School of Natural Sciences and Mathematics

Molecular Biology and Business Administration (B.S.)

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.

Both B.S. and B.A. degrees are offered in Biology at UT 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.

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

Faculty

**Professors:** Lee A. Bulla, Santosh D'Mello, Rockford K. Draper, Juan González, Donald M. Gray, Stephen D. Levene, Lawrence J. Reitzer, Stephen Spiro, Li Zhang, Michael Q. Zhang

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

**Assistant Professors:** Tianbing Xia, Zhenyu Xuan, Hyuntae Yoo

**Professor Emeritus:** Hans Bremer, Claud S. Rupert

**Senior Lecturers:** Irina Borovkov, Mehmet Candar, Vincent P. Cirillo, Wen-ju Lin, Robert C. Marsh, David Murchison, Elizabeth Pickett, Ruben D. Ramirez, Scott A. Rippel, Ilya Sapochnikov, Wen-Ho Yu
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 UT Dallas; however, students deficient in the biology and chemistry requirements may be delayed in entering upper-division biology courses.

Bachelor of Science in Molecular Biology and Business Administration (Double Major)

*Degree Requirements (149 hours)*

I. Core Curriculum Requirements:

- **Communication (6 hours)**
  - 3 hours Communication (**RHET 1302**)
  - 3 hours Communication Elective (**BCOM 3311**)

- **Social and Behavioral Sciences (15 hours)**
  - 6 hours Government (**GOVT 2301** and **GOVT 2302**)
  - 6 hours American History
  - 3 hours Social and Behavior Sciences Elective (**ECON 2301**)

- **Humanities and Fine Arts (6 hours)**
  - 3 hours Fine Arts (**ARTS 1301**)
  - 3 hours Humanities (**HUMA 1301**)

- **Mathematics and Quantitative Reasoning (6 hours)**
6 hours Calculus (MATH 2417 and MATH 2419)^4

Science (9 hours)

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

II. Major Requirements: 95 hours

Biology Major Preparatory Courses (17 hours beyond Core Curriculum)

CHEM 1111 General Chemistry Laboratory I
CHEM 1112 General Chemistry Laboratory II
CHEM 1311 General Chemistry I
CHEM 1312 General Chemistry II
CHEM 2123^5 Introductory Organic Chemistry Laboratory I
CHEM 2125^5 Introductory Organic Chemistry Laboratory II
CHEM 2323^5 Introductory Organic Chemistry I
CHEM 2325^5 Introductory Organic Chemistry II
MATH 2417 Calculus I^4
MATH 2419 Calculus II^4
PHYS 2325 and PHYS 2125 Mechanics with Laboratory
PHYS 2326 and PHYS 2126 Electromagnetism and Waves with Laboratory

Biology Major Core Courses (36 hours)

BIOL 2111^5 Introduction to Modern Biology Workshop I
BIOL 2112^5 Introduction to Modern Biology Workshop II
BIOL 2281^5 Introductory Biology Laboratory
BIOL 2311^5 Introduction to Modern Biology I
BIOL 2312^5 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 4461  Biophysical Chemistry

Business Administration Major Preparatory Courses (15 hours beyond Core Curriculum)

ACCT 2301  Introductory Financial Accounting
ACCT 2302  Introductory Management Accounting
BLAW 2301  Business and Public Law
ECON 2301  Principles of Macroeconomics
ECON 2302  Principles of Microeconomics
OPRE 3333  Quantitative Business Analysis
or MATH 2333  Matrices, Vectors and Their Application

Business Administration Core Courses (27 hours)

BCOM 3311  Business Communications
BCOM 4350  Advanced Business Communications
FIN 3320  Business Finance
MIS 3300  Introduction to Management Information Systems
OPRE 3310  Operations Management
OBHR 3310  Organizational Behavior
MKT 3300  Principles of Marketing
BPS 4305  Strategic Management
IMS 3310  International Business
STAT 3360  Probability and Statistics for Management and Economics
or STAT 3332  Statistics for Life Sciences
or OPRE 3360  Managerial Decision Making under Uncertainty

III. Elective Requirements: 12 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.

Guided Electives (12 hours)

Business (9 hours): To be selected from upper-level JSOM courses. If qualified, the student may select from JSOM graduate courses.

Biology (3 hours): To be selected from BIOL 4380, BIOL 3V96 (3 hours),\textsuperscript{6} BIOL 4391,\textsuperscript{6} or BIOL 4399 (3 hours).\textsuperscript{6}

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

1. Degree is 150 hours if students are required to take NATS 1101.

2. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses 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 hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Major Preparatory Courses.

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

6. Requires permission of the Biology Undergraduate Advisor to ensure training in recombinant DNA analysis.