

**MICHIGAN STATE
UNIVERSITY**

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MEMORANDUM

TO: Dr. June Youatt, Assistant Provost for Undergraduate Education
and Dean of Undergraduate Studies

FROM: Dr. Linda O. Stanford, Assistant Provost for Academic Services and
Registrar

RE: Request for a New Academic Program – Bachelor of Science Degree in
Diagnostic Molecular Science

For Transmittal to the University Committee on Academic Policy (UCAP)

The request referenced above is being sent to you for action by the University Committee on Academic Policy (UCAP). The Medical Technology Program is requesting to establish a new Bachelor of Science degree in Diagnostic Molecular Science. Included in the requirements are requirements for admission as a junior as well as academic standards requirements.

Please ask the UCAP to consider the request referenced above at its meeting on February 10, 2005. Please mail the related materials referenced under the heading Attachments at the end of this memorandum to the members of the UCAP.

The academic program request referenced above will be included on the agenda for the February 17, 2005 meeting of Subcommittee A, University Committee on Curriculum (UCC). Requests that are approved by Subcommittee A on February 17 will be before the Full Committee, UCC, for action on March 3, 2005. Requests that are approved by the Full Committee on March 3 will be included in the March 22, 2005, Report of the UCC to the Academic Council.

If you have any questions about this memorandum or the attached materials, please call me at 5-8420.

Thank you for your help.

Attachments:

1. Request for a New Academic Program form dated October 28, 2004; Bachelor of Science Degree in Diagnostic Molecular Science and attachments.

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**UNIVERSITY
CURRICULUM
and CATALOG**

Michigan State University
176 Administration Building
East Lansing, Michigan
48824-1046

PH: 517/355-8420
FAX: 517/353-1935

COLLEGE OF NATURAL SCIENCE

1. Request to establish a **Bachelor of Science** degree in **Diagnostic Molecular Science** in the Medical Technology Program, College of Natural Science. The University Committee on Academic Policy (UCAP) will consider this request at its February 10, 2005 meeting.

- a. **Background Information:**

The diagnostic molecular science major is a professional program analogous to the clinical laboratory sciences major offered by the Medical Technology Program. The program will prepare students to perform laboratory assays that involve DNA (i.e. molecular testing). The major includes three phases. The first phase is the pre-professional and preparatory courses that include the University and College requirements as well as prerequisites to the major courses. The second phase is the on-campus professional (major) courses. The third phase is a clinical practicum in clinical and other laboratories. The program is seeking accreditation from the National Accrediting Agency for Clinical Laboratory Sciences. This specialized accreditation will allow graduates to sit for the national certifying examinations offered for medical laboratory professionals. Medical laboratory employers prefer to hire certified individuals as it reduces the training required on the job.

A number of factors were considered during the development of the diagnostic molecular science program including: (1) the tremendous growth in the *in vitro* diagnostic market and the development of test kits using molecular biology techniques; (2) the implementation in medical laboratories of molecular diagnostic technology in routine testing and the creation of molecular diagnostic divisions now that the technology is more readily available; (3) the increased enrollment in graduate-level certificate courses in molecular laboratory diagnostics which indicates a need for working medical laboratory professionals to acquire this new knowledge and for entry-level professionals; and (4) the favorable employment outlook for this major and national certifying examinations. These considerations demonstrate the need for medical laboratory professionals proficient in the diagnostic methods needed to detect acquired, inherited, and infectious diseases via molecular techniques. The development of the diagnostic molecular science major has a prominent place in the future of MSU education and ensures that MSU continues as a leader in innovative laboratory science education.

Michigan State University provides a superior learning environment and excellent educational opportunities for students. Extensive resources offered by the university support student success and ready compliance with accreditation standards. The implementation of the diagnostic molecular science major is innovative, because there are only three other accredited programs nationwide. Although one of those programs is at Northern Michigan University, a program serving the southern part of the state is justified as this field expands. Development of this program will be essential for MSU to uphold its reputation as a leader in laboratory science education.

- b. **Academic Programs Catalog Text:**

Diagnostic molecular science is the allied health profession whose practitioners specialize in performing medical laboratory tests on DNA and RNA. These tests are used to diagnose and monitor hereditary conditions and acquired diseases such as leukemia and infectious diseases. The diagnostic molecular science major is a professional program designed to prepare students for national certification in diagnostic molecular science qualifying them to work in medical laboratories performing molecular testing. Graduates will also be prepared for positions in research and industrial laboratories. The program includes courses in mathematics and statistics, molecular biology, genetics, chemistry, biochemistry, and clinical laboratory sciences and includes a semester-long practicum experience in clinical and other laboratories. The first phase of the program is the pre-professional and preparatory courses that include the University and College requirements as well as prerequisites to the major courses. The second phase is the on-campus professional (major) courses. The third phase is a clinical practicum in clinical and other laboratories.

Admission as a Junior

Enrollment in the diagnostic molecular science major is limited. A new class is admitted at the junior level each calendar year. Applications for admission must be received by December 1 in the year in which admission is sought.

To be considered for admission, the applicant must meet the following minimal criteria, in addition to the College of Natural Science requirements:

1. Have an overall grade-point average of 2.50.
2. Have completed a minimum of 56 credits which must include the following courses:
 - a. Medical Technology 213.
 - b. Chemistry 162, 251, and 252.
 - c. Mathematics 116 or equivalent.
 - d. Biological Science 111 and 111L.

Applications for admission to the diagnostic molecular science major are reviewed by a committee of the faculty. Factors considered by the admission committee in the applicant's review and admission action are (1) grade-point average in science and non-science courses, (2) grade-point average for selected preclinical laboratory science courses, (3) diagnostic laboratory exposure, (4) interview, and (5) written compositions.

Academic Standards

To progress to the clinical phase of the curriculum, students must earn a 2.0 or higher in Zoology 341, and Medical Technology 436 and 438.

A specific statement of the policies for the clinical phase is provided in the *Student Policies for Diagnostic Molecular Science Students*. These policies are provided to all students upon acceptance to the major, but may be obtained earlier from the Medical Technology Program, 322 N. Kedzie Hall. Admitted students are responsible for knowing and adhering to these program policies.

Requirements for the Bachelor of Science Degree in Diagnostic Molecular Science

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science degree in Diagnostic Molecular Science.

The University's Tier II writing requirement for the Diagnostic Molecular Science major is met by completing Medical Technology 455. That course is referenced in item 3. b. below.

Students who are enrolled in the College of Natural Science may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading *Graduation Requirements* in the College statement. Certain courses referenced in requirement 3. below may be used to satisfy the alternative track.

2. The requirements of the College of Natural Science for the Bachelor of Science degree.

The credits earned in certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.

3. The following requirements for the major: CREDITS
 - a. Courses outside medical technology: 48
 - (1) All of the following courses (45 credits):

BMB	461	Biochemistry I	3
BMB	462	Biochemistry II	3
BS	111	Cells and Molecules	3
BS	111L	Cell and Molecular Biology Laboratory	2
CEM	141	General Chemistry	4

	CEM	161	Chemistry Laboratory I	1
	CEM	162	Chemistry Laboratory II	1
	CEM	251	Organic Chemistry I	3
	CEM	252	Organic Chemistry II	3
	CEM	332	Instrumental Methods	2
	PHY	231	Introductory Physics I	3
	PHY	232	Introductory Physics II	3
	PSL	250	Introductory Physiology	4
	STT	421	Statistics I	3
	STT	422	Statistics II	3
	ZOL	341	Fundamental Genetics	4
(2)	One of the following courses (3 credits):			
	MTH	124	Survey of Calculus I	3
	MTH	132	Calculus I	3
b.	All of the following medical technology courses (31 credits):			
	MT	204	Mechanisms of Disease	3
	MT	213	Application of Clinical Laboratory Principles	2
	MT	220	Preparing for a Health Professions Career	1
	MT	417	Quality Processes in Diagnostic Laboratory Testing	2
	MT	436	Principles of Diagnostic Molecular Science	2
	MT	437	Clinical Applications of Diagnostic Molecular Science	2
	MT	438	Molecular Diagnostic Laboratory	2
	MT	442	Education and Management in the Clinical Laboratory	3
	MT	455	Integrating Clinical Laboratory Science Discipline (W)	2
	MT	482	Advanced Diagnostic Molecular Science	2
	MT	483	Molecular Diagnostic Experience in Hematopathology and Oncology	2
	MT	484	Molecular Diagnostic Experience in Infectious Disease	2
	MT	485	Molecular Diagnostic Experience in Inherited and Predictive Genetics	2
	MT	486	Molecular Diagnostic Experience in Genotyping and Individual Identification	2
	MT	496	Integrative Correlations in Clinical Laboratory Science I	1
	MT	497	Integrative Correlations in Clinical Laboratory Science II	1
c.	At least two of the following courses (5 to 7 credits):			
	MMG	301	Introductory Microbiology	3
	MMG	431	Microbial Genetics	3
	MMG	433	Microbial Genomics	3
	MMG	445	Basic Biotechnology	3
	MMG	463	Medical Microbiology	3
	MT	324	Fundamentals of Hematology, Hemostasis, and Urinalysis	3
	MT	416	Clinical Chemistry	4
	MT	424	Advanced Hematology, Hemostasis, and Urinalysis	2
	MT	434	Immunology	3
	ZOL	404	Human Genetics	3
	ZOL	450	Cancer Biology	3

Effective Fall 2005.