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

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:

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

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

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

4. 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 Introductory Organic Chemistry Laboratory I
- CHEM 2125 Introductory Organic Chemistry Laboratory II
- CHEM 2323 Introductory Organic Chemistry I
- CHEM 2325 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 Introduction to Modern Biology Workshop I
- BIOL 2112 Introduction to Modern Biology Workshop II
- BIOL 2281 Introductory Biology Laboratory
- 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 4461** Biophysical Chemistry

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

**ACCT 2301**<sup>5</sup> Introductory Financial Accounting

**ACCT 2302**<sup>5</sup> Introductory Management Accounting

**BLAW 2301**<sup>5</sup> Business and Public Law

**ECON 2301**<sup>5</sup> Principles of Macroeconomics<sup>3</sup>

**ECON 2302**<sup>5</sup> Principles of Microeconomics

**OPRE 3333**<sup>5</sup> Quantitative Business Analysis

or **MATH 2333**<sup>5</sup> Matrices, Vectors and Their Application

**Business Administration Core Courses (27 hours)**

**BCOM 3311** Business Communications<sup>3</sup>

**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<sup>3</sup>

**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**

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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), 6 BIOL 4391, 6 or BIOL 4399 (3 hours). 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.