

BIOLOGY – M.S.

Program director

Stephen G. Dunbar

Program learning outcomes

By the end of the program, the graduate should be able to:

1. Demonstrate critical independent evaluation of published scientific literature.
2. Plan and carry out independent research.
3. Critically evaluate philosophies of science and their relation to issues of public interest.
4. Demonstrate proficient oral and written skills in communicating science topics.
5. Demonstrate professional aptitude and attitudes.

Student financial aid

Assistantships for research and/or teaching are available in the Department of Earth and Biological Sciences on a competitive basis. Further information can be obtained, including contact information, from the department web page at <http://www.llu.edu/medicine/ebs/index.page?> (<http://medicine.llu.edu/research/department-earth-and-biological-sciences/>). Qualified students are also encouraged to seek fellowships from federal and private agencies with the help of their advisors.

General requirements

For information about requirements and practices to which all graduate students are subject, the student should consult the relevant sections of this catalog and of the school in which this program is housed.

Seminar attendance requirements

All graduate students in residence must register for and attend seminars (BIOL 607) at this university each quarter.

Research proposal

Students are urged to select a research project early in their programs, in consultation with faculty members and approved by the department. A written research proposal and oral defense of the student's proposed research should be completed early in the third quarter of study. A comprehensive plan for completion of the degree will be approved at that time.

Registration and tuition after normative time

This program is designed for M.S. degree students to finish within the normative time of two years. In certain circumstances, students may require slightly more time for completion. Students who are past the normative time for completing their degrees must register for two units without a tuition waiver each quarter, until they complete their degrees. After their normative time, students may request a one-year grace period that must be approved by the department faculty.

Thesis

The written thesis must be a completed significant, original research paper, formatted in the style of an appropriate scientific journal—since the manuscript is likely to be submitted for publication.

Admissions

In addition to Loma Linda University (<http://llucatalog.llu.edu/about-university/admission-policies-information/#admissionrequirements>), the applicant must also complete the following requirements:

- Expected undergraduate preparation includes a bachelor's degree with a biology major or equivalent from an accredited college or university, including the following courses*:

Required:

- General biology (one year)
- General chemistry (one year)
- Genetics (one course)
- Organic chemistry (one year)
- General physics (one year)
- Precalculus
- Statistics (one course)

Recommended:

- Biochemistry
- Calculus

*Some of these courses may be taken during residence at this University, with the approval of the EBS admissions committee.

- An undergraduate G.P.A. of at least 3.0 is expected
- an acceptable score on the general Graduate Record Examination (GRE) (the subject GRE is not required)

It is also recommended that applicants contact the department at ebs@llu.edu.

Application time

Applications are accepted at any time, although students are usually admitted for Autumn Quarter. Review of applications begin in February for Autumn Quarter admission. Research assistantships are competitively awarded.

Program requirements

A total of 48 units of courses and research is required, including at least 36 at or above the 500 level. See below for a list of courses.

All values below are in quarter units

Required

Additional courses beyond those listed below will be chosen in consultation with the student's advisor		
BIOL 502	Orientation to Graduate Biology	1
BIOL 545	Genetics and Speciation	4
BIOL 558	Philosophy of Science ¹	4
BIOL 607	Seminar in Biology ²	3
BIOL 616	Research and Experimental Design	2
BIOL 617	Proposal Writing and Grantsmanship	2
BIOL 664	Science Communication Outreach ⁴	1

Select one or more course(s) from any of the following areas for at least 6 units **6**

Biological systems

BIOL 517	Ecological Physiology	
BIOL 555	Molecular Genetics	
MICR 540	Physiology and Molecular Genetics of Microbes	
MICR 570	Mechanisms of Microbial Pathogenesis	
Ecology		
BIOL 444	Paleobotany	
BIOL 505	Marine Biology	
BIOL 515	Biogeography	
BIOL 539	Behavioral Ecology	
BIOL 546	Techniques in Vertebrate Ecology	
BIOL 549	Biodiversity and Conservation	
Organismal		
BIOL 409	Mammalogy	
BIOL 426	Invertebrate Paleontology	
BIOL 427	Vertebrate Paleontology	
BIOL 504	Biology of Marine Invertebrates	
BIOL 539	Behavioral Ecology	
GEOL 444	Paleobotany	
GEOL 545	Taphonomy	
Religion		
REL_5__	Graduate-level Religion	3
Electives		
Additional courses required by the student's guidance committee to complete the total units required for the degree ³		8
ANAT 516	Neuroscience GS	
ANAT 542	Cell Structure and Function GS	
BCHM 515	Introduction to Bioinformatics	
Research		
Typically research units will be graded each quarter and can be repeated for additional credit		
BIOL 698	Thesis Research (1-8)	15
Total Units		49

¹ BIOL 559 Philosophy of Science and Origins required for students who have taken BIOL 475 Philosophy of Science and Origins or equivalent

² Each quarter in residence; 0.5 unit per quarter (Total units required may vary depending on the number of quarters a student is on campus.)

³ In addition to this list, courses may also be chosen from unused courses listed above for biological systems, ecology, and organismal biology. When choosing elective, keep in mind that a minimum of 44 units for the M.S. degree must be numbered 500 or above.

⁴ Fulfills service learning requirement

Noncourse requirements

Advancement to candidacy

Students may apply for advancement to candidacy by completing Form A, which requires:

- Completing all deficiencies and corequisites.
- Selecting a research committee.
- Completing an approved written research proposal.
- Passing the oral defense of the research proposal.

- Being recommended by the program faculty (should be completed by the end of the third quarter of study).

Defense of thesis

An oral presentation and defense of the thesis, including final oral examination on the student's field of study, are required.

Grade requirement for graduation

All courses applied toward a graduate degree must have a grade of B or higher.

Length of program

Two (2) years – based on full-time enrollment; part time is permitted.