

# Biological Sciences, BS - Microbiology Concentration

## Biological Sciences, Microbiology Concentration, BS Requirements:

- All students are encouraged to see an advisor after completion of 24 credits.
- Biological Sciences, Microbiology concentration BS degree requires 128 credit hours.
- 39 of 128 credit hours must be taken at 300 level or higher (39 credits includes courses taken at the 300+ level in major, minor (if chosen), Pre professional area and electives).
- 12 credit hours of 300 level and above must be taken in the major or 6 credit hours in the major and 6 credit hours in the minor (if chosen).
- 12 of the last 18 credit hours must be taken at UAH, with an overall 25% of coursework taken at UAH.
- Unless otherwise noted a C- or better is required for all College of Science prerequisite courses.
- No more than 64 credit hours from a two-year college can be applied toward a UAH degree.
- For graduation application instructions, see here (<http://catalog.uah.edu/undergrad/policies-procedures/application-graduation/>).

## Degree Requirements

Charger Foundations Requirements

\*Please see Area V for CoS requirements that can also be used to fulfill Charger Foundations Requirements.

Code	Title	Semester Hours
<b>Area I: Freshman Composition</b>		<b>3-6</b>
EH 101 or EH 101S	COLLEGE WRITING I COLLEGE WRITING I W/STUDIO	
EH 102	COLLEGE WRITING II	
EH 103	ACCELERATED COLLEGE WRITING	
EH 105	HONORS ENGLISH SEMINAR	
<b>Area II: Humanities and Fine Arts*</b>		<b>12</b>
Fine Arts		3
ARH 100	ARH SURV:ANCIENT-MEDIEVAL	
ARH 101	ARH SURV:RENAISSANCE-MODERN	
ARH 103	ARH SUR: WORLD ART	
ARS 160	DRAWING: FOUNDATIONS	
TH 122	THEATRE APPRECIATION	
TH 123	INTRO TO FILM STUDIES	
MU 100	INTRO TO MUSIC LITERATURE	
Literature		3-6
EH 207	READINGS LITERATURE/CULTURE I	
EH 208	READINGS LITERATURE/CULTURE 2	
EH 209	HONORS SEM READINGS LIT/CUL I	
EH 210	HONORS SEM READINGS LIT/CUL 2	
EH 242	MYTHOLOGY	
Humanities and Fine Arts		3-6
CM 113	Intro to Rhetorical Communication	
WLC 101S or WLC 101A or WLC 101F or WLC 101G or WLC 101J or WLC 101R	INTRO FOREIGN LANG I: SPANISH INTRO FOREIGN LANG I: ARABIC INTRO FOREIGN LANG I:FRENCH INTRO FOREIGN LANG I:GERMAN INTRO FOREIGN LANG I:JAPANESE INTRO FOREIGN LANG I:RUSSIAN	
WLC 102S or WLC 102A or WLC 102F	INTRO FOREIGN LANG II:SPANISH INTRO FOREIGN LANG II: ARABIC INTRO FOREIGN LANG II:FRENCH	

or WLC 102G	INTRO FOREIGN LANG II:GERMAN
or WLC 102J	INTRO FOREIGN LANG II:JAPANESE
or WLC 102R	INTRO FOREIGN LANG II:RUSSIAN
WLC 201S	INTERM FOREIGN LANG:SPANISH
or WLC 201A	INTERM FOREIGN LANG I: ARABIC
or WLC 201F	INTERM FOREIGN LANG:FRENCH
or WLC 201G	INTERM FOREIGN LANG:GERMAN
or WLC 201J	INTERM FOREIGN LANG: JAPANESE
or WLC 201R	INTERM FOREIGN LANG:RUSSIAN
WLC 202S	INTERM FOREIGN LANG II:SPANISH
or WLC 202A	INTERM FOREIGN LANG II: ARABIC
or WLC 202F	INTERM FOREIGN LANG II:FRENCH
or WLC 202G	INTERM FOREIGN LANG II:GERMAN
or WLC 202J	INTERM FORGN LANG II:JAPANESE
or WLC 202R	INTERM FOREIGN LANG II:RUSSIAN
WLC 204	INTERNATIONAL CINEMA
PHL 101	INTRODUCTION TO PHILOSOPHY
PHL 102	INTRO TO ETHICS
PHL 103	INTRODUCTION TO LOGIC
PHL 150	TECH, SCIENCE & HUMAN VALUES
WGS 200	INTRO WOMEN'S & GENDER STUDIES
AMS 229	ANCIENT & MEDIEVAL WORLDS
ARH 100	ARH SURV:ANCIENT-MEDIEVAL
ARH 101	ARH SURV:RENAISSANCE-MODERN
ARH 103	ARH SUR: WORLD ART
ARS 160	DRAWING: FOUNDATIONS
TH 122	THEATRE APPRECIATION
TH 123	INTRO TO FILM STUDIES
MU 100	INTRO TO MUSIC LITERATURE

**Area III: Mathematics and Sciences****11-12**

## Mathematics

3-4

MA 105	NATURE OF MATHEMATICS
MA 107	ALGEBRA WITH APPLICATIONS
MA 110	FINITE MATHEMATICS
MA 112	PRECALCULUS ALGEBRA
MA 113	PRECALCULUS TRIGONOMETRY
MA 115	PRECALCULUS ALGEBRA & TRIG
MA 120	MATH PROFESSIONAL APPLICATIONS
MA 171	CALCULUS A

## Natural Sciences (Lab)

8

AST 100	SURVEY OF ASTRONOMY
AST 106	EXPLORING THE COSMOS I
AST 107	EXPLORING THE COSMOS II
BYS 109	FUNDAMENTALS OF BIOLOGY
BYS 119	PRINCIPLES OF BIOLOGY
BYS 120	ORGANISMAL BIOLOGY
BYS 215	HUMAN ANATOMY & PHYSIOLOGY I
CH 101 & CH 105	INTRO TO CHEMISTRY and INTRO CHEMISTRY LAB
CH 121 & CH 125	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB I
CH 123 & CH 126	GENERAL CHEMISTRY II and GENERAL CHEMISTRY LAB II

CH 151 & CH 105	GENERAL, ORGANIC, BIOCHEMISTRY and INTRO CHEMISTRY LAB
ESS 103	ENVIRONMENTAL EARTH SCIENCE
ESS 111	WEATHER, CLIMATE & GLOBAL CHNG
PH 100	CONCEPTUAL PHYSICS
PH 101	GENERAL PHYSICS I
PH 102	GENERAL PHYSICS II
PH 111 & PH 114	GEN PHYSICS W/CALCULUS I and GENERAL PHYSICS LAB I
PH 112 & PH 115	GEN PHYSICS W/CALC II and GENERAL PHYSICS LAB II
PH 113 & PH 116	GEN PHYSICS W/CALC III and GENERAL PHYSICS LAB III

**Area IV: History and Social and Behavioral Sciences\*** **12**History **3-6**

HY 103	WORLD HISTORY TO 1500
HY 104	WORLD HISTORY SINCE 1500
HY 221	UNITED STATES TO 1877
HY 222	UNITED STATES SINCE 1877

Social and Behavioral Sciences **6-9**

ECN 142	PRINC OF MACROECONOMICS
ECN 143	PRINC OF MICROECONOMICS
GS 200	GLOBAL SYSTEMS AND CULTURES
ESS 105	WORLD REGIONAL GEOGRAPHY
ESS 110	PRINCIPLES OF HUMAN GEOGRAPHY
PSC 101	INTRO TO AMERICAN GOVERNMENT
PSC 102	INTRO TO COMPARATIVE POLITICS
PSC 260	INTRODUCTION TO INTERNATIONAL RELATIONS
PY 101	GENERAL PSYCHOLOGY I
PY 201	LIFE-SPAN DEVELOPMENT
SOC 100	INTRO TO SOCIOLOGY
SOC 102	ANALYSIS OF SOCIAL PROBLEMS
SOC 103	INTRO TO CRIMINOLOGY
SOC 105	

\* Take either 1 EH (Area II) + 2 HY (Area IV) <OR> 2 EH (Area II) + 1 HY (Area IV). Take no more than six hours in a single discipline in Area II or Area IV.

## Area V: Pre Professional Requirements

Code	Title	Semester Hours
Courses in this area may also fulfill Charger Foundations requirements		
<b>Communications</b>		<b>3</b>
CM 113	Intro to Rhetorical Communication	
<b>Calculus - Choose one</b>		<b>3-4</b>
MA 120	MATH PROFESSIONAL APPLICATIONS	
MA 171	CALCULUS A	
<b>Physics Sequence - Choose one</b>		<b>8</b>
PH 101 & 101L and	GENERAL PHYSICS I and GENERAL PHYSICS I LAB	
PH 102 & 102L	GENERAL PHYSICS II and GENERAL PHYSICS LAB II	

OR

PH 111 & PH 114 and PH 112 & PH 115	GEN PHYSICS W/CALCULUS I and GENERAL PHYSICS LAB I  GEN PHYSICS W/CALC II and GENERAL PHYSICS LAB II	
<b>Computer Science: Choose one</b>		<b>3</b>
CS 100 or CS 102 or CS 103 or CS 104	INTRO COMPUTERS & PROGRAM INTRO TO C PROGRAMMING INTRO PROGRAMMING USING JAVA INTRO TO CS USING PYTHON	
<b>Technical Writing</b>		<b>3</b>
EH 301	TECHNICAL WRITING	

## Major Requirements

Code	Title	Semester Hours
<b>Biology Core <sup>5</sup></b>		<b>18</b>
BYS 119 & 119L & 119R	PRINCIPLES OF BIOLOGY and LABORATORY and RECITATION	
BYS 120 & 120L & 120R	ORGANISMAL BIOLOGY and ORGANISMAL BIOLOGY LAB and RECITATION	
BYS 219 & 219L & 219R	GENETICS AND EVOLUTION and LABORATORY and RECITATION	
BYS 300 & 300L	CELL & DEVELOPMENTAL BIOLOGY and CELL & DEVELOPMENT BIO LAB	
BYS 490	SENIOR CAPSTONE	
<b>Microbiology Concentration Requirements</b>		<b>18</b>
BYS 321 & 321L	GENERAL MICROBIOLOGY I and LABORATORY	
BYS 322 & 322L	GENERAL MICROBIOLOGY II and GENERAL MICROBIOLOGY II LAB	
BYS 361	GENERAL BIOCHEMISTRY	
BYS 430	IMMUNOLOGY	
Biology Elective course 300+ level or higher, 3 credits		

## Chemistry Minor Requirements (this minor is required for this concentration)

Code	Title	Semester Hours
<b>Chemistry Minor</b>		<b>21</b>
CH 121 & CH 125	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB I	
CH 123 & CH 126	GENERAL CHEMISTRY II and GENERAL CHEMISTRY LAB II	
CH 223 & CH 224	QUANTITATIVE ANALYSIS and QUANTITATIVE ANALYSIS LAB	
CH 331 & CH 335	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY LAB I	
CH 332 & CH 336	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY LAB II	
CH 362	GENERAL BIOCHEMISTRY LAB	

## Electives

Code	Title	Semester Hours
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**Elective Courses**
**24-25**

Additional Elective courses 100+ level to reach 128 credit hours. Electives can be taken from any department and do not have to be taken in your major or minor. No more than 4 credits of 100 level HPE courses can count toward degree requirements.

**Overall Requirements**

Code	Title	Semester Hours
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All College of Science degrees must have at least 128 credits.

At least 39 of the 128 credits must be at the 300+ level. These may be taken in any area including electives.

**Total Semester Hours**
**128**

- 1 Students must take one literature and one history course. Students must also take either a second literature or history course to complete a sequence. Acceptable Literature sequences must include one early literature (EH 207 or EH 242 or EH 209) and one later literature (EH 208 or EH 210). Acceptable history sequences are (HY 103 + HY 104), or (HY 221 + HY 222)
- 2 Based on Math placement, (<http://www.uah.edu/science/departments/math/undergraduate-students/placement/>) prerequisite MA 112 and/ or MA 113 Mathematics courses may be required. If the student intends to pursue a course of study requiring more advanced mathematics background, they should take MA 171 . Otherwise, MA 120 may be used to meet this requirement.
- 3 No more than 6 credit hours can be taken in a single discipline.
- 4 For choices see the World Languages and Cultures (<http://catalog.uah.edu/undergrad/colleges-departments/arts-humanities-social-sciences/foreign-languages-literatures/>) department.
- 5 Biology pre requisites require a minimum grade of D- or higher. BYS 301 and BYS 314 pre requisites require a minimum grade of C- or higher.

**Sample four year plan for Biological Sciences, Microbiology Concentration BS degree:**

Note: This is only an example and variations are possible.

**Year 1**

Fall		Semester Hours
FYE 101S	CHARGER SUCCESS - SCIENCE	1
BYS 119 & 119L & 119R	PRINCIPLES OF BIOLOGY and LABORATORY and RECITATION	4
CH 121 & CH 125	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB I	4
MA 171 or MA 120	CALCULUS A or MATH PROFESSIONAL APPLICATIONS	4
EH 101	COLLEGE WRITING I	3
Term Semester Hours:		16
<b>Spring</b>		
BYS 120 & 120L & 120R	ORGANISMAL BIOLOGY and ORGANISMAL BIOLOGY LAB and RECITATION	4
CH 123 & CH 126	GENERAL CHEMISTRY II and GENERAL CHEMISTRY LAB II	4
EH 102	COLLEGE WRITING II	3
Fine Art		3
See Requirements tab for approved list.		
Elective		1
Elective		1
Electives can be taken from any department and do not have to be taken in your major or minor. No more than 4 credit hours of 100 level HPE courses can count toward degree requirements.		
Term Semester Hours:		16

**Year 2**

**Fall**

BYS 219 & 219L & 219R	GENETICS AND EVOLUTION and LABORATORY and RECITATION	4
CH 223 & CH 224	QUANTITATIVE ANALYSIS and QUANTITATIVE ANALYSIS LAB	4
Literature See Requirements tab for approved list.		3
Social and Behavioral science See Requirements tab for approved list.		3
Elective Electives can be taken from any department and do not have to be taken in your major or minor. No more than 4 credit hours of 100 level HPE courses can count toward degree requirements.		2

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Term Semester Hours: 16

**Spring**

BYS 300 & 300L	CELL & DEVELOPMENTAL BIOLOGY and CELL & DEVELOPMENT BIO LAB	4
CH 331 & CH 335	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY LAB I	4
Humanities, 2nd Fine Art or 2nd Literature See Requirements tab for approved list.		3
Social and Behavioral science See Requirements tab for approved list.		3
Elective Electives can be taken from any department and do not have to be taken in your major or minor. No more than 4 credit hours of 100 level HPE courses can count toward degree requirements.		3

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Term Semester Hours: 17

**Year 3****Fall**

BYS 321 & 321L	GENERAL MICROBIOLOGY I and LABORATORY	4
CH 332 & CH 336	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY LAB II	4
PH 101 & 101L	GENERAL PHYSICS I and GENERAL PHYSICS I LAB	4
History See Requirements tab for approved list.		3

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Term Semester Hours: 15

**Spring**

BYS 361 & CH 362	GENERAL BIOCHEMISTRY and GENERAL BIOCHEMISTRY LAB	4
BYS 300+ level or higher course		3
PH 102 & 102L	GENERAL PHYSICS II and GENERAL PHYSICS LAB II	4
2nd History or 3rd Social/Behavioral science See Requirements tab for approved list.		3
Elective		3

Electives can be taken from any department and do not have to be taken in your major or minor. No more than 4 credit hours of 100 level HPE courses can count toward degree requirements.

	Term Semester Hours:	17
<b>Year 4</b>		
<b>Fall</b>		
BYS 419	MICROBIAL GENETICS	3
CM 113	Intro to Rhetorical Communication	3
EH 301	TECHNICAL WRITING	3
CS 100	INTRO COMPUTERS PROGRAM	3
or CS 102	or INTRO TO C PROGRAMMING	
or CS 103	or INTRO PROGRAMMING USING JAVA	
or CS 104	or INTRO TO CS USING PYTHON	
Elective		3
Electives can be taken from any department and do not have to be taken in your major or minor. No more than 4 credit hours of 100 level HPE courses can count toward degree requirements.		
	Term Semester Hours:	15
<b>Spring</b>		
BYS 430	IMMUNOLOGY	4
BYS 490	SENIOR CAPSTONE	2
Elective 300+ level course or higher		4
Elective		3
Elective		3
Electives can be taken from any department and do not have to be taken in your major or minor. No more than 4 credit hours of 100 level HPE courses can count toward degree requirements.		
	Term Semester Hours:	16
	Total Semester Hours:	128