

# Degree Worksheet for the College of Arts and Sciences: 2019-2020 B.S. APPLIED MATHEMATICS - Biology Concentration

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## 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: <https://www.gonzaga.edu/college-of-arts-sciences/about/information-for-students/language-requirement-information>*

	Credits	Sem/Yr

## UNIVERSITY CORE REQUIREMENTS:

### ► FUNDAMENTAL CORE COURSES

#### Year 1: Understanding & Creating

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

#### Year 2: Being & Becoming

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

#### Year 3: Caring & Doing

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

#### Year 4: Imagining the Possible

	Credits	Sem/Yr
<i>Core Integration Seminar</i>		
Dept. 432	3	

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

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

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

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

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

**\*\*for list of approved RELI, Broadening & Designated courses, see : <https://my.gonzaga.edu/academics/undergraduate-programs/general-degree-requirements-procedures/university-core>**

## B.S. APPLIED MATHEMATICS: Biology Concentration

**68 CREDITS**

### APPLIED MATHEMATICS

**34 Credits**

#### LOWER DIVISION

**18 Credits**

	Course	Course Title	Credits	Grade
	MATH 157	Calculus & Analytic Geometry I	4	
	MATH 258	Calculus & Analytic Geometry II	4	
	MATH 259	Calculus & Analytic Geometry III	4	
	MATH 260	Ordinary Differential Equations	3	
	CPSC 121	Computer Science I	3	

#### UPPER DIVISION

**13 Credits**

MATH 301	Fundamentals of Mathematics	3	
MATH 339	Linear Algebra	3	
MATH 350	Elementary Numerical Analysis	3	
MATH 413	Real Analysis I	3	
MATH 499	Comprehensive	1	

#### One of the following two courses:

**3 Credits**

MATH 321	Statistics for Experimentalists	3	
MATH 422	Mathematical Statistics	3	

*If MATH 422 is chosen, then one MATH 400 level elective may be replaced by a MATH 300 level elective.*

### BIOLOGY CONCENTRATION

**34 Credits**

#### One of the following two courses:

**3 Credits**

MATH 454	Partial Differential Equations	3	
MATH 462	Nonlinear Systems & Chaos	3	

#### Mathematics 400 Level Electives:

**6 Credits**

MATH	3	
MATH	3	

*(All 6 credits must be from the Math electives list; cannot double-count with another requirement)*

- MATH 328 Operations Research
- MATH 341 Modern Geometry
- MATH 351 Combinatorics & Graph Theory
- MATH 360-363 Selected Topics
- MATH 414 Real Analysis II
- MATH 417 Complex Variables
- MATH 421 Probability Theory
- MATH 437 Abstract Algebra I
- MATH 438 Abstract Algebra II
- MATH 450-453 Selected Topics
- MATH 454 Partial Differential Equations
- MATH 457 Number Theory & Cryptography
- MATH 459 Topology
- MATH 462 Nonlinear Systems & Chaos
- MATH 498A/498B Thesis I/II

**11 Credits**

CHEM 101/101L	General Chemistry/Lab	4	
BIOL 105/105L	Info Flow-Biological System/Lab	4	
BIOL 106	Energy Flow-Biological Systems	3	

#### Two of the following three courses:

**8 Credits**

BIOL 205/205L	Physiology & Biodiversity/Lab	4	
BIOL 206/206L	Ecology/Lab	4	
BIOL 207/207L	Genetics/Lab	4	

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Biology 300-400 Level Electives:		6 Credits
BIOL	3	<input type="checkbox"/>
BIOL	3	<input type="checkbox"/>

*Cannot double count with another requirement.*

- BIOL 303 Population Ecology
- BIOL 313 Animal Behavior
- BIOL 323 Conservation Biology
- BIOL 331 Parasitology
- BIOL 333 Community Ecology
- BIOL 334 Advanced Evolution
- BIOL 335 Advanced Genetics: Selected Topics
- BIOL 337 Developmental Biology
- BIOL 338 Histology
- BIOL 340 Field Botany
- BIOL 341 Human Physiology
- BIOL 343 Plant Community Ecology
- BIOL 344 GIS & Ecological Techniques
- BIOL 357 Principles of Wildlife Management
- BIOL 360 Plant Biology
- BIOL 367 Entomology
- BIOL 371 Vertebrate Biology & Anatomy
- BIOL 399 Advanced Topics
- BIOL 403 Marine Biology
- BIOL 420 Physiological Ecology
- BIOL 441 Advanced Physiology
- BIOL 451 Comparative Endocrinology

*(other courses may be considered on a case-by-case basis)*

*Check for pre-requisites when selecting electives*