

# BIOCHEMISTRY

## REQUIREMENTS

**CORE CURRICULUM** The Core Curriculum is designed to foster critical thinking skills and introduce students to basic domains of thinking that transcend disciplines. The Core applies to all majors. Information on specific classes in the Core can be found at [marshall.edu/gened](http://marshall.edu/gened).

### CORE 1: CRITICAL THINKING

CODE	COURSE NAME	HRS	GRADE
FYS 100	First Year Sem Crit Thinking	3	_____
MTH 229	Critical Thinking Course	3	_____
_____	Critical Thinking Course	3	_____
<b>Additional University Requirements</b>			
CHM 357/358	Writing Intensive	3	_____
_____	Writing Intensive	3	_____
_____	Multicultural or International	3	_____
CHM 491	Capstone	2	_____

### CORE 2:

CODE	COURSE NAME	HRS	GRADE
ENG 101	Beginning Composition	3	_____
ENG 201	Advanced Composition	3	_____
CMM 103	Fund Speech-Communication	3	_____
MTH 229	Calculus/Analytic Geom I (CT)	5	_____
BSC 120	Principles of Biology I	4	_____
_____	Core II Humanities	3	_____
_____	Core II Social Science	3	_____
_____	Core II Fine Arts	3	_____

### MAJOR-SPECIFIC

All Biochemistry majors are required to take the following courses:

CODE	COURSE NAME	HRS	GRADE	CODE	COURSE NAME	HRS	GRADE
BSC 121	Principles of Biology II	4	_____	CHM 491	Capstone (C)	2	_____
CHM 211	Principles of Chemistry I	3	_____	CHM 432	Seminar	0	_____
CHM 217	Principles of Chemistry I Lab	2	_____	BSC 322	Principles of Cell Biology	4	_____
CHM 212	Principles of Chemistry II	3	_____	BSC 324	Principles of Genetics	4	_____
CHM 218	Principles of Chemistry II Lab	2	_____	BSC 450	Molecular Biology	3	_____
CHM 355	Organic Chemistry I	3	_____	PHY 201	College Physics I	3	_____
CHM 356	Organic Chemistry II	3	_____	PHY 202	College Physics I Lab	1	_____
CHM 361	Organic Chemistry II Lab	3	_____	PHY 203	College Physics II	3	_____
CHM 305	Research Methods Chemistry	1	_____	PHY 204	College Physics II Lab	1	_____
CHM 358	Physical Chemistry (or 357 in Fall) (WI)	4	_____	_____	300/400 Chemistry Elective	3	_____
CHM 345	Intro to Analytical Chem	4	_____	_____	Free Elective	3	_____
CHM 365	Introductory Biochemistry	3	_____	_____	Free Elective	3	_____
CHM 366	Intro Biochemistry Lab	2	_____	_____	Free Elective	3	_____
CHM 467	Intermediate Biochemistry	3	_____	_____	Free Elective	3	_____
				_____	Free Elective	3	_____

### MAJOR INFORMATION

- Students are required to know and track their degree requirements for graduation or for entrance to a professional school.
- In addition to the Core General Education requirements, the College of Science requires 3 hours of Calculus, and 40 hours of upper level credit.
- The CHM coursework provides a Chemical Sciences minor.
- Coursework listed as "elective" may vary for each student. Students are encouraged to use elective hours toward a 2nd minor or toward prerequisites.
- Students are strongly encouraged to select courses that meet two or more Core or College requirements. For example, a writing intensive literature course could satisfy the Core II Humanities requirement as well as the University writing intensive requirement.
- Course offerings and course attributes are subject to change each semester. Please consult each semesters schedule of courses for availability and

- attributes.
- Math is based on an ACT Mathematics score of 27 or higher. Students with an ACT Mathematics score less than 27 will be placed in the appropriate prerequisite mathematics and science courses.
- CHM 358 or 411 is recommended for students considering graduate school.
- The BSC coursework provides a Biological Sciences minor.
- A Grade Point Average of 2.0 is required 1) overall, 2) at MU, 3) in all required Chemistry courses, 4) in all Chemistry courses, and 5) in all required Chemistry courses taken at MU.

# BIOCHEMISTRY

Students completing the Biochemistry major will be prepared for career opportunities in the biotechnology, forensics, environmental, pharmaceutical, agricultural, and medical fields. Students will also be well prepared for graduate-level study in biochemistry, biotechnology, and genetics and molecular biology. Additionally, Biochemistry is an excellent choice for students desiring to attend professional training in Medicine, Dentistry, Pharmacy, Law or Engineering.

YEAR ONE	FALL SEMESTER				SPRING SEMESTER			
	CODE	COURSE NAME	HRS	GRADE	CODE	COURSE NAME	HRS	GRADE
	CHM 211	Principles of Chemistry I	3	_____	BSC 121	Principles of Biology II	4	_____
	CHM 217	Principles of Chemistry I Lab	2	_____	CHM 212	Principles of Chemistry II	3	_____
	BSC 120	Principles of Biology I	4	_____	CHM 218	Principles of Chemistry II Lab	2	_____
	ENG 101	Beginning Composition	3	_____	_____	Core I Critical Thinking	3	_____
	FYS 100	First Year Sem Crit Thinking	3	_____	_____	Free Elective	3	_____
	UNI 100	Freshman First Class	1	_____				
	<b>TOTAL HOURS</b>		<b>16</b>		<b>TOTAL HOURS</b>		<b>15</b>	
	Summer Term (optional):							

YEAR TWO	FALL SEMESTER				SPRING SEMESTER			
	CODE	COURSE NAME	HRS	GRADE	CODE	COURSE NAME	HRS	GRADE
	MTH 229	Calculus/Analytic Geom I (CT)	5	_____	BSC 324	Principles of Genetics	4	_____
	CHM 355	Organic Chemistry I	3	_____	CHM 356	Organic Chemistry II	3	_____
	ENG 201	Advanced Composition	3	_____	CHM 361	Organic Chemistry Lab	3	_____
	_____	Free Elective	3	_____	CMM 103	Fund Speech Communication	3	_____
					_____	Core II Fine Arts	3	_____
	<b>TOTAL HOURS</b>		<b>14</b>		<b>TOTAL HOURS</b>		<b>16</b>	
	Summer Term (optional):							

YEAR THREE	FALL SEMESTER				SPRING SEMESTER			
	CODE	COURSE NAME	HRS	GRADE	CODE	COURSE NAME	HRS	GRADE
	BSC 322	Principles of Cell Biology	4	_____	CHM 366	Intro Biochemistry Lab	2	_____
	CHM 305	Research Methods Chemistry	1	_____	CHM 467	Intermediate Biochemistry	3	_____
	CHM 365	Introductory Biochemistry	3	_____	PHY 203	College Physics II	3	_____
	PHY 201	College Physics I	1	_____	PHY 204	College Physics II Lab	1	_____
	PHY 202	College Physics I Lab	3	_____	_____	Core II Humanities	3	_____
	_____	Core II Social Science (MC/I)	3	_____				
	<b>TOTAL HOURS</b>		<b>15</b>		<b>TOTAL HOURS</b>		<b>12</b>	
	Summer Term (optional):							

YEAR FOUR	FALL SEMESTER				SPRING SEMESTER			
	CODE	COURSE NAME	HRS	GRADE	CODE	COURSE NAME	HRS	GRADE
	BSC 450	Molecular Biology	3	_____	CHM 432	Chemistry Seminar	0	_____
	CHM 345	Intro to Analytical Chem	4	_____	_____	300/400 CHM Elective	4	_____
	CHM 491	Capstone Experience	2	_____	CHM 358	Physical Chemistry (or 357 in Fall) (WI)	4	_____
	_____	Free Elective	3	_____	_____	Free Elective	3	_____
	_____	Writing Intensive	3	_____	_____	Free Elective	3	_____
	<b>TOTAL HOURS</b>		<b>15</b>		<b>TOTAL HOURS</b>		<b>17</b>	
	Summer Term (optional):							

● General Education Requirement  
■ College Requirement  
◆ Major Requirement  
◆ Area of Emphasis

Milestone Course: This is a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.

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## INVOLVEMENT OPPORTUNITIES

- Student Government Association
- Campus Activity Board
- JMELI
- Commuter Student Advisory Board
- Club Sports
- Religious Organizations
- Political Organizations
- Residence Hall Association
- Cultural Organizations
- National Society of Leadership and Success
- Greek Life

## RELATED MAJORS

- Biomechanics
- Athletic Training
- Education
- Geology
- Geography
- Environmental Science

## GRADUATION REQUIREMENTS


- Have a minimum of 120 credit hours (some colleges or majors require more);
- Have an overall and Marshall Grade Point Average of 2.00 or higher;
- Have an overall Grade Point Average of 2.00 or higher in the major area of study;
- Have earned a grade of C or better in English 201 or 201 H;
- Have met all major(s) and college requirements;
- Have met the requirements of the Core Curriculum;
- Have met the residence requirements of Marshall University, including 12 hours of 300/400 level coursework in the student's college (see section entitled "Residence Requirements" in the undergraduate catalogue);
- Be enrolled at Marshall at least one semester of the senior year;
- Have transferred no more than 72 credit hours from an accredited West Virginia two-year institution of higher education.

Colleges and specific programs may have unique requirements that are more stringent than those noted above. Students are responsible for staying informed about and ensuring that they meet the requirements for graduation.


This academic map is to be used as a guide in planning your coursework toward a degree. Due to the complexities of degree programs, it is unfortunate but inevitable that an error may occur in the creation of this document. The official source of degree requirements at Marshall University is DegreeWorks available in your myMU portal. Always consult regularly with your advisor.

# BIOCHEMISTRY – 2019-2020


## YEAR ONE




Develop relationships with professors who can serve as future references by attending their office hours.




Stay on the Herd Path and come to class! Class attendance is more important to your success than your high school GPA, your class standing, or your ACT/SAT scores.




Discuss undergraduate research opportunities with faculty in Chemistry right now.




In order to graduate on time, you need to take an average of 15 credits per semester. Are you on track? Take 15 to Finish!



Take a pulse check. Know what you need to do every year to keep your grants, scholarships, or federal financial aid.




Join the Alpha Chi Sigma chemistry professional fraternity.




Apply for a nationally competitive scholarship like Goldwater, Fullbright, Rhodes, or Gates Cambridge. Contact the Office of National Scholarships at Marshall.


## YEAR TWO




Did you do really well in a hard course? Become a Tutor or a Supplemental Instructor.




Discuss undergraduate research opportunities with faculty in Chemistry right now.




Present your research at a national or regional American Chemical Society meeting.




Develop relationships with professors who can serve as future references by attending their office hours.



Want to continue your education and increase your opportunities? Talk to a faculty member about whether graduate school fits your career goals.




Apply in the spring semester for Chemistry Department scholarships and summer fellowships.




Apply for a nationally competitive scholarship like Goldwater, Fullbright, Rhodes, or Gates Cambridge. Contact the Office of National Scholarships at Marshall.


## YEAR THREE




Apply for a nationally competitive scholarship like Goldwater, Fullbright, Rhodes, or Gates Cambridge. Contact the Office of National Scholarships at Marshall.




Develop relationships with professors who can serve as future references by attending their office hours.




Apply in the spring semester for Chemistry Department scholarships and summer fellowships.




Present your research at a national or regional American Chemical Society meeting.



Did you do really well in a hard course? Become a Tutor or a Supplemental Instructor.




Discuss undergraduate research opportunities with faculty in Chemistry right now.




Want to continue your education and increase your opportunities? Talk to a faculty member about whether graduate school fits your career goals.


## YEAR FOUR




This is it! Are you on track to graduate? Meet with your advisor for your Senior Eval to see what requirements you have left.




Did you do really well in a hard course? Become a Tutor or a Supplemental Instructor.




Want to continue your education and increase your opportunities? Talk to a faculty member about whether graduate school fits your career goals.




Present your research at a national or regional American Chemical Society meeting.



Complete admissions exams (GRE, MCAT, PCAT) the summer before your senior year.



Be at the top of your professional game! Prepare a final resume and practice your interview skills with a career coach in Career Education.



Present your research at the College of Science Research Day.

## TRANSFERABLE SKILLS ASSOCIATED WITH THIS MAJOR

- Scientific Ability
- Oral and Written Communication Skills
- Ability to Work as Part of a Team
- Technological Literacy
- Adaptability

## ASSOCIATED CAREERS

- Product Development
- Process Development
- Analysis
- Quality Assurance/Control
- Environmental Analysis
- Chemical Engineer
- Pharmacist
- Pharmaceutical Sales
- Marketing



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