

# School of Natural Sciences and Mathematics

The Biology Program at UT Dallas emphasizes the unifying molecular and cellular nature of organisms. At the center of the Biology undergraduate curriculum are the biochemical, genetic, and cell biology concepts and tools used to study the genes of prokaryotes and eukaryotes, to study the proteins and ribonucleic acids (RNA) encoded by these genes, and to study how the expression of these genes is regulated during the development and lifetimes of organisms. Molecular Biology represents a fusion of the four disciplines of biochemistry, biophysics, genetics, and cell biology. Modern biology requires a background in other disciplines such as chemistry, mathematics, physics, and computer sciences. Principles from these disciplines have to be merged to understand and apply new biotechnology and genetic engineering techniques. It is desirable for entering students to have a broad interest and background in the sciences.

## Molecular Biology (BS)

A BS degree is offered in Molecular Biology. The BS degrees are intended as preparation for scientific careers in biology or careers in the health professions. Biology offers a streamlined double major with Business Administration or Criminology. Fast Track BS / MS Biology and Molecular Biology degree programs are available.

Minors are offered in Biology, Biomolecular Structure, Microbiology, Molecular and Cell Biology, and Neurobiology.

## Faculty

**Professors:** Lee A. Bulla, Rockford K. Draper, Juan E. González, Lawrence J. Reitzer, Stephen Spiro, Li Zhang, Michael Qiwei Zhang

**Professors Emeritus:** Hans Bremer, Donald M. Gray, Claud S. Rupert

**Associate Professors:** Gail A. M. Breen, John G. Burr, Jeff L. DeJong, Ernest M. Hannig, Tae Hoon Kim, Dennis L. Miller

**Assistant Professors:** Nikki Delk, Heng Du, Jung-whan (Jay) Kim, Kelli Palmer, Anh T. Tran, Duane D. Winkler, Zhenyu Xuan, Hyuntae Yoo

**Research Assistant Professor:** Lan Guo

**Senior Lecturers:** Irina Borovkov, Mehmet Candas, Vincent P. Cirillo, Monique Duncan, Brenna Hill, Wen-Ju Lin, Li Liu, Robert C. Marsh, David Murchison, Jing Pan, Elizabeth Pickett, Ruben D. Ramirez, Scott A. Rippel, Elizabeth L. Rugg, Ilya Sapozhnikov, Uma Srikanth, Michelle Wilson, Wen-Ho Yu

Lecturers: Uyen Henson, John Kolar

## Bachelor of Science in Molecular Biology

### Degree Requirements (120 semester credit hours)<sup>1</sup>

I. Core Curriculum Requirements: 42 semester credit hours<sup>2</sup>

**Communication: 6 semester credit hours**

[COMM 1311](#) Survey of Oral and Technology-based Communication

[RHET 1302](#) Rhetoric

**Mathematics: 3 semester credit hours**

[MATH 2417](#) Calculus I<sup>3, 4</sup>

**Life and Physical Sciences: 6 semester credit hours**

[CHEM 1311](#) General Chemistry I<sup>3</sup>

[CHEM 1312](#) General Chemistry II<sup>3</sup>

**Language, Philosophy and Culture: 3 semester credit hours**

Select any 3 semester credit hours from Language, Philosophy and Culture core courses (see advisor)

**Creative Arts: 3 semester credit hours**

Select any 3 semester credit hours from Creative Arts core courses (see advisor)

**American History: 6 semester credit hours**

Select any 3 semester credit hours from American History core courses (see advisor)

**Government / Political Science: 6 semester credit hours**

[GOVT 2305](#) American National Government

[GOVT 2306](#) State and Local Government

**Social and Behavioral Sciences: 3 semester credit hours**

Select any 3 semester credit hours from Social and Behavioral Sciences core courses (see advisor)

**Component Area Option: 6 semester credit hours**

[BIOL 2311](#) Introduction to Modern Biology I 3

[MATH 2419](#) Calculus II 3, 4

II. Major Requirements: 69 semester credit hours

**Major Preparatory Courses: 24 semester credit hours beyond Core Curriculum**

[CHEM 1111](#) General Chemistry Laboratory I

[CHEM 1112](#) General Chemistry Laboratory II

[CHEM 1311](#) General Chemistry I 3

[CHEM 1312](#) General Chemistry II 3

[CHEM 2123](#) Introductory Organic Chemistry Laboratory I 5

[CHEM 2125](#) Introductory Organic Chemistry Laboratory II 5

[CHEM 2323](#) Introductory Organic Chemistry I 5

[CHEM 2325](#) Introductory Organic Chemistry II 5

[MATH 2417](#) Calculus I 3, 4

[MATH 2419](#) Calculus II 3, 4

[MATH 2418](#) Linear Algebra

[PHYS 2125](#) Physics Laboratory I

[PHYS 2126](#) Physics Laboratory II

[PHYS 2325](#) Mechanics

[PHYS 2326](#) Electromagnetism and Waves

[NATS 1101](#) Natural Sciences and Mathematics Freshman Seminar

[UNIV 1010](#) Freshman Seminar

## Major Core Courses: 33 semester credit hours beyond Core Curriculum

[BIOL 2111](#) Introduction to Modern Biology Workshop I<sup>5</sup>

[BIOL 2112](#) Introduction to Modern Biology Workshop II<sup>5</sup>

[BIOL 2281](#) Introductory Biology Laboratory<sup>5</sup>

[BIOL 2311](#) Introduction to Modern Biology I<sup>3, 5</sup>

[BIOL 2312](#) Introduction to Modern Biology II<sup>5</sup>

[BIOL 3101](#) Classical and Molecular Genetics Workshop

[BIOL 3102](#) Eukaryotic Molecular and Cell Biology Workshop

[BIOL 3161](#) Biochemistry Workshop I

[BIOL 3162](#) Biochemistry Workshop II

[BIOL 3301](#) Classical and Molecular Genetics

[BIOL 3302](#) Eukaryotic Molecular and Cell Biology

[BIOL 3361](#) Biochemistry I

[BIOL 3362](#) Biochemistry II

or [BIOL 3335](#) Microbial Physiology

[BIOL 3380](#) Biochemistry Laboratory

[BIOL 4380](#) Cell & Molecular Biology Laboratory<sup>6</sup>

or [BIOL 3V96](#) (3 semester credit hours) Undergraduate Research in Molecular and Cell Biology<sup>6</sup>

or [BIOL 4399](#) (3 semester credit hours) Senior Honors Research in Molecular and Cell Biology<sup>6</sup>

or [BIOL 4391](#) (3 semester credit hours) Senior Research in Molecular and Cell Biology<sup>6</sup>

[BIOL 4461](#) Biophysical Chemistry

## Major Related Courses: 12 semester credit hours<sup>7</sup>

12 semester credit hours upper-division approved molecular biology-related BIOL or CHEM electives

III. Elective Requirements: 9 semester credit hours

### Free Electives: 9 semester credit hours

All students must complete at least 51 semester credit hours of upper-division courses to graduate.

## Fast Track Baccalaureate/Master's Degrees

UT Dallas undergraduate students with strong academic records, including at least 15 semester credit hours of upper-division Biology core courses, who intend to pursue graduate work in Biology at UT Dallas, may apply for the Fast Track which involves taking selected graduate courses as an upper-division student. After admission to the graduate program, 15 semester credit hours of graduate courses with an earned grade of B or better can be used toward completion of the BS and to satisfy requirements for those courses at the graduate level. Graduate courses must be approved by the graduate advisor. This program provides an opportunity to obtain the BS degree in Biology after 120 semester credit hours of work and an MS degree in Molecular and Cell Biology after an additional 21 semester credit hours of graduate course and research work. Interested students should contact the Biology undergraduate advisor well in advance of the senior year to prepare a degree plan taking maximal advantage of this Fast Track program.

## Degree Planning

Upper-division biology courses taken at other institutions may be included as part of the degree plan subject to the provisions of the section on Transfer Admissions.

Major-related courses may not include more than 9 semester credit hours (BS) or 6 semester credit hours (BA) of upper-division transfer credit and not more than 3 semester credit hours (Biology major) or 6 semester credit hours (Molecular Biology major) of individual instruction (e.g., [BIOL 3V90](#), [BIOL 3V91](#), [BIOL 3V92](#), [BIOL 3V95](#), [BIOL 3V96](#), [BIOL 4302](#), [BIOL 4390](#), [BIOL 4391](#), [BIOL 4398](#), [BIOL 4399](#), [BIOL 4V98](#), or [BIOL 4V99](#)).

Students planning a career in a particular allied health profession should consult the school they expect to attend to apprise themselves of the course requirements for admission.

Admission standards for medical and dental schools are set by the individual professional school, whose specific requirements should be reviewed with the help of the UT Dallas Health Professions Advising Center (HPAC). Most professional schools prefer that admission applications be channeled through the HPAC.

1. Incoming freshmen must complete and pass UNIV 1010 Freshman Seminar and the corresponding school-related freshman seminar course. Students, including transfer students, who complete their core curriculum at UT Dallas must take UNIV 2020.

2. Curriculum Requirements can be fulfilled by other approved courses from institutions of higher education. The courses listed are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. Six semester credit hours of Calculus are counted under Mathematics Core and Component Area Option and 2 semester credit hours of Calculus are counted as Major Preparatory Courses.
5. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
6. These substitutes for BIOL 4380 require permission of the Biology Undergraduate Advisor to ensure equivalent training in recombinant DNA analysis.
7. Up to 6 semester credit hours of research may be used in fulfilling the major related course requirement.

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