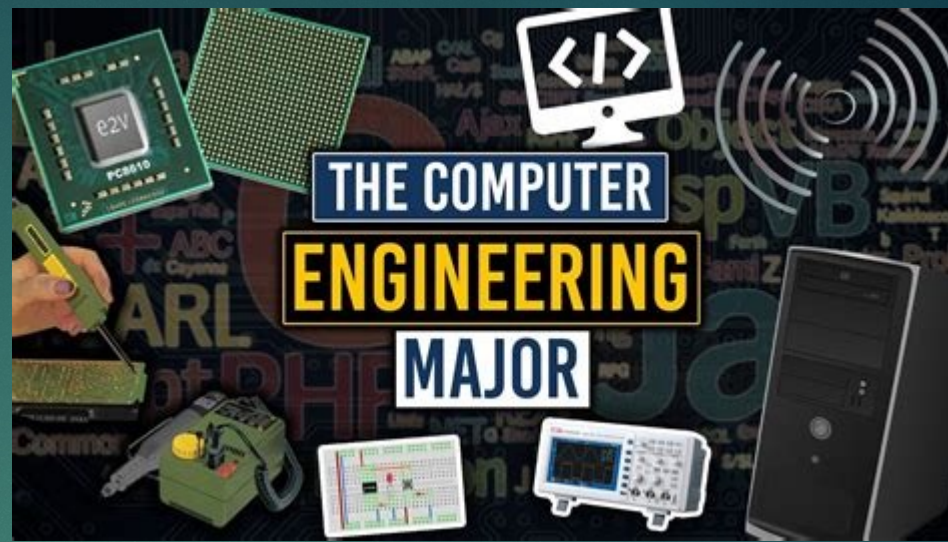




Intro to Computer Engineering

PROFESSOR PAUL MORTON

FALL 20202

LECTURE GIVEN TO EE 1322 (INTRO TO ECE)

Catalog Information

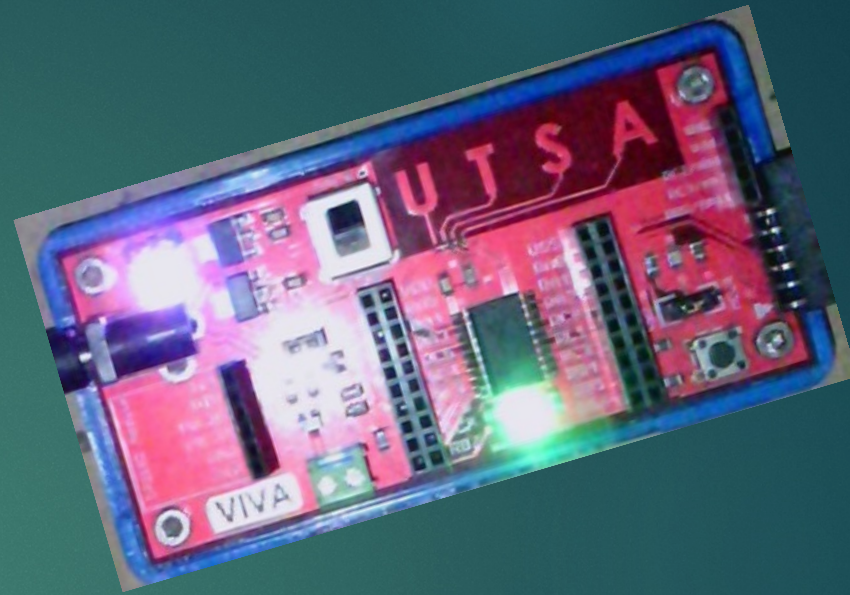
Computer Engineering gives the students the opportunity to acquire broad engineering skills and knowledge to enable them to design and implement computer and digital systems. The discipline of computer engineering includes topics such as:

Topics in Our Curriculum

- ▶ Logic Design
- ▶ Digital Systems Design
- ▶ Discrete Mathematics
- ▶ Computer Organization
- ▶ Embedded Systems Design
 - ▶ Assembly Programming Of Microprocessors
 - ▶ High-level Programming
 - ▶ Interfacing Of Processors To Other Circuits
- ▶ Hardware design languages (HDL)
 - ▶ Using Field Programmable Gate Arrays (FPGA's)
 - ▶ Very Large Scale Integrated (VLSI) circuit design
- ▶ Fundamental electrical engineering
- ▶ Mathematics
- ▶ Science

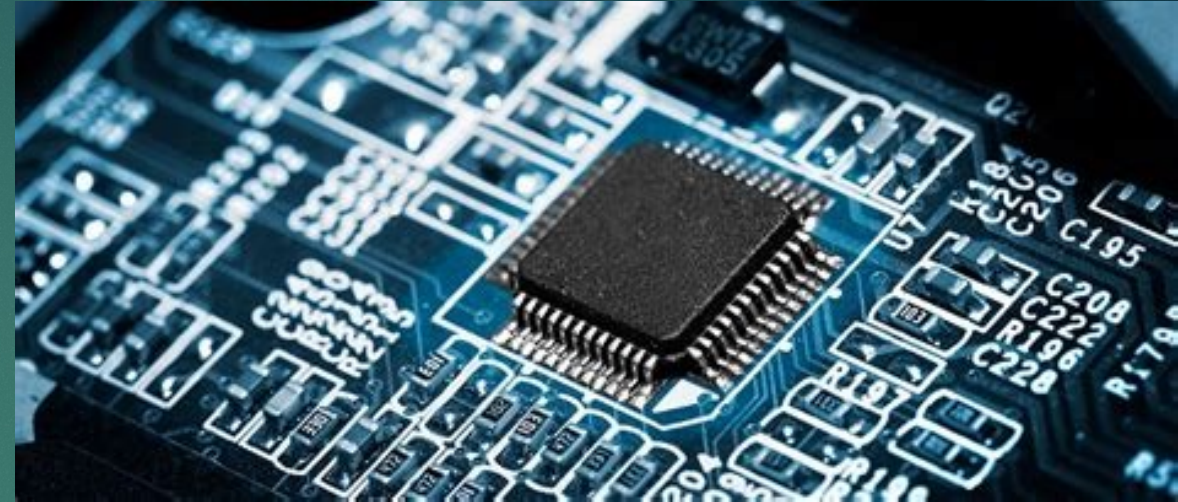
Hour Requirements

- ▶ 126 Hours
 - ▶ 39 in upper division level courses
 - ▶ 42 must be at UTSA
 - ▶ 42 in Core Curriculum
 - ▶ <https://catalog.utsa.edu/undergraduate/engineering/electricalcomputerengineering/#computerengineering>
- ▶ 22 General Engineering Requirements
 - ▶ Chem
 - ▶ Calc 1 & 2
 - ▶ EA 1
 - ▶ Physics for Engineers 1 & 2



ECE Courses

EE 1322	Introduction to Electrical and Computer Engineering	2
EE 2423	Network Theory	3
EE 2511	Logic Design Laboratory	1
EE 2513	Logic Design	3
EE 3113	Electrical and Computer Engineering Laboratory I	3
EE 3223	C++ and Data Structures	3
EE 3233	Systems Programming for Engineers	3
EE 3313	Electronic Circuits I	3
EE 3323	Electronic Devices	3
EE 3423	Mathematics in Signals and Systems	3
EE 3463	Microcomputer Systems I	3
EE 3563	Digital Systems Design	3
EE 4113	Electrical and Computer Engineering Laboratory II	3
EE 4243	Computer Organization and Architecture	3
CPE 4812	Computer Engineering Design I	2
CPE 4813	Computer Engineering Design II	3
EGR 3323	Applied Engineering Analysis II	3



Supporting Courses

[CPE 2073](#)

Introduction to
Computer Programming 3
for Engineers

or [CS 2073](#)

Computer Programming with Engineering
Applications

[CS 2233](#)

Discrete Mathematical 3
Structures

[EE 3533](#)

Probability and 3
Stochastic Processes

CpE Electives for 15 Hours

[EE 4513](#)

Introduction to VLSI Design

[EE 4553](#)

VLSI Testing

[EE 4563](#)

FPGA-Based System Design

[EE 4583](#)

Microcomputer Systems II

[EE 4593](#)

Embedded System Design

[EE 4643](#)

Digital Signal Processing

[EE 4663](#)

Digital Image Processing

[EE 4953](#)

Special Studies in Electrical and
Computer Engineering
(Computer Engineering related
topics only)

[MAT 2233](#)

Linear Algebra

[MAT 3013](#)

Foundations of Mathematics

[MAT 3123](#)

Fundamentals of Geometry

But What Does a CpE Major DO!

- ▶ CpE is a major that integrates CS and EE
 - ▶ Can focus on software or hardware or both
 - ▶ Can focus on the design of microcontrollers to super computers
 - ▶ Can involve the development of firmware for embedded systems to operating systems
 - ▶ Can include the systems for controlling Robots to Space Vehicles
- ▶ Some CpEs can manage the operation of a large Cloud or Server facility and be responsible to keep it running and on line.
- ▶ A CpE can



Certifications

- ▶ PE since 2003
- ▶ Cisco certifications for network expertise
- ▶ Microsoft certifications for various windows and windows hosted products like SQL servers, Azure
- ▶ Certified Information Security Manager– five years experience and an exam and re-exam every 3 years

Skills

- ▶ Coding and manage software development
- ▶ Troubleshooting hardware and software problems
- ▶ Have to be a team player in many situations
- ▶ Developing interfaces between different software tools so the information can be passed back and forth

Specialty Areas of CpE

- ▶ Coding, cryptography, and information protection
- ▶ Communications and wireless networks
- ▶ Compilers and operating systems
- ▶ Computational science and engineering
- ▶ Computer networks, mobile computing, and distributed systems
- ▶ Computer systems: architecture, parallel processing, and dependability
- ▶ Computer vision and robotics
- ▶ Embedded systems
- ▶ Integrated circuits, VLSI design, testing and CAD
- ▶ Signal, image and speech processing
- ▶ Quantum computing

