Computer and Systems Engineering (CSE)
Master of Science Programs

The **Computer and Systems Engineering (CSE) degree** offered by the University of Houston (UH) is a graduate level interdisciplinary program administered by the Department of Electrical and Computer Engineering (ECE) that provides specialization in Computer Engineering.

Applicants can have a B.S. in any one of the following fields: Electrical Engineering, Computer Engineering, Computer Science or a degree in any Engineering field or Quantitative Science. Depending on previous background a set of prerequisites and/or leveling courses may need to be satisfied before the student starts the graduate program in CSE. A student can complete the degree either on a full or part time basis and has the option of doing a thesis or not.

Prospective students can contact the admissions advisor at ece_grad_admit@uh.edu or the CSE Program Director, Dr. Zhu Han at zhan2@central.uh.edu.

Admission Requirements

Unconditional Admission

- A bachelor's degree in Engineering from an ABET accredited program, a degree in Computer Science, or a degree in Quantitative Science, with a grade point average of at least 3.0/4.0 on the last 60 hours of the undergraduate degree and on any coursework completed since graduation.
- General GRE scores must be submitted. While no minimum GRE scores are used to exclude students, typically students entering the program have GRE scores greater than 150 on the Verbal, greater than 159 on the Quantitative and greater than 4.0 on the Writing Assessment.
- International students must submit an official TOEFL or IELTS. Recommended score 92 or better

Conditional Admission

- Requirements are the same as unconditional admission except that the grade point average may be between 2.6 and 3.0 on the last 60 hours with high GRE scores.
- Student must be a citizen or permanent resident of the United States.

NOTE: The conditionally admitted student must earn a GPA of at least 3.0 on the first 12 hours of graduate work after enrolling in the program. A general petition needs to be submitted to change conditional admission status after completing 12 hours.

Detailed information on the application process can be obtained from the web at
http://www.ee.uh.edu/graduate/prospective-graduate-students.

Prerequisites

Upon admission to the program, each student will meet with the Director of the CSE Program who will review the student's background and inform the student of the prerequisite courses, if any, that the student must complete before taking any graduate level courses.

A. Mathematics

A student must have a mathematics background that includes calculus, differential equations, linear algebra, and numerical methods. These prerequisites may be satisfied by the following courses at UH or similar courses at another university:

MATH 1431	CALCULUS I
MATH 1432	CALCULUS II
MATH 2432	CALCULUS III
MATH 3331	DIFFERENTIAL EQUATIONS

B. Computers

A student must have had courses in high level and assembly language programming, elementary data structures, and in digital logic design and microcomputers. These prerequisites may be satisfied by the following courses at UH or similar courses at another university:

ECE 1331	Computer and Problem Solving
ECE 3441	Digital Logic Design
ECE 4436	Microprocessor Systems
COSC 6304	Data Structures
COSC 6310	Fundamental of Operating Systems

C. Circuits and Electronics

A student must have had courses in circuits and electronics. These prerequisites may be satisfied by the following courses at UH or similar courses at another university:

ECE 2300 and ECE 2100	Circuit Analysis and Circuit Analysis Lab
ECE 3355 and ECE3155	Electronics and Electronics Lab
ECE 3457	Digital Electronics

Required Graduate Courses

To receive the degree of Master of Science, the student is required to complete (on a part-time or full-time basis), with a grade point average of at least 3.0, a minimum of 36 semester credit hours for the non-thesis option or a minimum of 30 semester hours for the thesis option.

Upon admission to the program, the student will meet with the Director of the CSE Program to develop a plan that involves any required prerequisite courses as well as the appropriate courses for the degree plan. If the student follows the thesis option he/she will be advised to find an advisor who will supervise and direct his/her research. The thesis advisor will subsequently advise the student about his/her degree plan.

Non-thesis Option:

A student that follows the non-thesis option should complete a minimum of 30 semester credit hours of coursework (10 courses).

- Four of these courses should be from the List of Required ECE Courses while the remaining can be from the List of Suggested Elective ECE courses.

- A minimum of six courses should be from the Department of Electrical & Computer Engineering.

- A maximum of four courses can be from outside the ECE department. These courses must be from the Department of Computer Science, College of Engineering, or College of Business Administration. No courses from the College of Technology can be used on the Degree Plan.

Before graduation the student's degree plan will have to be approved by the ECE Academic Advisor and the Director of the Computer and Systems Engineering Program.

Thesis Option:

A student who follows the thesis option should complete a minimum of 30 semester hours.

- A minimum of 21 semester credit hours of coursework (7 courses)
- Four of these courses should be from the List of Required ECE Courses
- Six hours of thesis (ECE 6399 and ECE 7399) and
- Three hours of research (ECE 6398)

Before graduation the student's degree plan will have to be approved by the thesis advisor, the ECE Academic Advisor, and the Director of the Computer and Systems Engineering Program.

List of Required ECE Courses:

Choose 4 courses from the following required course list:

ECE 6370 Advanced Digital Design

ECE 6346 VLSI Design

ECE 6373 Advanced Computer Architecture

ECE 7373 Advanced Topics in Computer Architecture

ECE6371 Fundamental Hardware Design

ECE6372 Advanced Hardware Design

ECE 6328 CMOS Analog Integrate Circuits

ECE 6321 Principles of Internetworking

To satisfy the coursework requirements and form a meaningful coherent program of study, a student may choose the remaining courses from the following list of Approved ECE Elective Courses.

List of Approved ECE Elective Courses:

ECE 6313	Neural Networks
ECE 6315	Neural Computation Computational
ECE 6316	and Biological Vision

ECE 6321	Principles of Internetworking
ECE 6322	Introduction to Spread Spectrum Communications
ECE 6323	Optical Fiber Communications
ECE 6324	Digital Telephony
ECE 6328	CMOS analog ICs
ECE 6325	State Space Control systems
ECE 6330	Mobile Radio Communication Systems
ECE 6331	Advanced Telecommunications Engineering
ECE 6332	Wireless Telecommunication Systems
ECE 6335	Digital Control Systems
ECE 6336	Advanced Microprocessor Systems
ECE 6337	Introduction to Stochastic Processes and Random Variables
ECE 6342	Digital Signal Processing
ECE 6347	Advanced Topics in MOS Devices
ECE 6353	RF and Microwave Electronics
ECE 6354	Digital Video in Telecommunications
ECE 6356	Electronic Circuit design
ECE 6364	Digital Image Processing
ECE 6372	Advanced Hardware Design
ECE 6376	Digital Pattern Recognition
ECE 6390	Linear Multivariable Control Systems
ECE 6397	Robotics in Healthcare
ECE 6397	Introduction to Cybersecurity
ECE 6466	Integrated Circuit Engineering
ECE 7342	Advanced Topics in Signal Processing
ECE 7349	Advanced Topics in Microelectronics
ECE 7366	Advanced Process Integration for VLSI

The above list is subject to change, and other graduate ECE courses can be taken with the approval of the Director of the CSE Program.

In all cases no credit will be given for courses that are equivalent to courses used in the student's undergraduate degree.

Restrictions for Courses Outside the ECE Department:

- All CS courses should be at the graduate level.
- COSC 6301, 6302, 6303, 6304, 6305, 6306, 6308, 6309, and 6310 cannot be used on the degree plan.
- All courses from the College of Business Administration should be at the 6000 level or higher.
- Courses from the General Business Administration (GENB) cannot be used on the degree plan.
- All the courses of the College of Engineering should be at the 6000 level or higher.
- Courses that do not receive a letter grade but are graded S, U or W will not be counted towards the degree plan.
- **Non-ECE courses with similar content as ECE courses**: In case a graduate level (6000 or above) course is offered in another department with similar content to a regularly offered ECE graduate course; graduate ECE students must take the ECE version. If the course in question is not offered regularly, or in the graduating semester, then the students may be allowed to take the non-ECE version by submitting a general petition. *Under no circumstances will graduate credit be awarded for both the ECE and the non-ECE on of the course.*

IMPORTANT NOTE

Students must refer to ECE department policies and procedures for any information not covered in this document, including those found at
http://www.ee.uh.edu/graduate/procedures-requirements-standards.