminar
Spring. 1(1-0) R: Open to students in the Biomedical Laboratory Diagnostics Program. SA: MT 810 Not open to students with credit in NSC 830.
Best practices for the research enterprise. Ethical conduct of research. Critical evaluation of scientific literature.

810 Fundamentals of Scientific Research
Spring of even years. 1(1-0) R: Open to masters students in the Biomedical Laboratory Diagnostics Program. SA: MT 810 Not open to students with credit in NSC 830.
Best practices for the research enterprise. Ethical conduct of research. Critical evaluation of scientific literature.

811 Fundamentals of Scientific Research Seminar
Spring. 1(1-0) R: Open to masters students in the Biomedical Laboratory Diagnostics Program. SA: MT 810 Not open to students with credit in NSC 830.
Best practices for the research enterprise. Ethical conduct of research. Critical evaluation of scientific literature.

815 Cell Biology in Health and Disease I
Spring. 2(2-0) R: Undergraduate course in Biochemistry and Physiology. Experience in a clinical laboratory. Principles and theories of cell biology and biochemistry are presented with a focus on applications to clinical pathology.

816 Cell Biology in Health and Disease II
Spring. 2(2-0) R: Undergraduate course in Biochemistry and Physiology. Experience in a clinical laboratory. Continuation of BLD 815.

820 Advanced Human Hematology
Fall of odd years. 2(2-0) Interdepartmental with Pathobiology and Diagnostic Investigation. Administered by Biomedical Laboratory Diagnostics. RB: BLD 424
Pathogenesis, mechanisms, and morphological pictures. Laboratory tests and interpretation of results.

821 Advanced Clinical Laboratory Practice
Spring. 1(1-0) P: PHM 830 or approval of department RB: Experience in a clinical laboratory
Establishment and review of good clinical laboratory practice through the appropriate use of statistical functions.

830 Concepts in Molecular Biology
Fall, Spring. 2(2-0) Interdepartmental with Pathobiology and Diagnostic Investigation. Administered by Biomedical Laboratory Diagnostics. RB: One course in biochemistry or concurrently. SA: MT 830
Techniques and theories of molecular biology, nucleic acid synthesis and isolation, enzymatic digestion and modification, electrophoresis, hybridization, amplification, library construction, and cloning.

831 Clinical Application of Molecular Biology
Spring, Summer. 2(2-0) P: BLD 830 RB: Basic biochemistry, medical or research laboratory experience SA: MT 831
Molecular diagnostic principles. Diagnostic outcomes in traditional and non-traditional laboratory disciplines.

832 Molecular Pathology Laboratory
Summer. 2(0-4) P: BLD 831 or concurrently SA: MT 831L, MT 832
Equipment operation, DNA extraction and measurement, electrophoresis, hybridization and transfers, amplification and detection including techniques and automated sequencing. Clinical applications.

835 Hemostasis, Thrombosis and Effective Resource Management
Fall. 3(3-0) RB: Background in hemostasis, thrombosis and blood product management. R: Open to lifelong graduate students in the College of Natural Science or in the Biomedical Laboratory Diagnostics Program or in the Clinical Laboratory Sciences major or approval of department.
Theories of coagulation, thrombosis and effective blood product management. Needs and particular stresses during an active bleeding crisis.

842 Managing Biomedical Laboratory Operations
Fall. 2(2-0) R: Open to in the Biomedical Laboratory Operations major or approval of department. SA: MT 842
Integration of the roles of legislative, regulatory, technological and economic factors that influence the practice and management of biomedical laboratory operations.

844 Topics in Biomedical Laboratory Operations
Spring. 1(1-0) P: BLD 842 R: Open to students in the Biomedical Laboratory Operations major or approval of department. SA: MT 844
Current issues relevant to biomedical laboratory operations from an interdisciplinary perspective with an emphasis on efficient laboratory operations.

846 Decision Processes for Biomedical Laboratory Operations
Fall. 2(2-0) P: BLD 842 R: Open to students in the Biomedical Laboratory Operations major or approval of department. SA: MT 846
Integrative case studies presented in a problem-based learning format. Strategies for decision-making in the operations of a biomedical laboratory. Cases integrate scientific principles, management principles and regulatory factors.

850 Concepts in Immunodiagnosics
Fall, Spring. 2(2-0) RB: An undergraduate course in biochemistry or cell biology. SA: MT 850
Immunology principles and theory applied to diagnostic evaluation of the host immune response during health and disease.

851 Clinical Application of Immunodiagnostic Principles
Spring, Summer. 2(2-0) P: BLD 850 SA: MT 851
Immunodiagnostic theories and principles applied to clinical assay development and method evaluation.

852 Immunodiagnostic Laboratory
Summer. 2(2-0) P: BLD 850 SA: MT 851L, MT 852
Performance of immunopurifications, in vitro diagnostic assays and basic flow cytometry. Data analysis and quality control evaluation.

860 Clinical Laboratory Diagnosis of Infectious Diseases
Fall of odd years. 2(2-0) Interdepartmental with Pathobiology and Diagnostic Investigation. Administered by Biomedical Laboratory Diagnostics. RB: MMG 451 and MMG 464 and BLD 434 SA: MT 860
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 3 credits in all enrollments for this course. R: Open to graduate students in the Clinical Laboratory Sciences major. SA: MT 890
Non-thesis research for Plan B master's students.

895 Projects in Biomedical Laboratory Operations
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to masters students in the Biomedical Laboratory Operations major or approval of department. SA: MT 895
Completion of a significant on-site project in cooperation with an industrial/clinical partner.

899 Master's Thesis Research
Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open to graduate students in the Clinical Laboratory Sciences major. SA: MT 899
Master's thesis research.