

Checklist for B.S. in Biochemistry, Molecular and Cellular Biology

For students entering Fall 2015 and after

University-Wide Discovery and Inquiry Requirements			
Course	Semester	Credits	Grade
Writing ENGL 401 (WI) First Year Writing		4	
Quant. Reasoning MATH 424B Calculus		4	
Biological Science BIOL 411 Biology ¹		4	
Physical Science PHYS 401 Physics		4	
Environ., Technol. & Society			
Fine & Performing Arts			
Historical Perspectives			
Humanities			
Social Science			
World Cultures			
Capstone (<i>see next page</i>)			
¹ Inquiry requirement is met by taking BIOL 411			

Bioscience Core Courses			
Course	Semester	Credits	Grade
BIOL 411 Intro Biology: Molecular& Cellular		4	
BIOL 412 Intro Biology: Evolution, Biodivers & Ecol		4	
BMS 503 General Microbiology		5	
GEN 604 Principles of Genetics		4	

BMCB Core Courses			
Course	Semester	Credits	Grade
BMCB 401 Opport. In Biochem, Molec. & Cell Biology		1	
BMCB 605 Eukaryotic Cell and Developmental Biol.		4	
BMCB 751 Principles of Biochemistry		4	
BMCB 752 Principles of Biochemistry		4	
GEN 704 (Genetics of Prokaryotes) or GEN 771 (Molecular Genetics)		5/4	

University-Wide Writing Intensive Requirements			
Course	Semester	Credits	Grade
ENGL 401 First Year Writing		4	
One course in major ²			
600/700-level course ²			
Elective course			
² The same course may be used to fulfill the requirements for a writing intensive course in the major and for a 600/700 level course but every student must have 4 writing intensive courses			

3 Major Elective Courses			
A) One of these Laboratory Techniques courses.	Semester	Credits	Grade
BMCB 754 - Lab Biochem. Mol. Biol. Nucleic Acids (WI)		5	
BMCB 755 - Lab Biochem. & Molecular Biology (WI)		5	
BMCB 753 - Cell Culture (<i>capstone</i>)		5	
BMCB 714/715 - Electron Microscopy		3/2	
B) Two additional Major Electives courses (<i>see next page</i>)			

Foundation Courses			
Course	Semester	Credits	Grade
CHEM 403 General Chemistry I		4	
CHEM 404 General Chemistry II		4	
CHEM 547/549 Organic Chemistry w/lab		3/2	
CHEM 548/550 Organic Chemistry w/lab		3/2	
MATH 424B Calculus for Life Sciences ³		4	
BIOL 528 Applied Biostatistics ³		4	
PHYS 401 Introduction to Physics I ⁴		4	
PHYS 402 Introduction to Physics II ⁴		4	

³MATH 425 & 426 can be substituted for MATH 424B and BIOL 528.

⁴PHYS 407 and PHYS 408 can be substituted.

128 credits needed for graduation. A grade of C- or better in all COLSA courses is required.

Major elective courses for Biochemistry, Molecular, & Cellular Biology

Major Electives (Group B)

ANSC 701	<i>Physiology of Reproduction</i>	
ANSC 715	<i>Physiology of Lactation (pre-req: ANSC 701)</i>	
BMCB 714/715*	<i>Electron Microscopy/EM Lab</i>	
BMCB 750	<i>Physical Biochemistry</i>	
BMCB 753*	<i>Cell Culture</i>	
BMCB 754*	<i>Lab. Biochem. Mol. Biol. Nucleic Acids</i>	WI
BMCB 755*	<i>Lab Biochem. & Molecular Biology</i>	WI
BMCB 760	<i>Pharmacology</i>	
BMCB 763	<i>Biochemistry of Cancer</i>	
BMCB 783	<i>Proteomics for Biological Discoveries</i>	
BMCB 794	<i>Protein Structure and Function</i>	
BMS 702	<i>Endocrinology</i>	
BMS 704	<i>Pathologic Basis of Disease (pre-req: 2 sem A&P)</i>	
BMS 705/715	<i>Immunology/Immunology Lab</i>	
BMS 706/708	<i>Virology/Virology Lab</i>	
BMS 718	<i>Mammalian Physiology</i>	WI
CHEM 755	<i>Advanced Organic Chemistry (co-req: CHEM 756)</i>	
GEN 704	<i>Genetics of Prokaryotic Microbes</i>	WI
GEN 706	<i>Human Genetics</i>	
GEN 711	<i>Genomics & Bioinformatics</i>	
GEN 713	<i>Microbial Ecology and Evolution</i>	
GEN 715	<i>Molecular Evolution</i>	
GEN 717	<i>Molecular Microbiology</i>	WI
GEN 771	<i>Molecular Genetics</i>	
NUTR 750	<i>Nutritional Biochemistry (pre-rec: ANSC 511/512)</i>	WI
PSYC 731	<i>Brain and Behavior</i>	WI
ZOOL 777	<i>Neurobiology and Behavior</i>	

WI = writing intensive

*If used to fulfill the Lab Techniques requirement (Group A), cannot also count as a Group B major elective.

In addition to the courses that are required for completion of major requirements, students following different career tracks may be interested in the following general electives.

Pre-professional health (pre-med, pre-dental, pre-vet, pharmacy, etc):

See the Pre-Vet Advising Program and Pre-Professional Health Program web sites for additional info.

ANSC 602	<i>Animal Rights and Societal Issues</i>
ANTH 610	<i>Medical Anthropology: Illness & Healing</i>
ANTH 685	<i>Gender, Sexuality & HIV/AIDS in Sub-Saharan Africa</i>
BMS 644	<i>Hematology</i>
CLAS 525	<i>Greek and Latin Origins of Medical Terms</i>
HIST 522	<i>Science in the Modern World</i>
HIST 654	<i>Topics in History of Science</i>
HMP 401	<i>United States Health Care Systems</i>
HMP 569	<i>Human Behavior and Public Health</i>
HMP 735	<i>Social Marketing</i>
HMP 744	<i>Health Ethics and Law</i>
HMP 746	<i>Health Policy</i>
HUMA 651	<i>Humanities & Science: Nature of Scientific Creativity</i>
INCO 403	<i>Pre-Professional Health Programs Advising</i>
KIN 607	<i>Biology of Aging</i>
PHIL 660	<i>Law, Medicine, and Ethics</i>
PSYC 511	<i>Sensation and Perception</i>
PSYC 513	<i>Cognitive Psychology</i>
PSYC 561	<i>Abnormal Behavior</i>
SOC 635	<i>Medical Sociology</i>
ZOOL 518	<i>Vertebrate Morphology</i>
ZOOL 690	<i>Evolution</i>

Capstone courses (must be taken as a senior)

BMCB 753	<i>Cell Culture</i>
BMCB 763	<i>Biochemistry of Cancer</i>
BMCB 783	<i>Proteomics for Biological Discoveries</i>
BMCB 794	<i>Protein Structure and Function</i>
BMCB 795	<i>Investigations</i>
BMCB 799	<i>Senior Thesis</i>
INCO 790	<i>Advanced Research Experience</i>

In addition to capstone courses above, you may design your own capstone experience during your senior year.

Before beginning any Capstone Experience, you must submit a Capstone Approval Form (see BMCB web site).

Graduate School:

Consider 700-level courses in disciplines in which you may pursue an advanced degree (M.S. or Ph.D.). For example:

Biochemistry: BMCB 750, 760, 763, 783, 794; BMS 711, CHEM 755/7. NUTR 750, 751

Biomedicine: ANSC 701, 715; BMCB 760, 763, 783; BMS 702, 703, 704, 705, 706, 711, 718, 719, 730; GEN 706; NUTR 750, 751

Microbiology: BMS 602, 703, 704, 706, 719

Genetics: GEN 704, 705, 706, 711, 713, 715, 717, 771

Neuroscience: PSYC 511, 531, 731, 733; ZOOL 713, 777

Industry (e.g., biotechnology or pharmaceutical)

Gaining additional laboratory skills is very useful when seeking employment as a research technician. In addition to conducting independent research (BMCB 795 or 799, INCO 790), consider the following laboratory courses:

BMCB 714/715, 753, 754, 755, 760, 763, 783

BMS 705/715, 706/708

CHEM 755/756

GEN 704, 717