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

**Senior Lecturers:** Irina Borovkov, Mehmet Candas, Vincent P. Cirillo, Wen-Ju Lin, Robert C. Marsh, Ruben D. Ramirez, Scott A. Rippel, Ilya Sapozhnikov, Wen-Ho Yu

**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. Core Curriculum Requirements: 42 hours

   **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
   or **MATH 2413** Differential Calculus

   **Life and Physical Sciences:** 6 semester credit hours
   - **CHEM 1311** General Chemistry
   or **CHEM 1315** Honors Freshman Chemistry
   - **CHEM 1312** General Chemistry II
   or **CHEM 1316** Honors Freshman Chemistry II

   **Language, Philosophy and Culture:** 3 semester credit hours
   - Select any 3 semester credit hours from Language, Philosophy and Culture core courses (see

https://catalog.utdallas.edu/2014/undergraduate/programs/nsm/biochemistry
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
   or CHEM 1316 Honors Freshman 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
CHEM 2401 Introductory Quantitative Methods in Chemistry

MATH Sequence - Students may choose one of the following sequences:
   I. MATH 2413 Differential Calculus
      and MATH 2414 Integral Calculus
      and MATH 2415 Calculus of Several Variables
   OR
   II. MATH 2417 Calculus I
      and MATH 2419 Calculus II
      and MATH 2451 Multivariable Calculus with Applications

PHYS 2125 Physics Laboratory I
PHYS 2126 Physics Laboratory II
PHYS 2325 Mechanics
   or PHYS 2421 Honors Physics I - Mechanics and Heat
PHYS 2326 Electromagnetism and Waves
   or PHYS 2422 Honors Physics II - Electromagnetism and Waves

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](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.