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
Choose any course from Humanities, except for Professional Ethics, and complete:
COMM 1315 Public Speaking

B – MAJOR REQUIREMENTS – 44 HOURS (33 advanced)

1 – Computer Science Core – 29 hours (18 advanced)
CSCI 1101 Introduction to Computer Science
CSCI 1170 Engineering Computer Science I Lab (or CSCI 1178 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 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 – 41 HOURS (15 advanced)  

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

ENGL 3342 Technical Communication  

2 – Mathematics and Engineering – 21 hours (6 advanced)
CSCI/CMP E 1370 Engineering Computer Science I (or CSCI/CMP E 1378 Honors)

CSCI 3310 Discrete Structures
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:
   MATH 4337 Probability and Statistics I
   ELEE 3340 Probability and Statistics for Electrical Engineers
   MATH 3331 Applied Statistics I

3 – Laboratory – 2 hours
Choose corresponding pair from Life and Physical 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 Lab (or CHEM 1107)
   CHEM 1112 General Chemistry II Lab
   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

4 – Basic Science – 4 hours
Choose one:
   BIOL 1406 General Biology I (or BIOL 1487 Honors)
   BIOL 2401 Anatomy and Physiology I
   CHEM 1311 and CHEM 1111 General Chemistry I or CHEM 1307 and CHEM 1107
   PHYS 1401 General Physics I
   PHYS 2425 Physics for Scientists and Engineers I

5 – Free Electives – 11 hours (6 advanced)

TOTAL CREDIT HOURS FOR GRADUATION – 127 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. In addition to the graduation requirements listed in the UTRGV 2015-2017 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.