

University of Wisconsin – Milwaukee

College of Engineering and Applied Science

COMPUTER SCIENCE

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Computer Science is 120 credits. Students who need background preparation courses in math, English, and chemistry may need additional credits. See information below regarding placement exams.

^Computer Science Requirements (50 credits)		Credits	Prerequisite
CompSci 150	Survey of Computer Science (recommended only)	3	None
CompSci 250	Introductory Computer Programming	3	Math 116 or 211
CompSci 251	Intermediate Computer Programming	3	CompSci 250*, Math 116 or 211
CompSci 315	Introduction to Computer Organization & Assembly Language Programming	3	CompSci 250, Math 116 or 211
CompSci 317	Discrete Information Structures	3	CompSci 250, Math 221*, 226 or 231*
CompSci 337	Systems Programming	3	CompSci 251*
CompSci 351	Data Structures & Algorithms	3	CompSci 251*, Math 116 or 211
CompSci 361	Introduction to Software Engineering	3	CompSci 351*, GER English
CompSci 395	Social, Professional & Ethical Issues	3	Soph St
CompSci 417	Introduction to the Theory of Computation	3	Jr St, CompSci 317*, Math 221or 232
CompSci 431	Programming Languages Concepts	3	Jr St, CompSci 351*
CompSci 458	Computer Architecture	3	Jr St, CompSci 315 or ElecEng 367, 354
CompSci 520	Computer Networks	3	Jr St, CompSci 315 or 458 or ElecEng 367
CompSci 535	Algorithm Design & Analysis	3	Jr St, CompSci 317*, 351*
CompSci 537	Introduction to Operating Systems	3	Jr St, CompSci 337, CompSci 458 or ElecEng 458
CompSci 595	Capstone Project	4	Sr St, CompSci 361, 458, 535, 537
EAS 200	Professional Seminar	1	None
ElecEng 354	Digital Logic	3	CompSci 240 or 250

^^Mathematics Requirements (4 credits)		
Complete one of the following courses:		
Math 211	Survey in Calculus and Analytic Geometry	4 Math Placement Level B
Math 213	Calculus with Life Sciences Applications	4 Math Placement Level A
Math 221	Honors Calculus I	5 Math Placement Level A+
Math 231	Calculus & Analytic Geometry I	4 Math Placement Level A

^^Natural Science Requirements (12 credits including at least 1 laboratory credit)		
Must include one of the following sequences:		
BioSci 150 - 152	Foundations of Biology I & II	8 Chem Placement, Chem 100 or 102
BioSci 202 - 203	Anatomy & Physiology I & II	8 None
Chem 102 - 104	General Chemistry I & II	10 Math 105*or 108*, or Chem 100* or Chem Placement
Physics 120 –122	General Physics I & II	8 Math Placement, Physics 100*
Physics 209 –210	Physics I & II	8 Math 227(C), 228(C), or 232 (C)
Remaining credits to be chosen from the Natural Science GER list, except that CompSci 150, Math and MathStat courses may not be used as part of the Natural Science Requirement.		

General Education Requirements		
<i>Distribution Requirements (15 credits)</i>		
Art		3
Humanities		3
Social Science		3
English 310	Writing, Speaking & Technoscience in the 21 st Century	3 English Competency
Commun 105	Business & Professional Communication	3 None
Cultural Diversity - One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.		
<i>Competency Requirements</i>		
^^English Composition (0-6 credits)		
The English Composition requirement is satisfied by one of the following:		
1. Earning a satisfactory score on the English placement test. 2. Earning a grade of C or higher in English 102. 3. Transferring with a grade of C or better in a course (3 credits or more) equivalent to English 102 or higher level expository writing course.		
Foreign Language (0-8 credits)		
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		

***C or better in prerequisite** (C) Concurrent Enrollment in Designated Course

^Advancement to Major: 1. Completion of the following courses, each with a minimum C grade in each course: Math 231, 232, CompSci 250, 251, 315, 317 and ElecEng 354. 2. Complete EAS 200 Professional Seminar. 3. Complete the English composition requirement. 4. Obtain a 2.33 GPA in all courses in item 1. **The program may impose major status as a prerequisite for courses number 400 or above.**

^^Placement Examinations: Students without previous college level credits in Math, Chemistry or English may be required to take placement exams. The results of these tests determine the appropriate course in which to register. Background prerequisite courses may be required in addition to the courses listed above.

Technical Electives – Computer Science Major

The Computer Science program requires a total of 15 credits of technical electives, chosen as follows.

All non-required CompSci courses number 400-699 are either Computer Science or Applied Technology Electives.

The Applied Technology Electives are in range 480-489. All other non-required CompSci courses in the 400-699 range are Computer Science Electives. A minimum of 6 credits must come from the Computer Science Electives.

Computer Science Electives (Select 9 to 15 credits from this list)		Credits	Prerequisite
CompSci 422	Introduction to Artificial Intelligence	3	Jr St, CompSci 317*, 351*
CompSci 423	Introduction to Natural Language Processing	3	Jr St, CompSci 351*
CompSci 425	Introduction to Data Mining	3	Jr St, CompSci 251, Math 221 or 232
CompSci 438	Software Engineering Laboratory	(1 – 6)	Jr St, CompSci 251*
CompSci 444	Intro to Text Retrieval & Its Applications in Biomedicine	3	Jr St, CompSci 351 or HCA 442
CompSci 459	Fundamentals of Computer Graphics	3	Jr St, CompSci 251, Math 232
CompSci 469	Introduction to Computer Security	3	Jr St, CompSci 251*, 317*
CompSci 511	Symbolic Logic	3	Jr St, Phil 212 or 6cr 300 math
CompSci 530	Computer Networks Laboratory	3	Jr St, CompSci 520
CompSci 536	Software Engineering	3	Jr St, CompSci 251*
CompSci 552	Advanced Object Oriented Programming	3	Jr St, CompSci 351*, 361*
CompSci 557	Introduction to Database Systems	3	Jr St, CompSci 251, 315
CompSci 581	Web Languages & Standards	3	Jr St, CompSci 417, 431
CompSci 599	Senior Thesis	3	Sr St, Cons Instr
CompSci 654	Introduction to Compilers	3	Jr St, CompSci 431, 655(C)
CompSci 655	Compiler Implementation Laboratory	3	Jr St, CompSci 431, 654(C) or 754(C)
CompSci 657	Topics in Computer Science	(1 – 4)	Variable
CompSci 699	Independent Study	(1 – 3)	Variable
ElecEng 367	Introduction to Microprocessors	4	CompSci 240 or 250, ElecEng 354*
ElecEng 451	Introduction to VLSI Design	3	Jr St, ElecEng 330, 354
ElecEng 457	Digital Logic Laboratory	3	Jr St, ElecEng 330, 354
Applied Technology Electives (Select 0 to 6 credits from this list)			
CompSci 481	Server-Side Internet Programming	3	CompSci 113(C), InfoSt 240(C), or Art 324(C)
CompSci 482	Rich Internet Applications	3	CompSci 361 or 481
CompSci 658	Topics in Applied Computing	3	Variable
Supplemental Electives (Select 0 to 6 credits from this list)			
Bus Adm 490	Entrepreneur Internship	3	Jr St, Bus Adm 295 or 497
EAS 001	Engineering Co-Op Work Period	(1 – 3)	Prior Cons Co-Op Dir
EAS 497	Study Abroad	(1 – 3)	Acceptance to Study Abroad Program
English 206	Technical Writing	3	GER English

Applied Mathematics Electives (Select 9 credits from this list)

May not include both Math 234 and ElecEng 234

Math 232	Calculus & Analytic Geometry II	4	Math 231*
Math 233	Calculus & Analytic Geometry III	4	Math 232*
Math 234	Linear Algebra & Differential Equations	4	Math 232*
Math 240	Matrices & Applications	3	Math Placement A or 200-level*
Math 305	Introduction to Mathematical and Computational Math	3	Math 211* and one addl 200-level math; or 231*
Math 313	Linear Programming and Optimization	3	Math/ElecEng 234* or 240*
Math 315	Mathematical Programming and Optimization	3	234* or 240*; and Math 211* or 233*
Math 320	Introduction to Differential Equations	3	Math 232*, 240*; or 234*
Math 405	Mathematical Models and Applications	3	Math 211* or 231* and Math/ElecEng 234* or 240*
Math 431	Modern Algebra with Applications	3	Jr St, Math 232
Math 451	Axiomatic Geometry	3	Jr St, Math 232(C), 341
MthStat 361	Introduction to Mathematical Statistics I	3	Jr St, Math 233
MthStat 469	Biostatistics	3	Jr St, elementary stats course
MthStat 563	Regression Analysis	3	MthStat 467 or 362
ElecEng 234	Analytical Methods in Engineering	4	Math 232*
Ind Eng 367	Intro Statistics for Physical Sciences & Engineering	3	B- or better Math 211 or 213; C or better Math 221 or 231

May include only one of Math 240, Math 234, ElecEng 234

May include only one of Math 320, Math 234, ElecEng 234

Free Elective Courses (Variable credits)

University level courses of your choice as needed to reach a minimum of 120 total credits.

*C or better in prerequisite

(C) Concurrent Enrollment in Designated Course

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