

# DIVISION OF CHEMISTRY AND BIOCHEMISTRY

**Web Site:** <http://www.twu.edu/chemistry-biochemistry/>

**Interim Division Head:** Manal Omary, Ph.D.

**Location:** SRC, 1041

**Phone:** 940-898-2565

**Fax:** 940-898-2548

**E-mail:** chembiochem@twu.edu

**Chemistry Major Advisor:** Manal Omary, Ph.D.

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**Fax:** 940-898-2548

**Email:** MOmary@twu.edu

## Graduate Degree Offered

- M.S. in Chemistry (Business) (<https://catalog.twu.edu/graduate/arts-sciences/chemistry-biochemistry/chemistry-business-ms/>)
- M.S. in Chemistry (Science) (<https://catalog.twu.edu/graduate/arts-sciences/chemistry-biochemistry/chemistry-science-ms/>)
- M.S. in Chemistry (Research) (<https://catalog.twu.edu/graduate/arts-sciences/chemistry-biochemistry/chemistry-research-ms/>)
- M.A.T. (Interdisciplinary) (<https://catalog.twu.edu/graduate/professional-education/mat-graduate-interdisciplinary-degree/>)

Analytical, biological, inorganic, organic, and physical chemistry are areas in which advanced coursework and research are available in the department. A course of study and research is designed by a faculty committee as a degree program leading to a master's degree best fitted to the individual's career goals. The department has excellent facilities and resources to support a broad variety of research directions.

Cooperation and interaction among the faculty and with the graduate students create an environment of strong support for the student in both studies and research, and facilitate the attainment of the educational goals of each student. Opportunities to serve as a teaching assistant and/or as a research assistant provide both financial support and educational experience. Fellowships and scholarships are also available.

We offer a M.S. degree in Chemistry with research focuses on biochemistry, biophysical chemistry, organic chemistry, and inorganic/materials chemistry. All M.S. degree-seeking students will be required to take a minimum of four basic courses covering different aspects of chemistry for a broad background. Students can also take other graduate courses for more in-depth perspectives. We now offer two pathways to the M.S., including a research path or a coursework path with a science or business track emphasis.

## Minors

### Master's level

Six semester credit hours of organized graduate courses in the Department of Chemistry and Biochemistry as defined by the chemistry representative on the candidate's advisory committee.

## Faculty

\*ANDERSON, MARY E., Professor of Chemistry and Biochemistry, B.A., Hollins College; Ph.D., Cornell University

\*BEATTY, JOHN, Assistant Professor of Chemistry, B.S., Angelo State University; M.S., Angelo State University; Ph.D., University of North Texas

\*LI, YUNXIANG, Lecturer II of Chemistry, B.S., Tianjin University, China PR; Ph.D., Texas Tech University

\*LIN, SHIRU, Assistant Professor, Ph.D., University of Puerto Rico

\*MIRSALEH-KOHAN, NASRIN, Professor of Chemistry and Biochemistry; Division Lead of Chemistry and Biochemistry, B.S., University of Tehran; M.S., Bowling Green State University; Ph.D., University of Tennessee, Knoxville

\*OMARY, MANAL A., Professor of Chemistry and Biochemistry, B.S., Yarmouk University; Ph.D., University of Maine, Augusta

\*PETROS, ROBBY, Associate Professor of Chemistry and Biochemistry, B.S., University of North Texas; M.S., University of North Texas; M.A., Columbia University; M.Phil., Columbia University; Ph.D., Columbia University

\*SALAZAR, GUSTAVO A., Assistant Professor of Chemistry, B.S., Autonomous University of Coahuila, Mexico; M.S., University of North Texas; Ph.D., University of North Texas

## Courses

**Contact hours identified in the course descriptions are based on a 15-week term. Students who enroll in Summer or mini-terms are expected to meet the same total number of contact hours as a 15-week term.**

**CHEM 5013. Advanced Physical Chemistry.** Fundamental laws, states of matter, thermodynamics of solutions, and chemical equilibria with an emphasis on biological systems. Three lecture hours a week. Credit: Three hours.

**CHEM 5101. Seminar.** Presentation of chemical papers of current interest, followed by discussion. Prerequisite: One semester of graduate work. One seminar hour a week. Credit: One hour.

**CHEM 5213. Advanced Organic Chemistry.** Problems and techniques of modern theoretical organic chemistry. Three lecture hours a week. Credit: Three hours.

**CHEM 5323. Advanced Analytical Chemistry.** Activity and equilibrium in water and nonaqueous solvents; precipitation, complexation, redox, electrochemical, and separative processes; sampling and statistics. Instrumentation. Three lecture hours a week. Credit: Three hours.

**CHEM 5523. Advanced Inorganic Chemistry.** Theory and description applicable to the elements and their inorganic compounds; bonding, structure stereochemistry, complexes, acid-base theory. Three lecture hours a week. Credit: Three hours.

**CHEM 5613. Advanced Biochemistry I.** Chemistry and structure of biomolecules (carbohydrates, lipids, amino acids and proteins, nucleotides and nucleic acids). Three lecture hours a week. Credit: Three hours.

**CHEM 5623. Advanced Biochemistry II.** Chemistry and metabolism of biomolecules (proteins, enzymes, nucleic acids, carbohydrates, and lipids). Pre-requisite: CHEM 5613. Three lecture hours a week. Credit: Three hours.

**CHEM 5891. Research in Chemistry.** Original research. May be used as thesis subject. May be repeated for additional credit. Prerequisite: Permission of the instructor. Credit: One hour.

**CHEM 5893. Research in Chemistry.** Original research. May be used as a thesis subject. May be repeated for additional credit. Prerequisite: Permission of the instructor. Credit: Three hours.

**CHEM 5896. Research in Chemistry.** Original research. May be used as a thesis subject. May be repeated for additional credit. Prerequisite: Permission of the instructor. Credit: Six hours.

**CHEM 5903. Special Topics.** Lectures or conferences on recent developments in chemical theory or practice. May be repeated with change of topic for additional credit. Prerequisite: Permission of the instructor. Three lecture hours a week. Credit: Three hours.

**CHEM 5911. Independent Study.** Independent student readings or experimentation in chemistry. Prerequisite: Permission of instructor. Credit: One hour.

**CHEM 5912. Independent Study.** Independent student readings or experimentation in chemistry. Prerequisite: Permission of instructor. Credit: Two hours.

**CHEM 5913. Independent Study.** Independent student readings or experimentation. Prerequisite: Permission of instructor. Credit: Three hours.

**CHEM 5953. Internship.** Cooperative work-study arrangement between business, industry, or selected institution and the University. Pre-planning and evaluation will involve approximately 10% of the practicum hours per week. May be repeated for credit. Nine practicum hours a week. Credit: Three hours.

**CHEM 5956. Internship.** Cooperative work-study arrangement between business, industry, or selected institution and the University. Pre-planning and evaluation will involve approximately 10% of the practicum hours per week. May be repeated for credit. Eighteen practicum hours a week. Credit: Six hours.

**CHEM 5973. Professional Paper.** Written presentation of literature and possible laboratory and/or statistical research in a selected area of chemistry. Credit: Three hours.

**CHEM 5983. Thesis.** Credit: Three hours.

**CHEM 5993. Thesis.** Prerequisite: CHEM 5983. Credit: Three hours.

**SCI 5903. Special Topics.** Advanced topics in general science. Three lecture hours a week. Credit: Three hours.

**SCI 5911. Independent Study.** Independent student readings or study in general sciences. Prerequisite: Permission of the instructor. Credit: One hour.

**SCI 5913. Independent Study.** Independent student readings or study in general science. Prerequisite: Permission of the instructor. Credit: Three hours.