

Computer Engineering Technology

College of Science, Engineering & Technology
Department of Electrical and Computer Engineering
and Technology

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Computer Engineering Technology is a technological field requiring the application of scientific and engineering knowledge and methods, combined with technical skills, in support of computer activities. A computer engineering technologist is a person who is knowledgeable in computer hardware and software theory and design and who can apply them to a variety of industrial and consumer problems. Computers, controls/automation, robotics, instrumentation, and communications are just a few fields open to computer engineering technologists.

The program strives to prepare students for successful entry into the technical workforce. This means that the curriculum prepares students to:

1. Apply knowledge of mathematics, science, and computer engineering to problems.
2. Design and construct experiments and analyze and interpret the resulting data.
3. Design systems, components, or processes to meet specified needs.
4. Function effectively in teams.
5. Identify, formulate, and solve problems in computer engineering technology.
6. Understand their professional and ethical responsibilities.
7. Communicate effectively.

Admission to Major is granted by the department. Minimum program admission requirements are:

- a minimum of 32 earned semester credit hours.
- a minimum cumulative GPA of 2.00 (C).

Contact the department for application procedures.

Students who do not have the required background for MATH 115 may have to take additional preparatory coursework as well. Consult with your major adviser to plan your general education and major requirements.

All students must complete a minimum of 12 semester credits of mathematics starting with Precalculus math and a minimum of 24 semester credits of mathematics and science courses.

COMPUTER ENGINEERING TECHNOLOGY BS

It is strongly recommended that all CET students enroll in EET 101 Introduction to EET/CET in their freshman year.

Required for Major (Communication, Mathematics and Science, 36 credits):

| | | |
|------|-----|---|
| ENG | 101 | Composition (4) |
| ENG | 271 | Technical Communication (4) |
| MATH | 115 | Precalculus Mathematics (4) |
| MATH | 121 | Calculus I (4) |
| MATH | 127 | Calculus II for Engineering Technology: Integration (2) |
| MATH | 180 | Math for Computer Science (4) |
| PHYS | 211 | Principles of Physics I (4) |
| PHYS | 212 | Principles of Physics II (4) |
| SPEE | 102 | Public Speaking (3) |

Choose one of the following:

| | | |
|------|-----|--|
| STAT | 154 | Elementary Statistics (3) |
| MATH | 354 | Concepts of Probability and Statistics (3) |
| CHEM | 105 | Introduction to Chemistry (3) |

Required for Major (COMS, 20 credits):

| | | |
|------|-----|---|
| COMS | 110 | Introduction to Computer Science (4) |
| COMS | 211 | Fundamentals of Computer Science I (4) |
| COMS | 212 | Fundamentals of Computer Science II (4) |
| COMS | 340 | Database Systems Management I (4) |
| COMS | 380 | Systems Analysis and Design (4) |

Required for Major (EET, 46 credits):

| | | |
|-----|------|-------------------------------|
| EET | 113 | DC Circuits (3) |
| EET | 114 | AC Circuits (3) |
| EET | 221 | Electronic CAD (3) |
| EET | 222 | Electronics I (4) |
| EET | 223 | Electronics II (4) |
| EET | 225 | Digital Principles (3) |
| EET | 241 | Electronic Shop Practices (2) |
| EET | 400 | Network Analysis (3) |
| EET | 454 | Microprocessors I (4) |
| EET | 456 | Communications I (4) |
| EET | 480 | Automatic Controls (3) |
| EET | 484 | Microprocessors II (4) |
| EET | 488 | Senior Project Design I (1) |
| EET | 489 | Senior Project Design II (2) |
| EET | 497* | Internship (3) |

* You may substitute one EET advanced elective for internship. Permission required.

Required Minor: None.

NETWORKING EMPHASIS

Required for Emphasis (Communication, Mathematics, and Science, 36 credits):

| | | |
|------|-----|---|
| CHEM | 105 | Introduction to Chemistry (3) |
| ENG | 101 | Composition (4) |
| ENG | 271 | Technical Communication (4) |
| MATH | 115 | Precalculus Mathematics (4) |
| MATH | 121 | Calculus I (4) |
| MATH | 127 | Calculus II for Engineering Technology: Integration (2) |
| MATH | 180 | Math for Computer Science (4) |
| PHYS | 211 | Principles of Physics I (4) |

PHYS 212 Principles of Physics II (4)

SPEE 102 Public Speaking (3)

Required for Emphasis (COMS, 22 credits):

COMS 110 Foundation of Computer Science (4)

COMS 171 Introduction to C++ Programming (2)

COMS 211 Fundamentals of Computer Science I (4)

COMS 212 Fundamentals of Computer Science II (4)

COMS 340 Database Systems Management I (4)

COMS 380 Systems Analysis and Design (4)

Required for Emphasis (EET, 48 credits):

EET 113 D C Circuits (3)

EET 114 A C Circuits (3)

EET 221 Electronic CAD (3)

EET 222 Electronics I (4)

EET 225 Digital Principles (3)

EET 230 Microcomputer Technology (4)

EET 241 Electronic Shop Practices (2)

EET 430 Computer Networking I (4)

EET 431 Computer Networking II (4)

EET 454 Microprocessors I (4)

EET 456 Communications I (4)

EET 484 Microprocessors II (4)

EET 488 Senior Project Design I (1)

EET 489 Senior Project Design II (2)

EET 497* Internship (3)

* You may substitute one EET advanced elective for internship. Permission required.

Required Minor: None

POLICIES/INFORMATION

GPA Policy. Students graduating with a degree in Computer Engineering Technology must have (1) completed a minimum of 20 semester credit hours of upper division EET and COMS at MSU, (2) have a cumulative GPA of 2.0 or better on all upper division EET and COMS courses, and (3) have completed their senior design sequence at MSU.

P/N Grading Policy. A student who majors in CET must elect the grade option for all required courses including general education courses listed by number even if offered by another department.

If the credits earned for composition, technical writing and speech courses equal less than 9 credits, either an advanced speech course or a course in English language literature must be selected as a general elective.

Transfer of credit to the CET major is subject to policies described in this bulletin for all students transferring to MSU and to the following department policies:

1. All transfer students must take EET 221 if not proficient with current MSU software.
2. For courses taken at technical colleges/vocational technical schools and pertinent courses taken in the military the student may receive up to 8 credits upon review of course materials, grades and written approval

by the program coordinator. These credits may be used for EET 112, 113, and 114. The student may also attempt to test out of EET 114, 222, 223 and 225.

3. For courses taken at community colleges and four-year colleges, up to 25 credits may be accepted if the transcript is from an ABET-accredited program. If the program is not accredited by ABET, up to 20 credits may be accepted. Grades of transfer credits must be C or better to be acceptable for substitution for required courses.

Testing for course credit will be available via prior application made with the program coordinator. Students may not apply for credit by examination for an EET course in which they were previously enrolled at MSU or for any EET course above EET 225.

COURSE DESCRIPTIONS

Computer Science

COMS 110 (4) Foundation of Computer Science

This course provides a comprehensive introduction to the foundations of computer science. The topics covered include algorithms, pseudocode, computer theory, computer hardware, computer software, and the related social issues. Lab work develops familiarity with both hardware and software. The course is intended to provide knowledge and skills applicable to all disciplines while providing a broad introduction to the field of computer science.

Pre: MATH 112 (College Algebra)

GE-13

COMS 171 (2) Introduction to C++ Programming

This course provides an introduction to programming using C++. Emphasis on structured programming concepts, with a brief discussion of object-oriented programming. Control structures, expressions, input/output, arrays, and functions.

F, S

COMS 211 (4) Fundamentals of Computer Science I

This is the first course in a two-course sequence for students who are planning to major or minor in computer science. The course emphasizes concepts needed for continuing study in computer science, the use of abstraction in program design, and advanced problem-solving skills. Programming in a high-level language is a focal point of the course. Prerequisite: A grade of A or B in COMS 110.

Coreq.: MATH 121 (Calculus I).

COMS 212 (4) Fundamentals of Computer Science II

This course is a continuation of 211. The course introduces students to object-oriented concepts and programming techniques. It also covers essential data structures such as linked lists, stacks, and queues, and trees. The student will be expected to produce larger applications, utilizing multiple compilation units.

Prerequisite: COMS 211

COMS 340 (4) Database Management Systems I

Introduction to the concept of database systems; database models; database management systems; file organization; design of databases using data modeling and normalization; conversion of data model into relational, network, and hierarchical data models; extensive coverage of SQL and implementation of an application using a relational database in a team environment.

Pre: COMS 280 F, S

COMS 380 (4) Systems Analysis & Design

This course explores both structured as well as object oriented systems analysis and design. Use of upper and lower CASE tools are employed in the analysis, design and implementation of a team oriented term project.

Pre: COMS 111 F, S

Electronic Engineering Technology**EET 113 (3) DC Circuits**

A study of DC electrical circuits, Kirchhoff's laws, series and parallel circuits, inductors, capacitors, Thevenin's equivalent circuit theorem, and other network analysis theorems.

Pre: MATH 115, or concurrent F, S

EET 114 (3) AC Circuits

A study of AC circuits, power, phasors, series and parallel AC networks, and network analysis theorems.

Pre: EET 113 and MATH 115 F, S

EET 221 (3) Electronic CAD

Drafting Principles involving use of computer electronic CAD software in laying out block diagrams, schematic diagrams, production drawings, graphical presentation data, and printed circuit board layout and construction.

F

EET 222 (4) Electronics I

An introduction to semiconductor theory and circuits; includes characteristics curves, biasing techniques and small signal analysis of FETs and MOSFETs, feedback concept, BJT and FETs frequency response.

Pre: EET 114 or concurrent

EET 223 (4) Electronics II

Differential amplifier, linear and nonlinear operational amplifier, power amplifier, linear digital ICs, oscillators, power supplies, D/A, A/D conversion, four layered devices and their applications.

Pre: EET 222 S

EET 225 (3) Digital Principles

A study of number systems, Boolean algebra, switching function minimization techniques, binary arithmetic, small scale and medium scale logic chips, programmable logic devices, latches, flip-flops, registers and counters, and sequential circuit design.

S

EET 230 (4) Microcomputer Technology

An introduction to the installation, configuration, upgrading, troubleshooting and repair of microcomputers. Ba-

sic knowledge of desktop systems, basic networking concepts and printers will be introduced. Safety and common preventive maintenance procedures will be covered.

Pre: EET 113 or permission of instructor S

EET 241 (2) Electronic Shop Practices

An introduction to tools, equipment, materials, and techniques used in fabrication of electronic projects and printed circuit boards.

Pre: EET 222 and 221 S

EET 400 (3) Network Analysis

A course in network analysis that stresses time, frequency and Laplace transform domain techniques.

Pre: EET 114 and MATH 127

EET 430 (4) Computer Networking I

An introduction to the basic foundations of computer networking. The course will encompass telecommunications, local area networks, wide area networks and wireless communication. Topics covered include the OSI model, the TCP/IP model, different network topologies and associated hardware, error detection and correction, protocols, and security.

Pre: EET 230 and COMS 112 F

EET 431 (4) Computer Networking II

A continuation of EET 430. Router configurations, advanced LAN topologies, network configurations, protocols, and switching designs. Network troubleshooting and threaded case studies.

Pre: EET 430 S

EET 454 (4) Microprocessors I

A study of microcomputer hardware and software fundamentals, the instruction set and the addressing modes of a microprocessor/microcontroller, assembly programming, basic I/O concepts, parallel I/O methods, asynchronous serial I/O method, synchronous serial I/O methods, A/O conversion, timer applications, etc.

Pre: EET 225 S

EET 456 (4) Communications I

Communications principles & systems, practical engineering aspects involved in modulation-demodulation, receivers, transmitters & filters. Also included are radiation and antennas, guided waves, microwaves, and microwave systems.

Pre: EET 222 or Consent

EET 480 (3) Automatic Controls

Servomechanism analysis under transient and steady state conditions. Negative and positive feedback. Laplace transform analysis of feedback systems. Frequency response. System stability analysis using Bode plots and Root locus. Lead and velocity compensation. Analog computers. Microprocessor control and the analog/digital interface.

Pre: EET 400 F

EET 484 (4) Microprocessors II

A study of a high performance microprocessor architecture. Applications of a microprocessor for monitoring

and control of systems will be studied. Optimal utilization of a microprocessor's resources will be stressed. PC programming in assembly and a high level language.

Pre: EET 454

EET 488 (1) Senior Project Design I

An individual design project performed in consultation with the instructor. Phase I includes the acceptance of the proposal, defining, and limiting the project objectives, initial source contacts and procurement of materials.

Pre: EET 241, four 400-level EET courses or Consent of Instructor F, S

EET 489 (2) Senior Project Design II

Phase II includes completion of the project with evidence of extensive laboratory performance. A final oral report to the class and a standard formal written report are required.

Pre: EET488 F, S

EET 497 (1-6) Internship

Should be taken at end of junior year. Permission required.

Pre: 40 hrs EET creditor written permission of program coordinator

F, S