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

**Certificate in Scientific Computation Course Progression Worksheet 2022–2024 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 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
323H Scientific Computing-Honors

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Course(s) Fulfilled

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 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
328M Biostatistics

### 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
376C Methods of Applied Mathematics

**Mechanical Engineering:**
367S Simulation Modeling

**Management Information Systems:**
325 Database Management

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**Neuroscience:**
366M Quantitative Methods

**Statistics & Data Sciences:**
329D Practical Linear Algebra II
374C Parallel Computing
374D Distributed & Grid Computing for Sci. & Engineers
374E Visualization & Data Analysis

## IV. APPLIED COMPUTING COURSES

(choose one)

**Aerospace Engineering:**
347 Intro to Computational Fluid Dynamics

**Biochemistry:**
339N Systems Biology & Bioinformatics

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

**Finance/Statistics:**
(IROM) 372.6/372 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
348 Computation Biology & Bioinformatics

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

## 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