204  Mechanisms of Disease
Spring, 3(3-0) P: BS 161 or LB 145 or BS 181H SA: MT 204
Pathophysiological mechanisms of diseases. Selected applications to organ system pathology.

213  Application of Clinical Laboratory Principles
Fall, Summer. 2(1-3) P: (CEM 141 and CEM 161) or (LB 171 and LB 171L) RB: BS 171 R: Open to students in the Biomedical Laboratory Science major or in the Lyman Briggs Biomedical Laboratory Science Coordinate major or in the Clinical Laboratory Sciences major or in the Diagnostic Molecular Science major or in the Diagnostic Molecular Science major or in the Lyman Briggs Biomedical Laboratory Science major or in the Lyman Briggs Biomedical Science Coordinate major. Diagnostic assays across various disciplines within the clinical laboratory (microbiology, immunohematology, hematology and molecular diagnostics) as well as data interpretation and problem solving skills.

220  Preparing for a Health Professions Career
Spring. 1(1-0) R: Open to sophomores or juniors. SA: MT 220 Development of skills needed for success in a health professions career. Historical, economic, sociological and ethical perspectives on the U.S. health professions with focus on medical laboratory careers.

324  Fundamentals of Hematology, Hemostasis, and Urinalysis
Fall, 3(3-0) P: (BS 161 or concurrently) or (LB 145 or concurrently) or (BS 181H or concurrently) SA: MT 324 Physiology and biochemistry of normal hematologic, hemostatic, and urinary systems. Principles of diagnostic assays to detect diseases affecting those systems.

324L  Introductory Laboratory in Hematology, Hemostasis and Urinalysis
Fall. 1(0-3) P: BLD 324 or concurrently R: Open to students in the Clinical Laboratory Sciences major. Routine laboratory assays used to assess the health of the hematological, hemostatic, and urinary systems.

413  Advanced Biomedical Laboratory Diagnostics Laboratory
Spring. 1(0-3) P: BLD 213 and BLD 324 and BLD 434 and BLD 435 and MMG 463 RB: BLD 424 and BLD 430 R: Open to students in the Diagnostic Molecular Science major or in the Biomedical Laboratory Science major or in the Lyman Briggs Diagnostic Molecular Science Coordinate Major or in the Lyman Briggs Biomedical Science Coordinate major. Diagnostic assays across various disciplines within the clinical laboratory (microbiology, immunohematology, hematology and molecular diagnostics) as well as data interpretation and problem solving skills.

414  Clinical Chemistry Analysis and Practice
Spring. 3(3-0) P: (STT 200 or concurrently) or (STT 231 or concurrently) or (STT 351 or concurrently) or (STT 421 or concurrently) RB: BLD 213 and PHY 231 R: Open to students in the Biomedical Laboratory Science major or in the Lyman Briggs Biomedical Science Coordinate major or in the Human Biology major. SA: MT 213 Lab safety and standards of good laboratory practice including specimen handling and processing. Application of technologies and techniques to the performance of clinical diagnostic testing.

417  Quality Processes in Diagnostic Laboratory Testing
Spring. 2(2-0) P: (STT 200 or concurrently) or (STT 201 or concurrently) or (STT 421 or concurrently) or (STT 351 or concurrently) or (STT 231 or concurrently) RB: BLD 213 and PHY 231 R: Open to students in the Clinical Laboratory Sciences major or in the Diagnostic Molecular Science major or in the Lyman Briggs Diagnostic Molecular Science Coordinate Major. SA: MT 417 Not open to students with credit in BLD 417. Statistical methods for validating diagnostic laboratory tests including quality control processes, proficiency testing, method evaluation, related regulatory requirements, laboratory information systems, and laboratory mathematics.

424  Advanced Hematology, Hemostasis and Urinalysis
Spring. 2(2-0) P: BLD 324 SA: MT 422, MT 424 Etiology and pathogenesis of diseases of the hematologic, hemostatic and urinary systems including anemias, leukaemias, and hemophilias. Diagnostic testing for such diseases.

424L  Advanced Laboratory in Hematology, Hemostasis, and Urinalysis
Spring. 1(0-3) P: BLD 324L and (BLD 424 or concurrently) Specialized and advanced assays used in the diagnosis of diseases of the hematological, hemostatic, and urinary systems.

430  Molecular Laboratory Diagnostics
Spring. 2(2-0) P: BS 161 or LB 145 or BS 181H SA: MT 430 Concepts and principles of molecular analysis applied to medical diagnostics and related applications.

432, MT 434 Not open to students with credit in BLD 831. Principles and practices of transfusion medicine including blood typing. Principles and practices of transfusion medicine. Transfusion immunology, organ procurement, and rejection detection.

436  Principles of Diagnostic Molecular Science
Spring. 2(2-0) P: BLD 461 and (BS 161 or LB 145 or BS 181H) and ZOL 341 SA: MT 436 Not open to students with credit in BLD 830. C: BMB 462 concurrently. Principles and techniques of molecular diagnostic assays including applicable regulations.

437  Clinical Applications of Diagnostic Molecular Science
Spring. 2(2-0) P: BLD 436 SA: MT 437 Not open to students with credit in BLD 831. Application of molecular diagnostic methods in clinical and other types of laboratory disciplines.

438  Molecular Diagnostic Laboratory
Fall. 2(0-6) P: BLD 436 SA: MT 438 Not open to students with credit in BLD 832. Laboratory in molecular techniques with emphasis on clinical and diagnostic applications.

450  Eukaryotic Pathogens
Spring. 3(3-0) P: BS 161 or LB 145 or BS 181H RB: MMG 201 or MMG 301 SA: MT 450 Medically important fungi and parasites. Host-parasite relationships, life cycles, culture, identification, and associated diseases.
455 Integrating Clinical Laboratory Science Discipline (W) Fall, Spring. 2(0-2) P: (BLD 324 or concurrently) or (BLD 417 or concurrently) or (BLD 416 or concurrently) or (MMG 463 or concurrently) or (BLD 435 or concurrently) or (CIM 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 or in the Biomedical Laboratory Science major or in the Diagnostic Molecular Science 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 or (MMG 201 and BS 161) or (MMG 201 and LB 145) or (MMG 201 and BS 181H) 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 Biomedical Laboratory Science Major or in the Lyman Briggs Biomedical Laboratory Science Coordinate Major or in the Lyman Briggs Environmental Biology/Microbiology Coordinate Major or in the Environmental Biology/Microbiology Major or in the Genomics and Molecular Genetics Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Human Biology Coordinate Major or in the Human Biology Major or in the Microbiology Major or in the Lyman Briggs Microbiology Coordinate 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. 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 chemical and biochemical analysis.

472 Advanced Clinical Chemistry Fall, Spring. 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 424 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 immunohematology. 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. 1(0-2) P: (BLD 220 and BLD 442) and (BDL 471 or concurrently) or (BDL 473 or concurrently) or (BDL 475 or concurrently) or (BDL 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 485 concurrently or BLD 486 concurrently.

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

483 Molecular Diagnostic Experience in Hemopathology 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 laboratories with applications in hemopathology and oncology.

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 laboratories with applications to infectious disease diagnosis.

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 laboratories 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 laboratories with applications to genotyping and identification of individuals.

495 Directed Study Fall, Spring. 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 Coordination Major or in the Medical Technology major. SA: MT 495

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

498 Focused Problems in Clinical Laboratory Science Spring. 2(1-2) P: (MMG 463 or concurrently) and (MMG 464 or concurrently) R: Open to students in the Clinical Laboratory Sciences major. SA: MT 494, MT 498

Case study problems of medical microbiology, hematology, and clinical chemistry.

498L Infectious Disease Diagnostic Laboratory Spring. 1(0-3) P: MMG 463 and MMG 464 and BLD 434 and (BLD 450 or concurrently) RB: BLD 430 R: Open to undergraduate students in the Clinical Laboratory Sciences major. SA: MT 494

Applying pre-analytical, analytical, and post-analytical principles to the identification of infectious agents in unknown samples.

801 Biomedical Laboratory Diagnostics Seminar Fall, Spring. 1(1-0) A student may earn a maximum of 2 credits in all enrollments for this course. SA: MT 801

Current research topics in clinical laboratory sciences.
811 Fundamentals of Scientific Research  
Spring. 1(1-0) R: Open to masters students in the Biomedical Laboratory Diagnostics Program. SA: MT 810  
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) RB: 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  
Summer. 2(2-0) P: BLD 815 RB: Undergraduate course in biochemistry and physiology. Experience in a clinical laboratory  
Continuation of BLD 815.

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  
Equipment operation, DNA extraction and measurement, electrophoresis, hybridization and transfer, 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.

836 Adverse Transfusion Outcomes: Detection, Monitoring and Prevention  
Spring, Summer. 2(2-0) RB: Medical technology and clinical laboratory sciences laboratory professionals. R: Open to lifelong graduate students and open to graduate students in the Biomedical Laboratory Operations major or in the Clinical Laboratory Sciences major.  
Adverse transfusion outcomes (ATO) covering cause, methods of detection, monitoring paradigms and prevention.

837 Transfusion Service Operations and Management  
Fall, Spring. 1(1-0) RB: Clinical transfusion service practical experience. Management and operational practices needed to meet both the fiscal and regulatory oversight of a transfusion service.

842 Managing Biomedical Laboratory Operations  
Fall, Spring. 2(2-0) R: Open to graduate students or lifelong graduate students 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 graduate students or lifelong graduate students 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 masters students or lifelong graduate students 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 Immunodiagnostics  
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 Immunodiagnostics Laboratory  
Summer. 2(2-0) P: BLD 850  
Performance of immunopurifications, in vitro diagnostic assays and basic flow cytometry. Data analysis and quality control evaluation.

853 Advanced Flow Cytometry  
Summer. 2(2-0) P: BLD 850 and BLD 851 and (BLD 852 or concurrently) or approval of department  
Flow cytometry systems, software and reagents. Data analysis and experimental design of complex flow cytometric assays. Flow cytometry applications in medicine and research.

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 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.