Computer Engineering 445000BS

The following information has official approval of the **College of Engineering**, but is intended only as a supplemental guide. Official degree requirements are established at the time of transfer and admission to the degree-granting college. *Completion of this degree within the identified time frame below is contingent upon many factors, including but not limited to: class availability, total number of required credits, work schedule, finances, family, course drops/withdrawals, successfully passing courses, prerequisites, among others.* The transfer process is completed through an appointment with your academic advisor.

Italicized courses fulfill General Education requirements. Unless a course is specified, refer to the General Education guide at http://www.uakron.edu/advising/docs/General_Education_Guide.pdf

1st Year	**Fall Semester**	Credit Hours	Prerequisites
3150:151	*Principles of Chemistry I (Lecture and Recitation)(Natural Science Requirement)*	3	Placement into 3450:149 (Precalculus) or higher
3150:152	*Principles of Chemistry I Lab (Natural Science Requirement)*	1	3150:151 corequisite
3450:221	*Analytic Geometry-Calculus I*	4	Placement test or 3450:149 (PreCalculus)
4450:101	Tools for Computer Engineering (Lect and Lab)	3	3450:149 (PreCalculus) or higher, corequisite
	Physical Education Requirement	1	
	English Composition I Requirement	3	Appropriate placement by adviser
Total		**15**	

1st Year	**Spring Semester**		
3450:208	Discrete Math	4	3450:145 (College Algebra) or 3450:149 (PreCalculus) with C- or better
3650:291	*Elementary Classical Physics I (Lecture and Lab) (Natural Science Requirement)*	4	3450:221
3450:222	Analytic Geometry-Calculus II	4	3450:221 with C- or better
4450:220	Digital Logic Design (Lecture and Lab)	4	4400:101 or 4450:101
	English Composition II Requirement	3	3300:111 or equivalent
Total		**19**	

2nd Year	**Fall Semester**		
3450:223	Analytic Geometry-Calculus III	4	3450:222 with C- or better
3650:292	Elementary Classical Physics II (Lab)	4	3650:291
4400:230	Circuits I Lab	1	4400:231 corequisite
4400:231	Circuits I	3	4400:230, 3450:223, 3650:292 corequisites
3460:209	Computer Science I	4	3450:145 (College Algebra) or 3450:149 (PreCalculus), or 3450:208 or 3450:215 (Concepts of Calculus), or 3450:221 or 222 with a C- or better
	Speech/Oral Communication Requirement	3	
Total		**19**	

2nd Year	**Spring Semester**		
3460:210	Computer Science II (Lecture and Lab)	4	3450:208 and 3460:209 with a C- or better
4450:320	Computer Systems	3	3460:209 or 4450:208(Programming for Engineers), 4450:220 (Digital Logic Design) or 3450:208
3450:335	Introduction to Ordinary Differential Equations	3	3450:223 with C- or better
4400:330	Circuits II Lab	1	4400:332 corequisite
4400:332	Circuits II	3	4400:231 prerequisite; 4400:330, 3450:335 corequisites
3400:210 **or** 3400:211	*Humanities in the Western Tradition* ***-OR-*** *Humanities in the World since 1300*	4	32 credit hours and 3300:112 equivalent 32 credit hours and 3300:112 equivalent
Total		**18**	

3rd Year	Fall Semester		
4400:340	Signals & Systems	4	4400:332, 4450:208 **or** 3460:209, 3450:335
4450:325	Operating Systems Concepts	3	4450:320 and 3460:210
4400:360	Physical Electronics	3	4450:220, 4400:332
4450:422	Embedded Systems Interfacing (Lect and Lab)	3	4450:208 or 3460:209, prerequisites 4400:360, corequisite
	Social Science Requirement	3-4	
Total		**16-17**	

3rd Year	Spring Semester		
4450:309	Design Project Seminar	1	64 credits and permission
4450:367	VLSI Design	3	4400:360
4450:420	Computer System Design	3	4450:320
4450:427	Computer Networks	3	4450:320, and 4450:325 or 3460:426
4450:440	Digital Signal Processing	3	4400:340
Total		**13**	

3rd Year	Summer Semester		
3470:401	Probability and Statistics for Engineering	2	3450:222
	Area Studies/Cultural Diversity Requirement	2-3	
	Social Science Requirement	3	
Total		**7-8**	

4th Year	Fall Semester		
4450:401	Senior Design Project I	2	96 credits, 4450:309. Completion of 4450:367, 4450:420, 4450:427 and 4450:440 with a combined average grade of 2.0 or higher
	Computer Engineering Electives (Note a)	3	
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	Computer Engineering Electives (Note a)	3	
	Humanities Elective Requirement	3	
Total		**14**	

4th Year	Spring Semester		
4450:402	Senior Design Project II	3	4450:401
	Computer Engineering Electives (Note a)	3	
	Computer Engineering Electives (Note a)	3	
	Computer Engineering Electives (Note a)	3	
	Humanities Elective Requirement	3	
Total		**15**	

	Minimum Total Credits for Degree	**137**	

ALERT: 1) By the end of your first 48 credit hours attempted, you should have completed your General Education English, Math, and Oral Communication (Speech) requirements; 2) By the end of your first 48 credit hours attempted, you should have declared a major and transferred to (been accepted by) a degree granting college at The University of Akron.

NOTES:

a. The BS in Computer Engineering requires 18 credits of technical elective. The elective courses must be chosen so as to meet:
   1. Breadth requirement: The electives must include at least three credits each from three of the following four computer engineering areas of specialization.
   2. Depth requirement: The electives must include at least six credits from a single area of specialization.

Computer Engineering Areas of Specialization

Analog and Digital Hardware (AD)
Fa 4450:462 Analog IC Design Fa
4450:465 Programmable Logic
Fa 4450:467 VLSI Circuits & Systems
Sp 4400:361 Electronic Design

Communications and Sig. Proc. (CM)
Fa 4400:441 Digital Communication
Sp 4400:341 Intro to Comm. Systems
Sp 4400:445 Wireless Communication
Sp 4400:451 Electromagnetic Compatibility

Numerical Computation (NC)
Fa 3450:427 Applied Numerical Methods I
Fa 4450:410 Embedded Sci. Computing
Sp 3450:428 Applied Numerical Methods II
Sp 4450:415 System Simulation

Software and Algorithms (SW)
3460:316 Data Structures
3460:453 Computer Security
3460:457 Computer Graphics
3460:460 AI and Heuristic Programming
3460:477 Intro. Parallel Processing

Remaining electives may be any course listed in the areas of specialization, or included in the following list:

Computer Engineering Open Electives
Fa 4400:353 Electromagnetics I
Fa 4400:381 Energy Conversion
Fa 4400:453 Antenna Theory
Fa 4400:472 Control Systems II
Fa 4400:481 Modern Power Systems
Fa 4400:483 Power Electronics I
Fa 4400:489 Electric and Hybrid Vehicles
4400:498 Special Topics in EE
4450:498 Special Topics in CpE
Su 4400:469 Intro to Sensors and Actuators
Sp 4400:354 Electromagnetics II
Sp 4400:371 Control Systems I
Sp 4400:434 Active Circuits
Sp 4400:448 Optical Comm. Networks
Sp 4400:461 Optical Elect & Photonic Dev.
Sp 4400:485 Electric Motor Drives
4450:301 Undergrad. Research I CpE
4450:302 Undergrad. Research II CpE
4450:303 Undergrad. Research III CpE

Of the 18 total credits of technical elective listed above, at least nine credits must be from the ECE department. All course prerequisites must be met.

Faculty Advisor: Dr. Abbas Omar, e-mail aomar@uakron.edu 330-972-7483, ASEC Room 157

IN GENERAL: Computer engineering applies computer technology along with traditional engineering science to address systems in which computing is an essential function. Such systems include the smart device or instrument, the flexible manufacturing system, and communication systems that characterize the information age. Computer engineering covers a demanding range of science and technology, combining software with hardware, and the discrete with the continuous.

3300:112 English Composition II is preferred, however 2020:222 Technical Report Writing will be accepted.

SALARY LEVEL: Starting salary offers for new graduates range from $44,000 to $67,000 per year. The average is $56,000.

COOPERATIVE EDUCATION: Students can choose between a five-year program, which includes up to four semesters of co-op experience, or a four-year program without co-op experience. The Co-op Program provides an opportunity to gain real-world, relevant experience while working toward a bachelor's degree. Students who participate in the Co-op Program earn money to help fund their education, graduate with 12 or more months of career-related experience, and often receive a higher starting salary after graduation. More information about the Co-op Program can be found at engineering.uakron.edu/coop.

TRANSFER TO COLLEGE OF ENGINEERING: To be admitted to the college, the student must:

- Complete at least 30 semester hours of coursework post high school
- Complete Calculus 2 with a C- or higher
- Have a 2.3 grade point average in at least three of the following categories:
  - in all coursework
  - in all engineering coursework
  - in all required mathematics coursework
  - in all required science coursework (chemistry, physics, computer science, biology)

Admission of students who do not meet the above requirements will be considered by the dean or representative only if the request originates by an Engineering department head or representative.

Students can arrange inter-college transfers through an appointment with their academic advisor; advisor contact information is listed in “My Akron.”

WOMEN AND MINORITY ENGINEERS: Eligible students are invited to register into the applicable engineering course elective. There are two options; 4100:110, Women in Engineering Seminar & Peer Group (Contact: Heidi Cressman, 330-972-7701, or hec9@uakron.edu). This course provides beginning women students an overview of the career opportunities for women in engineering. The course introduces relevant topics in engineering, an overview of career opportunities, student led discussion groups and an opportunity to meet with professionals in various engineering disciplines. The other option is 4100:120, Minority Engineering Seminar and Peer Groups (Contact: Julie Zhao, 330-972-2823, or zhao1@uakron.edu). This course provides an overview of disciplines and opportunities in engineering. It also reinforces educational/ career choices and provides role models of successful minority engineers.

PLACEMENT: The Engineering Co-op and Placement Office, ASEC 203, Akron, Ohio 44325 assists all graduates with full-time placement.

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