

MAJOR IN NEUROSCIENCE, CELL AND MOLECULAR NEUROSCIENCE CONCENTRATION

The Cell and Molecular Neuroscience Concentration integrates neuroanatomy with the cellular and molecular basis of nervous system function. Its focus is to understand cellular based processes in neurons and glia at the molecular level. It differs from degree programs in biochemistry or biomedical sciences by its specific focus on the nervous system. Required courses in microbiology, immunology, biochemistry, and advanced cell biology provide an excellent background for students interested in pursuing careers in medicine or biomedical research through graduate/professional schools. However, graduates with this concentration should also be well qualified for any positions in academia, government or the private sector where knowledge of cell and molecular processes is required, whether or not it is applied to the nervous system.

Students in the CMN Concentration with strong research interests and a GPA of 3.250 or above, may qualify for early entry into the MS degree program in Biochemistry while pursuing the BS degree program in Neuroscience. Early entry requires that students have identified a faculty member willing to mentor them in their laboratory research for the MS degree and that they have obtained permission from the Neuroscience Program and the Department of Biochemistry and Molecular Biology to apply to the graduate school for this. Students can apply to the graduate program (allowing them access to courses above those at the 500 level) during the semester that they complete 90 or more credits.

Students will be moved from undergraduate to graduate standing the semester after they complete 120 or more credits. At that time they begin paying graduate tuition and fees and will lose all undergraduate institutional and scholarship aid, but they can qualify for many graduate assistantships and fellowships. Both degrees can be awarded during the same semester but the MS degree cannot be awarded before completing the requirements of the BS degree.

Requirements Effective Spring 2015

Freshman

		AUCC	Credits
CHEM 111	General Chemistry I (GT-SC2)	3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	3A	1
CHEM 113	General Chemistry II		3
CHEM 114	General Chemistry Lab II		1
CO 150	College Composition (GT-CO2)	1A	3
LIFE 102	Attributes of Living Systems (GT-SC1)	3A	4
LIFE 201B	Introductory Genetics: Molecular/Immunological/Developmental (GT-SC2)	3A	3
LIFE 203	Introductory Genetics Laboratory		2
MATH 155	Calculus for Biological Scientists I (GT-MA1)	1B	4
NB 192	Introductory Neuroscience Seminar		1
PSY 100	General Psychology (GT-SS3)	3C	3
Arts and Humanities		3B	3
Total Credits			32

Sophomore

CHEM 341	Modern Organic Chemistry I		3
CHEM 343	Modern Organic Chemistry II		3
CHEM 344	Modern Organic Chemistry Laboratory		2
Select one from the following:			3
CO 300	Writing Arguments (GT-CO3)	2	
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)	2	
LIFE 210	Introductory Eukaryotic Cell Biology		3
LIFE 212	Introductory Cell Biology Laboratory		2
MATH 255	Calculus for Biological Scientists II (GT-MA1)	1B	4
Select one from the following:			5
PH 121	General Physics I (GT-SC1)	3A	
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	
PSY 252	Mind, Brain, and Behavior		3
Arts and Humanities		3B	3
Total Credits			31

Junior

BC 401	Comprehensive Biochemistry I	4A	3
BC 403	Comprehensive Biochemistry II	4B	3
BC 404	Comprehensive Biochemistry Laboratory		2
BMS 300	Principles of Human Physiology		4
BMS 345	Functional Neuroanatomy		4
NB 399	Thesis Preparation		1
Select one from the following:			5
PH 122	General Physics II (GT-SC1)	3A	
PH 142	Physics for Scientists and Engineers II (GT-SC1)	3A	
Select one from the following:			3
STAT 301	Introduction to Statistical Methods		
STAT 307	Introduction to Biostatistics		
Global and Cultural Awareness		3E	3
Historical Perspectives		3D	3
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Total Credits			31

Senior

BC 465	Molecular Regulation of Cell Function		3
BMS 325	Cellular Neurobiology		3
MIP 300	General Microbiology		3
MIP 342	Immunology		4
NB 493	Senior Seminar	4C	1
NB 499	Senior Thesis	4A,4C	3
Electives ¹			9
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Total Credits			26
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Program Total Credits:			120

¹ Select enough elective credits to bring the program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).

Major Completion Map**Freshman**

Semester 1		Critical	Recommended	AUCC	Credits
LIFE 102	Attributes of Living Systems (GT-SC1)	X		3A	4
CHEM 111	General Chemistry I (GT-SC2)	X		3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	X		3A	1
CO 150	College Composition (GT-CO2)		X	1A	3
NB 192	Introductory Neuroscience Seminar	X			1
Arts and Humanities				3B	3
MATH 124, MATH 125, MATH 126 must be completed by the end of Semester 1, if necessary.					
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Total Credits					16

Semester 2		Critical	Recommended	AUCC	Credits
CHEM 113	General Chemistry II	X			3
CHEM 114	General Chemistry Lab II	X			1
MATH 155	Calculus for Biological Scientists I (GT-MA1)			1B	4
PSY 100	General Psychology (GT-SS3)	X		3C	3
LIFE 201B	Introductory Genetics: Molecular/Immunological/Developmental (GT-SC2)			3A	3

LIFE 203	Introductory Genetics Laboratory				2
Total Credits					16
Sophomore					
Semester 3					
		Critical	Recommended	AUCC	Credits
CHEM 341	Modern Organic Chemistry I		X		3
LIFE 210	Introductory Eukaryotic Cell Biology	X			3
LIFE 212	Introductory Cell Biology Laboratory	X			2
MATH 255	Calculus for Biological Scientists II (GT-MA1)			1B	4
Select one course from the following:					3
CO 300	Writing Arguments (GT-CO3)			2	
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)			2	
Total Credits					15
Semester 4					
		Critical	Recommended	AUCC	Credits
CHEM 343	Modern Organic Chemistry II		X		3
CHEM 344	Modern Organic Chemistry Laboratory		X		2
Select one course from the following:					5
PH 121	General Physics I (GT-SC1)		X	3A	
PH 141	Physics for Scientists and Engineers I (GT-SC1)		X	3A	
PSY 252	Mind, Brain, and Behavior				3
Arts and Humanities				3B	3
CHEM 341 must be completed by the end of Semester 4.		X			
Total Credits					16
Junior					
Semester 5					
		Critical	Recommended	AUCC	Credits
BC 401	Comprehensive Biochemistry I	X			3
BMS 300	Principles of Human Physiology	X			4
Select one course from the following:					5
PH 122	General Physics II (GT-SC1)			3A	
PH 142	Physics for Scientists and Engineers II (GT-SC1)			3A	
Select one course from the following:					3
STAT 301	Introduction to Statistical Methods		X		
STAT 307	Introduction to Biostatistics		X		
Total Credits					15
Semester 6					
		Critical	Recommended	AUCC	Credits
BC 403	Comprehensive Biochemistry II			4B	3
BC 404	Comprehensive Biochemistry Laboratory				2
BMS 345	Functional Neuroanatomy		X		4
NB 399	Thesis Preparation		X		1
Global and Cultural Awareness				3E	3
Historical Perspectives				3D	3
Total Credits					16
Senior					
Semester 7					
		Critical	Recommended	AUCC	Credits
BMS 325	Cellular Neurobiology	X			3
MIP 300	General Microbiology	X			3
NB 493	Senior Seminar	X		4C	1
Free Electives					6
Total Credits					13
Semester 8					
		Critical	Recommended	AUCC	Credits
BC 465	Molecular Regulation of Cell Function	X			3
MIP 342	Immunology	X			4
NB 499	Senior Thesis	X		4A,4C	3

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Free Electives	X	3
The benchmark courses for the 8th semester are the remaining courses in the entire program of study.	X	
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Total Credits		13
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Program Total Credits:		120