

DISCLAIMER: THIS CHECKLIST IS ADVISORY ONLY.

CONSULT DEGREE WORKS OR THE UNDERGRADUATE CATALOG FOR THE MOST ACCURATE INFORMATION ON DEGREE REQUIREMENTS.

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

May 2017

University Discovery and Inquiry Requirements¹			
Course	Semester	Credits	Grade
Writing ENGL 401 (WI) First Year Writing ²		4	
Quant. Reasoning MATH 424B Calculus		4	
Biological Science BIOL 411 Biology		4	
Physical Science CHEM 403 General Chemistry I		4	
Environ., Technol. & Society			
Fine & Performing Arts			
Historical Perspectives			
Humanities			
Social Science			
World Cultures			
Capstone (see next page)			

University-Wide Writing Intensive Requirements

Course	Semester	Credits	Grade
ENGL 401 First Year Writing		4	
One course in major ³			
600/700-level course ³			
Elective course			

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 ⁴		4	
BIOL 528 Applied Biostatistics ⁴		4	
PHYS 401 Introduction to Physics I ⁵		4	
PHYS 402 Introduction to Physics II ⁵		4	

Bioscience Core Courses			
Course	Semester	Credits	Grade
BIOL 411 Intro Biology: Molecular & Cellular		4	
BIOL 412 Intro Biology: Evolution, Biodivers & Ecol		4	
BMS 503 /504 General Microbiology/lab		3/2	
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 Biology		4	
BMCB 751 Principles of Biochemistry		4	
BMCB 752 Principles of Biochemistry		4	
GEN 704 Genetics of Prokaryotic Microbes (WI) or GEN 771 Molecular Genetics		5/4	

Major Elective Courses

A) One Laboratory Techniques course	Semester	Credits	Grade
BMCB 754 - Molecular Biology Research Methods (WI)		5	
BMCB 755 - Lab in Biochemistry & Molecular Biology (WI)		5	
BMCB 753 - Cell Culture		5	

B) Two additional Major Electives courses (see next page)

A total of 128 credits is needed for graduation.

A grade of C- or better is required in all COLSA courses.

¹ Inquiry requirement & Discovery Lab requirement are met by BIOL 411

² Students applying to health profession schools need a full year of English, a full year of Organic Chemistry, and a full year of Introductory Biology. ENGL 502 or 503 could be taken in addition to ENGL 401. See <http://www.unh.edu/premed-advising/curric.htm>

³ 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

⁴ MATH 425 & 426 can be substituted for MATH 424B and BIOL 528.

⁵ PHYS 407 and PHYS 408 can be substituted for PHYS 401 and PHYS 402.

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5/1/17

Major Electives		
BMCB 750	<i>Physical Biochemistry</i>	
BMCB 753	<i>Cell Culture</i> ⁶	
BMCB 754	<i>Molecular Biology Research Methods</i> ⁶	WI
BMCB 755	<i>Lab Biochem. & Molecular Biology</i> ⁶	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>	
ANSC 701	<i>Physiology of Reproduction</i>	
ANSC 715	<i>Physiology of Lactation (pre-req: ANSC 701)</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> ⁶	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> ⁶	
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

⁶If course was used to fulfill the BMCB Core or Lab Techniques requirement, it cannot also count as a Major Elective.

Capstone courses (must be taken as a senior)	
BMCB 750	<i>Physical Biochemistry</i>
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>
BMCB 795	<i>Investigations (4-credit minimum)</i>
BMCB 795W	<i>Investigations (4-credit minimum)</i>
BMCB 799	<i>Senior Thesis (4-credit minimum)</i>
BMCB 799H	<i>Honors Senior Thesis</i>
INCO 790	<i>Advanced Research Experience (4-credit minimum)</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).

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>

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 755/756; 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 613, 777

Industry (e.g., biotechnology or pharmaceutical):

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

BMCB 753, 754, 755, 760, 763, 783
BMS 705/715, 706/708
CHEM 755/756
GEN 704, 717

Sample Course Sequence for Biochemistry, Molecular & Cellular Biology

This is just ONE way that the requirements for the BMCB degree can be arranged in order to complete the degree in 8 semesters.

May 2017

	Fall	Spring
1st Year	BMCB 401 - Opportunities Biochem, Molec & Cell Biol BIOL 411 - Introductory Biology: Molecular & Cellular CHEM 403 - General Chemistry I ENGL 401 - First-Year Writing ⁷ Discovery Course	BIOL 412 - Intro. Biology: Evolution, Biodiv., & Ecology MATH 424B - Calculus for Life Sciences CHEM 404 - General Chemistry II Discovery Course
2nd Year	BMS 503/504 - General Microbiology & Lab CHEM 547/549 - Organic Chemistry I & Lab PHYS 401 - Intro to Physics I BIOL 528 - Applied Biostatistics I	GEN 604 - Principles of Genetics CHEM 548/550 - Organic Chemistry II & Lab PHYS 402 - Intro to Physics II Discovery Course
3rd Year	BMCB 751 - Principles of Biochemistry BMCB Core or Lab Techniques Course Discovery Course Elective (any course)	BMCB 752 - Principles of Biochemistry BMCB 605 - Eukaryotic Cell & Developmental Biology BMCB Core or Lab Techniques Course Discovery Course
4th Year	Major Elective (possible Capstone) Discovery Course Elective (any course) Elective (any course)	Major Elective Elective (any course) Elective (any course)

⁷ Students applying to health profession schools need a full year of English, a full year of Organic Chemistry, and a full year of Introductory Biology. See <http://www.unh.edu/premed-advising/curric.htm>