DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Contact Information
Chair: Afzel Noore
Phone: 361-593-2004
Email: afzel.noore@tamuk.edu
Building Name: Engineering Complex
Room Number: 207

Computer Science Program Educational Objectives
1. Graduates will demonstrate a synthesis of theory and practice in computer science and electrical engineering that will be expanded upon throughout their professional careers.
2. Graduates will act according to their ethical, global, social, legal, information security and other professional responsibilities.
3. Graduates entering industry positions will contribute effectively to the technology projects carried out by their respective employers.
4. Graduate who continue to advanced studies will successfully complete their chosen degree programs.

Electrical Engineering Educational Objectives
1. Graduates will be capable of pursuing professional careers and/or advanced studies.
2. Graduates will pursue state-of-the-art solutions to engineering problems and evaluate/embrace new technologies.
3. Graduates will exhibit personal commitment to continuous learning, high ethical standards, sound business decisions and engineering excellence.

Faculty
Department Faculty
Alam, Mohammad S Professor, Department of Electrical Engineering and Computer Science; Dean, Frank H. Dotterweich College of Engineering; B.S., Bangladesh University of Engineering and Technology (Bangladesh); M.S., Bangladesh University of Engineering and Technology (Bangladesh); M.S., Wayne State University; Ph.D., University of Dayton.

Aurangzeb, Muhammad Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., University of Punjab (Pakistan); B.S., University of Engineering and Technology (Pakistan); M.S., University of Engineering and Technology (Pakistan); M.S., National University of Computer and Engineering Sciences (Pakistan); Ph.D., The University of Texas at Arlington.

Challoo, Rajab Professor, Department of Electrical Engineering and Computer Science; Chair; B.S., Wichita State University; M.S., Wichita State University; Ph.D., Wichita State University.

Fu, Xiangang Visiting Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., Ocean University of China (China); M.S., Ocean University of China (China); Ph.D., University of Alabama.

Goyal, Ayush Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., Boise State University; Ph.D., University of Oxford (United Kingdom).

Hicks, David Associate Professor, Department of Electrical Engineering and Computer Science; B.S., Angelo State University; M.C.S., Texas A&M University; Ph.D., Texas A&M University.

Hossain, Gahangir Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., Shahjala University of Science and Technology (Bangladesh); M.Sc., Bangladesh University of Engineering and Technology (Bangladesh); M.S., The University of Memphis; Ph.D., The University of Memphis.

Khan, Mohammad S Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., Bangladesh University of Engineering and Technology (Bangladesh); M.S., North Dakota State University; Ph.D., Purdue University.

Kim, Taesic Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., Changwon National University (South Korea); M.S., University of Nebraska-Lincoln; Ph.D., University of Nebraska-Lincoln.

Leung, Chung S Associate Professor, Department of Electrical Engineering and Computer Science; B.S., Florida Institute of Technology; M.S., Florida Institute of Technology; Ph.D., Florida Atlantic University.
McLauchlan, Lifford L. Associate Professor, Department of Electrical Engineering and Computer Science; B.S., Texas A&I University; M.S., Texas A&I University; Ph.D., Texas A&M University.

Nekovei, A. Reza. Professor, Department of Electrical Engineering and Computer Science; B.S., University of Maine; M.S., University of Maine; Ph.D., University of Rhode Island.

Nijim, Mais. Associate Professor, Department of Electrical Engineering and Computer Science; B.S., Princess Sumaya University for Technology (Jordan); M.S., New Mexico State University; Ph.D., New Mexico Institute of Mining and Technology.

Noore, Afzel. Professor, Department of Electrical Engineering and Computer Science; Associate Dean for Undergraduate Affairs, Frank H. Dotterweich College of Engineering; B.E., University of Madras (India); M.S., Indian Institute of Technology (India); Ph.D., West Virginia University.

Omar, S. Iqbal. Professor, Department of Electrical Engineering and Computer Science; B.S., Allahabad University (India); B.S., Aligarh University (India); M.E., Indian Institute of Science (India); Ph.D., Carleton University (Canada).

Park, Sung-won. Professor, Department of Electrical Engineering and Computer Science; B.E., Hanyang University (South Korea); M.E., Hanyang University (South Korea); M.S.E.E., University of New Mexico; Ph.D., University of New Mexico.

Rahmani, Md. Visiting Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., Bangladesh University of Engineering and Technology (Bangladesh); M.S., Texas Tech University; Ph.D., Clemson University.

Toscano, George. Visiting Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., Bangladesh University of Engineering and Technology (Bangladesh); M.S., Bangladesh University of Engineering and Technology (Bangladesh); Ph.D., University of Texas at Arlington.

Trivedi, Yagnesh. Lecturer I, Department of Electrical Engineering and Computer Science; B.E., Gujarat University (India); M.S., University of Southern California; Ph.D., Polytechnic Institute of New York University.

Verma, Amit. Associate Professor, Department of Electrical Engineering and Computer Science; B.Tech, Institute of Technology (India); M.S., Vanderbilt University; Ph.D., Georgia Institute of Technology.

Wang, Zhaohui. Visiting Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., Shandong University (China); M.E., University of Science and Technology (China); M.S.E., University of Toledo; M.S.E., University of Arizona; Ph.D., University of Arizona.

Yang, Xue. Assistant Professor, Department of Electrical Engineering and Computer Science; B.E., Beijing University of Chemical Technology (China); M.S., Texas Tech University; Ph.D., Texas Tech University.

Yilmaz, Muhittin. Associate Professor, Department of Electrical Engineering and Computer Science; B.S., Gazi University (Turkey); M.S., Pennsylvania State University; Ph.D., Pennsylvania State University.

Yilmazer, Nuri. Associate Professor, Department of Electrical Engineering and Computer Science; B.S., Cukurova University (Turkey); M.S., University of Florida; Ph.D., Syracuse University.

Zhang, Xuewei. Assistant Professor, Department of Electrical Engineering and Computer Science; B.S., Tsinghua University (China); M.S., Tsinghua University (China); Ph.D., Massachusetts Institute of Technology.

Emeritus

Diersing, Robert. Professor of Electrical Engineering, Department of Electrical Engineering and Computer Science; B.B.A., Texas A&I University; M.S., Texas A&I University; M.B.A., Corpus Christi State University; Ph.D., Texas A&M University.

Gorakhpurwalla, Homi. Professor of Electrical Engineering and Computer Science, Department of Electrical Engineering and Computer Science; B.S., Bombay University (India); B.S.E.E., Purdue University; M.S.E.E., Purdue University.

Courses

Computer Science (CSEN)

In addition to the listed prerequisite for the following 3000 and 4000 level courses, a student must have an overall grade point average of 2.0 or higher.

CSEN 2303 Intro to Comp Basic and Excel 3 SCH (3-0)
Problem solving methods and algorithm development. Computer programming using Visual Basic. How to use Excel. Designing, coding, debugging and documenting programs using techniques of good programming style. Prerequisites: MATH 1314 and MATH 1316 or equivalent.

CSEN 2304 Intro to Computer Science 3 SCH (3-0)
Introduction to computer systems, problem solving methods and algorithm development. Structured programming using a programming language such as C. Designing, coding, debugging and documenting programs using techniques of software development cycle. Prerequisites: Credit or registration in MATH 1314.
CSEN 2306  Object-Oriented Programming  3 SCH  (3-0)
Fundamental features of C++ programming, introduction to objects and classes, major concepts of object-oriented programming such as data abstraction, encapsulation, polymorphism, and inheritance. Prerequisite: CSEN 2304.

CSEN 2310  Objt Oriented Software Enginr  3 SCH  (3-0)
Object-oriented analysis and modeling, object-oriented design, implementation using an object-oriented language, such as JAVA, object-oriented software development, Unified Modeling Language (UML), Graphical User Interface (GUI). Prerequisite: CSEN 2304.

CSEN 2328  Data Structures & Algorithms  3 SCH  (3-0)
Specification and implementation of data types and associated algorithms: lists, stacks, queues, trees, hashing, priority queues, sorting, and graphs. Prerequisite: CSEN 2304.

CSEN 2330  Assembly Lang and Computer Org  3 SCH  (3-0)
Fee: $5.00

CSEN 3314  Database Systems  3 SCH  (3-0)

CSEN 3315  Computer Graphics  3 SCH  (3-0)
Man-machine communication in graphical form. Graphics hardware and software. Use of a commercial graphics package. Representation and manipulation of two-and three dimensional data. Use of color. Prerequisites: CSEN 2304 and MATH 1348.

CSEN 3316  Software Engineering I  3 SCH  (3-0)
Introduction to formal software design principles. An engineering approach to software development. Software project management. Software requirements analysis, specification, design, development and validation. Prerequisite: 6 semester hours of Computer Science or Information Systems.

CSEN 3330  Android Mobile App Dev  3 SCH  (3-0)
Strategies and techniques for designing and developing Android mobile applications, including user interface screen layouts, the definition of program logic, and the connection between them. Prerequisite: CSEN 2310.

CSEN 3331  iOS Mobile App Dev  3 SCH  (3-0)
Technologies, tools, and techniques used to develop iOS mobile applications including user interface development, gender-based interfaces, integrated location services, multi-touch event handling, Appie iOS platform, Xcode IDE, Objective-C, and Swift programming languages. Prerequisite: CSEN 2310.

CSEN 4201  Software Engineering Project  2 SCH  (1-3)
A major project of an original nature carried to completion over a period of two semesters. Normally taken in the final academic year prior to graduation. Prerequisite: senior standing in Computer Science.
Fee: $5.00

CSEN 4202  Software Engineering Proj (WI)  2 SCH  (1-3)
A major project of an original nature carried to completion over a period of two semesters. Normally taken in the final academic year prior to graduation. Prerequisite: senior standing in Computer Science.
Fee: $5.00

CSEN 4317  Software Engineering II  3 SCH  (3-0)
Advanced software design principles. An engineering approach to software development emphasizing advanced techniques for validation and verification. Prerequisite: CSEN 3316.

CSEN 4320  Computer Networks  3 SCH  (3-0)
Data communication networks and ISO reference model, the electrical interface, data transmission, data link and its protocols, local area network and its protocols, wide area network and its protocols, internetworking. Prerequisite: 6 hours of upper level Computer Science.

CSEN 4332  Web Mobile App Dev  3 SCH  (3-0)
Concepts and technologies to design and develop mobile web applications, including system environment and architecture, system development methodologies, user interface design, data processing, and operations of data management. Prerequisite: CSEN 2310.

CSEN 4335  Selected Topics  1-3 SCH  (1-3)
One or more topics of computer science. May be repeated for a total of 6 semester hours. Prerequisite: consent of instructor.

CSEN 4336  Special Problems  1-3 SCH  (1-3)
Individual solution of selected problems in computer science conducted under direct supervision of a faculty member. May be repeated for up to 6 semester hours. Prerequisite: consent of instructor.

CSEN 4340  Computer Security  3 SCH  (3-0)
Theory and practice of computer security. Cryptographic tools used to provide security, such as shared key encryption, public key encryption, key exchange, and digital signature, with application to security in computer programs, operating systems, database management systems, and networks. Prerequisite: CSEN 4320.
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Contact Hours</th>
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<tbody>
<tr>
<td><strong>CSEN 4362</strong></td>
<td>Operating Systems</td>
<td>3 SCH</td>
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<tr>
<td><strong>CSEN 4366</strong></td>
<td>Programming Languages</td>
<td>3 SCH</td>
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<tr>
<td><strong>CSEN 4367</strong></td>
<td>Data Mining</td>
<td>3 SCH</td>
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<tr>
<td><strong>CSEN 4399</strong></td>
<td>Internship in Computer Science</td>
<td>1-3 SCH</td>
<td>(1-3)</td>
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<tr>
<td><strong>EEEN 1201</strong></td>
<td>Intro to Elec Engineering</td>
<td>2 SCH</td>
<td>(1-3)</td>
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<tr>
<td><strong>EEEN 2323</strong></td>
<td>Network Analysis I</td>
<td>3 SCH</td>
<td>(3-0)</td>
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<tr>
<td><strong>EEEN 2340</strong></td>
<td>Digital Logic Design</td>
<td>3 SCH</td>
<td>(3-0)</td>
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<tr>
<td><strong>EEEN 3212</strong></td>
<td>Circuits and Electronics Lab</td>
<td>2 SCH</td>
<td>(1-3)</td>
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<tr>
<td><strong>EEEN 3321</strong></td>
<td>Network Analysis II</td>
<td>3 SCH</td>
<td>(3-0)</td>
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<tr>
<td><strong>EEEN 3324</strong></td>
<td>Electromagnetics</td>
<td>3 SCH</td>
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<td><strong>EEEN 3325</strong></td>
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<tr>
<td><strong>EEEN 3331</strong></td>
<td>Circuits and Electromag Devices</td>
<td>3 SCH</td>
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<tr>
<td><strong>EEEN 3333</strong></td>
<td>Linear Systems and Signals</td>
<td>3 SCH</td>
<td>(3-0)</td>
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<tr>
<td><strong>EEEN 3334</strong></td>
<td>Random Signals</td>
<td>3 SCH</td>
<td>(3-0)</td>
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<tr>
<td><strong>EEEN 3449</strong></td>
<td>Microprocessor Systems</td>
<td>4 SCH</td>
<td>(3-3)</td>
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<tr>
<td><strong>EEEN 4224</strong></td>
<td>Elec &amp; Compu Eng Proj Lab (WI)</td>
<td>2 SCH</td>
<td>(6)</td>
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**Electrical Engineering (EEEN)**

In addition to the listed prerequisite for the following 3000 and 4000 level courses, a student must have an overall grade point average of 2.0 or higher.

**EEEN 1201 Intro to Elec Engineering**

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Introduction to electrical engineering and its role in society. Electrical engineering skills, tools and techniques applied to problem solving and academic and professional survival strategies. Introduction to electrical circuits, electrical measurements, digital logic and ethics. Includes a writing component as well as use of computers (spreadsheets, tables, graphing and simulations). For students planning to pursue a career in electrical engineering or computer science.

Fee: $5.00

**EEEN 2323 Network Analysis I**

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Introduction to linear network analysis techniques. Phasor analysis and sinusoidal steady-state response. Single-phase and polyphase circuits. Prerequisites: MATH 2414; Corequisites: PHYS 2326/PHYS 2126 and MATH 3320.

**EEEN 2340 Digital Logic Design**

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Hardware implementation of arithmetic and logical functions, organization and design of digital systems. Prerequisites: CSEN 2304.

**EEEN 3212 Circuits and Electronics Lab**

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Laboratory course to correlate with circuits and electronics. Prerequisite: credit for or registration in EEEN 3325.

Fee: $5.00

**EEEN 3321 Network Analysis II**

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<td>3 SCH</td>
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Two-port networks, Fourier analysis, time domain response, transient response and Laplace transform techniques. Prerequisites: EEEN 2323, CSEN 2304 and MATH 3320.

**EEEN 3324 Electromagnetics**

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Vector analysis, electrostatics, steady magnetic fields. Maxwell's equations, uniform plane waves, circuit concepts, propagation and radiation. Prerequisites: PHYS 2326/PHYS 2126 and MATH 3320.

**EEEN 3325 Electronics I**

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**EEEN 3331 Circuits and Electromag Devices**

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<td>(3-0)</td>
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General network analysis, steady-state AC/DC circuits. Energy conversion and applications. Prerequisite: PHYS 2326/2126.

**EEEN 3333 Linear Systems and Signals**

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Signal representation, sampling and quantization, Laplace and z-transforms, transfer functions and frequency response, convolution, stability, Fourier series, Fourier transforms and applications. Prerequisite: EEEN 3321.

**EEEN 3334 Random Signals**

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Probability, random variables, white noise and band-limited system, narrowband Gaussian process, pseudorandom signals and random signal response of linear systems. Prerequisite: MATH 2414.

**EEEN 3449 Microprocessor Systems**

<table>
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Basic computer structure, the instruction set, addressing modes, assembly language programming, assembly language subroutines, arithmetic operations, programming in C, implementation of C procedures, elementary data structures, input and output and a survey of microprocessor design. Prerequisites: EEEN 2340.

Fee: $5.00

**EEEN 4224 Elec & Compu Eng Proj Lab (WI)**

<table>
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Participation in engineering design activity. Prerequisite: EEEN 4252.

Fee: $5.00
EEEN 4252  Advanced Laboratory  2 SCH (1-3)
Capstone design project development to completion over two semesters in EEEN 4252 and EEEN 4224. The design project will take into account
global, societal, environmental and economic constraints to solve or analyze practical electrical engineering problems. Students first research and
develop a Capstone Design Project proposal in EEEN 4252 and then complete the design in EEEN 4224. The two-course sequence is normally taken in
the final academic year prior to graduation. Prerequisites: EEEN 3212, EEEN 3333, EEEN 3449 and communication elective.
Fee: $5.00

EEEN 4310  Intro to VLSI Circuit Design  3 SCH (3-0)
Introduction to design and fabrication of micro-electronic circuits via Very Large Scale Integrated circuitry (VLSI); structured design methods for VLSI
systems, use of computer-aided design (CAD) tools and design projects of small to medium scale integrated circuits. Prerequisites: EEEN 3325 and
EEEN 2340.

EEEN 4329  Communications Engineering  3 SCH (3-0)
Digital communication system and secure communications. Introduction to DSP. Prerequisites: EEEN 3333 and EEEN 3334.

EEEN 4335  Special Problems  1-3 SCH (1-3)
Individual solution of selected problems in electrical engineering conducted under direct supervision of a faculty member. May be repeated for up to 6
hours. Prerequisite: consent of instructor.

EEEN 4336  Selected Topics  1-3 SCH (1-3)
One or more topics of electrical engineering. May be repeated when topic changes. Prerequisite: consent of instructor.

EEEN 4340  Power Electronics  3 SCH (2-3)
Classical and modern design and analysis methods of power electronic circuits and the feedback control designs of power electronic converters and
related laboratory experiments. Topics include diode rectifiers, thyristor converters, DC-DC converters and associated controls, DC/AC inverters, power-
factor correction and control, isolated switch-mode power supplies, applications of power electronic converters and related hardware and virtual
laboratory experiments. Prerequisite: EEEN 3325 or consent of instructor.

EEEN 4342  Electronic II  3 SCH (3-0)
Analysis and design of analog electronic circuits; differential, multistage and power amplifiers; frequency response; feedback and stability.
Prerequisite: EEEN 3325.

EEEN 4343  Microprocessor Based Contrl Syst  3 SCH (3-0)
Design of micro-controller based real-time control systems. Application of theoretical principles in electrical engineering to control small-scale
systems, such as a mobile robot incorporating sensors, actuators and intelligence. Controller design; signal conditioning and drive circuits for
interfacing with various sensors and actuators; ; programming and programmable logic controllers. Prerequisites: EEEN 3333 and EEEN 3449.

EEEN 4344  Computer Architectr and Design  3 SCH (3-0)
Basic computer organization, data representation and arithmetic, instruction sets and addressing modes, assembly language, data path and control,
memory, input and output and communication. Prerequisites: EEEN 3449 or CSEN 2330, EEEN 2340.

EEEN 4354  Linear Control Systems  3 SCH (2-3)
Analysis and design techniques for linear feedback control systems. Controller functions and compensation, applications to serve and process control
problems. Prerequisite: EEEN 3333.

EEEN 4355  Digital Systems Engineering  3 SCH (2-3)
Principles in digital system design and testing, digital integrated circuits, digital system design with PLDS and FPGAS, introduction to an HDL, memory,
microprocessors and design for testability. Prerequisites: EEEN 3325 and EEEN 2340.
Fee: $5.00

EEEN 4357  Wireless Sensor Networks  3 SCH (3-0)
Foundations of wireless sensor networks, localization, routing, optimization, security, energy-aware systems and algorithms, design/analysis and
applications of wireless sensor networks. Prerequisites: Completed General Education natural sciences requirement.

EEEN 4358  Embedded Systems  3 SCH (2-3)
System level embedded design exploring hardware/software co-design, Linux sysfs, bash shell, firmware partitioning, I/O interfaces, IP cores, system
specifications to hardware-software implementation and synthesis. Prerequisites: EEEN 3449 and EEEN 4355.

EEEN 4360  Robotics II  3 SCH (3-0)
Multidisciplinary development to robotics, combining concepts from electrical engineering, mechanical engineering and computer science. Topics
include sensing, communication, localization, planning and navigation. Prerequisite: MEEN 4355 or consent of instructor.

EEEN 4362  Image Proc and Biometrics  3 SCH (3-0)
Basic image processing; intensity transformations, spatial and frequency domain filters, image restoration, and compression. Biometric applications:
fingerprint and facial recognition; biometric issues: privacy, legal concerns, testing, and standards. Prerequisite: EEEN 3333 or consent of instructor.
EEEN 4422 Electric Drives 4 SCH (3-3)
Introduction to power electronic converters for motor drives and controls, single and three phase transformers, DC motors and generators, feedback control design of DC motor drives, PMAC drives, synchronous generators, induction motor drives, speed and vector control of induction motor drives. Laboratory experiments to identify electric machine parameters and characteristics, and DC/AC motor drive controls, by designing and conducting experiments using digital computers. Prerequisite: EEEN 3321.
Fee: $5.00

Degree Requirements

Majors
- Computer Science, B.S. (https://catalog.tamuk.edu/undergraduate/engineering/electrical-computer-science/computer-science-bs)
- Computer Science, B.S. with Teacher Certification (https://catalog.tamuk.edu/undergraduate/engineering/electrical-computer-science/computer-science-bs-teacher-certification)

Minor
- Computer Science, Minor (https://catalog.tamuk.edu/undergraduate/engineering/minors/computer-science-minor)

Certificate