

# Degree Guide for the College of Arts and Sciences: 2017-2018

## B.S. BIOLOGY with Research Concentration

Page 1 of 2 (see reverse)

### COLLEGE of ARTS & SCIENCES Language Requirement

All students who major in the College of Arts & Sciences are required to demonstrate competence in a second language. For complete details see:

<http://www.gonzaga.edu/Academics/Colleges-and-Schools/College-of-Arts-and-Sciences/Majors-Programs/language-requirement->

	Credits	Sem/Yr

### UNIVERSITY CORE REQUIREMENTS:

#### ► FUNDAMENTAL CORE COURSES

##### Year 1: Understanding & Creating

Writing	Credits	Sem/Yr
ENGL 101 Writing (fulfills 3 credits Writing Enriched)*	3	
Reasoning		
PHIL 101 Reasoning	3	
First Year Seminar		
193	3	
Communication & Speech		
COMM 100 Communication & Speech	3	
Math		
MATH (must be above Math 100)	3	
Scientific Inquiry (2cr + 1cr lab)		
BIOL or CHEM or PHYS 104/104L (taken year 1 or 2)	3	

##### Year 2: Being & Becoming

Christianity & Catholic Traditions	Credits	Sem/Yr
RELI (see approved list)**	3	
Philosophy of Human Nature		
PHIL 201 Philosophy of Human Nature	3	

##### Year 3: Caring & Doing

World/Comparative Religion	Credits	Sem/Yr
RELI (see approved list)** (fulfills 3cr Global Studies)*	3	
Ethics		
PHIL 301 Ethics or RELI 330 Principals-Christian Morality	3	

##### Year 4: Imagining the Possible

Core Integration Seminar	Credits	Sem/Yr
492	3	

**NOTE: some courses have pre-requisites, check the catalogue carefully!**

#### ► BROADENING COURSES - see approved list\*\*

Social & Behavioral Science	Credits	Sem/Yr
	3	
Literature		
	3	
History		
	3	
Fine Arts & Design		
	3	

#### ► REQUIRED COURSE DESIGNATIONS - see approved list\*\*

*Writing Enriched	Credits	Sem/Yr
	9 total	
Social Justice		
	3 total	
*Global Studies		
	6 total	

**\*\*for list of approved RELI, Broadening & Designated courses, see :**

<http://www.gonzaga.edu/Academics/Undergraduate/General-Degree-Requirements-and-Procedures/University-Core/Default.asp>

### B.S. BIOLOGY-Research Concentration 69-70 CREDITS

#### LOWER DIVISION

**44 Credits**

Course	Course Title	Credits	Grade
BIOL 105	Info Flow in Biological Systems**	3	
BIOL 105L	Info Flow in Biological Systems Lab**	1	
BIOL 106	Energy Flow in Biological Systems	3	
BIOL 205 & 205L	Physiology & Biodiversity & Lab	4	
BIOL 206 & 206L	Ecology & Lab	4	
BIOL 207 & 207L	Genetics & Lab	4	
CHEM 101 & 101L	General Chemistry & Lab	4	
CHEM 230 & 230L	Organic Chemistry & Lab	5	
CHEM 231 & 231L	Organic Chemistry II & Lab	4	
CHEM 245 & 245L	Biochemistry & Lab	4	

**Choose one of the following sets of courses and labs:**

PHYS 101 & 101L	General Physics I & Lab	4	
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**OR**

PHYS 103* & 103L	Scientific Physics I & Lab	4*	
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**Choose one of the following sets of courses and labs:**

PHYS 102 & 102L	General Physics II & Lab	4	
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**OR**

PHYS 204* & 204L	Scientific Physics II & Lab	4*	
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**Choose one of the following two courses :**

MATH 148	Survey of Calculus	3	
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**OR**

MATH 157	Calculus & Analytic Geometry I	4	
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**Complete a Statistics or Biological Mathematics course:**

Course	Course Title	Credits	Grade
		3	

**(MATH 121, MATH 321 or BIOL 305)**

#### UPPER DIVISION

**23 Credits**

Course	Course Title	Credits	Grade
BIOL 399	Advanced Topics	2	
BIOL 484	Research Seminar	1	
BIOL 495	Senior Evaluation	0	
BIOL 499	Senior Colloquium	1	

#### BIOL Upper Division Electives:

**15 Credits**

**(must be approved by an advisor in Biology)**

Course	Course Title	Credits	Grade
BIOL			
BIOL			
BIOL			
BIOL			
BIOL			

**+ Complete additional requirements as listed on Page 2**

**\*NOTE: the required number of credits for these courses differ from actual course credits.**

**\*\*BIOL 105/105L meets the Scientific Inquiry requirement of the University Core for Biology Majors & Minors.**

**NOTE:** A pre-requisite for BIOL 205, BIOL 206, and BIOL 207 is a C- grade or better in BIOL 105, BIOL 105L, and BIOL 106. Students must also get a C- grade or better in BIOL 205, BIOL 206, BIOL 207, & BIOL 399 in order to take BIOL 499. For upper division biology electives, a minimum of 10 credits (BS), 6 credits (BA), or 4 credits (Minor) must be biology courses taken from Gonzaga faculty: students participating in School for Field Studies programs or other study abroad programs should make note.

**All** courses should be chosen in consultation with a faculty advisor.

## DEGREE GUIDE FOR THE COLLEGE OF ARTS AND SCIENCES: 2017-2018

### **B.S.: BIOLOGY with Research Concentration**

*Page 2 of 2*

The Research Concentration is a challenging track within the Biology major. Its goals are to make research experiences available to more students, to show students the value of science education outreach through experiential learning, and to provide students with a more solid foundation in biological mathematics and science communication. It consists of a number of courses and experiences designed to prepare students to pursue research in some venue (graduate school, industry, government, medical school, or science education) after graduation. Students can enter the program at any time, although we anticipate most students will enter the program as sophomores and juniors.

To complete the Research Concentration, the following requirements are added to the requirements for the BS degree in Biology:

1. Participate in a significant research experience. This means working on an independent research project for the equivalent of 4 credits. Most students can fulfill this requirement in one summer of full-time research or four academic semesters of research while enrolled in other classes. Enrolling in the Research Concentration does not guarantee a research experience. It is the student's responsibility to secure a research position. This requirement can be fulfilled in the lab of a GU faculty member, or with prior permission, at a different institution.
2. Present the results from the independent research (in oral or poster format) to the scientific community at a venue outside of the Gonzaga campus.
3. Write up the research results under advisement with student's research mentor. Final papers will be turned in to the Research Coordinator the last month of the final semester the student is enrolled at Gonzaga. If student did research off campus, see the Research Coordinator to arrange a local writing mentor.
4. Participate in science education outreach for 16 hours one semester (BIOL 295/CHEM 295).
5. Take BIOL 484 Research Seminar (1 credit) and attend a minimum of 12 biology-related seminars (including those in BIOL 484), and upload a Seminar Evaluation Form for each seminar.
6. Take a college calculus course (Survey of Calculus (MATH 148) or Calculus and Analytic Geometry I (MATH 157)).
7. Complete a statistics course (MATH 121 or MATH 321) or biological mathematics course (BIOL 305).