The University of Texas at Dallas
Online Catalog

2006-2008 Undergraduate Catalog (2007 Supplement)

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Biology (B.A., B.S.)

Faculty

Professors: Lee A. Bulla, Santosh D'Mello, Rockford K. Draper, Steven R. Goodman, Donald M. Gray, Betty S. Pace, Lawrence J. Reitzer
Associate Professors: Gail A.M. Breen, John G. Burr, Jeff L. DeJong, Juan E. González, Ernest M. Hannig, Stephen D. Levene, Robert C. Marsh, Dennis L. Miller
Assistant Professors: Tianbing Xia
Professor Emeritus: Hans Bremer, Claud S. Rupert
Senior Lecturers: Vincent P. Cirillo, John Moltz, Scott A. Rippel, Ilya Sapozhnikov

The Biology Program at U.T. 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.

Both B.S. and B.A. degrees are offered in Biology at U.T. Dallas; a B.S. degree is offered in Molecular Biology. The B.S. degrees are intended as preparation for scientific careers in biology or careers in the health professions. The B.A. degree is intended as liberal arts biology major with less emphasis on calculus and more free hours for course work in other disciplines. Each degree in Biology offers a streamlined double major with Business Administration or Crime and Justice Studies. Five-year Fast Track B.S./M.S. Biology and Molecular Biology degree programs are available, and a 7-year accelerated B.S./D.O. degree program is offered together with the UNT Health Science Center at the Fort Worth College of Osteopathic Medicine (UNTHSC/TCOM).

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

Transfer Students

Students transferring into Biology or Molecular Biology at the junior level in either the B.S. or the B.A. programs are expected to have completed courses equivalent to:

- Introductory Biology with lab, BIOL 2311, 2312, and 2281
- General Chemistry with lab, CHEM 1311, 1111, 1312, and 1112
- Organic Chemistry with lab, CHEM 2323, 2123, 2325, and 2125
- Calculus, MATH 2417 and 2419 (B.S. or B.A. degree); or Applied Calculus, MATH 1325, (B.A. degree only)
- Physics with lab, calculus-based PHYS 2325, 2125, 2326 and 2126 (B.S. or B.A. degree); or algebra-based PHYS 1301, 1101, 1302, 1102 (B.A. degree only).

Junior-level transfer students deficient in these lower-division requirements may satisfy the requirements with courses taken at U.T. Dallas; however, students deficient in the biology and chemistry requirements may be delayed in entering upper-division biology courses.

Bachelor of Arts or Bachelor of Science in Biology Degree Requirements (124 hours)

I. Core Curriculum Requirements[1]: 42 hours
A. Communication (6 hours)
3 hours Communication (RHET 1302)
3 hours Communication Elective (BIOL 4337, BIOL 4390, BIOL 4399 or NATS 4310)[2]
B. Social and Behavioral Sciences (15 hours)
6 hours Government (GOVT 2301 and 2302)
6 hours American History

NATURAL SCIENCE AND MATHEMATICS
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Biology & Crime/Justice
Chemistry
Geosciences
Mathematical Sciences
Molecular Biology
Molecular Biology & Business Admin.
Molecular Biology & Crime/Justice Studies
Physics

3 hours Social and Behavior Sciences Elective

C. Humanities and Fine Arts (6 hours)
3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

D. Mathematics and Quantitative Reasoning (6 hours)
6 hours Calculus (MATH 2417 and 2419) - BA or BS [3]
or Applied Calculus and Statistics (MATH 1325 and STAT 3332) -BA only

E. Science (9 hours)
9 hours Chemistry (CHEM 1311/1111, 1312/1112 and 2123)

[1] Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parenthesis are recommended as the most efficient way to satisfy both Core Curriculum and Major requirements at UT Dallas.

II. Major Requirements: 53 - 61 hours (53-55, B.A.; 61, B.S.)

Major Preparatory Courses (16-18 hours beyond Core Curriculum)
CHEM 1311/1111, 1312/ 1112 General Chemistry I and II with Laboratory
CHEM 2323*/2123* and 2325/2125 Introductory Organic Chemistry I and II with Laboratory
MATH 2417 and 2419 Calculus I and II (BA or BS)
or MATH 1325 Applied Calculus I and STAT 3332 Statistics for Life Sciences (BA only)
PHYS 3341/2125 Physics for BioScience I with Laboratory (BA or BS)
or PHYS 1301/1101 College Physics I with Laboratory (BA only)
PHYS 3342/2126 Physics for BioScience II with Laboratory (BA or BS)
or PHYS 1302/1102 College Physics II with Laboratory (BA only)

Major Core Courses (29-32 hours)
BIOL 2281* Introductory Biology Laboratory
BIOL 2111* Introduction to Modern Biology Workshop I
BIOL 2112* Introduction to Modern Biology Workshop II
BIOL 2311* Introduction to Modern Biology I
BIOL 2312* Introduction to Modern Biology II
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 and Molecular Biology Laboratory (BS only)

Major Related Courses (9-12 hours)[4]
9 hours upper-division BIOL electives (BA only)
12 hours upper-division BIOL electives (BS only)

[2] Biology majors may choose BIOL 4337, BIOL 4390, BIOL 4399, or NATS 4310 or another approved Biology elective to fulfill the Core Curriculum Communication Elective.

[3] Six hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Major Preparatory Courses.

[4] Up to 3 hours of individual instruction may be used in fulfilling this requirement.

** Indicates a prerequisite class to be completed before enrolling for upper-division classes.*

III. Elective Requirements: 21 - 29 hours

Advanced Electives
All students are required to take at least six hours of advanced electives outside their major
field of study. These must be either upper-division classes or lower-division classes that
have prerequisites. These may be satisfied with CHEM 2323 and 2325, counted under Major
Preparatory Courses.

Free Electives (21 hours for BS; 27-29 hours for BA)

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

Minor in Biology

Course Requirements: 18 hours
BIOL 2311/2111 Introduction to Modern Biology I with Workshop
BIOL 3301/3101 Classical and Molecular Genetics with Workshop
BIOL 3361/3161 Biochemistry I with Workshop
Two BIOL electives for majors

Minor in Biomolecular Structure

Course Requirements: 18 hours
BIOL 3336 Protein and Nucleic Acid Structure
BIOL/CHEM 4461 Biophysical Chemistry, unless taken to fulfill the Molecular Biology major requirements
BIOL 4261 Biomolecular Modeling
CHEM 2323 and 2325 Introductory Organic Chemistry I and II
One to two approved BIOL, CHEM, CS, EE, MATH, or PHYS electives

Minor in Molecular and Cell Biology

Course Requirements: 18 hours
CHEM 2323 and 2325 Introductory Organic Chemistry I and II
Four approved molecular and cell biology electives

Minor in Microbiology

Course Requirements: 18 hours
BIOL 3V20 General Microbiology with Laboratory[1]
BIOL 3335 Microbial Physiology[2]
BIOL 4350 Medical Microbiology
or BIOL 4316 Parasites and Symbionts
BIOL 4345 Immunobiology
CHEM 2323 Introductory Organic Chemistry I
One approved microbiology elective

[1] Two hrs of BIOL 3V20 may be used to satisfy the Cell and Molecular Biology Laboratory core requirement for Biology and Molecular Biology majors.
[2] May be substituted with CHEM 2325 Introductory Chemistry II if used to satisfy the Biochemistry II core requirement for Biology and Molecular Biology majors.

Minor in Neurobiology

Course Requirements: 18 hours
BIOL 4370 Developmental Neurobiology
BIOL 3371 Biology of the Brain
or NSC 4352 Cellular Neuroscience
CHEM 2323 and 2325 Introductory Organic Chemistry I and II
NSC 4353 Neuroscience Laboratory Methods
NSC 4354 Integrative Neuroscience

Fast Track Baccalaureate/Master's Degrees

U.T. Dallas undergraduate students with strong academic records, including at least 15 hours of upper-division Biology core courses, who intend to pursue graduate work in Biology at U.T. 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 hours of graduate courses with an earned grade of B or better can be used toward completion of the B.S. 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 B.S. degree in Biology after 125 hours of work and an M.S. degree in Molecular and Cell Biology after an additional 21 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 5-year Fast Track program.

The 7-Year B.S. /D.O. Dual Degree Program

The Biology Program has recently developed an accelerated program that, in conjunction with the UNT Health Science Center at Fort Worth College of Osteopathic Medicine (UNTHSC/TCOM), would provide Biology majors the opportunity to earn both a Bachelor of Science degree from U.T. Dallas and a Doctor of Osteopathic Medicine degree in 7 years. Students enrolled in the program would take regular biology core courses at U.T. Dallas

for the first three years and apply for admission to TCOM. However, progress towards the completion of a B.S. in Biology at U.T. Dallas does not ensure that the student will be admitted into TCOM. U.T. Dallas students in this program do not receive any special considerations from TCOM during the application process and must be accepted based upon their merit while at U.T. Dallas. After acceptance into TCOM, the student will spend the fourth year taking courses for credit towards a D.O. degree at TCOM. Once the student has successfully completed the first year at TCOM, the student will receive a Bachelor of Science degree in Biology from U.T. Dallas. Students interested in this program should contact the Biology undergraduate advisor or program coordinator.

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 hours (B.S.) or 6 hours (B.A.) of upper-division transfer credit and not more than 3 hours (Biology major) or 6 hours (Molecular Biology major) of individual instruction (e.g., BIOL 3V90, BIOL 3V91, BIOL 3V92, BIOL 3V95, BIOL 3V96, BIOL 4302, BIOL 4390, or BIOL 4399).

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 U.T. Dallas Health Professions Education Advisors. Most professional schools prefer that admission applications be channeled through the Health Professions Education Office.

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