University of Wisconsin – Milwaukee

College of Engineering and Applied Science

COMPUTER ENGINEERING CURRICULUM

The typical number of credits required to complete the Bachelor of Science in Engineering with a major in Computer Engineering is 126 credits. Students who need background preparation courses may need additional credits. See information below regarding placement examinations.

Engineering Core Courses (10 credits)		**Credits**	**Prerequisite**
EAS 200	Professional Seminar	1	Soph. St.
CompSci 201	Introductory Computer Programming	3	Math 105 (P)
ElecEng 301	Electrical Circuits I	3	Physic 210 (C), ElecEng 234 (C)
IndEng 360	Engineering Economic Analysis	3	Jr St

Computer Engineering Major (58 credits)			
CompSci 251	Intermediate Computer Programming	4	CompSci 201(P)
ElecEng 305	Electrical Circuits II	4	ElecEng 301 (P), ElecEng 234 (P)
ElecEng 310	Signals and Systems	3	ElecEng 305 (P)
CompSci 315	Introduction to Computer Organization and Assembly Language Programming	3	CompSci 201(P)*, Math 211(P), 226(P), or 231(P)
CompSci 317	Discrete Information Structures	3	CompSci 201(P)*, Math 226(P) or 231(P)
ElecEng 330	Electronics I	4	ElecEng 305 (P)
ElecEng 335	Electronics II	4	ElecEng 330 (P) or 331 (P), ElecEng 310 (P)
CompSci 351	Data Structures and Algorithms	4	CompSci 251(P)*
ElecEng 354	Digital Logic	3	CompSci 151 (P) or 152 (P) or 153 (P) or 201 (P) or 315 (P)
ElecEng 367	Introduction to Microprocessors	4	ElecEng 354(P), CompSci 151(P) or152 (P) or 153 (P) or 201
ElecEng 457	Digital Logic Laboratory	3	Jr St, ElecEng 330(P),or 331(P),354(P)
CompSci 458	Computer Architecture	3	CompSci 315 or ElecEng 354
CompSci 490	Ethics, Society, Profession	3	Jr. St.
CompSci 520	Computer Networks	3	CompSci 315 or Elec Eng 367
CompSci 535	Algorithm Design and Analysis	3	CompSci 317(P), 351(P)*
CompSci 536	Introduction to Software Engineering	3	Jr. St., CompSci 251(P)
CompSci 537	Introduction to Operating Systems	4	CompSci 315(P)*, 317(P)*, 431(P) or 535(P)

* C or better in Computer Science prerequisites

***Mathematics (14 - 16 credits)**		(16 credits typical: Math 231,232,233, ElecEng 234)
One of the following **Calculus** sequences must be completed:		
Math 231-232-233	12	Math placement or previous course with at least "C" grade.
Or Math 221- 222 (Honors)	10	
And ElecEng 234 (Analytical Methods in Engineering)	4	Math 232 (P)

***Chemistry (5 - 10 credits)**	
One of the following sequences must be completed:	
Chem 105 (5 cr., Suggested) or Chem 102 -104 (10 cr.)	Chem 100 with "C" grade or Chemistry placement test

Physics (8 credits)	
Physics 209 – 210	Physics 209: Math 232 Physics 210: Math 233 (C)

General Education Requirements (15 credits)

Distribution Requirements

Art	3	none
Humanities	6	none
Social Science	6	none

One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.

(Commun 103 Public Speaking or Commun 105 Business and Professional Communication are recommended as part of the distribution requirements.)

Competency Requirements

***English Composition (0-6 credits)**

The English Composition requirement is satisfied by:

1. Earning a satisfactory score on the English placement test, or
2. Earning a grade of C or higher in English 102

Foreign Language (0-8 credits) (for new freshman starting fall 1999)

The foreign language requirement can be completed with one of these options:

1. Two years of a single foreign language in high school
2. Two semesters of a single foreign language in college
3. Demonstrate ability by examination

***Placement Examinations**

Once admitted to UWM, most engineering students are required to take placement examinations in mathematics, English and chemistry. Students with previous college level credits in these areas may not be required to take placement exams. The placement exams are administered by the UWM Testing Center, Mellencamp Hall, room B28, (414) 229-4689. The results of these tests help students determine the appropriate course in which to register. Background prerequisite courses may be required in addition to the courses listed above. Possible Math placements for engineering students are Math 090-095-105-116-117-231. Possible English placements are English 090-095-101-102. Possible Chemistry placements are Chemistry 100, 102 or 105.

Effective Fall 2007

Technical Electives Computer Engineering Major. (16 credits)

Choose from the following lists.

Group A Technical Electives:
Select 12 credits from the following list.

		Credits	Prerequisite
EAS 001	Co-op Work Period	3[1]	none
ElecEng 361	Electromagnetic Fields	3	Physics 210 (P), ElecEng 234 (P)
ElecEng 410	Principles of Discrete Systems & Digital Signal Processing	3	Jr St, ElecEng 310(P)
CompSci 417	Introduction to the Theory of Computation	3	CompSci(P) 317*, Math 221(P) or 232(P)
ElecEng 420	Random Signals and Systems	3	JrSt, ElecEng 310 (P)
ElecEng 421	Communication Systems	3	ElecEng 335(C) or 332(P)
CompSci 422	Introduction to Artificial Intelligence	3	CompSci 317(P)*, 351(P)*
CompSci 423	Introduction to Natural Language Processing	3	CompSci 351(P)*, 417(P)
ElecEng 429	Wireless Communication Systems	3	Jr St, ElecEng 234(P)
CompSci 431	Programming Languages Concepts	3	CompSci 351(P)*
ElecEng 436	Introduction of Medical Instrumentation	3	Jr St, ElecEng 330(P)
ElecEng 437	Introduction to Biomedical Imaging	3	Sr St, ElecEng 310 (P)
ElecEng 451	Introduction to VLSI Design	3	Jr St, ElecEng 330(P) or 331(P), 354(P)
CompSci 459	Fundamentals of Computer Graphics	3	Jr St, ElecEng 234(P); CompSci 251 (P) or 351(P)
ElecEng 461	Microwave Engineering	3	Jr St, ElecEng 361(P)
ElecEng 462	Antenna Theory	3	Jr St, ElecEng 361(P)
ElecEng 465	Broadband optical networks	3	Jr St, ElecEng 305(P), 361(P)
CompSci 469	Introduction to Computer Security	3	CompSci 201(P)*, 317(P)
ElecEng 474	Introduction to Control Systems	4	Jr St, ElecEng 310(P) , Civ Eng 202 or cons instr
ElecEng 490	Special Topics	1-3	Jr St
CompSci 530	Computer Networks Laboratory	3	CompSci 520
ElecEng 541	Integrated Circuits and Systems	3	Jr St, ElecEng 330(P) or 331(P)
CompSci 552	Object Oriented Programming	3	CompSci 431(P)
CompSci 557	Introduction to Database Systems	3	CompSci 315(P),351(P)
ElecEng 561	Microwave Solid State Circuit Design	3	Sr St, ElecEng 330(P) or 331(P)
ElecEng 562	Telecommunication Circuits	3	Sr St, ElecEng 330(P) or 331(P)
ElecEng 565	Optical Communication	3	Sr St, ElecEng 361(P), 335(C) or 332(C)
ElecEngr 572	Power Electronics	3	Sr. St, ElenEng 335(C) or 332(C)
ComSci 581	Web Languages and Standards	3	CompSci 431(P), 417(P)
CompSci 654	Introduction to Compilers	4	CompSci 417(P), 431(P)
CompSci 657	Topics in Computer Science	1-4	variable
CompSci 699	Independent Study	1-3	variable
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209(P)
MechEng 321	Basic Heat Transfer	4	Jr. St., MechEng 301

*C or better in prerequisite.

Group B Technical Elective
Choose 4 credits from the following list.

ElecEng 595	Capstone Design Project	4	Sr. St., ElecEng 335(P) or 332(P), ElecEng 367(P)
CompSci 595	Capstone Design Project	4	Sr. St., CompSci 458(P),536(P)

[1]Students who earn **3 or more** credits of Co-op may use 3 of those credits as approved technical electives.

CompSci 490: Ethics, Society, Profession, 3 CR
Critical examination of ethical problems associated with computer engineering. Discussion of these problems is conducted within the framework of classical philosophical ethical theories. Legal and quasi-legal (i.e.,policy and regulative) issues are also considered. Topics addressed include the process of ethical decision-making, privacy and confidentiality, computer crime, professional codes and responsibilities, software piracy, the impact of computers on society.
Prerequisites:Junior standing

CompSci 595: Capstone Design Project, 4 CR.
Individually defined projects oriented toward providing experience in establishment of objectives and criteria, synthesis, analysis, construction, testing, and evaluation; development of student creativity through the solution of open-ended problems; individual instruction in design methodology.
Prerequisites: CompSci 458, CompSci 536

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