Computer Science is the study of the structure, function and application of computers and is central to the rapidly expanding use of information technology. Computers have traditionally been used in business, engineering and scientific applications, and now applications are found in almost all human activities from art to zoology. Computer science is both an applied and theoretical discipline, supported by the principles of science, engineering, and mathematics that has a direct and profound impact on the quality of life and society at large.

The Department of Computer Science offers three degrees: Bachelor of Science in Computer Science (BSCS), Master of Science in Computer Science (MSCS), and Master of Science in Information Technology (MSIT). The BSCS degree is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org. *The Department offers a Bachelor of Science in Computer Engineering (BSCE) in cooperation with the Department of Electrical Engineering. The Department also offers service courses to fulfill University core curriculum requirements, and computer science courses required for degree programs in engineering, science, and mathematics. Faculty conduct research in computer science, computer science education, and interdisciplinary fields, and contribute their professional service to student advising, mentoring, professional organizations, University activities, industrial interactions, and to the community through professional expertise.*

The undergraduate curricula in computer science are based on the Association for Computing Machinery and the Institute of Electrical and Electronics Engineers Computer Society recommendations for curricula and reflect the goals of a liberal arts education. The graduate curricula provide advanced and specialized study in the areas of computer science and information technology. The curricula in computer science provide the student with marketable expertise to enter the computing and information technology fields, the skills and education required to adapt to the rapidly changing characteristic of the fields, and the foundation to pursue graduate study in computer science and information technology.

A – GENERAL EDUCATION CORE – 42 HOURS

Students must fulfill the General Education Core requirements. The courses listed below satisfy both degree requirements and General Education core requirements.

Required

020 - Mathematics – 3 hours
MATH 2413 Calculus I (or MATH 2487 Honors) three-hour lecture

030 - Life and Physical Science – 6 hours
Choose one pair:
BIOL 1406 General Biology I (or BIOL 1487 Honors) three-hour lecture
BIOL 1407 General Biology II (or BIOL 1488 Honors) three-hour lecture

BIOL 2401 Anatomy and Physiology I three-hour lecture
BIOL 2402 Anatomy and Physiology II three-hour lecture

CHEM 1311 General Chemistry I (or CHEM 1307)
CHEM 1312 General Chemistry II

PHYS 1401 General Physics I three-hour lecture
PHYS 1402 General Physics II three-hour lecture

PHYS 2425 Physics for Scientists and Engineers I three-hour lecture
PHYS 2426 Physics for Scientists and Engineers II three-hour lecture

040 - Language, Philosophy, and Culture – 3 hours
Choose one:
PHIL 1310 Ethics, Happiness, and the Good Life (Must be Engineering/Computer Science section)
PHIL 2326 Ethics, Technology, and Society

090 - Integrative and Experiential Learning – 6 hours
COMM 1315 Public Speaking
And complete three hours of laboratory from corresponding Science courses from category 030 and Basic Science:
BIOL 1406 General Biology I (or BIOL 1487 Honors) one-hour lab
BIOL 1407 General Biology II (or BIOL 1488 Honors) one-hour lab

BIOL 2401 Anatomy and Physiology I one-hour lab
BIOL 2402 Anatomy and Physiology II one-hour lab

CHEM 1111 General Chemistry I Laboratory (or CHEM 1107)
CHEM 1112 General Chemistry II Laboratory

PHYS 1401 General Physics I one-hour lab
PHYS 1402 General Physics II one-hour lab

PHYS 2425 Physics for Scientists and Engineers I one-hour lab
PHYS 2426 Physics for Scientists and Engineers II one-hour lab

B – MAJOR REQUIREMENTS – 50 HOURS (36 advanced)

1 – Computer Science Core – 35 hours (21 advanced)
CSCI 1101 Introduction to Computer Science
CSCI 1170 Engineering Computer Science I Lab (or CSCI 1178 Honors)
CSCI/CMPE 1370 Engineering Computer Science I (or CSCI/CMPE 1378 Honors)
CSCI 2333 Computer Organization and Assembly Language
CSCI 2344 Programming in UNIX / Linux Environment
CSCI 2380 Computer Science II (or CSCI 2388 Honors)
CSCI 3310 Mathematical Foundations of Computer Science
CSCI 3333 Algorithms and Data Structures
CSCI 3334 Systems Programming
CSCI 3336 Organization of Programming Languages
CSCI 3340 Software Engineering I
CSCI 4325 Automata, Formal Languages and Computability
CSCI 4390 Senior Project

2 – Computer Science Electives – 15 hours (15 advanced)

a – Programming Language – 3 hours (3 advanced)
Choose from:
CSCI 3326 Object Oriented Programming in JAVA
CSCI 3327 Object Oriented Programming in Visual Basic
CSCI 3328 Object Oriented Programming in C#

b – Databases, Networking, and Operating Systems – 6 hours (6 advanced)
Choose from:
CSCI 4333 Database Design and Implementation
CSCI 4334 Operating Systems
CSCI 4335 Computer Architecture
CSCI 4345 Computer Networks

c – Technical Electives – 6 hours (6 advanced)
Choose from:
CSCI 3300 Internship in Computer Science
CSCI 3341 Software Engineering II
CSCI 3342 Internet Programming
CSCI 3350 Numerical Methods
CSCI 3370 Introduction to Game Development
CSCI 4185 Research Seminar
CSCI 4301 Digital Image Processing
CSCI 4302 Multimedia Systems
CSCI 4303 Computer Vision
CSCI 4310 Design and Analysis of Algorithms
CSCI 4318 Cyber Security
CSCI 4319 Digital Forensics
CSCI 4321 E-Commerce
CSCI 4327 Compiler Construction
CSCI 4336 Parallel and Distributed Computing
CSCI 4341 Topics in Computer Science
CSCI 4343 Data Mining
CSCI 4344 Bioinformatics
CSCI 4350 Artificial Intelligence

CSCI 4352 Machine Learning
CSCI 4355 Expert Systems
CSCI 4360 Computer Graphics and Interactive Systems
CSCI 4363 Advanced Databases
CSCI 4365 Computer and Network Security
CSCI 4370 Advanced Game Development
CSCI 4381 Interactive Systems and User Interface Design
CSCI 4382 Computer Visualization
CSCI 4383 Bioinformatics Imaging

C – SUPPORT COURSES – 32 HOURS (12 advanced)

1 – Oral and Written Communication – 3 hours (3 advanced)

ENGL 3342 Technical Communication

2 – Mathematics and Engineering – 15 hours (3 advanced)

ELEE 2130 Digital Systems Engineering I Lab
ELEE 2330 Digital Systems Engineering I
MATH 2318 Linear Algebra
MATH 2413 Calculus I (or MATH 2487 Honors) one-hour lecture
MATH 2414 Calculus II (or MATH 2488 Honors)
Choose one:
STAT 3337 Probability and Statistics
ELEE 3340 Probability and Statistics for Electrical Engineers
STAT 3301 Applied Statistics for Science, Engineering, and Medical Science

3 – Basic Science – 3 hours

Choose one course not completed in the General Education Core:
BIOL 1406 General Biology I (or BIOL 1487 Honors) three-hour lecture
BIOL 2401 Anatomy and Physiology I three-hour lecture
CHEM 1311 General Chemistry I <u>or</u> CHEM 1307 Chemistry for Engineers
PHYS 1401 General Physics I three-hour lecture
PHYS 2425 Physics for Scientists and Engineers I three-hour lecture

5 – Free Electives – 11 hours (6 advanced)

TOTAL CREDIT HOURS FOR GRADUATION – 124 HOURS
TOTAL ADVANCED HOURS – 48 HOURS

ADMISSION, PROGRESSION, AND GRADUATION REQUIREMENTS, if applicable:

Graduation requirements

1. All courses in the Computer Science Core must be completed with a grade 'C' or better.
2. All courses in section 2a-Programming Language and 2b-Databases, Networking, and Operating Systems must be completed with a grade of 'C' or better.
3. In addition to the graduation requirements listed in the UTRGV 2017-2018 Undergraduate Catalog, demonstration of proficiency in a language other than English is required at the undergraduate level equivalent to a minimum of six credit hours. Proficiency can be demonstrated by a college credit exam, a placement test approved through the UTRGV Department of Writing and Language Studies, and/or up to six credit hours of college-level language coursework.