

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

B.S. BIOLOGY with Research 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

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|---|----------------|
| <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. BIOLOGY-Research Concentration 71-72 CREDITS

LOWER DIVISION

46 Credits

| Course | Course Title | Credits | Grade |
|-----------------|---------------------------------------|---------|-------|
| BIOL 105 | Info Flow in Biological Systems** | 3 | |
| BIOL 105L | Info Flow in Biological Systems Lab** | 1 | |
| BIOL 106 | Energy Flow in Biological Systems | 3 | |
| BIOL 205 & 205L | Physiology & Biodiversity & Lab | 4 | |
| BIOL 206 & 206L | Ecology & Lab | 4 | |
| BIOL 207 & 207L | Genetics & Lab | 4 | |
| CHEM 101 & 101L | General Chemistry & Lab | 4 | |
| CHEM 230 & 230L | Organic Chemistry I & Lab | 5 | |
| CHEM 231 & 231L | Organic Chemistry II & Lab | 4 | |
| CHEM 245 & 245L | Biochemistry & Lab | 4 | |

Choose one of the following sets of courses and labs:

| | | | |
|-----------------|----------------------------|---|--|
| PHYS 101 & 101L | General Physics I & Lab | 5 | |
| PHYS 103 & 103L | Scientific Physics I & Lab | 5 | |

Choose one of the following sets of courses and labs:

| | | | |
|-----------------|-----------------------------|---|--|
| PHYS 102 & 102L | General Physics II & Lab | 5 | |
| PHYS 204 & 204L | Scientific Physics II & Lab | 5 | |

UPPER DIVISION

18 Credits

| | | | |
|----------|-------------------|---|--|
| BIOL 399 | Advanced Topics | 2 | |
| BIOL 495 | Senior Evaluation | 0 | |
| BIOL 499 | Senior Colloquium | 1 | |

BIOL Upper Division Electives:

15 Credits

(must be approved by an advisor in Biology)*

| Course | Course Title | Credits | Grade |
|--------|--------------|---------|-------|
| BIOL | | | |
| BIOL | | | |
| BIOL | | | |
| BIOL | | | |
| BIOL | | | |

RESEARCH CONCENTRATION

Complete additional requirements #1-#7, details Page 2.

#1. - #4. details on Page 2.

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|------------|---------------------------|---|--|
| #5. | BIOL 484 Research Seminar | 1 | |
|------------|---------------------------|---|--|

#6. Select one of the following two courses:

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|----------|--------------------------------|---|--|
| MATH 148 | Survey of Calculus | 3 | |
| MATH 157 | Calculus & Analytic Geometry I | 4 | |

#7. Complete a statistics or biological mathematics course:

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| stastics: MATH 121 or MATH 321 or biological mathematics: BIOL 305 | 3-4 | |
|--|-----|--|

*Students must earn a C- grade or better in BIOL 105/105L & BIOL 106 in order to take BIOL 205, 206, or 207. Students must also get a C- grade or better in BIOL 205/205L, 206/206L, 207/207L & BIOL 399 in order to take BIOL 499.

For upper division biology electives, a minimum of 10 credits (B.S.), 6 credits (B.A.), or 4 credits (Minor) must be biology courses taken from Gonzaga faculty. Students participating in School for Field Studies programs or other study abroad programs should make note.

****BIOL 105/105L meets the Scientific Inquiry requirement of the University Core for Biology Majors & Minors.**

Credits from BIOL 497 Biology Internship, do not satisfy any requirements for the Biology Major or Minor.

All courses should be chosen in consultation with a Biology faculty advisor.

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The Research Concentration is a challenging area of study within the Biology major. Its goals are to make research experiences available to more students, to show students the value of science education outreach through experiential learning, and to provide students with a more solid foundation in biological mathematics and science communication. It consists of a number of courses and experiences designed to prepare students to pursue research in some venue (graduate school, industry, government, medical school, or science education) after graduation. Students can enter the program at any time, although we anticipate most students will enter the program as sophomores and juniors.

To complete the Research Concentration, the following requirements are in addition to the requirements for the B.S. degree in Biology:

1. Participate in a significant research experience. This means working on an independent research project for the equivalent of 4 credits. Most students can fulfill this requirement in one summer of full-time research or four academic semesters of research while enrolled in other classes. Enrolling in the Research Concentration does not guarantee a research experience. It is the student's responsibility to secure a research position. This requirement can be fulfilled in the lab of a GU faculty member, or with prior permission, at a different institution.
2. Present the results from the independent research (in oral or poster format) to the scientific community at a venue outside of the Gonzaga campus.
3. Write up the research results under advisement with student's research mentor. Final papers will be turned in to the Research Coordinator the last month of the final semester the student is enrolled at Gonzaga. If student did research off campus, see the Research Coordinator to arrange a local writing mentor.
4. Participate in science education outreach for 16 hours one semester (BIOL 295/CHEM 295).
5. Take BIOL 484 Research Seminar (1 credit) and attend a minimum of 12 biology-related seminars (including those in BIOL 484), and write and submit a seminar reflection for each seminar.
6. Take a college calculus course (Survey of Calculus MATH 148 **or** Calculus and Analytic Geometry I MATH 157).
7. Complete a statistics course (MATH 121 **or** MATH 321) **or** a biological mathematics course, Biological Data Analysis BIOL 305.