Minimum Hrs Required

Course(s) Fulfilled

REQUIRED COURSEWORK

Teacher Education Preparation Coursework:

Step 1 (UTS101)

Step 2 (UTS110)

EDC 365C or UTS 350 - Knowing and Learning

EDC 365D or UTS 355 - Classroom Interactions

EDC 365E or UTS 360 - Project Based Instruction

EDC 651S - Secondary School Teaching Practicum, Science or Math

UTS 170 - Student Teaching Seminar

Research Methods
Biology: 337-2; Chemistry: 368-1,
or Physics: 341-7

Perspectives
History: 329U or Philosophy: 329U
(Students must complete both Research Methods and Perspectives)

Middle Grades Certification Only Complete the Following Coursework:

EDC 339F

STUDENTS MUST ALSO SELECT A CERTIFICATION AREA FROM ONE OF THE OPTIONS BELOW:

Composite Science Certification:
Students must select a primary field from one of the following: Biology, Chemistry, Physics or Geology (restricted to GEO majors) and complete a minimum of 24 hours in that field.

Primary Field BIOLOGY Course Requirements:
BIO 325, INB 370, and additional coursework to meet minimum hours required: MBS 320, MBS 326M (or MBS 326R), MBS 328 strongly recommended

Primary Field CHEMISTRY Course Requirements:
CH 320M, CH 320N and CH 220C or CH 328M + CH 128K and CH 328N + CH 128N
BCH 339F or BCH 369; CH 353M or CH 353, CH 456; and additional coursework to meet minimum hours required

Primary Field GEOLOGY Course Requirements (Restricted to Geology majors): GEO 401 (or GEO 303), GEO 405, GEO 416K, GEO 416M, GEO 420K (or GEO 320L) and additional coursework to meet minimum hours required

Primary Field PHYSICS
PHY 355, PHY 353L
9 hours chosen from the following: PHY 329, PHY 336K, PHY 338K, PHY 333, PHY 352K, PHY373, SCI 365 and additional coursework to meet minimum hours required

For all composite science tracks, in addition to their primary field, students also choose 2nd (12 hours), 3rd (6 hours), and 4th (6 hours) fields from CH, BIO, PHY, GEO; coursework for 2nd, 3rd, 4th fields must be outside of their primary field. See a UTeach advisor for details.

Computer Science Certification (Restricted to CS Majors):
A minimum of 24 hours of computer science coursework is required
Complete calculus sequence; CS 312, CS 311, CS 314, CS 429
One course chosen from the following: CS 439, CS 343, CS 345, CS 347, CS 354, or CS 370, enough additional hours to reach a total of 24 semester credit hours.

Mathematics Certification:
Complete calculus sequence; M 315C, M 325K, one of M 375D, M 343K, or M 373K, M 333L, M 341, M 362K, M 358K.

Mathematics, Physical Science, Engineering Certification (Engineering Majors Only): Calculus for degree; PHY 303K + PHY 103M, PHY 303L + PHY 103N; M 315C, M333L, M 427K; CH 301. Senior Design Project counts in lieu of Research Methods (see above).

Physical Science (Physics and Chemistry) Certification:
Calculus for degree; Physics I and II plus PHY 315, and PHY 115L CH 301, CH 302, CH 204, CH 353 or CH 353M + 153K, CH 455 (or 456); PHY 353L (or 355); 3 hours of approved upper-division physics. See a UTeach advisor for details.

Physics and Mathematics Certification
Calculus for degree; Complete the following Physics sequence: (12 hours): PHY 301, PHY 101L, PHY 316, PHY 116L, PHY 315, and PHY 115
PHY 355, PHY 353L; 3 courses from the following list: PHY 329, PHY 333,PHY 336K, PHY 338K, PHY 352K, PHY 373, SCI 365; M 315C, M 375D, M 427K, M 427L, M 325K, M 333L, M 340L, M 362K, M358K.

UTEACH POLICIES & PROCEDURES

- No application for admission required
- Courses in the certification area are required in addition to the Professional Development Sequence.
- All courses must be for science majors.
- A C- or better is required in order to count a course toward certification.
- A 2.5 cumulative GPA is required for teacher certification.
- All content courses must be completed in order to be recommended for educator certification.
- BSA Students: Courses in the Professional Development Sequence (24 hours) fulfill the requirement for the transcript recognized certificate and the BSA degree.
- All content courses must be completed in order to be recommended for educator certification.
- Students must meet departmental pre-requisites.
- Students completing requirements will be automatically entered into the transcripted certificate system.
- Please visit the certificate website for additional information

	Minimum Hrs Required	Course(s) Fulfilled
REQUIRED COURSEWORK: 18HRS TOTAL		
Two Core Courses:	6	
C S 303E: Elements of Computer Programming		
C S 313E: Elements of Software Design		
Four of the Following Upper Division Courses:	12	
C S 323E: Elements of Scientific Computing		
C S 324E: Elements of Graphics and Visualization		
C S 326E: Elements of Networking		
C S 327E: Elements of Databases		
C S 329E: Advanced Topics in Elements of Computing • Elements of Data Integration • Elements of Data Visualization • Elements of Mobile Computing • Elements of Web Programming • Elements of Data Analytics • Elements of Game Development		
C S 330E: Elements of Software Engineering I		
C S 331E: Elements of Software Engineering II		

toward the 12 additional hour requirement as long as topics vary

*With the approval of the certificate program faculty committee, other appropriate upper division courses may be counted toward the elective requirement.

*Please visit our website for a list of pre-approved substitute courses: http://www.cs.utexas.edu/undergraduate-program/academics/programming-and-computation

*No more than 2 substititions are allowed to count toward the 18hr Programming and Computation Certificate

*Multiple topics of C S 329E may count

POLICIES & PROCEDURES
- Application for admission required
- Total of 18 hours required; 12 of which must be upper division
- Students may only register for up to 3 upper division C S Elements courses in a given semester
- All coursework must be completed with a grade of C- or higher
- Please visit the certificate website for additional information:
  http://www.cs.utexas.edu/undergraduate-program/academics/programming-and-computation

The University of Texas at Austin
Department of Statistics and Data Sciences
College of Natural Sciences

Certificate in Scientific Computation Course Progression Worksheet 2024–2026 Catalog

Course(s) Fulfilled

ADMISSION REQUIREMENTS

I. PREREQUISITE KNOWLEDGE (choose one)

Mathematics:
408D Differential & Integral Calculus
408M Multivariable Calculus

II. CORE REQUIREMENTS

A. Computer Programming (choose one)

Aerospace Engineering:
301 Intro to Computer Programming

Biomedical Engineering:
303 Intro to Computing

Computational Engineering:
301 Intro to Computer Programming
322 Scientific Computing

Computer Science:
303E Elements of Computers & Programming
313E Elements of Software Design

Electrical and Computer Engineering:
312 Software Design & Implementation
312H Software Design & Implementation Honors

Geological Sciences:
325J Programming in FORTRAN & MATLAB

Statistics & Data Sciences:
322 Intro to Scientific Programming

B. Mathematics (choose one)

Mathematics:
340L Matrices & Matrix Calculations
341 Linear Algebra & Matrix Theory
372K Partial Differential Equations & Applications

Statistics & Data Sciences:
329C Practical Linear Algebra I

III. SCIENTIFIC COMPUTING COURSES

(Choose two categories & take one course in each)

A. Numerical Methods

Biomedical Engineering:
313L Intro to Numerical Methods

Chemical Engineering:
348 Numerical Methods in Chemical Engineering

Computational Engineering:
311K Engineering Computing

Computer Science:
323E Elements of Scientific Computing

Course(s) Fulfilled

323H Scientific Computing-Honors
367 Numerical Methods

Mathematics:
348 Scientific Computation in Numerical Analysis
368K Numerical Methods for Applications

Petroleum & Geosystems Engineering:
310 Formulation & Solution of Geosystems Engineering Problems

Statistics & Data Sciences:
335 Scientific & Technical Computing

B. Statistical Methods

Biomedical Engineering:
335 Engineering, Probability, & Statistics

Economics:
329 Economic Statistics

Electrical and Computer Engineering:
351K Probability & Random Processes

Mathematics:
358K Applied Statistics
378K Intro to Mathematical Statistics

Mechanical Engineering:
335 Engineering Statistics

Statistics & Data Sciences:
325H Honor Statistics
320E Elements of Statistics

C. Other Computing Topics

Biomedical Engineering:
350 Computational Methods for Biomeical Engineers

Chemistry:
354M Intro to Computational Methods in Chemistry

Computer Science:
324E Elements of Graphics & Visualization
327E Elements of Databases
329E Topics in Elements of Computing
377 Principles & Applications of Parallel Programming

Mathematics:
346 Applied Linear Algebra
362M Introduction to Stochastic Processes
368K Numerical Methods for Applications
372K Partial Differential Equations and Applications
375T Topics in Mathematics (Approved topics)
376C Methods of Applied Mathematics

The University of Texas at Austin
Department of Statistics and Data Sciences
College of Natural Sciences

Certificate in Scientific Computation Course Progression Worksheet 2024–2026 Catalog *(Continued)*

Course(s) Fulfilled

Mechanical Engineering:
367S Simulation Modeling

Management Information Systems:
325 Database Management

Neuroscience:
366M Quantitative Methods

Statistics & Data Sciences:
374C Parallel Computing
374E Visualization & Data Analysis

IV. APPLIED COMPUTING COURSES

(choose one)

Biochemistry:
339N Systems Biology & Bioinformatics

Integrative Biology:
321G Intro to Computational Bio

Computer Science:
324E Elements of Graphics & Visualization
329E Topics in Elements of Computing*

Chemistry:
368 Advanced Topics in Chemistry

Biomedical Engineering:
342 Computational Biomechanics,
346 Computational Structural Biology,
377T Topics in Biomedical Engineering*

Computational Engineering:
347 Introduction to Computational Fluid Dynamics

Economics:
363C Computational Economics

Electrical and Computer Engineering:
379K Topics in Electrical Engineering*

Finance/Statistics:
(IROM) 372T.16 Optimization Methods in Finance

Geological Sciences:
325K Computational Methods in Geological Sciences

Linguistics:
350 Special Topics in the Study of Linguistics*

Mathematics:
375T Topics in Mathematics*
374M Mathematical Modeling in Science & Engineering

Physics:
329 Introduction to Computational Physics

Statistics and Data Sciences:
322E Elements of Data Science

*Topics Courses must be approved by the faculty committee. See SDS website for details on approval process.

Course(s) Fulfilled

V. RESEARCH PROJECT

Statistics & Data Sciences: 3/479R

Undergraduate Research

Work with a faculty supervisor on an original research project that is presented in a research paper. Topics must be approved by the SDS Faculty Committee prior to enrollment. Students are responsible for finding their own faculty supervisor. See our website for more information.

POLICIES & PROCEDURES

- Return applications to GDC, Campus Mail Code: D9800
- Total of 18 hours required
- All coursework must be completed with a grade of C- or higher
- Please visit the certificate website for more detailed information on course options & policies
- stat.utexas.edu/undergraduate/certificate-in-scientific-computation

Certificate in Applied Statistical Modeling Course Progression Worksheet 2024–2026 Catalog

Course(s) Fulfilled

ADMISSION REQUIREMENTS

1. PREREQUISITE KNOWLEDGE (pick one)

Mathematics:
408C Calculus I
408L Integral Calculus
408Q Differential and Integral Calculus for Business
408R Calculus for Biologists
408S Integral Calculus

2. MATHEMATICAL FOUNDATION OF STATISTICS (pick one)

Biomedical Engineering
335 Engineering Probability & Sttistics
Electrical Engineering
351K Probability and Random Processes
Mathematics
362K Probability I
Statistics and Data Sciences
321 Intro to Probability & Statistics

3. APPLIED STATISTICS COURSE 1 (pick one)

Economics
329 Economic Statistics
Educational Psychology
371 Intro to Statistics
Government
350K Statistical Analysis in Political Science
Mathematics
358K Applied Statistics
Psychology
420M Psychological Methods and Statistics
Sociology
317L Intro to Social Statistics
Statistics
STA 301 Introduction to Data Science
STA 301H Introduction to Data Science Honors
Statistics and Data Sciences
302F Foundations of Statistics
320E Elements of Statistics
320H Elements of Statistics Honors

4. APPLIED STATISTICS COURSE 2 (pick one)

Economics
441K Intro to Econometrics
Electrical and Computer Engineering
461P Data Science Principles
Mathematics
349R Applied Regression
Psychology
325K Advanced Statistics
Statistics and Data Sciences
324E Elements of Regression Analysis
SDS 322 Elements of Dat5a Science
SDS 323 Statistical Learning and Inference

5. ELECTIVES (pick three)

Students are encouraged to select courses within their own majors or colleges as appropriate. The Statistics and Data Sciences courses are available to students in all majors.

Advertising
344K Advertising Research
Communication Studies
348 Communication Research Methods
Computer Science
342 Neural Networks
343 Artificial Intelligence
363M Principles of Machine Learning 1
371R Information Retrieval and Web Search
Economics
348K.1 Advanced Econometrics
354K Intro to Game Theory
342L Advanced Economics
353M Empirical Public Economics
Geological Sciences
325K Computational Methods
365N Seismic Data Processing
Health Education
343 Foundations of Epidemiology
373 Evaluation & Research Design
Kinesiology
376 Measurement in Kinesiology
Linguistics
350.15 Computational Semantics
Mathematics
339J Probability Models with Actuarial Applications
349P Actuarial Statistical Estimate
362M Introduction to Stochastic Processes
378K Introduction to Mathematical Statistics
378P or SDS 378P Decision Analytics
Management Information Systems
372T Topic 11: Advanced Analytics Programming
372T Topic 22: Predicitive Analytics and Data Mining
Petroleum and Geosystems Engineering
378 Applied Reservoir Characterization
Psychology
325K Advanced Statistics
Public Health
354 Epidemiology
Statistics
372T Topic 21: Time Series Forecasting
235 Data Science for Business Applications
235H Data Science for Business Applications Honors
Statistics and Data Sciences
322E Elements of Data Science
324E Elements of Regression Analysis
326E Elements of Statistical Machine Learning
353 Advanced Multivariate Methods
358 Special Topics in Statistics
375 Data Viz in R
379R Undergraduate Research