

BIOMEDICAL SCIENCE MAJOR: MEDICAL LABORATORY SCIENCES OPTION (B.S.)

<http://colsa.unh.edu/mcbs/biomedical/medical-laboratory-science-mls-option>

Description

The Medical Laboratory Sciences (MLS) program is NAACLS accredited (<http://www.naacls.org/>) and follows accreditation requirements. Students in this option take four Foundation courses, five Bioscience Core courses, six required BMS:MLS core courses, and five Major Elective courses. One capstone experience, supervised and approved within the major, is required of all seniors. The capstone explores areas of interest based on the integration of prior learning. In addition, all other University academic requirements must be completed, including those for Discovery Program (<http://catalog.unh.edu/archives/2017-2018/undergraduate/university-academic-requirements/discovery-program>) and the University Writing Requirement (<http://catalog.unh.edu/archives/2017-2018/undergraduate/university-academic-requirements/writing>).

Requirements

A grade of C-minus or above is required in BMS:MLS Core Courses.

Foundation Courses

CHEM 403	General Chemistry I ¹	4
CHEM 404	General Chemistry II	4
CHEM 545 & CHEM 546	Organic Chemistry and Organic Chemistry Laboratory ²	5
Select one of the following: ³		
BIOL 528	Applied Biostatistics I	4
PSYC 402	Statistics in Psychology	4
SOC 502	Statistics	4
MATH 439	Statistical Discovery for Everyone	4

Bioscience Core Courses

BMS 508	Human Anatomy and Physiology II	4
GEN 604	Principles of Genetics	4
BMCB 658 & BMCB 659	General Biochemistry and General Biochemistry Lab	5
Select one of the following: 4-5		
BMS 503 & BMS 504	General Microbiology and General Microbiology Laboratory	5
BMS 501	Microbes in Human Disease	4
Select one of the following: ⁴		
BMS 507	Human Anatomy and Physiology I	4
BIOL 411	Introductory Biology: Molecular and Cellular ²	4

- ¹ CHEM 403 fulfills the Physical Science Discovery requirement.
- ² Students applying to health profession schools need a full year of English, a full year of Introductory Biology, and a full year of Organic Chemistry. ENGL 502 or 503 should be taken in addition to ENGL 401; CHEM 651/653 and CHEM 652/654 should be taken in place of CHEM 545/546. See Pre-Professional Health Program Advising. (<http://www.unh.edu/uacc/premed-advising>)
- ³ Any of these courses fulfills the Quantitative Reasoning Discovery requirement
- ⁴ Either course fulfills the Biological Science Discovery requirement and Discovery Laboratory requirement. BIOL 411 also fulfills the Discovery Inquiry requirement.

BMS-MLS Core Courses

BMS 401	Professional Perspectives in Biomedical Sciences	1
BMS 560 & BMS 561	Body Fluids and Body Fluids Laboratory	4
BMS 602 & BMS 603	Pathogenic Microbiology and Pathogenic Microbiology Laboratory	5
BMS 642 & BMS 643	Clinical Immunology and Serology and Clinical Serology Laboratory	4
BMS 650	Molecular Diagnostics ⁵	4
BMS 720	Mycology, Parasitology, and Virology ⁶	3

- ⁵ BMS 650 fulfills the Environment, Tech and Society Discovery requirement
- ⁶ If BMS 721 Mycology, Parasitology, and Virology Laboratory is taken concurrently with BMS 720, it may count as one of the two required laboratory elective components. However, BMS 721 does not count as a Major Elective course, so five Major Electives must still be completed, at least one of which includes a lab component, plus four additional Major Electives with or without lab.

BMS-MLS Major Electives

A total of five unique Major Electives is required. Two courses must have a Laboratory component.

Choose TWO Major Electives with a Laboratory component

BMS 623	Histology: Microscopic Cellular Structure and Function	4
BMS 644 & BMS 645	Clinical Hematology and Clinical Hematology Laboratory ⁷	5
BMS 656 & BMS 657	Immunohematology and Blood Banking Laboratory ⁷	4
BMS 658 & BMS 659	Medical Biochemistry and Clinical Chemistry Laboratory ⁷	5
BMS 705 & BMS 715	Immunology and Immunology Laboratory	5
BMS 706 & BMS 708	Virology and Virology Laboratory	5
BMS 721	Mycology, Parasitology, and Virology Laboratory (coreq BMS 720) ^{6,7}	2
BMS 740	Human Microbiome	4

Choose THREE Major Electives from the list below (FOUR if BMS 721 is counted as a Laboratory course) ⁶

BMS 610	Biomedical Lab Management ⁷	4
---------	--	---

BMS 623	Histology: Microscopic Cellular Structure and Function	4
BMS 635	Preceptorial in Prehospital Care	2
BMS 640	Phlebotomy Theory ⁷	2
BMS 641	Phlebotomy Clinical Internship ⁷	1-2
BMS 644	Clinical Hematology	3
BMS 644 & BMS 645	Clinical Hematology and Clinical Hematology Laboratory ⁷	5
BMS 644 & BMS 646	Clinical Hematology and Clinical Hemostasis	4
BMS 656 & BMS 657	Immunoematology and Blood Banking Laboratory ⁷	4
BMS 658 & BMS 659	Medical Biochemistry and Clinical Chemistry Laboratory ⁷	5
BMS 702	Endocrinology	4
BMS 703	Infectious Disease and Health	4
BMS 704	Pathologic Basis of Disease	4
BMS 705 & BMS 715	Immunology and Immunology Laboratory	5
BMS 706 & BMS 708	Virology and Virology Laboratory	5
BMS 711	Toxicology	4
BMS 712	Grand Rounds	2
BMS 716	Public Health: Food- and Water-borne Diseases	4
BMS 718	Mammalian Physiology	4
BMS 719	Host-Microbe Interactions	4
BMS 730	Ethical Issues in Biomedical Science	4
BMS 740	Human Microbiome	4
BMS 750	Case Studies ⁷	1-5
BMCB 753	Cell Culture	5
BMCB 760	Pharmacology	4
BMCB 763	Biochemistry of Cancer	4
GEN 706	Human Genetics	4
BMS 751	Advanced Clinical Microbiology Internship ⁷	5
BMS 752	Advanced Hematology Internship ⁷	5
BMS 753	Advanced Immunoematology Internship ⁷	5
BMS 754	Advanced Clinical Chemistry Internship ⁷	5
BMS 761	Clinical Microbiology Internship	20
BMS 762	Clinical Hematology Internship	20
BMS 763	Clinical Immunoematology Internship	20
BMS 764	Clinical Chemistry Internship	20
BMS 790	Undergraduate Teaching Experience	1-4
BMS 795	Investigations in Biomedical Science	1-8
BMS 795W	Investigations in Biomedical Science	1-8
BMS 796	Biomedical Research Internship	4-16
BMS 799	Senior Thesis	1-4
BMS 799H	Senior Honors Thesis	1-4

⁷ Required for students interested in MLS clinical generalist internship

Approved BMS:MLS Capstone Courses

The capstone explores areas of interest based on the integration of prior learning. The capstone requirement may be satisfied through a course, created work or product, or some form of experiential learning

(e.g., honors thesis, mentored research project, or other special student activity). The capstone requirement can only be fulfilled once a student has senior standing in the major.

BMS 635	Preceptorial in Prehospital Care	2
BMS 716	Public Health: Food- and Water-borne Diseases	4
BMS 719	Host-Microbe Interactions	4
BMS 740	Human Microbiome	4
BMS 750	Case Studies	1-5
BMS 751	Advanced Clinical Microbiology Internship	5
BMS 752	Advanced Hematology Internship	5
BMS 753	Advanced Immunoematology Internship	5
BMS 754	Advanced Clinical Chemistry Internship	5
BMS 761	Clinical Microbiology Internship	20
BMS 762	Clinical Hematology Internship	20
BMS 763	Clinical Immunoematology Internship	20
BMS 764	Clinical Chemistry Internship	20
BMS 790	Undergraduate Teaching Experience (2 semesters, including lab presentation or instruction)	1-4
BMS 795	Investigations in Biomedical Science (4-credit minimum)	1-8
BMS 795W	Investigations in Biomedical Science (4-credit minimum)	1-8
BMS 796	Biomedical Research Internship	4-16
BMS 799	Senior Thesis (4-credit minimum)	1-4
BMS 799H	Senior Honors Thesis	1-4
INCO 790	Advanced Research Experience (4-credit minimum)	1-4

For a Capstone experience not listed above, such as an internship, submit a Capstone Experience Approval form **prior** to beginning the experience.

Degree Plan

SAMPLE Course Sequence for Medical Laboratory Science

Course	Title	Credits
First Year		
Fall		
BMS 401	Professional Perspectives in Biomedical Sciences	1
ENGL 401	First-Year Writing	4
BMS 507 or BIOL 411	Human Anatomy and Physiology I or Introductory Biology: Molecular and Cellular	4
CHEM 403	General Chemistry I	4
Discovery Course		4
Credits		17
Spring		
BMS 508	Human Anatomy and Physiology II	4
CHEM 404	General Chemistry II	4
Statistics		4
Discovery Course		4
Credits		16

Second Year**Fall**

BMS 503 & BMS 504	General Microbiology and General Microbiology Laboratory	5
GEN 604	Principles of Genetics	4
Discovery Course		4
Discovery Course		4
	Credits	17

Spring

BMS 602 & BMS 603	Pathogenic Microbiology and Pathogenic Microbiology Laboratory	5
BMS 560 & BMS 561	Body Fluids and Body Fluids Laboratory	4
CHEM 545 & CHEM 546	Organic Chemistry and Organic Chemistry Laboratory	5
Major Elective		4
	Credits	18

Third Year**Fall**

Major Elective with lab		4-6
BMCB 658 & BMCB 659	General Biochemistry and General Biochemistry Lab	5
BMS 650	Molecular Diagnostics	4
	Credits	13-15

Spring

BMS 642 & BMS 643	Clinical Immunology and Serology and Clinical Serology Laboratory	4
BMS 720	Mycology, Parasitology, and Virology	3
Major Elective with lab		4-5
Elective (any course)		4
	Credits	15-16

Fourth Year**Fall**

Major Elective (WI)		4
Major Elective (Capstone)		4
Discovery Course		4
Elective (any course)		4
	Credits	16

Spring

Elective (any course)		4
Elective (any course)		4
Elective (any course)		4
Elective (any course)		4
	Credits	16
	Total Credits	128-131