Metropolitan State University of Denver

Electrical Engineering Technology (EET)

Electrical Engineering Technology provides a foundation of knowledge in technology by merging the analytic skills of the engineer with the practical skills of the technician. Concentrations in Computers, Communications, and Power & Control Systems are offered in addition to the core technical curriculum. The combination of theory and application in the curriculum prepares for a transition to rewarding employment in a variety of industries including: manufacturing, technical services, computers and public utilities.

Faculty – The faculty in the EET program give top priority to teaching, and emphasize high levels of faculty-student interaction as a critical part of each student's education. The faculty have many years of industrial experience and bring a wealth of expertise, relevancy, and currency to the classes.

Students – The faculty provide each student with individualized academic counseling and assistance in meeting graduation requirements. Many EET students work part-time or full-time. The department offers many courses during evening hours for the working student. The students may participate in campus clubs. The Institute of Electronics and Electrical Engineers, Inc. (IEEE) has a student branch. The Instrument Society of America (ISA) is a strong supporter of the college, and students are forming a local chapter. These clubs are active in promoting professional development, academic scholarships, and interaction with industry. They invite guest speakers to meetings, arrange field trips, host social functions, participate in inter-university design contests, and provide community service. Students are encouraged to enroll in the college's Cooperative Education Program gaining valuable work experience.

Graduates – Virtually all EET graduates have been able to find industrial jobs, even during soft economic times. Employment opportunities exist in both the private and public sector.

The primary goal of the Engineering Technology programs is to deliver a solid technical foundation that will enable graduates to perform well in a wide variety of employment situations. A cooperative education program enables the student to combine on-the-job work experience with classroom studies.
Metro State students graduate with an extensive engineering technology education enabling them to be valuable contributors in many industries both established and emerging. We offer day and evening courses to accommodate working students' schedules.

Accreditation – The Electrical Engineering Technology Bachelor of Science degree program is accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET, 415 North Charles Street, Baltimore, MD 21201,

ABET Engineering Technology Accreditation Commission

Telephone: (410) 347-7700, www.abet.org.

Metropolitan State University of Denver

ELECTRICAL ENGINEERING TECHNOLOGY
Department of Engineering & Engineering Technology
For Students Starting Fall 2019

Electrical Engineering Technology (EET) graduates have much of the "know-why" of the engineer and the "know-how" of the technician. The EET curriculum combines theory and applications and is designed to prepare graduates for satisfying and meaningful employment in the electrical and electronics industry. The sound theoretical grounding has allowed graduates to earn master's degrees at local universities. The practical curriculum makes the transition to industrial employment very smooth. The EET degree is a true four-year engineering related degree, rather than a technician level degree.

General Studies Requirements

Written Communication (6 credits)

- ENG 1010 - Composing Arguments **Credits:** 3
- ENG 1020 - Freshman Composition: Analysis, Research, and Documentation **Credits:** 3

Oral Communication (3 credits)

- CAS 1010 - Public Speaking **Credits:** 3

Quantitative Literacy (4 credits)

- MTH 1400 - Precalculus Mathematics **Credits:** 4
  (the sequence of MTH 1110 - College Algebra and MTH 1120 - College Trigonometry may be substituted for MTH 1400)

Arts and Humanities (6 credits)

- PHI 1030 - Introduction to Ethics **Credits:** 3
  - or PHI 3360 - Business Ethics
- See the General Studies section of the catalog for approved courses.

Historical (3 credits)

- See the General Studies section of the catalog for approved courses.

Natural and Physical Sciences (10 credits)

- CHE 1100 - Principles of Chemistry **Credits:** 4
- CHE 1150 - Principles of Chemistry Laboratory **Credits:** 1
- PHY 2311 - General Physics I **Credits:** 4
- PHY 2321 - General Physics I Laboratory **Credits:** 1

Social and Behavioral Sciences I (3 credits)

- See the General Studies section of the catalog for approved courses.

Social and Behavioral Sciences II (3 credits)

- See the General Studies section of the catalog for approved courses.

Global Diversity (0 or 3 credits)

Multicultural Requirement (0 or 3 credits)

The department recommends that this requirement be met along with the Arts & Humanities, Historical, or Social & Behavioral Sciences general studies choices. See the Global Diversity and Multicultural section of the catalog for approved courses.

General Studies Total: 38 credits

Required EET Core Courses

			Prerequisites	Credit Hours
____	EET 1001	Electronics: An Introduction	High School Algebra	3
	OR			4
____	EET 1040	Introduction to Engineering	(none)	4
____	EET 1140	Circuits I	Intermediate Algebra	4
____	EET 1150	Circuits II	EET 1140, MTH 1120 or 1400	4
____	EET 2145	Electronics	EET 1150 or 2000, CHE 1100 or 1800 CoReq: EET 2165	
____	EET 2165	Electronics Lab	CoReq: EET 2145	1
____	EET 2310	Digital Circuits I	Intermediate Algebra	3
____	EET 2340	Technical Programming Applications	MTH 1400 or (MTH 1110 and MTH 1120)	3

____	EET 2350	Advanced Technical Programming	MTH 1400 or (MTH 1110 and MTH 1120)	3
____	EET 3110	Transform Methods in Circuit Analysis	EET 1150, MTH 2410	4
____	EET 3120	Advance Analog Electronics	EET 2145, EET 3110, MTH 2410	4
____	EET 3330	Digital Circuits II	EET 2310	3
____	EET 3410	Electric Machines	MTH 2410, EET 2145 or 3010	3
____	EET 3620	Analog and Digital Communications	MTH 2410, EET 2145 or 3010	3
____	EET 3630	Electromagnetic Fields	EET 3110, EET 3620, MTH 2410	3
____	EET 3715	Control Systems Analysis	EET 3110, EET 3120, MTH 2410	4
____	EET 3730	Process Control Systems	EET 1150 or EET 2000	2
____	EET 3740	Programmable Logic Controllers	EET 1150 or EET 2000	2
____	EET 4100	Senior Project I*	JMP 2610, EET 3120, EET 4370, Senior	1
____	EET 4110	Senior Project II*	CAS 1010, EET 4100, EET 4340	2
____	EET 4340	Interface Techniques	EET 3330, EET 4370	3
____	JMP 4370	Microcontrollers	EET 2350, EET 3330	3
____	JMP 2610	Intro to Technical Writing	ENG 1010	3
____	MTH 1410	Calculus I	MTH 1109 or MTH 1110 or MTH 1111 & MTH 1120, or MTH 1400	4
____	MTH 2410	Calculus II	MTH 1410	4

**These courses satisfy the University's Senior Experience requirement.*

EET Concentration Area

Students must select one of the three concentration areas listed below.
In select cases, a minor in another area may be substituted for a concentration with prior approval of an EET advisor.

Communications Concentration – 18 hours

____	EET 3670	Measurements for Communications Systems	EET 2340, EET 3620, MTH 2410	3
____	EET 4020	Dig. Circuits III: Hardware Description Language	EET 2350 or CSS 2227, EET 3330	3
____	EET 4320	Digital Filters	EET 2340, EET 3110	3
____	EET 4620	Advanced Communications Systems	EET 3620	3
____	6 credit hours from: CET 2150 (3); CET 3120 (3); EET 4330 (3); EET 4730 (3); MET 3110 (3); MET 3125 (3)			6

Computer Engineering Technology Concentration – 18 hours

____	CS 1050	Computer Science I	permission of dept.	4
____	CS 2050	Computer Science II	CS 1050, MTH 1110	4
____	EET 4020	Dig. Circuits III: Hardware Description Language	EET 2350 or CSS 2227, EET 3330	3
____	EET 4330	Data Communications	EET 2310	3
____	Approved CS elective (consult an advisor)			4

Power & Control Systems Concentration – 18 hours

____	EET 3420	Electric Power Distribution	MTH 2410, EET 2145 or 3010	3
____	EET 3430	Power Generation Using Renewable Energies	MTH 2410, EET 2145 or 3010	3
____	EET 4710	Digital Control Systems Design	EET 3710 or EET 3715	4
____	8 credit hours from: CET 2150 (3); CET 3120 (3); EET 4320 (3); EET 4330 (3); EET 4730 (3); MET 3110 (3); MET 3125 (3)			8

Program Total: 128 credits

Metropolitan State University of Denver

General Studies	***38 credits***
Required EET Core	***72 credits***
EET Concentration Area	***18 credits***

Electrical Engineering Technology Certificate or Minor: 19 credits

Prerequisites:

	MTH 1400	Precalculus Mathematics	Completion of either MTH 1109 or MTH 1110 or MTH 1111, and MTH 1120 with grades of "C-" or better or other evidence showing knowledge of this material or an appropriate score on a department-approved placement test. (The sequence MTH 1110 and MTH 1120; or MTH 1410 may be substituted.)	4
	PHY 2311	General Physics I	Prerequisite(s): MTH 1410 Corequisite(s): Concurrent registration with PHY 2321 General Physics I Laboratory is recommended. Satisfaction of either ENG 1010 or the Oral Communication requirement. (Algebra-based PHY 2010 may be substituted.)	4
	PHY 2321	General Physics I Laboratory	Prerequisite(s): MTH 1120 or equivalent; and satisfaction of either ENG 1010 or the Oral Communication requirement Corequisite(s): Concurrent registration with PHY 2311 is recommended (Algebra-based PHY 2030 may be substituted.)	1
	PHY 2331	General Physics II	Prerequisite(s): MTH 2410, PHY 2311 or equivalent, and completion of either ENG 1010 or the Oral Communication requirement. Corequisite(s): Concurrent registration with PHY 2341 is recommended. (Algebra-based PHY 2020 may be substituted.)	4
	PHY 2341	General Physics II Laboratory	Prerequisite(s): MTH 1120 or equivalent, and satisfaction of either ENG 1010 or the Oral Communication requirement Corequisite(s): Concurrent registration with PHY 2331 is recommended (Algebra-based PHY 2040 may be substituted.)	1

Required Courses:

	EET 2000	Electric Circuits and Machines (The sequence EET 1140 and EET 1150 may be substituted.)	MTH 1120 or MTH 1400, PHY 2020 or PHY 2331, with grades of "C" or better	3
	EET 2310	Digital Circuits I	An intermediate algebra course or one-and-one-half years of secondary school algebra or equivalent and appropriate score on the mathematics preassessment placement test or higher level math course, with a grade of "C" or better	3
	EET 2350	Advanced Technical Programming	MTH 1400 (or MTH 1110 and MTH 1120) (or a higher level math course) with a grade of "C" or better	3
	EET 2145	Electronics	Prerequisite(s): EET 1150 or EET 2000, and CHE 1100 or CHE 1800, with a grade of "C" or better for all prerequisites Corequisite(s): EET 2165	3
	or			
	EET 3010	Industrial Electronics	EET 1150 or EET 2000 with a grade of "C" or better	4
	EET 3330	Digital Circuits II	EET 2310 with a grade of "C" or better	3
	EET 4370	Microcontrollers	EET 2350 and EET 3330 with grades of "C" or better	3

Note:

*EET certificate students planning to continue on to the Electrical Engineering Technology Bachelor of Science degree are required to take EET 1140, EET 1150, and EET 2145.

Metropolitan State University of Denver, Department of Engineering And Engineering Technology
Electrical Engineering Technology
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EET 1001 – Electronics: An Introduction
Credits: 3 (2 + 2)
Prerequisite(s): High school algebra
Description: This course introduces physical foundations of electricity, electronics, and computers, emphasizing hands-on application of theory. Engineering ethics, technology related careers and the effect of technological changes on modem society will also be discussed. Students will assemble specific electronic projects.

EET 1040 – Introduction to Engineering
Credits: 3 (2 + 2)
Prerequisite(s): Minimum performance standard score on math placement test
Description: This course is an introductory engineering course exposing students to a cross section of topics in contemporary civil, electrical and mechanical engineering disciplines to assist them with their education career choices. Students are taught to work in teams, introduced to the design process, utilize math and computer programs to analyze raw data and properly display their results in a presentation to their peers. The history of the engineering profession and its relation to current national, social, industrial, ethical, and international issues and problems will be discussed.

EET 1140 – Circuits I
Credits: 4 (3 + 2)
Prerequisite(s): An intermediate algebra course or one and one-half years of secondary school algebra or equivalent and appropriate score on the mathematics preassessment placement test or higher level math course, with a grade of "C" or better.
Description: This course covers DC circuit analysis, including mesh analysis, nodal analysis, Thevenin conversion, Norton conversion, power, magnetism and magnetic circuits, capacitance, and inductance. An introduction to electrical laboratory procedures and the measurement of basic circuit parameters is also included.

EET 1150 – Circuits II
Credits: 4 (3 + 2)
Prerequisite(s): EET 1140 and (MTH 1120 or MTH 1400 or higher level math course), with grades of "C" or Better
Description: This course is a continuation of EET 1140, using trigonometry and complex algebra. Studies include single-time constant circuits, phasors, and the j operator, RLC circuits with sinusoidal, steady-state sources, impedance and admittance, AC formulation of classic network theorems, complex network equations, complex power, frequency response, transformers, and two-port network models.

EET 2000 – Electronic Circuits and Machines
Credits: 3 (2 + 2)
Prerequisite(s): MTH 1120 or MTH 1400, PHY 2020 or PHY 2331, with grades of "C" or better
Description: This course introduces electric circuits for non-EET majors. It covers DC and AC circuits, generators, motors, transformers, elementary electronic devices, and circuits.

EET 2145 – Electronics
Credits: 3 (3 + 0)
Prerequisite(s): EET 1150 or EET 2000, and CHE 1100 or CHE 1800, with a grade of "C" or better for all prerequisites
Corequisite(s): EET 2165
Description: Students in this course will study the theory, modeling and application of semiconductor based electronic circuits. Devices studied include: diodes, bipolar junctions transistors, MOS field effect transistors, thyristors and operational amplifiers. The student will learn to integrate electronic devices in applications such as filtering, amplification, and oscillation.

EET 2165 – Electronics Laboratory
Credits: 1 (0 + 2)
Prerequisite(s): EET 1150 or EET 2000, and CHE 1100 or CHE 1800, with a grade of "C" or better for all prerequisites
Corequisite(s): EET 2145
Description: The student will develop the laboratory skills necessary for integration of electronic devices in applications such as filtering, amplification, and oscillation. The student will integrate the lecture content of EET2145 in the practical, hands-on laboratory exercises developed in this course.

EET 2310 – Digital Circuits I
Credits: 3 (2 + 2)
Prerequisite(s): An intermediate algebra course or one-and-one-half years of secondary school algebra or equivalent and appropriate score on the mathematics preassessment placement test or higher level math course, with a grade of "C" or better
Description: This course covers the analysis and design of logic circuits using Boolean algebra and Karnaugh maps. Adders, comparators, decoders, encoders, multiplexers and other logic circuits are also studied. Flip-flops, memories, analog-to-digital (ADC) and digital-to-analog converters (DAC) are used to design simple digital circuits. Computer architecture is introduced.

EET 2340 – Technical Programming Applications
Credits: 3 (3 + 0)
Prerequisite(s): MTH 1400 or (MTH 1110 and MTH 1120) or higher level math course, with a grade of "C" or better
Description: This is a beginning-level course using Visual Basic and spreadsheets. Students will solve engineering applications problems from the various areas of civil, electrical, and mechanical engineering technology.

EET 2350 – Advanced technical Programming
Credits: 3 (3 + 0)
Prerequisite(s): MTH 1400 (or MTH 1110 and MTH 1120) (or a higher level math course) with a grade of "C" or better
Description: This is an advanced-level programming course using the C programming language and National Instruments Lab View virtual instrumentation software. Methods for solving circuit and electronics problems using the C programming language are studied. The use of Lab View for the creation of virtual instrumentation in simulations and data acquisition is introduced.

EET 3010 – Industrial Electronics
Credits: 4 (3 + 2)
Prerequisite(s): EET 1150 or EET 2000 with a grade of "C" or better
Description: This course covers the application of transistors, op amps, and other electronic devices, both analog and digital. This course is for Mechanical Engineering Technology majors, EET certificates, and EET minors. This course does not count towards a major in EET.

EET 3110 – Transform Methods in Circuit Analysis
Credits: 4 (4 + 0)
Prerequisite(s): EET 1150 and MTH 2410 with grades of "C" or better
Description: This is an advanced-level circuit analysis course introducing the use of classical ordinary differential equations combined with mathematical transforms to solve complex electronic networks. MATLAB, or equivalent, software is introduced and used as a tool for circuit analysis throughout the course.

EET 3120 – Advanced Analog Electronics
Credits: 4 (3 + 2)
Prerequisite(s): EET 2145, EET 3110, and MTH 2410 with grades of "C" or better
Description: This course is an advanced analog electronics course with emphasis on the operational amplifier and other advanced analog circuits. Advanced mathematical techniques and computer simulations are developed for circuit analysis.

EET 3330 – Digital Circuits II
Credits: 3 (2 + 2)
Prerequisite(s): EET 2310 with a grade of "C" or better
Description: This course is a continuation of EET 2310. It covers the analysis and design of sequential (counters and shift registers) logic circuits. Programmable Logic Devices (PLD) and associated Computer Aided Design (CAD) software are used to implement digital circuits using the schematic design entry method.

EET 3370 - Digital Circuits for Advanced Manufacturing
Credits: 3 (2 + 2)
Prerequisite(s): An intermediate algebra course or one and one-half years of secondary school algebra or equivalent and appropriate score on the mathematics placement test or higher level math course, with a grade of "C" or better
Description: This course covers the analysis and design of logic circuits using Boolean algebra and Karnaugh maps. Combination logic elements such as adders, comparators, decoders, encoders, multiplexers and other logic circuits are also studied. Next, Flip-flops, and sequential (counters and shift registers) logic circuits are studied and used to design simple digital circuits utilizing Programmable Logic Devices (PLD) and associated Computer Aided Design (CAD) software employing the schematic design entry method. Computer architecture is introduced.

EET 3380 - Technical Programming for Advanced Manufacturing
Credits: 3 (3 + 0)
Prerequisite(s): MTH 1400 or (MTH 1110 and MTH 1120) or higher level math course, with a grade of "C" or better
Description: This is an upper-level programming course using the C programming language and National Instruments Lab View virtual instrumentation software. Methods for solving engineering problems using the C programming language are studied. The use of Lab View for the creation of virtual instrumentation in simulations and data acquisition is introduced.

EET 3410 – Electric Machines
Credits: 3 (2 + 2)
Prerequisite(s): MTH 2410 and either EET 2145 or EET 3010 with grades of "C" or better
Description: This course studies motors and generators and their applications. Topics include: magnetism and magnetic circuits, voltage and torque generation, DC motors, DC generators, single and three phase transformers, and synchronous alternators

EET 3420 – Electric Power Distribution

Credits: 3 (3 + 0)
Prerequisite(s): MTH 2410 and either EET 2145 or EET 3010 with grades of "C" or better
Description: This course studies techniques and equipment employed in electric power distribution and control.

EET 3430 – Power Generation Using Renewable Energies
Credits: 3 (3 + 0)
Prerequisite(s): MTH 2410 and either EET 2145 or EET 3010 with grades of "C" or better
Description: This is an introductory course in electrical power generation that examines various types of renewable energy sources. While examining many developing technologies, the course concentrates on the design and application of photovoltaic and wind electrical generation. It examines conventional synchronous and induction machines, as well as modem doubly-fed induction machines and their application in wind generation. It also provides an introduction to inverter technology and methods of interfacing renewable energy power plants with the electrical power grid.

EET 3620 – Analog and Digital Communications
Credits: 3 (3 + 0)
Prerequisite(s): MTH 2410 and either EET 2145 or EET 3010 with grades of "C" or better
Description: This course is an introduction to communication systems. Topics include: information theory, channel capacity, A/D and D/A techniques, modulation (AM, FM, and digital), noise sources, quantization, and transmission lines including Smith Charts.

EET 3630 – Electromagnetic Fields
Credits: 3 (3 + 0)
Prerequisite(s): EET 3110, EET 3620, and MTH 2410 with grades of "C" or better
Description: This course covers mathematical concepts of static and dynamic electromagnetic fields. Topics include: planewave propagation in lossless and lossy media, waveguide propagation, and radiation principles.

EET 3670 – Measurements for Communication Systems
Credits: 3 (1 + 4)
Prerequisite(s): EET 2340, EET 3620, and MTH 2410 with grades of "C" or better
Description: Students learn to perform measurements on communication circuits, including SNR, noise figure, impedance, admittance, phase, power, frequency, spectrum analysis, and fields at high frequencies.

EET 3690 – Fiber Optics
Credits: 3 (2 + 2)
Prerequisite(s): EET 2145 and MTH 2410 with grades of "C" or better
Description: Fiber optics is studied, including ray propagation, emitters, detectors, connectorization and systems, FDDI, and SONET.

EET 3715 – Control Systems Analysis
Credits: 4 (3 + 2)
Prerequisite(s): EET 3110, EET 3120, and MTH 2410 with grades of "C" or better
Description: This course analyzes classical, linear, continuous-time control systems. Topics include: Laplace transform, Bode plots, stability, transient response, steady-state response, and the design of PID, lag, and lead compensators. The laboratory portion of the course uses the classical approach to the analysis and design of control systems.

EET 3730 – Process Control Systems
Credits: 2 (1.5 + 1)
Prerequisite(s): EET 1150 or EET 2000 with a grade of "C" or better
Description: This course is an introduction to the applications of Proportional, Integral, & Derivative (PID) controllers in the process control industry. Topics include: structure of feedback, sensors, controllers, control valves, process dynamics, timing, piping and instrument drawing.

EET 3740 – Programmable Logic Controllers
Credits: 2 (1.5 + 1)
Prerequisite(s): EET 1150 or EET 2000 with a grade of "C" or better
Description: This course is an introduction to the applications of Programmable Logic Controllers (PLC) and their programming, using ladder diagrams. Topics include: PLC usage, types, advantages and disadvantages, system overview, ladder logic programming command language and applications, networking PLC systems, and installation and troubleshooting techniques.

EET 3980 – Internship in Electrical Engineering Technology
Credits: 1-15 (0 + 3-45)
Prerequisite(s): Major in Electrical Engineering Technology; junior or senior status; permission of instructor
Description: Supervised by a faculty member within the major department, internships provide practical, hands-on experience in a professional field related to the major. Internship placements must be established prior to enrollment in this course in consultation with the Applied Learning Center.
To register with the Applied Learning Center, students must meet the following qualifications:

- Completed at least one semester at MSU Denver
- Sophomore, junior or senior status
- Declared major in an undergraduate program
- 2.5 minimum cumulative GPA at MSU Denver
- Currently enrolled and taking classes at MSU Denver

EET 4020 – Digital Circuits III: Hardware Description Language
Credits: 3 (2 + 2)
Prerequisite(s): EET 2350 or CSS 2227 or permission of instructor; and EET 3330 with grades of "C" or better
Description: This course covers a Hardware Description Language (HDL) which is used to design and simulate very large scale digital integrated circuits.

EET 4100 – Senior Project I
Credits: 1 (0 + 2)
Prerequisite(s): JMP 2610, EET 3120, and EET 4370 all with grades of "C" or better; and senior standing
Description: This is a Senior Experience, capstone course designed to teach engineering design skills to students through project based learning. The course will focus on team project incorporating the application of fundamental engineering knowledge and skills. Projects require planning and design in consultation with faculty advisors and industry contacts. Through this course the students will learn the design process in a hands on way through conceptualization, construction, testing and presenting a deliverable project.
University Requirement(s): Senior Experience

EET 4110 – Senior Project II
Credits: 2 (0 + 4)
Prerequisite(s): SPE 1010, EET 4100, and EET 4340 with grades of "C" or better
Description: In this course, the student completes the project he or she started in EET 4100. The project is built, tested, and demonstrated. Written technical reports and oral presentations on the project are required. Part of this course involves the student working with a faculty member who acts as a consultant.
University Requirement(s): Senior Experience

EET 4320 – Digital Filters
Credits: 3 (2 + 2)
Prerequisite(s): EET 2340 and EET 3110, with grades of "C" or better
Description: This course introduces digital filters as applied in digital signal processing and sampled data control systems

EET 4330 – Data Communications
Credits: 3 (2 + 2)
Prerequisite(s): EET 2310, with a grade of "C" or better
Description: This course covers methods of local and distant digital communications including: systems, standards, and hardware used for transmitting digital data either synchronously or asynchronously.

EET 4340 – Interface Techniques
Credits: 3 (2 + 2)
Prerequisite(s): EET 3330 and EET 4370 with grades of "C" or better
Description: This course covers interfacing techniques between computers, peripherals, and other digital circuits.

EET 4370 – Microcontrollers
Credits: 3 (2 + 2)
Prerequisite(s): EET 2350 and EET 3330 with grades of "C" or better
Description: This course teaches microcontroller design. Topics include: programming, monitor functions, hardware configurations, timing, analog-to-digital conversion, parallel I/O, and serial I/O.

EET 4620 – Advanced Communications Systems
Credits: 3 (3 + 0)
Prerequisite(s): EET 3620 with a grade of "C" or better
Description: This senior research course requires students to analyze HF, VHF, UHF, microwave, spread spectrum, optical, video, and satellite systems. Analog and digital cellular and personal communication services, including AMPS, GSM, CDMA, wireless LANs, microwave satellite communication systems, are also studied.

EET 4700 – Special Topics in Electrical Engineering Technology
Credits: 3 (3 + 0)
Prerequisite(s): EET 3120 with a grade of "C" or better
Description: This course identifies and researches current and emerging trends, topics, and developments in the field of electrical engineering to determine their impact on society and to identify changes in the society that could result from these new developments.

EET 4710 – Digital Control Systems Design
Credits: 4 (4 + 0)
Prerequisite(s): EET 3710 or EET 3715 with a grade of "C" or better
Description: Students in this course will learn the process and theory of the design of

digital control systems, using classical and modern control theory. State variable feedback control laws and observers are designed.

EET 4730 – Robotics
Credits: 3 (3 + 0)
Prerequisite(s): MTH 2410, EET 3740, and EET 2145 or EET 3010 with grades of "C" or better
Description: This course covers the basics of design, analysis, modeling and control of robots. The topics covered include: robot kinematics, inverse kinematics, kinetics, sensors, actuators, and the industrial applications of robotics.

See Prerequisites for all classes

Metropolitan State University of Denver

Preparatory Courses *High School* → **Prep Math** → **MTH 1110** *College Algebra* → **MTH 1120** *College Trig*

Recommended course rotation:

Freshman Year

1st Semester (Fall) — 16 hours

- **ENG 1010** *Composing Arguments*
- **CAS 1010** *Public Speaking*
- **General Studies** *Social & Behavioral Science I*
- **EET 1001** *Electronics: An Introduction*
- **MTH 1400*** *Precalculus*

2nd Semester (Spring) — 16 hours

- **ENG 1020** *Freshman Composition*
- **EET 1140** *Circuits I*
- **CHE 1100** *Principles of Chemistry*
- **CHE 1150** *Principles of Chemistry Lab*
- **MTH 1410** *Calculus I*

Sophomore Year

3rd Semester (Fall) — 16 hours

- **EET 2340** *Technical Programming Applications*
- **EET 1150** *Circuits II*
- **PHY 2311** *General Physics I*
- **PHY 2321** *General Physics I-Lab*
- **MTH 2410** *Calculus II*

4th Semester (Spring) — 16 hours

- **EET 2350** *Adv. Technical Programming*
- **JMP 2610** *Intro to Technical Writing*
- **General Studies** *Arts & Humanities*
- **EET 2310** *Digital Circuits I*
- **EET 2145** *Electronics*
- **EET 2165** *Electronics Lab*

- Students placing directly in to MTH 1410 in the first semester may replace these credits with MTH 2420 in the third semester.

Communications Concentration

Junior Year

5th Semester (Fall) — 16 hours

- **General Studies** *History*
- **EET 3410** *Electric Machines*
- **EET 3110** *Transform Methods in Circuit Analysis*
- **EET 3620** *Analog & Digital Communications*
- **EET 3330** *Digital Circuits II*

6th Semester (Spring) — 17 hours

- **EET 3120** *Advanced Analog Electronics*
- **EET 3730** *Process Control Systems*
- **EET 3740** *Programmable Logic Controllers*
- **EET 3630** *Electromagnetic Fields*
- **EET 4370** *Microcontrollers*
- **EET 4020** *Digital Circuits III*

Senior Year

7th Semester (Fall) — 17 hours

- **EET 3715** *Control Systems Analysis*
- **EET 4100** *Senior Project I*
- **EET 4340** *Interface Techniques*
- **EET 4320** *Digital Filters*
- **EET 4620** *Adv. Communications Systems*
- **PHI 1030** *Intro to Ethics* **OR** **PHI 3360** *Business Ethics*

8th Semester (Spring) — 14 hours

- **EET 3670** *Measurements for Communication Systems*
- **EET 4110** *Senior Project II*
- **Approved technical elective**
- **Approved technical elective**
- **General Studies** *Social & Behavioral Science II*

Metropolitan State University of Denver, Department of Engineering And Engineering Technology
ELECTICAL ENGINEERING TECHNOLOGY
Campus Box 29, Aerospace and Engineering Sciences Suite 300, P.O. Box 173362, Denver, CO 80217-3362
Phone: (303) 615-0499, http://www.msudenver.edu/eet

Computer Engineering Technology Concentration

Junior Year

5th Semester (Fall)

16 hours

- **General Studies** *History*
- **EET 3410** *Electric Machines*
- **EET 3110** *Transform Methods in Circuit Analysis*
- **EET 3620** *Analog & Digital Communications*
- **EET 3330** *Digital Circuits II*

6th Semester (Spring)

18 hours

- **EET 3120** *Advanced Analog Electronics*
- **EET 3730** *Process Control Systems*
- **EET 3740** *Programmable Logic Controllers*
- **EET 3630** *Electromagnetic Fields*
- **EET 4370** *Microcontrollers*
- **CS 1050** *Computer Science I*

Senior Year

7th Semester (Fall)

18 hours

- **EET 3715** *Control Systems Analysis*
- **EET 4100** *Senior Project I*
- **EET 4340** *Interface Techniques*
- **Approved CS elective**
- **CS 2050** *Computer Science II*
- **PHI 1030** *Intro to Ethics* **OR** **PHI 3360** *Business Ethics*

8th Semester (Spring)

12 hours

- **EET 4020** *Digital Circuits III*
- **EET 4110** *Senior Project II*
- **EET 4330** *Data Communications*
- **General Studies** *Social & Behavioral Science II*

Power & Control Systems Concentration

Junior Year

5th Semester (Fall)

16 hours

- **General Studies** *History*
- **EET 3410** *Electric Machines*
- **EET 3110** *Transform Methods in Circuit Analysis*
- **EET 3620** *Analog & Digital Communications*
- **EET 3330** *Digital Circuits II*

6th Semester (Spring)

17 hours

- **EET 3120** *Advanced Analog Electronics*
- **EET 3730** *Process Control Systems*
- **EET 3740** *Programmable Logic Controllers*
- **EET 3630** *Electromagnetic Fields*
- **EET 4370** *Microcontrollers*
- **EET 3420** *Electric Power Distribution*

Senior Year

7th Semester (Fall)

18 hours

- **EET 3715** *Control Systems Analysis*
- **EET 4100** *Senior Project I*
- **EET 4340** *Interface Techniques*
- **General Studies** *Social & Behavioral Science II*
- **EET 3430** *Power Generation Using Renewable Energies*
- **PHI 1030** *Intro to Ethics* **OR** **PHI 3360** *Business Ethics*

8th Semester (Spring)

13 hours

- **EET 4710** *Digital Control Systems Design*
- **EET 4110** *Senior Project II*
- **Approved technical elective**
- **Approved technical elective**

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