School of Natural Sciences and Mathematics

Biochemistry (BS)

The Biochemistry program at UT Dallas, administered through the Department of Chemistry, draws on faculty from the Departments of Chemistry, Biological Sciences, and researchers from UT Southwestern Medical School to provide courses and research opportunities to its majors. The Biochemistry major bridges the gap between modern Chemistry and Biology. The curriculum, designed to prepare students for either graduate work in the Biological Sciences, the Chemical Sciences, or for entry-level positions in the biotechnology industry, builds on a base of biology, chemistry, physics, and mathematics to provide the student the opportunity to develop essential theoretical and practical skills.

Chemistry Faculty

- **Robert A. Welch Chair in Chemistry; Professors of Chemistry:** Ray H. Baughman, Dennis W. Smith Jr.
- **Cecil and Ida Green Distinguished Chair in Systems Biology; Professor of Chemistry:** A. Dean Sherry
- **Distinguished Chair in Natural Sciences and Mathematics; Dean of the School of Natural Sciences and Mathematics:** Bruce M. Novak

- **Professors:** Kenneth J. Balkus Jr., Julia Chan, Rockford K. Draper, John P. Ferraris, Bruce E. Gnade, Inga H. Musselman
- **Professor Emeritus:** Richard A. Caldwell
- **Research Professors:** Garry E. Kiefer, Duck Joo (D. J.) Yang
- **Associate Professors:** Jung-Mo Ahn, Michael C. Biewer, Gregg R. Dieckmann, Warren J. Goux, Steven O. Nielsen, Paul Pantano, John W. Sibert IV, Mihaela C. Stefan, Jie Zheng
- **Assistant Professors:** Jeremiah J. Gassensmith, Jiyong Lee, Ronald A. Smaldone
- **Senior Lecturers:** Sergio Cortes, Sandhya R. Gavva, Jason L. McAfee, Yanping Qin, Amandeep Sra, Claudia Taenzler
- **Affiliated Faculty:** Lee A. Bulla, Yves J. Chabal, Lev D. Gelb, Amy V. Walker, Anvar A. Zakhidov

Biological Sciences Faculty

- **Professors:** Lee A. Bulla, Rockford K. Draper, Juan E. González, Stephen D. Levene, Lawrence J. Reitzer, Stephen Spiro, Li Zhang, Michael Qiwei Zhang
- **Professor Emeritus:** Donald M. Gray
- **Associate Professors:** Gail A. M. Breen, John G. Burr, Jeff L. DeJong, Nikki Delk, Ernest M. Hannig, Tae Hoon Kim, Dennis L. Miller
- **Assistant Professors:** Zhenyu Xuan

UT Southwestern Medical School

UT Dallas Biochemistry majors may perform their research in the laboratories of faculty members from the departments of Biochemistry, Internal Medicine, Pharmacology and Physiology at UT Southwestern, as available.

Bachelor of Science in Biochemistry

Degree Requirements (120 semester credit hours)¹

I. Core Curriculum Requirements: 42 hours²

Communication: 6 semester credit hours

COMM 1311 Survey of Oral, and Technology-based Communication
RHET 1302 Rhetoric

Mathematics: 3 semester credit hours

MATH 2417 Calculus³,⁴
or MATH 2413 Differential Calculus³,⁴

Life and Physical Sciences: 6 semester credit hours⁵

CHEM 1311 General Chemistry I³
or CHEM 1315 Honors Freshman Chemistry I³
CHEM 1312 General Chemistry II³
or CHEM 1316 Honors Freshman Chemistry II³

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 6 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

- **MATH 2417** Calculus I\(^3, 4\)
  - or **MATH 2413** Differential Calculus\(^3, 4\)
- **MATH 2419** Calculus II\(^3, 4\)
  - or **MATH 2414** Integral Calculus\(^3, 4\)
- **PHYS 2125** Physics Laboratory I\(^3, 5\)

II. Major Requirements: 66 hours

Major Preparatory Courses: 29 semester credit hours beyond Core Curriculum

- **BIOL 2111** Introduction to Modern Biology Workshop I
- **BIOL 2311** Introduction to Modern Biology I
- **CHEM 1111** General Chemistry Laboratory I
  - or **CHEM 1115** Honors Freshman Chemistry Laboratory I
- **CHEM 1112** General Chemistry Laboratory II
  - or **CHEM 1116** Honors Freshman Chemistry Laboratory II
- **CHEM 1311** General Chemistry I\(^6\)
  - or **CHEM 1315** Honors Freshman Chemistry I\(^6\)
- **CHEM 1312** General Chemistry II\(^6\)
  - or **CHEM 1316** Honors Freshman Chemistry II\(^6\)
- **CHEM 2123** Introductory Organic Chemistry Laboratory I\(^7\)
- **CHEM 2125** Introductory Organic Chemistry Laboratory II\(^7\)
- **CHEM 2323** Introductory Organic Chemistry I\(^7\)
- **CHEM 2325** Introductory Organic Chemistry II\(^7\)
- **CHEM 2401** Introductory Quantitative Methods in Chemistry
MATH Sequence - Students may choose one of the following sequences:

I. **MATH 2413** Differential Calculus³, ⁴

and **MATH 2414** Integral Calculus³, ⁴

and **MATH 2415** Calculus of Several Variables

OR

II. **MATH 2417** Calculus I³, ⁴

and **MATH 2419** Calculus II³, ⁴

and **MATH 2451** Multivariable Calculus with Applications

**PHYS 2125** Physics Laboratory I³, ⁵

**PHYS 2126** Physics Laboratory II

**PHYS 2325** Mechanics⁸

or **PHYS 2421** Honors Physics I - Mechanics and Heat⁸

**PHYS 2326** Electromagnetism and Waves⁸

or **PHYS 2422** Honors Physics II - Electromagnetism and Waves⁸

**Major Core Courses: 37 semester credit hours**

**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 3380** Biochemistry Laboratory

**BIOL 3361** or **CHEM 3361** Biochemistry I

**BIOL 3362** or **CHEM 3362** Biochemistry II

**CHEM 3321** Physical Chemistry I

**CHEM 3322** Physical Chemistry II

**CHEM 3472** Instrumental Analysis

Any two upper-division Chemistry or Biology electives (8 semester credit hours) not taken to fulfill above.

**III. Elective Requirements: 12 semester credit hours**
Free Electives: 12 semester credit hours

The plan must include sufficient upper-division credit to total 51 upper-division credit hours.

STAT 2332 Statistics for Life Sciences is strongly recommended.

Fast Track Baccalaureate/Master's Degrees

Undergraduate students at UT Dallas with strong academic records who intend to pursue the MS in Chemistry at UT Dallas may apply for a Fast Track plan of study which involves taking selected graduate courses as an upper-level 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 baccalaureate degree and to satisfy requirements for the master's degree. Interested students should contact the undergraduate advisor well in advance of the junior year to prepare a sequence permitting maximal advantage to be taken of the catalog's regulations (see catalog.utdallas.edu/2014/undergraduate/policies/graduate-courses) regarding Undergraduate Registration for Graduate Courses.

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 Core Curriculum requirement. Semester credit hours are counted in the Core Curriculum.

4. Three semester credit hours of Calculus are counted to fulfill the Mathematics Core Requirement with the remaining five semester credit hours to be counted under Component Area Option Core.

5. Six semester credit hours of Physics are counted under Science core, and one semester of Physics (PHYS 2125) are counted under Component Area Option core.

6. A required Major course that also fulfills Core Curriculum requirement. Hours are counted in the Core Curriculum.

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

8. Students will take one of the two Physics sequences: PHYS 2325 and PHYS 2326 or PHYS 2421 and PHYS 2422 with accompanying labs.