120  Learning in the Biomedical Sciences
Fall. 1 credit. R: Open to freshmen or sophomores. SA: MT 120 Not open to stu-
dents with credit in NSC 201 or NSC 202. Learning strategies appropriate for science. Devel-
opment of critical thinking and problem solving. Group processes. Adapting study to personal learn-
ing styles and college instruction.

150  Preview of Biomedical Research
Spring. 1(1-0) Interdepartmental with Natu-
ral Science. Administered by Biomedical Laboratory Diagnostics. R: Open to fresh-
men or sophomores. SA: MT 150 Exploration of biomedical research careers. Biomed-
ical research in the United States: funding, safety, regulatory agencies, ethics, experimental design, trouble-shooting, and data interpretation.

204  Mechanisms of Disease
Spring. 3(3-0) P: BS 111 or LB 145 or BS 149H or BS 159H SA: MT 204 Pathophysiological mechanisms of diseases. Select-ed applications to organ system pathology.

213  Application of Clinical Laboratory Principles
Fall, Summer. 2(1-3) RB: BS 111L R: Open to students in the Clinical Laboratory Sciences major or in the Diagnostic Molecular Science major or in the Human Biology major or in the Lyman Briggs School Medical Technology Coordinate Major or in the Medical Technology major. SA: MT 213 Lab safety and standards of good laboratory prac-tice including specimen handling and processing. Application of technologies and techniques to the performance of clinical diagnostic testing.

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

324  Fundamentals of Hematology, Hemostasis, and Urinalysis
Fall. 3(3-0) P: (BS 111 or concurrently) or (LB 145 or concurrently) or (BS 149H or concurrently) or (BS 159H 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) R: P: BLD 324 R: Open to students in the Clinical Laboratory Sciences major. SA: MT 423, MT 324L Routine laboratory assays used to assess the health of the hematological, hemostatic, and urinary sys-
tems.

416  Clinical Chemistry
Fall. 4(4-0) P: BLD 213 and (BMB 401 or BMB 461) and (PSL 250 or PSL 432) RB: BLD 417 and (CEM 332 or CEM 333) SA: MT 416 Correlation of laboratory test results with normal physiology and biochemistry and with disease states. Metabolic and endocrine systems. Acquired and inherited diseases. Therapeutic drug monitor-
ing, and toxicology.

417  Quality Processes in Diagnostic Laboratory Testing
Fall. 2(2-0) P: (STT 200 or concurrently) or (STT 201 or concurrently) or (STT 213 or concurrently) or (STT 351 or concurrently) or (STT 421 or concurrently) RB: BLD 213 SA: MT 414, MT 417 Statistical methods for validating diagnostic labora-tory tests including quality control processes, profi-ciency 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 hema-tologic, hemostatic and urinary systems including anemias, leukemias, 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) SA: MT 423, MT 424L Specialized and advanced assays used in the diagno-sis of diseases of the hematological, hemostatic, and urinary systems.

430  Molecular Laboratory Diagnostics
Spring. 2(2-0) P: BS 111 or LB 145 or BS 149H or BS 159H SA: MT 430 Concepts and principles of molecular analysis ap-
plied to medical diagnostics and related applica-
tions.

433  Clinical Immunology and Immunohemohematology Laboratory
Spring. 1(0-3) P: BLD 213 and (BLD 435 or concurrently) R: Open to students in the Clinical Laboratory Sciences major. SA: MT 433 Immunologic methods for disease detection. Me-thods of blood typing and pre-transfusion testing.

434  Clinical Immunology
Fall. 3(3-0) P: (BS 111 or concurrently) or (LB 145 or concurrently) or (BS 149H or concurrently) or (BS 159H or concurrently) SA: MT 432, MT 434 Not open to students with credit in MMG 451. Concepts of innate, cellular, and humoral immunity. Immunodeficiency and autoimmunity. Principles and applications of immunoassays in medical labor-
atories.

435  Transfusion and Transplantation Medicine
Spring. 3(3-0) P: BLD 434 or MMG 451 SA: MT 432, MT 435 Principles and practice of transfusion medicine including blood typing. Principles and practices of transplantation medicine. Transplantation immunol-
ogy, organ procurement, and rejection detection.

436  Principles of Diagnostic Molecular Science
Spring. 2(2-0) P: BLD 461 and (BS 111 or LB 145 or BS 149H or BS 159H) and ZOL 341 SA: MT 436 Not open to students with credit in BLD 831. 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.

442  Education and Management in the Clinical Laboratory
Spring. 3(3-0) P: MTH 116 or (MTH 103 and MTH 114) or (STT 200 or STT 201 or STT 231 or STT 351 or STT 421) R: Open to students in the Clinical Laboratory Sciences major or in the Diagnostic Molecular Science major. SA: MT 442 Basic principles and concepts in education and management in clinical laboratories. Systematic approach to instructional design, delivery and evalua-
tion. Principles of leadership, personnel manage-
ment, fiscal management, and regulatory com-
pliance.

450  Eukaryotic Pathogens
Spring. 3(3-0) P: BS 111 or LB 145 or BS 149H or BS 159H RB: MMG 201 or MMG 301 SA: MT 450 Medically important fungi and parasites. Host-
parasite relationships, life cycles, culture, identifica-
tion, and associated diseases.

455  Integrating Clinical Laboratory Science Discipline (W)
Fall, Spring. 2(2-0) 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 (CEM 332 or concurrently) or (BLD 436 or concurrently)) and completion of Tier I writ-
ing requirement R: Open to undergraduate students in the Clinical Laboratory Sciences major and open to undergraduate students in the Medical Technology 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.
Biomedical Laboratory Diagnostics—BLD

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/Biology/ Microbiology Coordinate 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 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. 3(0-0-4) 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 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, Summer. 1(0-2) P: (BLD 220 and BLD 442) and ((BLD 471 or concurrent-l) or (BLD 473 or concurrently) or (BLD 475 or concurrently) or (BLD 477 or concurrent-l)) 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 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 laboratories with applications in hematopathology 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, 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, research, and laboratory experience.

496 Integrative Correlations in Clinical Laboratory Science I
Fall, Spring. 1(2-0) P: BLD 213 and BLD 417 R: Open to juniors or seniors 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 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.

497 Integrative Correlations in Clinical Laboratory Science II
Fall, Spring. 1(2-0) P: BLD 496 R: Open to juniors or seniors in the Medical Technology major or in the Diagnostic Molecular Science major or in the Lyman Briggs School-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 451 or concurrently) and MMG 301 or concurrently or BLD 417 R: Open to students in the Clinical Laboratory Sciences major. SA: MT 498 Case study problems of medical microbiology, hematology, and clinical chemistry.

801 Biomedical Laboratory Diagnostics Seminar
Spring. 1(0-0) A student may earn a maximum of 2 credits in all enrollments for this course. R: Open to graduate students in the Clinical Laboratory Sciences major. SA: MT 801 Current research topics in clinical laboratory sciences.

811 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 630. 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) P: 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.

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.

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 transfects, 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. SA: MT 835 Principles 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 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 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 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.