



Fall 2009 - Summer 2013 Electrical Engineering Program

Electrical Engineering & Computer Science Department
Undergraduate Advising Office
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This brochure applies to students who entered the College of Engineering Fall 2009 – Summer 2013

Welcome!

Thank you for your interest in Electrical Engineering, one of the three undergraduate degrees offered by the Department of Electrical Engineering and Computer Science at the University of Michigan. Electric lighting, electric motors, power systems, electrical communications, HDTV, digital cameras, cell-phones, MP3 players, personal computers, automotive electronics, and bioelectrical devices are the work of electrical engineers. Electrical engineering is a very broad field that continues to have a major impact on society and our quality of life. If you wish to understand electrical phenomena and apply this knowledge to design, invent and improve electrical systems and hardware, then there is no better field than EE. The EE program at the University of Michigan provides the flexibility for students to pursue their individual interests, whether they be in the area of circuits, systems (communications, signal processing and control), microelectrical mechanical systems (MEMs), electromagnetics, optics, power systems, solid state devices or computers.

This brochure provides a wealth of information regarding our EE program, including course requirements and links to related resources. The EECS Advising Office is ready to help you achieve your academic goals and welcomes your questions!

Electrical Engineering (EE) Declaration Requirements:

To declare a major in EE, you must be a College of Engineering student and:

- (1) Have completed at least one full term at UM Ann Arbor
- (2) Have an overall UM GPA of 2.0 or better in courses taken at the UM Ann Arbor campus and be in good standing
- (3) Have completed or earned credit by exam or transfer for at least one course in each of these categories
 - a. Calculus (e.g. Math 115, 116, 156)
 - b. Calculus based physics lectures (e.g. Physics 140, 160) or chemistry lectures (e.g. Chem 130)
 - c. Required engineering courses (Engr 100, 101, 151)

If you are interested in declaring an EE major and do not meet these requirements, please schedule an appointment with the EE Chief Program Advisor (CPA) to discuss your situation.

Getting Advice and Information:

If you are an EE major or considering becoming one, we recommend that you **see an EE advisor every term** even if you know what courses you want to take. There may be options or constraints of which you are unaware. Frequent meetings with an advisor will help ensure that you get the most out of your education here and that there are no surprises when you apply for your diploma.

- To schedule an appointment with an advisor, visit <http://www.eecs.umich.edu/eecs/undergraduate>
- Check the EECS undergraduate programs web page, <http://www.eecs.umich.edu/eecs/undergraduate> for information about class selection, registration procedures, course offerings, book lists, time schedules, advising hours, and career information.
- You may also e-mail the EECS Undergraduate Advising Office at eeadvising@umich.edu, or the EE Chief Program Advisor at eeadvisor@umich.edu.

This handout covers rules and advice for the EE program from Fall 2009 – Summer 2013. Your program is determined by the rules that were in effect when you entered the College of Engineering. The Fall 2009 - Summer 2013 program requires 8 Core Elective, 11 Upper Levels and 10 Flexible Technical Electives. Please contact the EECS Undergraduate Advising Office with any questions.

Fall 2009 – Summer 2013 Electrical Engineering Program Program Requirements & Grade Policy

Electrical Engineering Program Requirements:

1. **Program Core Courses:** All of the following courses are required (29 credits total):
 - a. Electrical Engineering Core: EECS 215 (Intro. to Electronic Circuits), EECS 216 (Intro. to Signals and Systems), EECS 280 (Data Structures & Algorithms), EECS 230 (Electromagnetics I), EECS 320 (Intro. to Semiconductor Devices)
 - b. Probabilistic Methods: EECS 301 or 401 (**note: MATH 425 does not fulfill this requirement**)
 - c. Technical Communications: TCHNCLCM 300 (1 credit)
 - d. Engineering professionalism: EECS 496 (2 credits)
 - e. Writing and oral presentation: TCHNCLCM 496 (2 credits)
2. **Technical Electives:** A minimum of 33 additional credits of technical electives are required:
 - a. *Core Electives:* 8 credits from two or more categories:
 - i. Signals & Systems: EECS 451, EECS 455, EECS 460
 - ii. Circuits: EECS 311, EECS 312
 - iii. Electromagnetics / Optics: EECS 330, EECS 334
 - iv. Computers: EECS 270, EECS 370
 - b. At least 11 credits from the approved *Upper Level EE Technical Electives* (a list of approved courses can be found later in this document). Students are encouraged to take more than the minimum. At least 7 of these credits must be at the 400-level or higher.
 - c. *Major Design Experience (MDE):* The MDE is a capstone design project taken during one of your final two terms. It is comprised of three courses, which should be taken concurrently: an MDE design project course (4 credits, see discussion below), EECS 496 and TCHNCLCM 496 (see Program Core).

MDE design project course (one from the following): EECS 411, EECS 413, EECS 425, EECS 427, EECS 430, EECS 438, EECS 452, EECS 470, 473. You may request special permission to use an MDE project course from another program, but if approved, you will need to complete an additional 4 credits of Upper Level EE Elective.
 - d. The remainder of the 33 technical elective credits (10 if the minimum number of Upper Level Electives are taken) may be chosen from the approved *Flexible Technical Electives* (a list of approved courses can be found later in this document). These are courses in engineering, mathematics, or science that are approved as appropriate for EE students.

EECS Grading Policy:

C- Grades. In order to receive EE program credit for any math, physical science, electrical engineering, or flexible technical elective, a student must receive a grade of C or better in the course.

Any required course for which a student receives a grade below a C must be repeated.

If a student receives between a C- and D- in any of the technical elective courses (and does not re-take the class), he/she will receive only free elective credit for the course.

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Core & Upper Level EE Technical Electives

Core Electives – minimum 8 credits

You must choose at least 8 credits from 2 or more categories (prerequisites in parentheses):

Communication, Control & Signal Processing

- EECS 451: Digital Signal Processing and Analysis (EECS 216)
- EECS 455: Digital Communication Signals and Systems (EECS 216 and EECS 401)
- EECS 460: Control Systems Analysis and Design (EECS 216)

Circuits & Solid State

- EECS 311: Electronic Circuits (EECS 216)
- EECS 312: Digital Integrated Circuits (EECS 216)

Electromagnetics/Optics

- EECS 330: Electromagnetics II (EECS 230)
- EECS 334: Principles of Optics (PHYSICS 240)

Computers

- EECS 270: Introduction to Logic Design (ENGR 101)
- EECS 370: Computer Architecture (EECS 203 or 270) AND (EECS 280)

Upper-Level EE Electives – minimum 11 credits

Select EECS courses from the following list. EECS 498 will be considered on a case-by-case basis by the CPA; at least 7 credits must be at the 400-level or higher.

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|---|---|
| EECS 311: Electronic Circuits | EECS 427: VLSI Design I |
| EECS 312: Digital Integrated Circuits | EECS 429: Semiconductor Optoelectronic Devices |
| EECS 330: Electromagnetics II | EECS 430: Radiowave Propagation and Link Design |
| EECS 334: Principles of Optics | EECS 434: Principles of Photonics |
| EECS 353: Introduction to Comm. Systems | EECS 435: Fourier Optics |
| EECS 370: Computer Architecture | EECS 438: Advanced Lasers and Optics Laboratory |
| EECS 373: Design of Microprocessor Based Systems | EECS 442: Computer Vision |
| EECS 376: Foundations of Computer Science | EECS 451: Digital Signal Processing and Analysis |
| EECS 411: Microwave Circuits I | EECS 452: Digital Signal Processing Design Laboratory |
| EECS 413: Monolithic Amplifier Circuits | EECS 455: Digital Communication Signals and Systems |
| EECS 414: Introduction to MEMS | EECS 458: Biomedical Instrumentation and Design |
| EECS 417: Electrical Biophysics | EECS 460: Control Systems Analysis and Design |
| EECS 418: Power Electronics | EECS 461: Embedded Control Systems |
| EECS 419: Electric Machinery and Drives | EECS 463: Power Systems Design and Operation |
| EECS 420: Phys. Principles Underlying Smart Devices | EECS 473: Advanced Embedded Systems |
| EECS 421: Properties of Transistors | EECS 470: Computer Architecture |
| EECS 423: Solid-State Device Laboratory | EECS 475: Introduction to Cryptography |
| EECS 425: Integrated Microsystems Laboratory | EECS 478: Logic Circuit Synthesis and Optimization |

Major Design Experience (one course) – minimum 4 credits

TCHNCLCM 496 AND EECS 496 should be elected concurrently with one of the MDE courses listed below.

- EECS 411: Microwave Circuits I (EECS 230 & [311 or 330])
- EECS 413: Monolithic Amplifier Circuits (EECS 311 & EECS 320)
- EECS 425: Integrated Microsystems Lab (EECS 311 or EECS 312 or EECS 414)
- EECS 427: VLSI Design I (EECS 270 & EECS 312 & EECS 320)
- EECS 430: Radiowave Propagation & Link Design (EECS 330 & senior standing)
- EECS 438: Advanced Lasers and Optics Lab (EECS 334 or EECS 434)
- EECS 452: Digital Signal Processing Lab (EECS 280 & EECS 216 & [EECS 451 or EECS 455])
- EECS 470: Computer Architecture (EECS 270 & EECS 370)
- EECS 473: Advanced Embedded Systems (EECS 373 & [215 or 281])

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Flexible Technical Electives

Flexible Technical Electives – minimum 10 credits

Other courses may be acceptable with prior approval of the Chief Program Advisor. The basic standard is that a class which you are proposing as an FTE should involve at least as much technical content as the classes on this list. A rough guideline is that it should involve the use of college-level mathematics (differential/integral calculus - Math 116, differential equations - Math 216, probability - Math 425/EECS 301, and/or linear algebra - Math 217 or 417/419). If little mathematics beyond arithmetic or basic algebra is involved, it is unlikely to be approved. Courses that involve only qualitative reasoning are not likely to be approved.

Aerospace Engineering

AEROSP 215	Intro to Solid Mechanics & Aerospace Structures
AEROSP 225	Intro to Gas Dynamics

300-level & above (except 494 & 495), for AERO 390 & 490: see Directed Study Rule

Atmospheric, Oceanic and Space Sciences

AOSS 320	Earth System Evolution
AOSS 321	Earth System Dynamics

AOSS 323	Earth System Analysis
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Biology

BIOLOGY 305	Genetics
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Any 400-level and above course (see Directed Study Rule above)
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Biomedical Engineering

BiomedE 214	Circuits & Systems for Biomed. Engin. (No program credit will be granted to EE students taking BME 211)
BIOMEDE 221	Biophysical Chemistry

BIOMEDE 231	Intro to Biomechanics
300-level & above (490, see Directed Study Rule)	

Chemical Engineering

CHE 230	Material & Energy Balances
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300-level & above, CHE 490 subject to Directed Study Rule above

Chemistry

CHEM 210	Structure and Reactivity I
CHEM 211	Investigations in Chemistry (1 cr.)
CHEM 215	Structure and Reactivity II (3 cr.)
CHEM 216	Synth. & Characterization of Org. Compounds (2 cr.)
CHEM 230	Physical Chemical Principles and Applications (3 cr.)

CHEM 241	Introduction to Chemical Analysis (2 cr.)
CHEM 242	Intro. to Chemical Analysis Lab. (2 cr.)
CHEM 260	Chemical Principles (3 cr.)
300-level or higher (see Directed Study Rule above)	

Civil and Environmental Engineering

CEE 211	Statics and Dynamics
CEE 212	Solid and Structural Mechanics

CEE 230	Energy and Environment
CEE 265	Sustainable Engineering Practices
300-level & above (CEE 490, see Directed Study Rule above)	

Economics

ECON 401	Intermediate Microeconomic Theory
ECON 402	Intermediate Macroeconomic Theory

ECON 406	Introduction to Econometrics
ECON 409	Game Theory

Electrical Engineering and Computer Science

EECS 203	Discrete Mathematics
EECS 250 (NA 202)	Electronic Sensing Systems

EECS 281	Data Structures and Algorithms
EECS 285	A Programming Language or Computer System (2 cr)
300-level & above (except EECS 314, 406, 410, or 495), 499 subject to Directed Study Rule	

Industrial and Operations Engineering

IOE 201	Economic Decision Making (2 cr.) [not open to students with senior standing]
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IOE 202	Operations Modeling (2 cr.) [not open to students with senior standing]
300-level & above, except 373 & 422 (490 subject to Directed study rule)	

Materials Science and Engineering

MATSCIE 220	Intro to Materials & Manufacturing
MATSCIE 242	Physics of Materials

MATSCIE 250	Principles of Engineering Materials
300-level & above (MATSCIE 490, see Directed study rule above)	

Mathematics

MATH 217	Linear Algebra*
MATH 354	Fourier Analysis and its Applications (3 cr)
MATH 395	Honors Analysis I
MATH 396	Honors Analysis II
MATH 404	Intermed. Diff. Equations and Dynamics (3 cr)
MATH 412	Introduction to Modern Algebra (3 cr)
MATH 416	Theory of Algorithms (3 cr)
MATH 417	Matrix Algebra I (3 cr)*
MATH 419	Linear Spaces and Matrix Theory (3 cr)*
MATH 423	Mathematics of Finance (3 cr)
MATH 424	Compound Interest and Life Insurance (3 cr)
MATH 433	Introduction to Differential Geometry (3 cr)

MATH 450	Advanced Mathematics for Engineers I
MATH 451	Advanced Calculus I (3 cr)
MATH 452	Advanced Calculus II (3 cr)
MATH 454	Boundary Value Problems for Partial Differential Equations (3 cr)
MATH 462	Mathematical Models (3 cr)
MATH 463	Mathematical Modeling in Biology (3 cr)
MATH 471	Introduction to Numerical Methods (3 cr)
MATH 475	Elementary Number Theory (3 cr)
MATH 476	Computational Lab. in Number Theory (1 cr)
MATH 481	Introduction to Mathematical Logic (3 cr)
MATH 490	Introduction to Topology (3 cr)
Tutoring classes are excluded.	

Mechanical Engineering

MECHENG 211	Introduction to Solid Mechanics
MECHENG 235	Thermodynamics I (3 cr.)

MECHENG 240	Introduction to Dynamics and Vibrations
MECHENG 250	Design and Manufacturing I
300-level & above (MECHENG 490 & 491, see Directed study rule above)	

Naval Architecture and Marine Engineering

NAVARCH 270	Marine Design
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300-level & above (NAVARCH 490, see Directed study rule above)	
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Nuclear Engineering and Radiological Sciences Engineering

NERS 211	Introduction to Nuclear Engineering
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NERS 250	Fundamentals of Nuclear Engineering
300-level & above, 499 subject to Directed study rule	

Performing Arts Technology (PAT dual majors ONLY)

PAT 461	Performance Systems
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Physics

Any 300-level course or above (except 333, 334, and 420) Tutoring classes are excluded	
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Statistics

STATS 406	Introduction to Statistical Computing
STATS 415	Data Mining and Statistical Learning
STATS 426	Introduction to Theoretical Statistics (3 cr.)

STATS 430	Applied Probability
STATS 470	Introduction to the Design of Experiments

*Credit will only be given for ONE of the following courses: MATH 214, 217, 417, 419, and 513

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Sample Schedule: BSE in Electrical Engineering

	Credit Hours	Terms							
		1	2	3	4	5	6	7	8
Subjects Required by all programs (55 hrs.)									
¹ Mathematics 115, 116, 215, and 216	16	4	4	4	4	-	-	-	-
ENGR 100	4	4	-	-	-	-	-	-	-
ENGR 101	4	-	4	-	-	-	-	-	-
Chemistry 125/126/130 or Chemistry 210/211	5	5	-	-	-	-	-	-	-
Physics 140 with Lab 141; 240 with Lab 241	10	-	5	5	-	-	-	-	-
Intellectual Breadth	16	4	4	4	4	-	-	-	-
Program Subjects (29 hrs.)									
EECS 215, Introduction to Circuits	4	-	-	4	-	-	-	-	-
EECS 216, Signals and Systems	4	-	-	-	4	-	-	-	-
² EECS 230, Electromagnetics I	4	-	-	-	-	4	-	-	-
EECS 280, Programming and Elem. Data Structures	4	-	-	-	4	-	-	-	-
³ EECS 320, Intro. to Semiconductor Device Theory	4	-	-	-	-	4	-	-	-
^{3,4} EECS 301 or 401, Probabilistic Methods in Engineering	4	-	-	-	-	-	4	-	-
⁵ TCHNCLCM 300	1	-	-	-	1	-	-	-	-
⁵ TCHNCLCM 496 and EECS 496	4	-	-	-	-	-	-	-	4
Technical Electives (33 hrs.)									
⁶ Flexible Technical Electives	10	-	-	-	-	3	-	4	3
⁷ Core Electives	8	-	-	-	-	4	4	-	-
⁸ Upper Level EE Technical Electives	11	-	-	-	-	-	4	7	-
⁹ Major Design Experience	4	-	-	-	-	-	-	-	4
Free Electives (11 hrs.)	11	-	-	-	-	-	4	4	3
Total	128	17	17	17	17	15	16	15	14

¹ EE students are advised to take MATH 216 before MATH 215 as EECS 216 is to be preceded or accompanied by MATH 216.

² EE students are advised to take EECS 230 no later than the fifth semester.

³ EE students are advised to take EECS 320 and EECS 301 or 401 no later than the sixth semester.

⁴ EE students may select only EECS 301 or 401 to fulfill this requirement. At most 4 credits of undergraduate probability may be applied towards the BSE-EE degree requirements. *MATH 425 will not suffice as a pre-requisite for any class that requires EECS 401.*

⁵ Technical Communication: TCHNCLCM 300 must be taken before EECS 496. It is advised to take TCHNCLCM 496 and EECS 496 concurrently with the Major Design (MDE) course.

⁶ Flexible Technical Electives (FTE): The flexible technical elective requirement may be fulfilled by taking *selected* courses in EECS, other engineering departments, biology, chemistry, economics, math, or physics. (See the list of approved courses on pages 8 and 9 of this document). All other courses must be approved by an EE program advisor. A maximum of 4 credits of EECS 499 may be applied to Technical Elective Requirements, and only in the area of Flexible Technical Electives. Anything beyond 4 credits will be applied toward Free Electives.

⁷ Core Electives: At least 8 credits from at least two categories: Communication, Control & Signal Processing (451, 455, 460), Circuits & Solid State (311 or 312), Electromagnetics/Optics (330 or 334) or Computers (270 or 370).

⁸ Upper Level EE Technical Electives: Select EECS courses from the preapproved list. At least two courses (7 credits) must be at the 400-level or higher. Excludes software courses. Credit hours in excess of 11 can be applied towards FTE.

⁹ Major Design Experience: Pre-approved courses: EECS 411, 413, 425, 427, 430, 438, 452, 470, 473; other courses that are MDEs in other engineering programs may be acceptable with prior approval of the Chief Program Advisor. It is advised that students enroll concurrently in EECS 496, TCHNCLCM 496 and the MDE course.

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General Advice

Selecting Courses

Here are some general things to remember when making your course selections:

- Do not assume that your online degree audit is accurate. Come in at least once a semester for a “check-up” to avoid unpleasant surprises.
- For students beginning the EE program in F06 or later, you must take EECS 301/401 as your probability class. **MATH 425 is no longer an option.**
- It is a bad idea to put off required classes until your last 1 or 2 semesters. Schedule conflicts between 200 & 300 level required classes and 400 level electives are common and could cause you problems in graduating or taking the elective classes you really want. Note that some courses are only offered once per year (for more information reference the past teaching schedule here: www.eecs.umich.edu/eecs/undergraduate/pastteaching.pdf).
- With this program, many courses can be taken to fulfill any one of several requirements. For example, EECS 430 may be an Upper Level Elective OR a Major Design Experience. However, you CANNOT double count the course toward both requirements. A total of 33 Technical Elective credits are required in the program (19 ULEE, 4 MDE, 10 FTE).
- Start planning for your MDE choice or choices as soon as you can. All MDEs have significant prerequisites and may be offered only once per year. Failure to plan may mean having to take an MDE you are less excited about or result in a longer time to graduation.
- Don't rely on rumors and advice from your friends when you have academic questions—**always** check with an advisor first.
- Special topics classes, such as EECS 498, may or *may not* qualify for various types of technical elective credit – consult with the EECS Undergraduate Advising Office to be sure.
- Schedule your time wisely! Remember that each EECS course will take 3 or more hours per week per credit (of work outside class)! Full-time is 12-18 hours, students need special permission from an advisor to take over 18.

College of Engineering Policies:

- **Intellectual Breadth - For students matriculated for Fall term 2011 and after, the following Intellectual Breadth requirements apply (formerly HU/SS requirements).** The courses that count toward the Intellectual Breadth requirements are complex and not always intuitive. See the CoE Bulletin for details. <http://www.engin.umich.edu/college/academics/bulletin/ug-ed/reqs#intellectualbreadth> If you have questions, please contact the EECS Undergraduate Advising Office. [Note that **Test Credit for Foreign Languages** (AP credits and credits by exam) at the 100-level count only as free electives. For more information about obtaining credit for languages, contact the appropriate department, e.g., the Asian Languages Dept. maintains information in the Chinese exam, etc.]
- **Dual degrees** You can earn a dual degree within Engineering by taking at least 14 additional credit hours of technical electives and making sure you satisfy all the requirements for each program. You can double count some requirements across degrees, but the 142-credit minimum (i.e., 128 first degree requirement + 14 additional credits for second degree) must be maintained.
- **Pass/Fail** is only allowed for HU/SS and free electives. The limit on pass/fail is 14 credits total and a maximum of 2 pass/fail courses per term (1 during half-terms like Spring or Summer). This can be a good way to maintain a good GPA during difficult semesters.
- **Transfer credit:** The College of Engineering maintains a list of approved transfer courses from many other institutions at <http://www.engin.umich.edu/transferdatabase>. Courses that do not appear on this list may still transfer but will need to be reviewed. Please contact the EECS Undergraduate Advising Office with questions about EECS transfer credit (note that it is very rare to receive transfer credit for any Upper Level EE course). *You will need to take 50 credits hours (including 30 hours of 300-level or above of technical credits) on the Ann Arbor campus in order to earn an Electrical Engineering degree from UM-Ann Arbor.*

Fall 2009 – Summer 2013 Electrical Engineering Program Research & Involvement Opportunities

Majoring in Electrical Engineering at UM provides many exciting opportunities. These include:

Research: Participate in an Independent Study.

You can get involved in research as an undergraduate, which will provide you with extraordinarily valuable training for future work in the field. EECS 499 (independent study) counts as a Flexible Technical Elective (4 cr. max.). It is usually most valuable to do a 499 relatively late in your program, when you have acquired knowledge and skills that contribute to the work, and have a clearer picture of what areas you are most interested in. EECS 499 coursework is arranged directly between students and faculty members - if one of your professors is doing work that is interesting to you, approach him or her to discuss this possibility.

Teaching: Become an Instructional Aid.

Undergraduates primarily lead discussions and lab sections of EECS 182, EECS 183, EECS 215, EECS 270, EECS 280, and ENGR 100 (CSE-base). As a section leader, you will have the chance to teach the next generation of majors and get them excited about computing. If you have done well in your courses and have an aptitude for and interest in teaching, you should contact the faculty covering the course.

Mentoring: Become a Peer Advisor.

Share your experiences with other undergraduates. If you are interested, check in with the Undergraduate Advising Office regarding the application process.

Getting Involved: Join an EECS Student Group.

gEECS: (Girls in Electrical Engineering and Computer Science) gEECS was founded for the purpose of bringing women in electrical engineering, computer engineering, and computer science together to provide a professional, social, and academic support network. In an effort to promote the education and success of technologically inclined women, gEECS involves women ranging from middle school girls to graduate students. <http://www.umich.edu/~geecs/>

IEEE: The Institute of Electrical and Electronics Engineers is the world's largest technical professional society and the Michigan student branch was founded in 1904. IEEE sponsors technical talks and supports the dB café. <http://ieee.eecs.umich.edu/>

CSE Scholars: CSE Scholars is a student society for CS-Eng, CS-LSA, and CE students. CSE Scholars seeks to build a challenging and supportive diverse community of scholars. The group is organized into "Working Groups" which perform different functions for the group. <http://www.eecs.umich.edu/~cseschol>

HKN: Eta Kappa Nu is an honor society for electrical and computer engineering students (including CS-Eng. majors). Members are selected on the basis of scholastic standing, character, and leadership. <https://hkn.eecs.umich.edu/>

CoE Student Groups: These groups offer many opportunities for students to make a difference in the community, their profession and on campus (EE students can get involved with any CoE student team – here are a few groups that EE students might find particularly interesting):

- **Solar Car:** An entirely student-run organization that designs and builds solar-powered vehicles. The team races both nationally and internationally. <http://solarcar.engin.umich.edu/>
- **Baja Racing:** Students build a prototype off road vehicle intended for mass production and sale as a safer alternative to an ATV. <http://www.umich.edu/~baja/>
- **Michigan Autonomous Aerial Vehicles (MAAV):** A student competition team with the goal of entering and winning the International Aerial Robotics Competition (IARC). <http://maav.engin.umich.edu/>

Getting Experience: Learn About Internships, Co-Ops, and Job Opportunities.

When looking for that perfect internship, co-op, or permanent job, your first step should always be to check in with the Engineering Career Resource Center (ECRC) to review their list of opportunities. The department forwards all job and internship postings to this office and the ENGenius system (<http://career.engin.umich.edu>). The Winter Job Fair is a great place to interview for internships, be sure to register through the ECRC!

The Michigan Embedded Systems Hub (<http://www.eecs.umich.edu/hub/>) is a great place to learn about the basics of embedded systems (embedded programming, soldering, and board design) and to get help with projects. It offers a number of introductory lessons and there are office hours for getting help with personal projects.

Mental Health.

If you are feeling stressed, depressed or just need someone to talk to, there are many places to find support on campus. See http://www.rackham.umich.edu/student_life/health_and_wellness/resources/mental_health/ for more information.

Unofficial CoE Student Advising Form - EE

For advising only; NOT official audit. Students -- consult with your advisor to confirm course selections satisfy degree requirements.

Last Name: _____	First Name: _____	Emplid: _____	Unique ID: _____	GPA: _____	CTP: _____	Elected Hrs: _____
Req Term: _____	Minor(s): _____	Honor(s): _____	Dual: _____	Subplan: _____	As of: _____	

Common Requirements (CoE)

Units Required: <u>36-39</u> Units (In Progress and Earned): <u>0</u>						
<input type="checkbox"/> Math115	<input type="checkbox"/> Engr100	<input type="checkbox"/> Chem 130 or 210	<input type="checkbox"/> Physics140			
<input type="checkbox"/> Math116	<input type="checkbox"/> Engr101	<input type="checkbox"/> Chem 125/126 or 211	<input type="checkbox"/> Physics141			
<input type="checkbox"/> Math215			<input type="checkbox"/> Physics240			
<input type="checkbox"/> Math216			<input type="checkbox"/> Physics241			
<input type="checkbox"/> 50 units minimum residency taken at UM-AA campus						
Category	Subject	Nbr	Sctn	Units	Term	Grade Note

Program Subjects (Prog)

Units Required: <u>29-28</u> Units Earned: <u> </u> Major GPA: <u> </u>						
<input type="checkbox"/> EECS215	<input type="checkbox"/> EECS280	<input type="checkbox"/> EECS496				
<input type="checkbox"/> EECS216	<input type="checkbox"/> EECS320	<input type="checkbox"/> TCom300				
<input type="checkbox"/> EECS230	<input type="checkbox"/> EECS401	<input type="checkbox"/> TCom496				
<input type="checkbox"/> 30 units 300 or higher tech courses taken at UM-AA while enrolled in CoE						
Category	Subject	Nbr	Sctn	Units	Term	Grade Note

Core Electives (CoreElec)

Units Required: <u>8</u> Units Earned: <u> </u> (One course from two categories) <u>8</u>						
Category	Subject	Nbr	Sctn	Units	Term	Grade Note

Intellectual Breadth

<input type="checkbox"/> Units Required: 16 Units Earned: <u> </u>						
<input type="checkbox"/> 3 units of Humanities			<input type="checkbox"/> Upper Div (3 units min)			
Category	Subject	Nbr	Sctn	Units	Term	Grade Note

Upper Level EE Electives and MDE (ULEEElec.MDE)

Units Required(ULEE): <u>11</u> Units Earned: <u> </u> <input type="checkbox"/> 300 Lvl <input type="checkbox"/> 400 Lvl						
Units Required (MDE): <u>4</u> Units Earned: <u> </u> <input type="checkbox"/> MDE						
Category	Subject	Nbr	Sctn	Units	Term	Grade Note

General Electives (General)

Units Required: <u>11</u> Units Earned: <u> </u> <input type="checkbox"/> 128 Credits Toward Prog Req						
Category	Subject	Nbr	Sctn	Units	Term	Grade Note

Flexible Technical Electives (FlexTech)

Units Required: <u>10</u> Units Earned: <u> </u>						
Category	Subject	Nbr	Sctn	Units	Term	Grade Note

Courses not eligible or not used for credit (NFC)

Category	Subject	Nbr	Sctn	Units	Term	Grade Note

Advisor: _____ Date: _____