

Bachelor of Science in Data Science (Physical Chemistry)

About This Program

In the Bachelor of Science in Data Science Physical Chemistry concentration, students learn how to handle large-scale chemical datasets, including spectroscopic data, reaction models, and material simulations. This track prepares students for work in chemical informatics, industrial research, laboratory data automation, and other chemistry-related data science applications. Beyond the UTA Core Curriculum requirements, the degree requires a sequence of courses in Mathematics, Data Science, and Chemistry. In addition, students must complete a year-long Capstone project in collaboration with a supervisor within the College of Science or an Industry Partner.

Competencies

1. Upon completion, students will demonstrate knowledge of fundamentals of mathematics and statistics, in applications to data science.
2. Upon completion, students will demonstrate knowledge of computer programming through receiving a certificate, and therefore passing, a programming course.
3. Upon completion, students will demonstrate the ability to effectively work in teams to complete data science projects

Curriculum

Foundations

General Core Requirements (<https://catalog.uta.edu/academicregulations/degree requirements/generalcore requirements/>) 42

Students are required to complete specific courses in certain core areas:

For Communication select:

ENGL 1301 RHETORIC AND COMPOSITION I

An additional communication area course

For Life and Physical Science select:

PHYS 1443 GENERAL TECHNICAL PHYSICS I

PHYS 1444 GENERAL TECHNICAL PHYSICS II

For Mathematics select:

MATH 1426 CALCULUS I

MATH 2425 CALCULUS II

Data Science Foundations

Additional hours required in core. 4

UNIV 1131 STUDENT SUCCESS 1

or UNIV-SC 1101 CAREER PREPARATION AND STUDENT SUCCESS

Select any course numbered 3300 or higher. 3

Data Science Specialization

DATA 3401 PYTHON FOR DATA SCIENCE 1 4

DATA 3402 PYTHON FOR DATA SCIENCE 2 4

DATA 3311 MATHEMATICS FOR DATA SCIENCE 3

DATA 3421 DATA MINING, MANAGEMENT, AND CURATION 4

DATA 3441 STATISTICAL METHODS FOR DATA SCIENCE 1 4

DATA 3442 STATISTICAL METHODS FOR DATA SCIENCE 2 4

DATA 3461 MACHINE LEARNING 4

DATA 4380 DATA PROBLEMS 3

DATA 4381 DATA CAPSTONE PROJECT 1 3

DATA 4382 DATA CAPSTONE PROJECT 2 3

Chemistry Specialization

CHEM 1441 GENERAL CHEMISTRY I 4

CHEM 1442 GENERAL CHEMISTRY II 4

CHEM 2321 ORGANIC CHEMISTRY I 3

CHEM 2181 ORGANIC CHEMISTRY I LABORATORY 1

CHEM 2322 ORGANIC CHEMISTRY II 3

CHEM 2182	ORGANIC CHEMISTRY II LABORATORY	1
CHEM 2335	QUANTITATIVE CHEMISTRY	3
CHEM 2285	QUANTITATIVE CHEMISTRY LABORATORY	2
CHEM 3317	INORGANIC CHEMISTRY	3
or CHEM 4318	INORGANIC CHEMISTRY	
Select one of the following options:		4
CHEM 3315 & CHEM 3175	INTRODUCTION TO BIOPHYSICAL CHEMISTRY and BIOPHYSICAL CHEMISTRY LABORATORY	
CHEM 3321 & CHEM 3181	PHYSICAL CHEMISTRY I and PHYSICAL CHEMISTRY I LABORATORY ¹	
CHEM 3322 & CHEM 3182	PHYSICAL CHEMISTRY II and PHYSICAL CHEMISTRY II LABORATORY ¹	
Select 2 CHEM courses numbered 3300 or higher or DATA courses numbered 2300 or higher.		6
Total Hours		120

¹ This option requires additional prerequisites; consult advisor.

SUGGESTED COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Data Science undergraduate advisor, particularly since many courses are not offered every semester. For all entering freshmen, it is important to begin the mathematics sequence, starting with MATH 1426, Calculus I, in the first semester.

First Year			
Fall Semester	Hours	Spring Semester	Hours
Component Area Course (Suggested DATA 1301)		3 CHEM 1442	4
UNIV 1131 or UNIV-SC 1101		1 MATH 2425	4
CHEM 1441		4 DATA 3311	3
MATH 1426		4 DATA 3402	4
DATA 3401		4	
		16	15
Second Year			
Fall Semester	Hours	Spring Semester	Hours
CHEM 2321		3 Approved Communication Core	3
CHEM 2181		1 CHEM 2322	3
DATA 3441		4 CHEM 2182	1
ENGL 1301		3 DATA 3442	4
ELECTIVE (33xx+)		3 DATA 3421	4
		14	15
Third Year			
Fall Semester	Hours	Spring Semester	Hours
DATA 3461		4 CHEM 3317 or 4318	3
CHEM 2335		3 ELECTIVE (CHEM 33xx+ or DATA 23xx+)	3
CHEM 2285		2 DATA 4380	3
Approved Creative Arts Core		3 POLS 2311	3
HIST 1301		3 Approved Language, Philosophy, Culture Core Course	3
		15	15
Fourth Year			
Fall Semester	Hours	Spring Semester	Hours
HIST 1302 or 1332		3 POLS 2312	3
ELECTIVE (CHEM 33xx+ or DATA 23xx+)		3 PHYS 1444	4
PHYS 1443		4 CHEM 3315	3
DATA 4381		3 CHEM 3175	1
Approved Social and Behavioral Core Course		3 DATA 4382	3
		16	14
Total Hours: 120			

Advising Resources

UNDERGRADUATE AND GRADUATE ADVISING

Location:

Life Science Building Room 206A and 206B

Email:

data.advising@uta.edu

Phone:

817-272-1512

Web:

Speak to an advisor in the Division of Data Science or schedule an appointment. (<https://www.uta.edu/academics/schools-colleges/science/departments/division-data-science/advising/>)