Degree Worksheet for the College of Arts and Sciences: 2020-2021
B.S. APPLIED MATHEMATICS - Biology Concentration

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 423 Stochastic Processes
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	
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