BIOMEDICAL LABORATORY SCIENCE (BLS)

BLS 1100 - Foundations of Medical Laboratory Science
Credit(s): 2 Credits
This course introduces students to medical science with an emphasis on Clinical Laboratory Science. Content focuses on major sub-specialties of medical laboratory science including chemistry, hematology, microbiology, urinalysis, immunology and blood banking. Identification and exploration of research opportunities, career options and volunteering services are also covered. Teaching modalities include lectures, case studies and discussion of laboratory testing in disease diagnosis.
Corequisite(s): BLS 1150

BLS 1150 - Foundations of Medical Laboratory Science Lab
Credit(s): 1 Credit
This laboratory course is a supplement to the Foundations of Medical Laboratory Science lecture course (BLS 1100) and serves to reinforce the basic concepts through hands-on laboratory testing. Students will perform a variety of routine clinical laboratory tests to solve patient cases. Basic principles of testing methods, laboratory techniques and interpretation of laboratory results will be covered.
Corequisite(s): BLS 1100

BLS 1850 - Research
Credit(s): 1-3 Credits (Repeatable for credit)
This experiential course provides the opportunity to familiarize students with basic principles of research design, data collection, data analysis, and hypothesis testing. In consultation with a faculty mentor, the student selects a research project and begins the preliminary activities associated with developing a research question to include searching the literature, participation in grant, IRB and animal control protocols, procedure writing and training in research techniques. Experimentation and data collection may begin as time permits. Students are required to meet with their faculty mentor on a regular basis during the semester.
Attributes: Special Approval Required

BLS 2850 - Research
Credit(s): 1-3 Credits (Repeatable for credit)
This experiential course provides the opportunity to apply the basic principles of research design, data collection, data analysis, and hypothesis testing to a research study. In consultation with a faculty mentor, the student performs experiments and collects data to test the research hypothesis associated with the research project selected. Students are required to meet with their faculty mentor on a regular basis during the semester.
Prerequisite(s): BLS 2850 with a grade of C or higher
Attributes: Special Approval Required

BLS 3850 - Research
Credit(s): 1-3 Credits (Repeatable for credit)
This experiential course provides the opportunity to apply the basic principles of research design, data collection, data analysis, and hypothesis testing to a research study. In consultation with a faculty mentor, the student performs experiments and collects data to test the research hypothesis associated with the research project selected. Students are required to meet with their faculty mentor on a regular basis during the semester.
Prerequisite(s): BLS 2850 with a grade of C or higher
Attributes: Special Approval Required

BLS 3930 - Special Topics
Credit(s): 1-3 Credits (Repeatable for credit)

BLS 4110 - Medical Biochemistry I
Credit(s): 3 Credits
Part one of a two-part course to study the biochemical principles as applied to clinical investigation of disease. Topics include but are not limited to: protein structure and function; enzyme kinetics; carbohydrate and lipid metabolism; fluid and electrolyte balance. Medical chemistry testing will be applied to the evaluation of specific organ systems diseases.
Prerequisite(s): BIOL 3020 with a grade of C- or higher; CHEM 2410 with a grade of C- or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Med Sciences or Medical Laboratory Science.

BLS 4120 - Medical Biochemistry II
Credit(s): 2 Credits
Continuation of BLS-4110 focusing on biochemical principles and their application to the clinical investigation of disease. Topics include but are not limited to: trace elements, acid base balance, liver function, endocrinology, therapeutically drug monitoring and toxicology.
Prerequisite(s): BLS 4110 with a grade of C or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Med Sciences or Medical Laboratory Science.

BLS 4130 - Principles & Techniques in Molecular Biology
Credit(s): 2 Credits
Course provides an introduction to principles and applications of molecular biology to include nucleic acid biochemistry as well as basic molecular techniques to include but not limited to isolation and analysis of DNA and RNA, hybridization, amplification, sequence analysis, mutation detection, gel electrophoresis and array technology. Course includes the application of concepts and principles to the diagnosis of human disease.
Prerequisite(s): BIOL 3020 with a grade of C- or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Med Sciences or Medical Laboratory Science.
BLS 4210 - Hematology
Credit(s): 4 Credits
Content emphasizes the physiology of the blood forming organs and
the maturation and function of their cellular products. Routine and
confirmatory laboratory testing will be discussed to include purpose
of test, performance of test and interpretation of results. Discussions
will involve the pathophysiology, evaluation and diagnosis of blood
dyscrasias to include anemias, leukemias, lymphomas, myeloproliferative
and myelodysplastic conditions and other blood diseases using
laboratory test results.
Prerequisite(s): BIOL 3020 with a grade of C- or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Med
Sciences or Medical Laboratory Science.

BLS 4220 - Hemostasis and Thrombosis
Credit(s): 2 Credits
Principles and laboratory analysis of normal hemostasis and fibrinolysis
will be presented to include blood vessel, platelet, and coagulation protein
function. Discussions will include the pathophysiology of bleeding
conditions, thrombotic disorders, and thrombophilia, and their diagnosis
using laboratory results. The physiology and laboratory monitoring of
anticoagulant therapy will be discussed.
Prerequisite(s): BIOL 3020 with a grade of C- or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Med
Sciences or Medical Laboratory Science.

BLS 4310 - Immunohematology
Credit(s): 3 Credits
This course introduces basic immunologic and genetic principles
governing blood groups and blood transfusion practice. Blood group
systems, antibody identification, compatibility testing, and transfusion
therapy are covered.
Prerequisite(s): BLS 4411 with a grade of C or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Med
Sciences or Medical Laboratory Science.

BLS 4410 - Fundamentals of Immunology
Credit(s): 2 Credits
Course focuses on the human immune system to include but is not
limited to theories of innate, humoral and cellular immunity, development
and functions of T-cells and B-cells, the antibody response, the genetics
of antibody diversity.
Prerequisite(s): BIOL 3020 with a grade of C- or higher

BLS 4420 - Medical Immunology
Credit(s): 2 Credits
The course will apply concepts of basic immunology to human
disease to include concepts of hypersensitivity, immune deficiencies,
transplantation and tumor immunology. Lecture presentations of the
recent advances in immunology that are relevant to transplantation,
infectious disease, tumor immunology and nutrition.
Prerequisite(s): BLS 4411 with a grade of C or higher

BLS 4411 with a grade of C or higher

BLS 4510 - Medical Microbiology
Credit(s): 4 Credits
Content focuses on microorganisms of pathologic importance to include
bacteria and viruses with an overview of parasites and fungi involved
in human disease. Included are discussions on structure, molecular
biology, molecular diagnostics, metabolism, growth, replication, food
borne illnesses, current topics and emerging concerns. Pathogenicity,
epidemiology, diagnosis and laboratory identification of important groups
of human pathogenic bacteria along with modes of action of selected
antimicrobics and chemotherapeutic agents are also discussed. In
addition to the prerequisites, BIOL 3020 is recommended.
Prerequisite(s): (BIOL 1100 with a grade of C- or higher or BIOL 1240 with
a grade of C- or higher); CHEM 1120 with a grade of C- or higher

BLS 4610 - Research Design, Critique & Presentation
Credit(s): 3 Credits
*This course introduces students to research and includes discussion
and assignments relevant to biomedical research design and
performance. Topics include but are not limited to critical reasoning,
safety and ethical components of research performance, literature review
and critique, scientific writing and principles of effective presentations.
Prerequisite(s): (MATH 1300 with a grade of C- or higher or STAT 1300
with a grade of C- or higher)
Restrictions:
Enrollment is limited to students with a major in Investigative Med
Sciences or Medical Laboratory Science.

BLS 4850 - Research
Credit(s): 3 Credits (Repeatable for credit)
This experiential course provides the opportunity for students to apply
the basic principles of research design, data collection, data analysis,
and hypothesis testing to a research study. In consultation with a faculty
mentor, the student performs experiments and collects data to test
the research hypothesis associated with the research project selected.
The course culminates in a publication ready manuscript. Students are
required to meet with their faculty mentor on a regular basis during the
semester.
Prerequisite(s): BLS 3850 with a grade of C or higher
Attributes: Special Approval Required

BLS 5125 - Introduction to Clinical Laboratory Medicine
Credit(s): 3 Credits
The purpose of the course is to discuss the most common laboratory
tests ordered, performed, and interpreted in the areas of Clinical
Chemistry, Hematology, Immunology, Transfusion Medicine (Blood Bank),
Hemostasis, Medical Microbiology, and Urinalysis. Discussions will
include the purpose of each test, test ordering practices, relationship to
disease pathophysiology, result interpretation, and how test results are
included in diagnostic algorithms. Physician Assistant majors only.
Restrictions:
Enrollment limited to students in the Master of Medical Science program.