

**College of Arts and Sciences 2024-2025 Degree Worksheet**  
**B.S. APPLIED MATHEMATICS**  
**with BIOLOGY & STATISTICS 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

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**UNIVERSITY CORE REQUIREMENTS:**

► **FUNDAMENTAL CORE COURSES**

**Year 1: Understanding & Creating**

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

Reasoning	Credits Sem/Yr
PHIL 101 Reasoning	3

First Year Seminar	Credits Sem/Yr
Dept. 193	3

Communication & Speech	Credits Sem/Yr
COMM 100 Communication & Speech	3

Math	Credits Sem/Yr
MATH (must be above Math 100)	3

Scientific Inquiry (2cr + 1cr lab)	Credits Sem/Yr
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	Credits Sem/Yr
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	Credits Sem/Yr
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	Credits Sem/Yr
	3

History	Credits Sem/Yr
	3

Fine Arts & Design	Credits Sem/Yr
	3

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

*Writing Enriched	Credits Sem/Yr
	9 total

Social Justice	Credits Sem/Yr
	3 total

*Global Studies	Credits Sem/Yr
	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: 77 CREDITS**  
**with BIOLOGY & STATISTICS DOUBLE 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**

**10 Credits**

MATH 301	Fundamentals of Mathematics	3	
MATH 350	Numerical Methods	3	
MATH 413	Real Analysis I	3	
MATH 496	Comprehensive-Applied Math	1	

**Select one of the following two courses:**

**3 Credits**

MATH 335	Applied Linear Algebra	3	
MATH 339	Linear Algebra	3	

**Select 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 and STATISTICS**

**43 Credits**

**DOUBLE CONCENTRATION**

**14 Credits**

MATH 421	Probability Theory	3	
CHEM 101/101L	General Chemistry + Lab	4	
BIOL 105/105L	Info Flow-Biological Systems + Lab	4	
BIOL 106	Energy Flow-Biological Systems	3	

**Select one of the following two courses:**

**3 Credits**

MATH 425	Applied Statistical Models	3	
MATH 426	Experimental Design	3	

**Select one of the following three courses:**

**3 Credits**

MATH 440	Foundations of Applied Math	3	
MATH 454	Partial Differential Equations	3	
MATH 462	Nonlinear Systems & Chaos	3	

**Select two of the following three course options:**

**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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**Select two Biology 300-400 level electives:**

BIOL	3		<b>6 Credits</b>
BIOL	3		

**Selection list for Biology 300-400 level electives:**

*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)*

*BIOL 334, 337, and 451 are allowed as Biology electives, but require BIOL 205, 206, and 207 as pre-requisites.*

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

**Select one 300-400 level Math elective:**

MATH	3		<b>3 Credits</b>
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*Cannot double-count with another requirement*

**Select two Statistics electives:**

MATH	3		<b>6 Credits</b>
	3		

*Cannot double-count with a course used elsewhere.*

*At least one course must be MATH.*

**MATH Electives:**

*Cannot use MATH 335, 339, 432, or 499 as MATH electives.  
A maximum of three (3) total credits from the following may be counted toward Math electives: MATH 365 (may be taken for credit only once), MATH 390, MATH 490, MATH 497.*

**Selection list for Statistics electives:**

*Cannot double-count with a requirement used elsewhere*

- MATH 422 Mathematical Statistics
- MATH 423 Stochastic Processes
- MATH 426 Experimental Design
- ECON 355 Regression Analysis
- ECON 451 Econometrics
- ECON 452 Time Series Analysis
- CPSC 322 Data Science Algorithms
- CPSC 323 Machine Learning & Intelligent Systems
- CPSC 324 Big Data Analytics
- PHYS 323 Statistical Mechanics
- PSYC 450 Advanced Statistics in Psychology

*Or any course with significant probability or statistics content with the **prior** approval of the Math Department Chair.*

**ALL of these courses have pre-requisites, and may require courses outside of the concentration to be taken.**