

# Degree Worksheet for the College of Arts and Sciences: 2020-2021 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

*Writing* Credits Sem/Yr  
ENGL 101 Writing (fulfills 3 credits Writing Enriched)\* 3

*Reasoning*  
PHIL 101 Reasoning 3

*First Year Seminar*  
Dept. 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 Principles-Christian Morality 3

#### Year 4: Imagining the Possible

*Core Integration Seminar* Credits Sem/Yr  
Dept. 432 3

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

<https://my.gonzaga.edu/academics/undergraduate-programs/general-degree-requirements-procedures/university-core>

## B.S. APPLIED MATHEMATICS: 68 CREDITS

### Biology Concentration

#### 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 496*	Comprehensive-Applied Math	1	

\* Majors usually take Fall of their final year.

##### 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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<b>Biology 300-400 Level Electives:</b>	<b>6 Credits</b>
BIOL	3
BIOL	3

*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 the catalog for pre-requisites when selecting electives***