

Degree Worksheet for the College of Arts and Sciences: 2022-2023

B.S. APPLIED MATHEMATICS with PHYSICS and STATISTICS DOUBLE 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

<i>Writing</i>	Credits Sem/Yr
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 & 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

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

Year 3: Caring & Doing

<i>World/Comparative Religion</i>	Credits Sem/Yr
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

<i>Core Integration Seminar</i>	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: 74 CREDITS with Physics & 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	

One of the following two courses:

3 Credits

MATH 335	Applied Linear Algebra	3	
MATH 339	Linear Algebra	3	

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.

PHYSICS & STATISTICS CONCENTRATION

40 Credits

3 Credits

MATH 421	Probability Theory	3	
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Select one of the following two courses:

3 Credits

MATH 425	Applied Statistical Models	3	
MATH 426	Experimental Design	3	

10 Credits

PHYS 103/103L	Scientific Physics I/Lab	5	
PHYS 204/204L	Scientific Physics II/Lab	5	

Select two of the following four courses:

6 Credits

MATH 417	Complex Variables	3	
MATH 440	Foundations of Applied Math	3	
MATH 454	Partial Differential Equations	3	
MATH 462	Nonlinear Systems & Chaos	3	

Select two 200-300-400 level PHYS electives:

6 Credits

PHYS		3	
PHYS		3	

Select one 300-400 level Math elective:

3 Credits

MATH		3	
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Select one 400-level Math elective:

3 Credits

MATH		3	
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Cannot double-count with another requirement.

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Physics 200, 300, 400 Electives Options:

PHYS 205 Modern Physics
 PHYS 301 Intermediate Mechanics
 PHYS 306 Electricity & Magnetism
 PHYS 307 Optics
 PHYS 402 Advanced Mechanics
 PHYS 407 Electricity & Magnetism II
 PHYS 409 Nuclear & Particle Physics*
 PHYS 415 Cosmology & Astrophysics
 PHYS 450 Statistical Physics
 PHYS 464 Intro to Quantum Physics*

**(PHYS 409 & 464 require PHYS 205 as a pre-requisite)*

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.

Check for pre-requisites when selecting electives!

Select two Statistics electives:

6 Credits

MATH	3	
	3	

*Cannot double-count with a course used elsewhere.
 At least one course must be MATH.*

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 450 Statistical Physics

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.