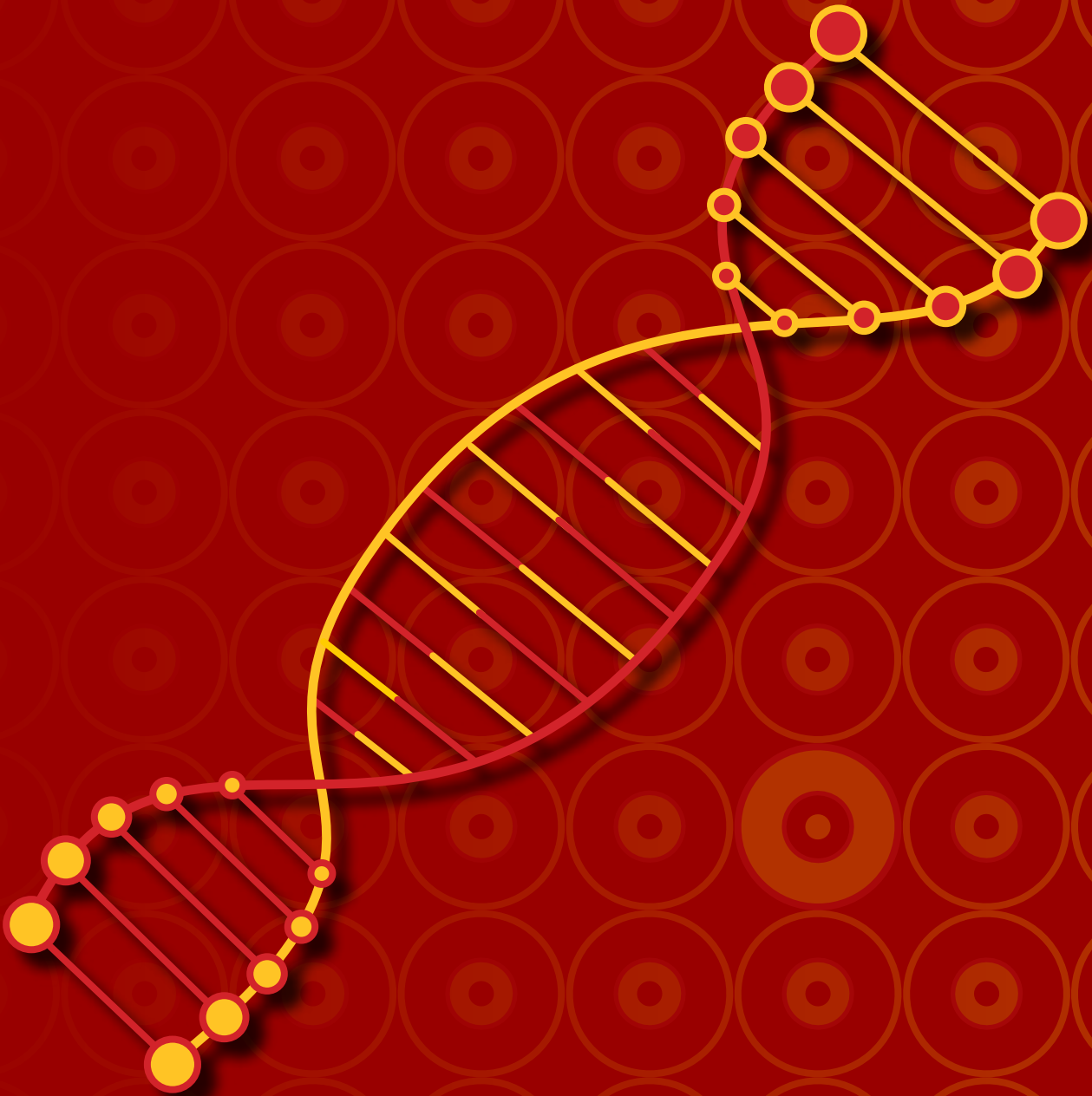


# Biological Sciences

## Undergraduate Advisement Guide



USC Dornsife

Dana and David Dornsife  
College of Letters, Arts and Sciences



Welcome to the study of the broadest, most dynamic, and (we think) most exciting of the natural sciences, the study of life itself, biology. The Department of Biological Sciences invites you to join our community of scholars as we teach, learn, and explore the living world together. Our students will gain a deep appreciation of organisms, from their smallest molecular mechanisms to their largest interactions within ecosystems. We will help you refine your skills in critical thinking, communication, and collaboration, as well as understand how biology can contribute to solving society's problems. We also offer the opportunity to participate in the discovery of new knowledge, by working alongside our faculty members in their laboratories. Students who complete our degree programs will be well prepared for professional careers in the health sciences as well as for careers in research and education in the basic biological and biomedical fields, and in many other professions.

We look forward to meeting you.

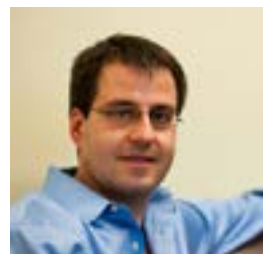
Doug Capone, Ph.D.  
Professor and Chair



Christa Bancroft, Ph.D.  
Professor and Director of Undergraduate Studies



Remo Rohs, Ph.D.  
Professor and Vice Chair



The Biological Sciences Department would like to extend their gratitude and appreciation to David Lichtenstein who first conceived of and put together the BISC Guide.

2014.06.12

### A. General Skills and Breadth

- Develop the ability to manage one's time, work independently, take initiative, and collaborate.
- Develop the ability to think critically, analyze, synthesize, and use information to solve problems.
- Acquire broad knowledge in the humanities, social sciences, mathematics, and physical sciences, and understand the relevance of these disciplines to the biological sciences.
- Develop the ability to communicate scientific ideas, orally and in writing.
- Develop facility in the use of computer applications and the internet.

### B. Scientific and Experimental Skills

- Understand and apply the scientific method, including forming hypotheses, designing experiments to test hypotheses, and collecting, analyzing, interpreting, and reporting data.
- Develop the ability to use appropriate laboratory or field procedures, methods, and instrumentation for biological studies.

### C. Biological Skills

- Develop breadth of knowledge in the biological sciences, including the fields of biochemistry, cell biology, ecology, evolution, molecular biology and genetics, and physiology.
  - Acquire an appreciation for all levels of biological organization, including the molecular, cellular, organismal, and systems levels.
  - Understand the processes that underlie embryonic development, cellular differentiation, and reproduction.
1. *Biochemistry*: Understand the structure and function of biological molecules, cellular energetics, cellular metabolism, and photosynthesis.
  2. *Cell Biology*: Understand the structure and function of prokaryotic and eukaryotic cells, as whole entities and in terms of their subcellular processes.
  3. *Ecology*: Understand the interactions between organisms and their environments, and the consequences of these interactions in natural populations, communities, and ecosystems.
  4. *Evolution*
    - Understand evolution as the central unifying concept in the biological sciences.
    - Understand natural selection, and how it contributes to the formation of species, biodiversity, and patterns of biological evolution.
    - Appreciate the scope of biological diversity in terms of the evolutionary history of the major groups of organisms.
  5. *Molecular Biology and Genetics*
    - Understand the synthesis, structure, and function of nucleic acids and proteins in prokaryotes and eukaryotes.
    - Understand the principles of inheritance from molecular mechanisms to population consequences.
    - Understand the flow of genetic information in populations and the relationship between genetics and evolutionary theory.
  6. *Physiology*: Understand the functioning of organisms, at the molecular, cellular, organ, and organismal levels.

### D. Ethics / Society

- Be able to place biological knowledge into an ethical context, especially how biology can contribute to the resolution of ethical, social, and environmental issues.

### E. After Graduation

- Prepare students with a sufficient depth of knowledge and abilities to prepare them for entry-level employment in a wide variety of fields, or for graduate study in the health professions or other biology-related disciplines.

## Philosophy of Academic Advising

Academic advising is an integral component to success in higher education by which professional advisors work collaboratively with students to help foster their intellectual and personal development toward graduation, post-graduation, and lifelong goals. The objective of academic advising is to engage students by extending learning opportunities beyond the classroom, facilitating personal reflection and empowering students with the necessary information to make informed decisions.

## Learning Outcomes for Students

**Personal Growth:** Develop effective communication skills, achieve greater autonomy, and problem-solving skills.

- Clearly articulate short and long term goals which are congruent with your values, interests, and personality
- Describe the relationship between academic goals and your personal values and goals
- Analyze problems and embrace all challenges as an opportunity for learning and growth
- Make your own decisions after gathering all the available facts and pertinent information

**Institutional Knowledge:** Awareness of programs, resources and opportunities to maximize learning.

- Identify location of major campus offices and their function within student services
- Apply for scholarships, internships, and special programs

**Co-curricular Integration:** Establishing link between current academic experiences to your future career and personal goals.

- Describe the relationship between major(s) and minor(s) and how they can assist in achieving future goals
- Define the knowledge gained from courses and identify skills and competencies developed through participation in extracurricular activities

## Mandatory Advisement Hold

Advising holds help ensure that students and advisors meet periodically, typically once each semester, to monitor progress toward graduation. Students cannot enroll in courses without first meeting with their academic advisor. Mandatory advising sessions are limited to 30 minutes. Students can always meet with an advisor by scheduling an appointment or coming to the office during walk-in hours anytime throughout the year.

Online appointment manager: <https://dornsifeadvising.dts.usc.edu/amonline/>

## Important Links

**Academic Review** - [usc.edu/academicreview](https://usc.edu/academicreview) - Academic probation, disqualification, petitions

**Articulation** - [usc.edu/articulation](https://usc.edu/articulation) - Reviews transfer course work from outside institutions

**Catalogue** - [usc.edu/catalogue](https://usc.edu/catalogue) - Covers most academic policies and university programs

**Grades** - [usc.edu/grades](https://usc.edu/grades) - Information about grading policies and procedures

**OASIS** - [usc.edu/oasis](https://usc.edu/oasis) - Grades, STARS Report, Transfer Credit Report, pre-approval for transfer course work

**Schedule of Classes** - [usc.edu/soc](https://usc.edu/soc) - Course offerings, important university dates, syllabi

## Partnership for Success

**Advisors expect you to:**

- Take ownership of your own education by taking an active role in all advisement meetings
  - ▷ Come prepared with questions and documents (if applicable)
  - ▷ Voice your concerns and speak up if anything is still unclear
  - ▷ Be honest
  - ▷ Review your own STARS Report before coming in for advisement
  - ▷ Make your own decisions after being advised
- Be punctual to all appointments. If you need to cancel an appointment, do so at least 24 hours in advance.
- Regularly check your USC.EDU email account; this is the official method of communication between the university and students.
- Establish rapport with professors and teaching assistants
- Promptly schedule an appointment if you have any issues that may affect your academic success. In other words, do not procrastinate as smaller problems can potentially turn into much larger problems if not addressed in time.
- Become knowledgeable about university policies, procedures, and resources
- Conduct yourself appropriately during meetings

**You can expect your advisor to:**

- Assist you in creating a personalized course plan for an enriching undergraduate experience by integrating your short and long-term goals with university resources and opportunities
- Listen carefully to your questions and concerns
- Be available and accessible during office hours or email during normal business hours
- Provide accurate information of university academic policies and regulations to help you make the best informed decision
- Support you toward achieving your personal best by serving as an advocate and mentor
- Adhere to the highest standard of ethics and best practices of academic advising
- Conduct himself or herself in a professional manner

I have read the above expectations and agree to take responsibility for my role in ensuring academic success and timely progress toward graduation.

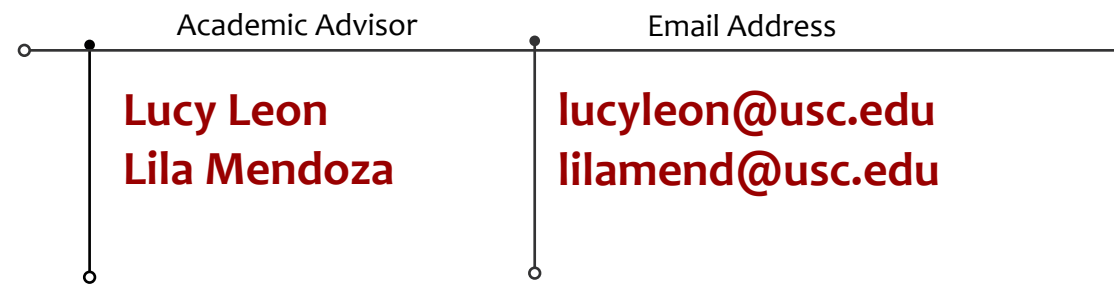
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Signature

Date

## Meeting With Your Advisor

Your academic advisor is available to discuss academic, career and personal issues and acts as your liaison to university resources. BISC majors communicate and meet with their advisor throughout their USC career to ensure satisfactory and timely academic progress. For the best experience, you should meet consistently with the same advisor so you can both get to know one another. You can schedule an appointment with an academic advisor by visiting <https://dornsifeadvising.dts.usc.edu/amonline/>



Your advisor will assist in navigating your academic career and selecting courses, and provide guidance for the various USC policies and procedures. Advisors also possess a wealth of information about campus resources, graduate school, internships and careers, student organizations, extracurricular opportunities and so on. We're generally pretty nice people who are looking out for your best interests and are available to talk about any concerns you may have. Come prepared with questions to make the most out of advisement meetings.

## USC Catalogue and Degree Requirements

You must meet the degree requirements for your major outlined in the USC Catalogue. Degree requirements fall into the following categories:

**Major** – BISC core, collateral (CHEM, MATH, PHYS) and upper-division BISC electives.

**Minor or additional major** – All course requirements for other programs of study.

**General Education** – Core Literacies (GE Categories A-F) and Global Perspectives (GE Categories G & H).

**Skill Level** – Writing (WRIT150 & WRIT340), foreign language (three semesters or equivalent).

**Electives** – Any course work not included in the above categories but for unit and grade credit only.

**Units** – There are many different unit requirements and limitations (overall degree, upper-division, Dornsife College, physical education, transfer, etc.).

**GPA** – Grade point average requirements including: cumulative, major(s), minor(s), university honors, etc.

All of these requirements can be quite confusing. This is why you should **meet with your advisor regularly** to ensure that you are on track toward graduation.

## Choosing a Major

The BISC programs are designed for students passionate about biology and the natural sciences. Many pre-health students choose the BISC major because most of the course requirements overlap with the pre-health curriculum. Some get “bit by the research bug” and decide to enter careers in academia or science. Rigorous training in scientific methods paired with a broad liberal arts education prepares BISC majors for careers in diverse fields such as business, education, law, and technology.

If you're unsure about pursuing the BISC major and want to explore other options, you should meet with an undecided advisor at Academic Counseling Services, [acs@provost.usc.edu](mailto:acs@provost.usc.edu).

## Major Course Requirements

	BA (56 units)	BS (72 units)
BISC-120L or 121L – Organismal Biology and Evolution	X	X
BISC-220L or 221L – Cell Biology and Physiology	X	X
BISC-320L – Molecular Biology	X	X
BISC-330L – Biochemistry	X	X
BISC-325 – Genetics	X	X
CHEM-105aL or 115aL – General Chemistry I	X	X
CHEM-105bL or 115bL – General Chemistry II	X	X
CHEM-322aL – Organic Chemistry I	X	X
CHEM-322bL – Organic Chemistry II	X	X
MATH-125 – Calculus I	X	X
MATH-208 or BISC-305* – Statistics		X
PHYS-135aL – Physics for Life Sciences I	X	X
PHYS-135bL – Physics for Life Sciences II	X	X
Upper-Division BISC Electives	<b>8 units</b>	<b>20 units (8 w/ lab)</b>

\*Most introductory statistics courses can be substituted.

## Upper-Division BISC Electives

Upper-division courses provide opportunities to explore cutting-edge, specialized topics within biology. BISC majors are required to complete upper-division BISC elective courses (8 units for BA, 20 units for BS). 300- and 400-level BISC courses meet this requirement (with the exception of the core BISC-320L, 325, 330L, and honors 493 & 494 courses). Many students opt to take BISC-490 Directed Research to fulfill part of this requirement. For more information about BISC-490, refer to the Research section on page 10.

- + More flexibility to pursue additional major(s) or minor(s), study abroad, or graduate early
- + Complete most pre-health requirements without additional science courses
- Less depth in biology course work

- + Excellent for students interested in research or graduate education in the natural sciences
- + Greater depth and opportunities to specialize
- Less space for additional programs of study

## Course Plan - B.S. Biological Sciences (BISC)

Freshman			Sophomore		
Fall	Spring	Units	Fall	Spring	Units
BISC-120L or BISC-121L (GE-D)	BISC-220L or BISC-221L (GE-D)	4	BISC 320L	BISC 330L	4
CHEM-105aL or CHEM115aL (GE-E)	CHEM-105bL or CHEM-115bL	4	CHEM-322aL	CHEM-322bL	4
WRIT-150	Foreign Language II	4	Foreign Language III	MATH-125 (GE-F)	4
Foreign Language I	GE-A/GESM 110*, B/GESM 120** or C/GESM130***	4	GE-A, B, C, G**** or H****	Elective	4
FSEM / Elective	FSEM / Elective	1-2/1-2	Elective	Elective	1-2/1-2

Junior			Senior		
Fall	Spring	Units	Fall	Spring	Units
BISC 325	PHYS-135bL	4	BISC Upper Division Elective	BISC Upper Division Elective	4
PHYS-135aL	GE-A, B, C, G or H	4	WRIT 340	GE-A, B, C, G or H	4
GE-A, B, C, G or H	GE-A, B, C, G or H	4	GE-A, B, C, G or H	Elective	4
Elective	Elective	4	Elective	Elective	4
Elective	BISC-493 (Honors Seminar)	1-2/1	BISC-493 (Honors Seminar)	BISC-494 (Honors Thesis)	1/2

\*GESM must be taken freshman year.  
 \*\* Two GE-B courses are required.  
 \*\*\* Two GE-C courses are required. Pre-med students should consider SOCI 200, 210 or 242 for the MCAT.  
 \*\*\*\* GE-G and GE-H can overlap with GE-A, GE-B or GE-C.

## Course Plan- B.A. Biological Sciences (BISC)

Freshman			Sophomore		
Fall	Spring	Units	Fall	Spring	Units
BISC-120L or BISC-121L (GE-D)	BISC-220L or BISC-221L (GE-D)	4	BISC 320L	BISC 330L	4
CHEM-105aL or CHEM115aL (GE-E)	CHEM-105bL or CHEM-115bL	4	CHEM-322aL	CHEM-322bL	4
WRIT-150	Foreign Language II	4	Foreign Language III	MATH-125 (GE-F)	4
Foreign Language I	GE-A/GESM 110*, B/GESM 120** or C/GESM130***	4	GE-A, B, C, G**** or H****	GE-A, B, C, G or H	4
FSEM / Elective	FSEM / Elective	1-2/1-2	Elective	Elective	1-2/1-2

Junior			Senior		
Fall	Spring	Units	Fall	Spring	Units
BISC 325	PHYS-135bL	4	BISC Upper Division Elective w/ lab	BISC Upper Division Elective	4
PHYS-135aL	Statistics*****	4	BISC Upper Division Elective	BISC Upper Division Elective	4
WRIT-340	BISC-490 or BISC UD elective w/ lab	4	GE-A, B, C, G or H	GE-A, B, C, G or H	4
GE-A, B, C, G or H	GE-A, B, C, G or H	4	Elective	Elective	4
Elective	BISC-493 (Honors Seminar)	1-2/1	BISC-493 (Honors Seminar)	BISC-494 (Honors Thesis)	1/2

\*GESM must be taken freshman year.  
 \*\* Two GE-B courses are required.  
 \*\*\* Two GE-C courses are required. Pre-med students should consider SOCI 200, 210 or 242 for the MCAT.  
 \*\*\*\* GE-G and GE-H can overlap with GE-A, GE-B or GE-C.  
 \*\*\*\*\* BISC will accept BISC 305, MATH 208, HP 340, PSYC 274, ECON 317 or BUAD 310 to fulfill the statistics requirement.

■ BISC major requirement

■ BISC major requirement

\*It is recommended to take MATH-125 in summer or during a semester with only one other lab science course.

- + Excellent for students interested in research or graduate education in the natural sciences
- + Greater depth and opportunities to specialize
- Less space for additional programs of study

## Course Plan - B.S. Quantitative Biology (QBIO)

Freshman		
Fall	Spring	Units
BISC-120L or BISC-121L (GE-D)	BISC-220L or BISC-221L (GE-D)	4
CSCI 103L	*CSCI 170 (QBIO Specialization Course)	4
WRIT-150	GE-A/GESM 110, B/GESM 120 or C/GESM130	4
Foreign Language I	Foreign Language II	4
FSEM / Elective	**QBIO 105 (2 units)	1/2

Sophomore		
Fall	Spring	Units
CHEM-105aL or CHEM-115aL (GE-E)	MATH 125 (GE F - prerequisite course)	4
CSCI 104L	Upper Division Elective	4
GE-A, B, C, G, or H	GE-A, B, C, G, or H	4
Foreign Language III	GE-A, B, C, G or H	4
Elective	Elective	1-2/1-2

Junior		
Fall	Spring	Units
PHYS-151L (GE E)	QBIO Specialization Course	4
QBIO Specialization Course	BISC Upper Division Course	4
QBIO Specialization Course	WRIT-340	4
GE-A, B, C, G or H	Elective	4
BISC-493 (Honors Seminar)	BISC-490 (2 units)	1/2

Senior		
Fall	Spring	Units
***QBIO Capstone	QBIO Specialization Course	4
BISC-490	BISC-490	4
Upper Division Elective	GE-A, B, C, G or H	4
GE-A, B, C, G or H	Elective	4
BISC-493 (Honors Seminar)	BISC-494 (Honors Thesis)	1/2

\*It is recommended that students take CSCI 170 before attempting CSCI 104.

\*\* In 2017-18, QBIO 105 will be taught in the spring.

\*\*\* BISC 481 is offered in the fall and BISC 478 is offered in the spring. You can move the capstone course to the spring of your senior year if you would like to take BISC 478.

■ BISC major requirement

\*It is recommended to take MATH-125 in summer or during a semester with only one other lab science course.

## Minor in Natural Sciences

Designed for students pursuing majors outside of the natural sciences or engineering, the Minor in Natural Sciences requires a broad array of course work in biology, chemistry and physics with elective offerings in math, earth sciences, and kinesiology. The minor also requires a 2-unit, Spring semester capstone course.

For pre-health students not majoring in the natural sciences.

### Core Courses – 20 units (choose 5 of 6)

BISC-120L or 121L  
 BISC-220L or 221L  
 CHEM-105aL or 115aL  
 CHEM-105bL or 115bL  
 PHYS-135aL or 151L  
 PHYS-135bL or 152L

### Elective Courses – 8 units

Any courses offered for major credit in the following departments: biology, chemistry, earth sciences, human biology, physics & astronomy.

### Capstone Course – 2 units

BISC-321x: Multidisciplinary Seminar in Science, Technology and Society.

## Minor in Computational Biology and Bioinformatics

This minor engages students to use computational, statistical and informatics tools to solve biological problems relating to the environment, health, food and energy. Addressing these urgent problems requires integrative knowledge in mathematics, statistics, computer science and biology. The Human Genome Project and new biotechnologies are generating enormous data and, as such, the new biology is becoming more data driven. Bioinformatics are in high demand in biotech companies, academia, medical centers, government agencies such as the NIH, EPA, and FDA among other emerging fields.

A total of 30 units is required for the minor.

### Biological Sciences Courses – 16 units

BISC-305: Introduction to Statistics for Biologists  
 BISC-320L: Molecular Biology  
 BISC-478: Computational Genome Analysis  
 BISC-481: Modeling of Biomolecules and Biological Systems

### Mathematics Courses – 8 units

MATH-125: Calculus I  
 MATH-126: Calculus II

### Computer Science Courses – 6 units

CSCI-103L: Introduction to Programming  
 CSCI-104L: Data Structure and Object Oriented Design

### Elective Courses (if needed)

Biological Sciences: BISC-230L, 300L, 313, 325, 330L, 403, 406L, 410  
 Computer Science: CSCI-170, 201L, 270, 477a, 477b, 485  
 Mathematics: MATH225, 226, 408, 432, 458, 465, 466, 467

## Minor in Marine Biology

Students pursuing a minor in Marine Biology will learn about the biology, evolution and ecology of organisms that inhabit marine environments and the ecological and physical processes linking them. In addition to courses on the main campus, students can gain field experience at the USC Wrigley Marine Science Center and other off-campus experiential learning opportunities.

The minor consists of 24 units of course work. At least 16 must be upper-division and unique to the minor. Courses required by the student's major or general education (GE) requirements may not be applied toward the minor. Students must earn a letter grade of C- or better in all coursework used for the minor. Prior to declaring the minor, students must have completed the requirement for BISC 120Lg or BISC 121Lg or BISC 103Lgx. Basic chemistry, such as CHEM 103Lgx or CHEM 105aLg and CHEM 105bL, is strongly recommended. Students are encouraged enroll in at least one field-based course. Courses may be substituted with approval of the minor in Marine Biology program director, and this approval must be filed with the Office of Academic Records and Registrar.

### Required Course – 4 units

BISC-469L: Marine Biology

### Field Courses and Other Electives – 16 units

BISC-431L: Aquatic Microbiology

### Field-based Courses

BISC-457L: Methods in Marine Biology and Biological Oceanography

ENST-298aL: Introduction to Scientific Diving

ENST-310: Sustainable Fisheries Management

ENST-480: Integrated Ecosystem Management in Micronesia

### Non-field-based Courses

BISC 140: Our Blue Planet in a Changing Climate

BISC 313L: Evolution and Population Genetics

BISC 315L: Introduction to Ecology

BISC 352: Conservation Biology

BISC 419L: Environmental Microbiology

BISC 427: The Global Environment

BISC 437L: Comparative Physiology of Animals

BISC 460: Seminar in Marine and Env. Biology

BISC 473L: Biological Oceanography

BISC 474L: Ecosystem Function and Earth Systems

BISC 483: Geobiology and Astrobiology

BISC 485: Advanced Seminar in Bacterial Survival and Evolution

### Non-field-based Courses (continued)

BISC 490x: Directed Research

BISC 499: Special Topics

CHEM 115aLg: Advanced General Chemistry

ENST 370: Marine and Coastal Environmental Policy

ENST 490x: Directed Research

ENST 499: Special Topics

GEOL 107Lg: Oceanography

GEOL 412: Oceans, Climate, and the Environment

GEOL 490x: Directed Research

GEOL 499: Special Topics

SSCI 265Lg: The Water Planet

## Minor in Biotechnology

This interdisciplinary minor combines courses in accounting, biology, business and chemistry to provide the essential scientific, analytical and corporate skills required in the rapidly growing biotechnology industry.

Well-suited for business, biology chemistry and engineering majors seeking careers in biomedical/biotechnical sciences or the administrative/business side of a biotechnology company.

### Business and Accounting Courses – 16-20 units

*Accounting (choose 1)*

ACCT-410x: Accounting for Non-Business Majors

BUAD-280 & 281: Accounting I & Accounting II

*Business*

BUAD-215x or BUAD-306: Business Finance

FBE-403: Introduction to the Legal Environment of Business

*Elective (choose 1)*

BUAD-304: Organization Behavior

BUAD-307: Marketing Management

### Natural Sciences Courses – 28 units

BISC-220L or 221L: Cell Biology & Physiology

BISC-320L: Molecular Biology

BISC-330L: Biochemistry

BISC-406L: Biotechnology

CHEM-105aL or 115aL: General Chemistry I

CHEM-105bL or 115bL: General Chemistry II

CHEM-322aL: Organic Chemistry I

## Minor in Craniofacial and Dental Technology

The USC School of Dentistry, Viterbi School of Engineering and Dornsife College jointly offer the Minor in Craniofacial and Dental Technology. This program is designed to prepare students to enter the dental biotechnology industry and introduce recent innovations in craniofacial science and therapeutics. Course work includes craniofacial histology, embryology, head and neck anatomy, genetics, biochemistry and biotechnology along with applications to dental diagnostics, imaging and therapies.

For more information or to declare the minor, contact Viterbi Biomedical Engineering, (213) 740-7237.

### Core Courses – 16 units

DENT-412: Fundamentals of Craniofacial and Dental Technology

DHIS-310: Basic Tissues and Histology and Embryology

BISC-320L: Molecular Biology

BISC-325: Genetics

BME-410: Introduction to Biomaterials and Tissue Engineering

### Electives – 6-8 units (choose 2)

BISC-330L, BISC-403, BISC 406L, BISC-410, BISC 435,

BME-404, BME-416, BME-451, DENT-221, ENGR-305, HP-340L, HP-350L, MASC-310,

For details, please see catalogue:

<https://catalogue.usc.edu/schools/dentistry/undergraduate/#minor-craniofacial-and-dental-tech>

## Progressive Masters Degrees:

Earn a Bachelor's and Master's degree in as little as 5 years, with a reduction of up to one-third of the units required for the Master's degree. Apply theoretical knowledge and basic research skills acquired as an undergraduate to practical applications of the professional world. Take your education a step further and better prepare yourself for a final degree, whether a PhD or M.D. Apply to the Graduate School without an application fee, and without the need to take the Graduate Record Examination. If you have a USC G.P.A of 3.0 or higher and will have 64-96 units completed in the near future, you are eligible to apply.

## Master of Science in Marine and Environmental Biology

The Master of Science degree in Marine and Environmental Biology (MEB) is designed to provide admitted students with a rigorous, quantitative and focused introduction to the burgeoning fields and breadth of topics in marine environmental biology/chemistry, geobiology, oceanography, conservation biology and population dynamics (depending upon the concentration selected). MEB provides students with independent research experiences that satisfy their own specific interests. The program is intended to position and stimulate students for possible advanced study leading to a Ph.D. in one of the areas stated above, and/or provide a unique facet to the background of a prospective medical student. The program will also provide fundamental tools and expertise for entry into a master's level position in academic, government or private sector research laboratories. It will prepare students interested in governmental and non-government (NGO) environmental regulatory science and forge career pathways into private sector positions in environmental consulting and business.

Details at <http://dornsife.usc.edu/bisc/progressive-masters-in-marine-and-environmental/>

## Master of Science in Molecular Genetics and Biochemistry

This degree option is available for a limited number of highly qualified students who want to take an extra year for an intensive graduate-level research experience with Molecular Biology faculty. Students apply at the end of their junior year, generally after at least 1 semester of research in their proposed mentor's laboratory. Application consists of a 2 page research proposal, letter of support from the mentor, and transcript, which will be reviewed by the Master's committee for admission. Admission is not guaranteed. Students who are accepted will take the graduate core course in Molecular Biology (502a/b) as well as a literature seminar and relevant electives, but a substantial part of the credit will be graduate-level research. Students will be reviewed during their senior year to ensure progress. All MS students must complete a summative paper at the end of their Master's year to be approved by their mentor and one member of the Master's committee.

## Getting Involved

<http://dornsife.usc.edu/bisc/research/>

Laboratory and field research can help students develop and refine their scientific inquiry and technical skills. Participation in research can be intellectually and personally illuminating, and is requisite for students pursuing graduate education in the natural sciences. There are several ways to get involved: volunteering, part-time work, or for course credit (BISC-490, Directed Research).

Ambitious students often aspire to dive into research during their freshman year. However, many professors prefer students with science courses and college experience under their belt, as participation requires basic science knowledge and can be a significant time commitment.

Conduct outstanding original research, become a **Discovery Scholar** and earn the chance to compete for a **\$10,000 scholarship for graduate study!**

Learn more at [http://www.usc.edu/programs/ugprograms/discovery/become\\_scholar.shtml](http://www.usc.edu/programs/ugprograms/discovery/become_scholar.shtml)

## Directed Research (BISC-490)

For those interested in major credit for research participation, the BISC department offers an upper-division course, BISC-490, that can be taken for a maximum of 8 units, but only 4 of those units will count toward upper division elective requirements. Students enrolled in BISC-490 are expected to work an average of 3-4 hours per unit per week in their lab and complete a final project due at the end of the semester.

Some tips for finding a research sponsor:

- Talk to your current instructors. Initial correspondence via email is appropriate but we recommend discussing research opportunities with professors in person when possible.
- Visit the BISC website ([dornsife.usc.edu/bisc](http://dornsife.usc.edu/bisc)) to locate faculty based on their research topics. You can peruse faculty in Marine Environmental Biology, Molecular and Computational Biology, Integrative and Evolutionary Biology, and Neurobiology to find prospective sponsors that match your interests.
- Visit the Programs in Biomedical & Biological Sciences website ([usc.edu/pibbs](http://usc.edu/pibbs)). The Faculty Research Topics link helps students locate faculty engaged in research at the University Park and Health Sciences campuses.
- If you are still having difficulty locating a faculty sponsor and would like additional tips, speak with your advisor.

## Programs, Funding and Scholarships

Student Opportunities for Academic Research (SOAR) provides funding to undergraduate students for participation in faculty-assisted research or pursuing scholarly projects of their own choosing. The Summer Undergraduate Research Fund (SURF) provides funding for undergraduate research, on or off campus, during summer. Info and application instructions at <http://dornsife.usc.edu/undergraduate-research-opportunities/>

Read more about USC research programs and funding for undergraduate students on the Undergraduate Programs website, [undergrad.usc.edu/research](http://undergrad.usc.edu/research)



## Freshman Science Honors Program

[dornsife.usc.edu/freshman-science-honors](http://dornsife.usc.edu/freshman-science-honors) – (213) 740-2961

Exceptionally qualified incoming freshmen may participate in the Freshman Science Honors Program (FSH), which allows students the opportunity to take enriched biology and chemistry courses in the first semester sequence: BISC-121Lg and CHEM-115aLg in the first semester, and BISC-221L and CHEM-115bLg in the second semester. The FSH courses tend to have smaller class sizes and offer students access to special lectures, tours, and field trips. Some students are invited prior to their acceptance of admission to the University, while others apply during Freshman Orientation. Students majoring in Biology who secure good grades in the program are typically invited to participate in the Department of Biological Sciences Honors Program.

## BISC Honors Program

<http://dornsife.usc.edu/bisc/undergraduate-honors/>

For outstanding students pursuing majors in Biological Sciences or Biochemistry, the Department of Biological Sciences Honors Program provides students the opportunity to enhance and deepen their involvements in the field through participation in honors seminars, undergraduate research opportunities, and faculty-advised writing of an honors thesis. In addition to major requirements, students pursuing departmental honors must take two semesters of BISC-493x Honors Seminar (1 unit per semester) and one semester of BISC-494x Honors Thesis (2 units). Honors students must also take BISC-490 Directed Research as one of the upper-division electives required for the major. In order to receive honors, students must complete their degrees with a GPA of 3.5 or higher in math and science courses being applied to the major. Successful completion of this program will earn students the transcript notation of “B.A./B.S. in Biological Sciences with Honors.”

## Department Honors and Awards

These awards, determined by the faculty and lab directors, are presented each Spring at the Honors Luncheon.

### Milo Don Appleman Award

Established in 1974, this award is given to the most outstanding graduating senior pursuing a career in the health sciences.

### SCynergy Award

Established in 1998, this award is given to the most outstanding graduating senior pursuing a career in the biological sciences.

### Okin Scholarship

This award, established in memory of Dr. Milton Okin, is given to the most outstanding sophomore or junior in the Department of Biological Sciences.

### Course Honors

Awarded to the most high achieving biology and biochemistry undergraduates in the BISC/HBIO core courses: BISC-120L, BISC-121L, BISC-220L, BISC-221L, BISC-320L, BISC-325, BISC-330L, HBIO 301, HBIO 302, HBIO 308, HBIO 320, HBIO 401, HBIO 407, HBIO 408, HBIO 420.

## Maymester

Learn more at [dornsife.usc.edu/scholars-global](http://dornsife.usc.edu/scholars-global)

BISC 431: Dr. John Heidelberg 213-740-5791 [jheidelb@usc.edu](mailto:jheidelb@usc.edu) or Dr. Eric Webb 740-7954 [eawebb@usc.edu](mailto:eawebb@usc.edu)

BISC 457: Dr. Wiebke Ziebis 213-821-1198 [wziebis@usc.edu](mailto:wziebis@usc.edu)

Maymester courses take place directly after graduation but are included as part of spring tuition. They are taught intensively and immersively over a 4 week period at the Wrigley Marine Sciences Center on Catalina.

### BISC 431L: Aquatic Microbial Ecology

Many people are aware that microbes can be harmful to humans, but few realize that microbes and their interactions (with each other and with other organisms) are essential for human life. Sample marine and terrestrial microbial communities on and around Catalina Island and learn what microbes live in the oceans, how they function, and how their presence and activity affect climate and ecosystem function.

### BISC 457L: Methods in Marine Biology and Biographical Oceanography

The purpose of this highly popular course is to introduce students to laboratory and field skills in Marine Biology and Oceanography. Students learn scientific methodology in the context of global environmental issues (human impacts on coastal environments, watershed interactions, future challenges). The course provides exposure to hands-on science and data-rich interdisciplinary science methodology, writing and oral presentations.

## Overseas Study

[dornsife.usc.edu/overseas-studies](http://dornsife.usc.edu/overseas-studies) – (213) 740-3636

Studying abroad offers an unparalleled opportunity for personal growth through immersion in foreign culture, allowing students to gain insights into themselves and others, while developing leadership and networking skills for the future. The Overseas Studies office offers students exciting and diverse opportunities to study abroad in 52 unique programs in 28 countries. The myriad programs offered enable BISC majors to choose programs that compliment their program of study. The majority of USC students who receive Fullbright fellowships have participated in a study abroad program.

Join the ranks of the **Global Scholars** and earn the chance to compete for a **\$10,000 scholarship for graduate study!** Learn more at [dornsife.usc.edu/scholars-global](http://dornsife.usc.edu/scholars-global)

## Problems Without Passports

[dornsife.usc.edu/problems-without-passports](http://dornsife.usc.edu/problems-without-passports)

Each summer, the USC Dana and David Dornsife College of Letters, Arts and Sciences offers students the opportunity to help solve global challenges, such as climate change or pandemics, through the Problems Without Passports program (PWP). PWP courses combine problem-based or inquiry learning research exercises with study in a foreign country, Washington D.C., or Los Angeles. Through PWP, students participate in field research, experience different cultures, and problem-solve transnational problems, all while earning credit toward their USC degrees. Examples of past PWP courses are: Anthropology 301: The Global Performance of Healing in Brazil; Biological Sciences 428: The Biology of Tropical Diseases in Oxford, England; and International Relations 308: Super Tourism - Impacts on Sustainable Development in Cairo, Egypt. Students applying to a PWP program are eligible to apply for the Summer Undergraduate Research Fund (SURF).

## **A Community Place**

[campus.acommunityplace@gmail.com](mailto:campus.acommunityplace@gmail.com)

ACP is a student-run organization that serves the homeless, senior citizens and families and their children by providing sack lunches and other services to meet the needs of the community members living and working around the USC campus.

## **Alpha Epsilon Delta**

<http://www.usc-aed.com/>

Alpha Epsilon Delta is USC's premier pre-medical honor society. We seek to foster a sense of community by offering guidance and mentorship to students seeking acceptance to medical school.

## **Alpha Phi Omega**

<http://www.apousc.org/main/>

As both USC and the nation's largest co-educational service fraternity, Alpha Phi Omega promotes growth and understanding of our three cardinal principles: to develop leadership, to promote friendship, and to provide service to humanity. While all of us come from different backgrounds, we are united by our genuine love for and commitment to community service and for each other.

## **African Americans in Health**

[aaih.usc@gmail.com](mailto:aaih.usc@gmail.com)

African Americans in Health is a student run campus organization centered on the goals of supporting African Americans in their pursuit of careers in the health industry. This includes the fields of medicine, dentistry, pharmacy, or public health. The organization provides academic support as well as opportunities to receive guidance from professionals working in different health fields. In addition to enhancing student's professional goals, the club sponsors various social and community service events aimed at increasing the sense of community amongst students of similar interests.

## **Delta Delta Sigma at USC**

<http://www.deltadeltastigma.net/>

Our objectives aim to provide programs and activities, which educate members on topics pertinent to dental career interest and development, provide a means by which pre-dental students may participate and collaborate with students, staff, and faculty of the Herman Ostrow School of Dentistry, and create and sustain a friendly support network for the pre-dental students of the University of Southern California.

## **Emergency Medical Services of USC**

<http://www.uscemsc.org/>

The Emergency Medical Services of the University of Southern California (EMSC) is a student organization that seeks to provide accessible pre-hospital care to Trojans and the USC community. We strive to augment the current emergency health care options at the University and create an opportunity for students to gain first-hand medical experience, serve their community, and develop critical leadership skills.

## **GlobeMed at USC**

<http://globemed.org/impact/university-of-southern-california/>

GlobeMed is part of an international student-run nonprofit aiming to empower students in the fight for global health equity. We work on project development with our partner organization based in Uganda, plan campus-wide educational events for World AIDS Day and World Day of Social Justice, work on a speaker series in conjunction with the Institute of Global Health, and take on various additional campaigns throughout the year!

## **Health Sciences Education Program**

[uschsep@gmail.com](mailto:uschsep@gmail.com)

HSEP is a teaching and outreach organization that seeks to educate K-12 students in surrounding neighborhoods and members of the USC community on relevant health topics. Through school visits and various events, we aim to empower students with knowledge on a wide range of topics, to instill in them curiosity and wonder for the health sciences, and to inspire them to take their health into their own hands by implementing preventive measures into their daily lives.

## **Healthcare Policy Alliance at USC**

[healthcarepolicyalliance@gmail.com](mailto:healthcarepolicyalliance@gmail.com)

The goal of HPA at USC is to provide information and discussion to students interested in pursuing careers in law or medicine on the various aspects of healthcare policy and how they relate to the current standing of our healthcare system on a global scale.

## **Interaxon @ USC**

<http://dornsife.usc.edu/usc-neuroscience/interaxon/>

Interaxon is a educational outreach group that visits elementary, middle, and high schools to teach neuroscience-focused lessons to encourage local kids to be inspired by, and perhaps further study the sciences. You don't need any neuroscience or teaching experience to join, we only ask that you are passionate about working with these students!

## **Inter-Health Council**

<https://uscihc.wordpress.com/>

IHC is a student organization that acts as the student ambassadors of the USC Pre-Health Office. Our mission is to bring together students interested in health-related issues and careers by fostering communication and ongoing partnership between student organizations, acting as a liaison between undergraduates, advisers, faculty, and the administration as well as supporting and advocating for the interests of the health-related student community.

## **MEDLIFE at USC**

<https://uscmelife.wordpress.com/>

Medlife at USC works to support global medicine, education, and development through planning mobile clinics in Ecuador, Peru, and Tanzania during winter, spring, and summer break. During our trips, students have the opportunity to shadow local doctors, nurses, and dentists, teach local people about public health topics, improve local infrastructure through development projects, and create long-lasting bonds and friendships!

## **Peer Health Exchange**

[usc@peerhealthexchange.org](mailto:usc@peerhealthexchange.org)

Peer Health Exchange's mission is to give teenagers the knowledge and skills they need to make healthy decisions. We do this by training college students to teach a comprehensive health curriculum in public high schools that lack health education.

## **Premed Asian Pacific American Medical Student Association (APAMSA)**

[uscpremedapamsa@gmail.com](mailto:uscpremedapamsa@gmail.com)

Pre-medical organization that provides members with opportunities to address the health issues in the Asian Pacific American community, to learn more about medical-related careers, to interact with other premed students at USC, and to network with medical students in other APAMSA chapters through shadowing and health conferences. Membership and participation in events is open to all students.

## **Pre-Medical Literary Circle**

[pmlc.usc@gmail.com](mailto:pmlc.usc@gmail.com)

As members of the Pre-Medical Literary Circle, we strive to provide a discussion space for pre-health students to engage in the pleasures of reading and discussions on health-related topics, and inspire a love for reading in the community around USC.

## **Pre-Pharmacy Society**

[prepharm@usc.edu](mailto:prepharm@usc.edu)

Connect students interested in Pharmacy, form professional relationships, gain hands-on experience, and prepare for Pharmacy as a career.

## **American Red Cross at USC**

[uscredcross@gmail.com](mailto:uscredcross@gmail.com)

The Red Cross Club organizes a campus wide blood drive once per semester, raises on-campus awareness of various social justice issues, and fundraises for disaster relief.

## **SCience Outreach**

[scoutusc@gmail.com](mailto:scoutusc@gmail.com)

Science Outreach was created at USC to teach elementary schoolers in neighboring schools science with fun and safe experiments. Our ultimate goal strives to inspire youth to make meaningful observations, work with peers, think critically, ask questions, and have fun learning by doing.

## Career Center

[careers.usc.edu](http://careers.usc.edu) – (213) 740-9111 – Student Union 110

The USC Career Center provides career services to all members of the Trojan Family. Their array of programs includes career counseling, workshops, company profile events, career panels, internships, job listings & searches, Trojan Network and Career Fairs.

## Disability Services and Programs

[dsp.usc.edu](http://dsp.usc.edu) – (213) 740-0776 - Grace Ford Salvatori Hall 120

DSP provides support services necessary to enable students with disabilities to develop their maximum academic potential. DSP services include assistance in providing tutoring in academic disciplines, learning assistants, readers, scribes, notetakers and/or interpreters, advocacy with faculty, special accommodations for test taking, and assistive technology for students with an identified learning disorder.

## Dornsife College Hub

[dornsife.usc.edu/hub](http://dornsife.usc.edu/hub)

Daily updates with news, events, and opportunities such as jobs and internships, research, scholarships, student organizations, study abroad, summer, free food and more!

## Dornsife Student Special Services

[dornsife.usc.edu/careerpathways/](http://dornsife.usc.edu/careerpathways/) - (213) 740-4334 - Grace Ford Salvatori Hall 308

Student Special Services works to align students' academic interests with individual career and professional pathways through self-assessment, exploration, and engagement in curricular and co-curricular opportunities.

## Korschak Center for Learning and Creativity

[kortschakcenter.usc.edu](http://kortschakcenter.usc.edu) – (213) 740-7884 – Student Union 311

USC KCLC provides insight and guidance into your preferred method of learning. The Center offers academic success seminars and workshops throughout the year in areas such as time management, power reading, memory enhancement, exam-taking strategies, writing papers, and note-taking.

## Pre-Health Advisement

[dornsife.usc.edu/pre-health](http://dornsife.usc.edu/pre-health) – (213) 740-4844 – Hedco Neurosciences Building 120

The Office of Pre-Health Advisement exists to serve all current students, alumni, and post-baccalaureates interested in pursuing careers in the health professions. Our pre-health advisors provide an array of student-centered advisement services and support tools tailored to meet the individual needs, interests, and goals of pre-health students.

## Student Counseling Services

[usc.edu/student-affairs/Health\\_Center/cs.index](http://usc.edu/student-affairs/Health_Center/cs.index) – (213)740-7711 – Engemann Student Health Center, 3rd floor

The professional staff of the Student Counseling Services offer individual, couple and group counseling, as well as emergency services, in order to help students to successfully cope with the variety of concerns common during their college experiences. All personal information is kept confidential. The staff also provides work-shops and consultation on stress management, assertiveness, communication skills, and conflict resolution techniques. Services are covered by the Student Health and Counseling Services Fee. To initiate counseling, please call or stop by the office. Initial appointments are 50 minutes.

## Supplemental Instruction (SI)

[dornsife.usc.edu/supplemental-instruction](http://dornsife.usc.edu/supplemental-instruction)

The SI program targets traditionally difficult courses and provides regularly scheduled, peer-led study sessions. These sessions are available to all students enrolled in the class at no cost. Work in small, collaborative groups with your classmates; review lecture material, course reading, and homework; and go over exam strategies with SI leaders who know the courses and professors. SI session schedules online at [dornsife.usc.edu/session-schedules](http://dornsife.usc.edu/session-schedules).