



Program Approval Form

For approval of new programs and deletions or modifications to an existing program.

Action Requested:

- Create New (SCHEV approval required except for minors)
- Inactivate Existing
- Modify Existing (check **ALL** that apply)
 - Title (SCHEV approval required except for minors)
 - Concentration** (Choose one): Add Delete Modify
 - Degree Requirements
 - Admission Standards/ Application Requirements
 - Other Changes: _____

Type (Check one):

- B.A. B.S. Minor
- Master's
- Ph.D.
- Undergraduate Certificate*
- Graduate Certificate*
- Bachelor's/Accelerated Master's Other:

College/School: **Department:**

Submitted by: **Ext:** **Email:**

Effective Term: Fall **Please note:** For students to be admitted to a new degree, minor, certificate or concentration, the program must be fully approved, entered into Banner, and published in the University Catalog.

Justification: (attach separate document if necessary)

Program Title: (Required)
Title must identify subject matter. Do not include name of college/school/dept.

Concentration(s):

Admissions Standards / Application Requirements: (Required only if different from those listed in the University Catalog)

Degree Requirements:
Consult University Catalog for models, attach separate document if necessary using track changes for modifications

Courses offered via distance:
(if applicable)

TOTAL CREDITS REQUIRED:

Existing	New/Modified
Medical Laboratory Science BS	
	Molecular Biology
	NA
	See attached
	NA
	30

*For Certificates Only: Indicate whether students are able to pursue on a Full-time basis Part-time basis

Approval Signatures

Department _____ Date _____ College/School _____ Date _____

If this program may impact another unit or is in collaboration with another unit at Mason, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Undergraduate Programs only

Undergraduate Council Member _____ Provost Office _____ Undergraduate Council Approval Date _____

For Graduate Programs Only

Graduate Council Member _____ Provost Office _____ Graduate Council Approval Date _____

Program Proposal Submitted to the College of Science Curriculum Committee (COSCC)

The form above is processed by the Office of the University Registrar. This second page is for the COSCC's reference.
Please complete the applicable portions of this page to clearly communicate what the form above is requesting.

FOR ALL PROGRAMS (required)

Program Title: Concentration in Molecular Biology

Date of Departmental Approval: November 18, 2016

FOR INACTIVATED PROGRAMS (required if inactivating a program)

- Reason for Inactivation:

FOR MODIFIED PROGRAMS (required if modifying a program)

- Summary of the Modification:
- Text before Modification (title, degree requirements, etc.):
- Text after Modification (title, degree requirements, etc.):
- Reason for the Modification:

FOR NEW PROGRAMS (required if creating a new program)

Reason for the New Program: The Medical Laboratory Science (MLAB) degree program addresses the growing national demand for trained medical laboratory scientists. It is our mission for students to gain the skills, knowledge, motivation, and insight through career-oriented laboratory education. At present the MLAB program only offers training as a generalist, meaning that once they leave GMU they will be able to take the board certification test and practice in any area of a hospital or laboratory. However some of our students would prefer to work in one particular area of the laboratory science. Offering a concentration in molecular biology would allow for students to do their clinical rotations specifically in this area. At the end of their training they would be able to take the board certification test in Molecular Biology. One of our Affiliated Clinics, Quest Diagnostics, is prepared to offer this concentration for us during the 4th clinical year required for the BS Degree in Medical Laboratory Science.

- Relationship to Existing Programs:
NA
- Relationship to Existing Courses:
NA
- Semester of Initial Offering:
Fall 2017
- Insert Tentative SCHEV Proposal Below



Department of Biology

4400 University Drive, MS 3E1, Fairfax, Virginia 22030

Phone: 703-993-1050; Fax: 703-993-1046

November 14, 2016

Proposal for a New Concentration within the BS in Medical Laboratory Science

Title: Concentration in Molecular Biology

Justification

Medical laboratory science (MLS) is the use of clinical laboratory tests to detect, diagnose, monitor, and treat disease. Medical laboratory scientists (formerly known as medical technologists) are laboratory professionals who are part of the medical team of specialists who work together to determine the presence, extent, or absence of disease. Over 70% of all medical decisions are based on medical laboratory scientist's results. The Medical Laboratory Science Program provides students with an education in clinical laboratory science and prepares graduates to become certified medical laboratory scientists (MLS). In addition MLS programs are highly competitive and are generally only able to train 4-12 students per year due to one-on-one training. In order to address the increased need in medical laboratory scientists with the aging population and the overall lack of clinical training programs offering a generalist degree we are proposing two new concentrations. These concentration would allow students more students to become certified MLSs in their chosen field.

Curriculum

In addition to the courses required for all students earning the BS degree in Medical Laboratory Science, the following will be required for 30 credits.

Molecular Biology Concentration

Description: The Technologist Training Program is a pathway leading to eligibility for categorical certification as a Certified Technologist by the American Society for Clinical Pathology (ASCP) Board of Certification (BOC). The course is one year long, consisting of about 20% classroom and 80% hands-on laboratory experience. Instructors include the expert clinical scientists and technologists of Quest Diagnostics, Chantilly, Virginia.

Molecular Biology Concentration

The following two topics will be covered under MLAB 401

Introduction to CLS and Laboratory Operations

This course is a brief introduction to the Clinical Laboratory Science professions and Laboratory Operations. Topics include Introduction to Laboratory Operations, Pre-analytics and Specimen Types, Quality Management Concepts, Quality Control, Laboratory Professions, Professional Ethics, Laboratory Mathematics, Proper use of Laboratory Equipment, Introduction to Laboratory Instrumentation.

Board Exam Preparation

This course is a structured review and practice in preparation for the American Society for Clinical Pathology Technologist in Molecular Biology Board of Certification Exam. Practice tests and questions from a variety of published and authoritative sources are used to reinforce the content of the Technologist in Molecular Biology program.

The following topics will be covered under MLAB 407

Introduction to Clinical Molecular Biology

This course presents the fundamentals of nucleic acid testing in the clinical laboratory, and the underlying human genetics. Topics include Fundamentals of Nucleic Acid Biochemistry, Common Techniques in Molecular Biology (Extraction, Resolution and Detection, of Nucleic Acids, Analysis and Characterization, Amplification, Chromosomal Structure and Mutations, Gene Mutations, and DNA Sequencing.

Advanced Methods in Clinical Molecular Biology

This course applies the fundamentals of nucleic acid testing to advanced methods commonly used in the contemporary clinical and research laboratory. Topics include PCR, Transcription-Based Amplification, Probe Amplification, Branched DNA, Hybrid Capture; Amplification: Signal , Cleavage-Based, Cycling Probe; Sequencing: Direct, Next Gen, Pyrosequencing, Bisulfite, RNA Sequencing; and Bioinformatics; Human Genome Project

Molecular Detection of Infectious Disease

This course examines the advances in using molecular methods to detect human infectious disease. Careful attention is given to the comparison of molecular technologies with traditional microbiology methods. Topics include molecular methods and applications, including PCR, sequencing, TMA, and PEGE; specimens of choice, sample preparation, Quality Control, primer selection; Molecular methods in selecting antimicrobial agents; molecular epidemiology, and target organisms: fungi, bacteria, parasites, and viruses.

Human Molecular and Chromosomal Applications and Pathology

This course presents advanced methods in nucleic acid testing to human medico-legal, forensic, and pathology applications. Topics include: Polymorphisms, RFLP, Paternity Testing, Linkage, Single Nucleotide Polymorphisms, Bone Marrow Engraftment, Mitochondrial DNA Polymorphisms and Disorders, Chromosomal Abnormalities, Patterns of Inheritance, Single Gene Disorders, Lysosomal Storage Disorders, Cystic Fibrosis, Trinucleotide Repeats, Genomic Imprinting , Array CGH, Molecular Oncology, HLA and Transplantation