

**B.A. Degree in Biology
Emphasis in Health and Medical Sciences
Pre-Pharmacy Orientation**

<http://www.mnstate.edu/jasperse/PrePharmacy/Pharmacy.html>

The following is a sample schedule for both completing pre-pharmacy requirements while also satisfying the requirements to graduate with a B.A. Degree in Biology with Emphasis in Health and Medical Sciences.

- For detailed program requirements: <http://appserv.mnstate.edu/home/degreereqs/degreereqs.asp?select=2103030401H>
- The schedule is sufficiently general to cover the requirements of most pharmacy schools.
- Many of the science classes are offered only in the fall or the spring, and many of these need to be taken in correct sequence in order to satisfy prerequisites.
- Exceptional students might take the PCAT (pharmacy college admissions test) during/before their junior year, and might be able to be admitted into pharmacy school after their junior year.

FALL	FRESHMAN YEAR	LASC
BIOL 115/115L	Organismal Biol (lab)	4
Chem 150/155	Gen Chem I (+ lab)	4 3L
Math 261/142	Calculus I or Precalc I ²	4 4
ENGL 101	English Composition ¹	4 1B
Hlth 122	Alcohol and College Life	1
	Total Credits	17

SPRING	LASC
BIOL 111	Cell Biology (lab) 4
Chem 210	Gen Chem II (lab) 4
MATH	Calc I or Statistics 3/4
CMST 100	Speech Commun. ¹ 3 1A
	Total Credits 15

FALL	SOPHOMORE YEAR	LASC
Chem 350/355	Organic Chem I (+ lab)	4
BIOL 323	Human Anatomy (lab)	4
BIOL 341	Genetics (lab)	4
	LASC Goal 2 Elective ¹	3 2
	Total Credits	15

SPRING	LASC
Chem 360/365	Organic Chem II (+lab) 4
BIOL 349	Human Physiology 4
Chem 380	Analytical Chem(+lab) 4
	Elective ⁴ 3
	Total Credits 15

FALL	JUNIOR YEAR	LASC
BIOL 350	Microbiology	4
Chem 400/405	Biochemistry I (+ lab)	4
PHYS 200	Physics I ^{5,6}	4 3
	Elective	3
	Total Credits	15

SPRING	LASC
Math 234	Probability+Statistics 4
Biol 385	Molecular Biol. (+ lab) 4
PHYS 201	Physics II ⁵ 4
	Electives 3
	Total Credits 15

FALL	SENIOR YEAR	LASC
Chem 400/405	Biochemistry I (+ lab)	4
Chem 320	Inorganic Chem I (no lab)	3
	Electives	8
	Total Credits	15

SPRING	LASC
Chem 410/415	Biochemistry II (+ lab) 4
BIOL 484	Biology Seminar 1
	Electives 10
	Total Credits 15

¹ These are standard LASC courses, but others can be taken in their place, including LASC 2 which might be BIOL 100. A goal should be to complete LASC goals 1A, 1B, and 2 by the end of year one if possible.

² The ACT math score is needed to inform whether a student should begin directly in calculus or a lower math class. It is very desirable to get through calculus during year one. If you take pre-calc in the fall, then you'd normally take Calculus I in the spring, in place of a LASC elective.

⁴ In considering electives, keep in mind that certain electives for the major must be taken, and all of the Liberal Arts and Science Curriculum requirements must be fulfilled.

⁵ U of M pharmacy requires either calculus-based PHYS 200 (a semester), or else PHYS 160/161 plus Calculus II (MATH 262). It requires statistics.

⁶ Physics is not included on the PCAT. Math, chemistry, and biology are. So it's not bad strategy to put physics off.

Curriculum Planning

For advising purposes only. Not officially approved by MSUM.

**Liberal Arts and Sciences Curriculum
(LASC) Checksheet**

See <http://web.mnstate.edu/acadaff/lasc/Current.htm> for list of courses.

Goal	Description	
1A	Oral Communication	
1B	Written Communication	
2	Critical Thinking	
3	Natural Science with Traditional Lab. Rubric 1	CHEM 150/150L
3	Natural Science Rubric 2	PHYS 200/160
4	Mathematics/Logical Reasoning	MATH 261
5	History and Social and Behavioral Sciences Rubric 1	
5	History and Social and Behavioral Sciences Rubric 2	
6	Humanities and Fine Arts Rubric 1	
6	Humanities and Fine Arts Rubric 2	
7	Human Diversity	
8	Global Perspectives	
9	Ethical and Civic Responsibility	
10	People and the Environment	

Writing Intensive Requirements

See <http://web.mnstate.edu/acadaff/UnivWriting/Courses.htm> for list of courses

W1 –identified by major, >300 level	ENGL 387
W2 –from within the LASC courses	
W3 –at 200 level or higher	CHEM 405
W4 –at 200 level or higher	BIOL 341/341L

- Biochem Lab (CHEM 405) is a writing intensive course, but is not the “writing intensive course identify by Student’s major”
- Technical Report Writing (ENGL 387) is the “writing intensive course identify by Student’s major”
- One of the writing intensive courses must be in the Liberal Arts and sciences Curriculum (LASC)
- Environmental Chemistry (CHEM 304) is a writing intensive LASC course.
- Genetics (BIOL 341) is a writing intensive course.

Biology Requirements	25 credits 17 ≥300		
BIOL 115/115L	Organismal Biology	F	4
BIOL 111/111L	Cell Biology	S	4
BIOL 323/323L	Anatomy	F	4
BIOL 341/341L	Genetics	F	4
BIOL 349/349L	Human Physiology	S	4
BIOL 350/350L	Microbiology	F	4
BIOL 484	Biology Seminar	S	1
Restricted Electives	4 > 300		
BIOL 365, 385, 430, or 438	One of those four. Molecular (385) preferred		4
Related Requirements	>23 credits 0 ≥300		
CHEM 150/150L	General Chemistry I	F/Sp/Sum	4
CHEM 210/210L	General Chemistry II	F/Sum	4
MATH 261	Calculus I	F/S	4
MATH 234	Probability/Statistics	F/S	3
PHYS 200/200L or 160/160L	Physics I (note: UM requires either 200 or else 160/161 + Calc II)	F	4
PHYS 201/201L or 161/161L	Physics II	S	4
Electives	18, most/all > 300		
CHEM 350/355	Organic Chem I	F	4
CHEM 360/365	Organic Chem II	S	3
CHEM 400	Biochemistry I	F	3
CHEM 410	Biochemistry II	S	3
	Biochem strongly preferred by UM, required at NDSU. Full year (8 credits) recommended. One or two more 300-level biology course will do for both the program requirements and the graduation requirement for at least 40 credits at the 300/400 level.		