

COMPUTER SCIENCE DEPARTMENT

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

**Department of Computer Science
College of Engineering
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This degree program is offered by the Computer Science Department within the College of Engineering. The curriculum offers two focus areas including information systems and media technologies. Career opportunities include database administration, web design, cyber security, game development, film production, and more.

To receive the Bachelor of Science Degree in Information Technology, the candidate must successfully complete 120 semester hours of credit including the following distribution: Computer Science (CS) course requirements - 27 hours of CS core courses, 24 hours of Information Technology (IT) courses, 12 hours of related math and business courses, 15-22 hours of courses in a minor and any remaining hours for elective courses. General Education requirements (30-33 hours) - English 1000, 9-12 hours of science, 9 hours of Social/Behavioral Sciences, and 9 hours of Humanities and Fine Arts. The student must complete at least 30 credit hours at the 3000 level or above.

The BS IT degree requires the completion of at least 9 hours of mathematics and statistics including 3 hours of calculus. An IT student can earn a minor in a related area outside of IT/CS. Examples include art, business, film studies, geography, journalism, mathematics, philosophy, theatre, etc.

Information Technology students must earn a C-range grade or better in all IT/CS courses that are prerequisites for other IT/CS courses that the student takes. To graduate, a student must earn a cumulative UM grade point average of 2.0 or better and a 2.0 grade point average or better in all courses that have an MU engineering prefix. See the MU Undergraduate Catalog for additional graduation requirements.

While working toward their degrees, many students participate in cooperative education or internship programs. In doing so, they gain valuable professional experience and are given opportunities to utilize unique commercial hardware and software systems beyond those available on campus. Many students are offered full-time positions with their employer upon graduation. The Engineering Career Services Office, W1025 Lafferre Hall, can assist students in searching for employment opportunities and for internship/co-op positions.

REQUIREMENTS FOR A BS DEGREE IN INFORMATION TECHNOLOGY - 120 hours

The minimum university requirements for students pursuing the Bachelor of Science Degree in Information Technology are listed below. A total of 120 hours are required. Courses in parentheses are prerequisites for the course listed.

Core Curriculum (63 hours)

Computer Science Courses (27 hours)

CS 1000	Introduction to Computer Science	1
CS 1040	Introduction to Problem Solving and Programming	3
CS 1050	Algorithm Design & Programming I (Math 1100 & CS 1040/entrance exam)	3
CS 2050	Algorithm Design & Programming II (CS 1050)	3
CS 2830	Introduction to the Internet, WWW and Multimedia Systems (CS 2050).....	3
CS 3310	Systems Analysis I – Writing Intensive (CS 2050 and English 1000)	3
CS 3380	Database Applications and Information Systems (CS 2050)	3
CS 4320	Software Engineering I (CS 3310).....	3
CS 4970	Senior Capstone Design I – Writing Intensive (CS 4320 and senior standing).....	3
CS 4980	Senior Capstone Design II (CS 4970)	2*

*Note: Students who began the program before Fall 2006 will not be required to take CS 4980.

Core IT Courses (9 hours)

InfoTc 2610	Audio/Video I (CS 1050, Math 1320 or Math 1300)	3
InfoTc 2810	Fundamentals of Network Technology (CS 1050).....	3
InfoTc 2910	Cyber Security (InfoTc 2810).....	3

Math and Business Courses (12 hours)

Math 1320	Elements of Calculus (Math 1100)	3
Math 1300	Finite Mathematics (grade of C- or better in MATH 1100 or 1120 or 1160 or an ACT math score of 26 or higher).....	3
Stat 2500	Probability and Statistics (Math 1320).....	3

One of the following Business courses:

Mgt 3000	Fundamentals of Management (45 semester hours) or	
IMSE 4750	Entrepreneurial Innovation Management (sophomore standing) or	
Mrktng 4650	e-Marketing (Mrktng 3000 and junior standing)	3

Technical Electives (15 hours) *Choose five with a minimum of three at the 3000 level or above.*

The student may take technical electives from (a) approved upper level Computer Science courses related to the IT field (listed below), (b) IT electives (listed below), or (c) approved IT-related courses from other units on campus. Students choosing courses in category (c) must have a well-defined plan and pre-approval for the courses. Examples include courses Management Information Systems in Accounting and Geographic Information Systems in Geography.

Approved CS courses to be used as IT electives

CS 2110	Production Languages-C (CS 2050).....	3
CS 3530	UNIX Operating System (CS 2050 and C language)	3
CS 3940	Internship in Computer Science (CS 2050).....	3
CS 4085	Problems in CS (senior standing)	3
CS 4380	Database Management Systems I (CS 3380)	3
CS 4610	Computer Graphics I (CS 2050, Math 1500 or Math 1300 & 1320)	3
CS 4830	Science and Engineering of the World Wide Web (CS 2830)	3
CS 4995	Undergraduate Honors Research (honors eligible)	3

IT Elective Courses *Phase 1: to be taught within first two years*

InfoTc 2620	Modeling and Animation I (CS 1050, CS 2050 concurrent)	3
InfoTc 3710	Introduction to Game Design (CS 1050, InfoTc 2620).....	3
InfoTc 3620	Modeling and Animation II (InfoTc 2620, CS 2050)	3
InfoTc 3850	Computer Systems Administration (CS 2050, junior standing)	3
InfoTc 3610	Audio/Video II (InfoTc 2610, CS 2050)	3
InfoTc 4390	Database Administration (CS 4380).....	3
InfoTc 4350	Introduction to Data Mining and Warehousing (CS 4380)	3

Focus Areas

It is recommended, but not required, that the student choose a focus area in Information Systems or Media Technologies. The courses prescribed for the focus areas are as follows:

Information Systems (15 hours)

CS 3530	UNIX Operating System (CS 2050 and C Programming Language).....	3
CS 4380	Database Management Systems I (CS 3380).....	3
CS 4830	Science and Engineering of the World Wide Web (CS 2830)	3
InfoTc 4390	Database Administration (CS 4380).....	3
	One elective of choice	3

Media Technologies (15 hours)

InfoTc 2620	Modeling and Animation I (CS 1050, CS 2050 concurrent)	3
InfoTc 3620	Modeling and Animation II (InfoTc 2620, CS 2050)	3
InfoTc 3610	Audio/Video II (InfoTc 2610, CS 2050)	3
InfoTc 3710	Introduction to Game Design (InfoTc 2620, CS 2050).....	3
	One elective of choice	3

Minor or Science Concentration (3 to 22 hours)

The student has two choices to complete his or her program of study. The student can: (a) create a minor program of study by pursuing the formal course requirements for minors in a department outside of Computer Science, or (b) take additional science courses (listed below) for a concentration in the sciences.

Minor Area Outside of Computer Science (15 to 22 hours)

Minors are available in many degree programs on campus. The student can take approved courses for a formal minor in another area of study such as art, business, film studies, geography, journalism, mathematics, philosophy, theatre, etc.

Science Concentration (12 hours minimum)

Twelve hours in science are required including one 2-semester sequence (listed below) in which both courses include laboratories. In the Biology sequence, take two of the three selections. If the student chooses to complete a minor outside of Computer Science, only 9 hours of science are required with one lab course.

Physics 1210	College Physics I (Math 1100).....	4
Physics 1220	College Physics II (Physics 1210).....	4
	Or	
Physics 2750	University Physics I (Coreq: Math 1700)	5
Physics 2760	University Physics II (Coreq: Math 2300 & C-range grade in Phys 2750)	5

Chemistry 1320	General Chemistry II (Math 1100 & C-range grade in Chem 1310)	3
Chemistry 1330	General Chemistry III (C-range grade in Chem 1320)	3

Two courses in Biology:

Biology 1010 and 1020	General Biology Lecture and Lab	5
<u>Or</u> Biology 1500	Intro to Biological Systems (Math 10 and high school chemistry)	5
Biology 1200	General Botany	5
Anthropology 2050 or 2051 & 2052	Intro to Biological Anthropology with Lab	5
Upper Class Biology course with a lab		3-5

Geology 1100 or 1120	Principles of Geology or Environmental Geology	4
Upper Class Geology Course with a lab		3-5

Science Electives (* may not take with required science sequence in the same department):

Astronomy 1010	Intro to Astronomy I (Math 1100)	4
Astronomy 1020	Intro to Laboratory Astronomy (Pre- or Coreq: Astronomy 1010)	2
Chemistry 1100	Atoms and Molecules *	3
Chemistry 1310	General Chemistry I (No credit if taken after Chem 1100)	2

Any course from the science sequence courses listed above

Any Biology, Chemistry, Geology, or Physics courses beyond the levels listed above for which the student has the prerequisite.

General Education Requirements (30 hours)

1. English 1000 (3 hours)

Two Writing Intensive courses are required. These WI courses may also meet other requirements. A C-range grade in English 1000 is a prerequisite for all WI courses. A C-range grade is required for WI courses.

2. Social/Behavioral Sciences (9 hours)

Missouri Constitutional Requirement (3 hours). One of the following social science courses is required: Political Science 1100, 1700, 2100, or History 1100, 1200, 2440, 2210, 4000, 4220, 4230.

Other suggestions: Economics 1014 or 1024

3. Humanities and Fine Arts in two fields (9 hours)

Suggestions: Philosophy 1100: Introduction to Ethics, Phil 1200: Introduction to Logic, Comm 2100: Media Communication in Society

4. Science (9-12 hours)

Nine to 12 hours of traditional science courses. Number of science hours depends on whether the student completes a minor outside of Computer Science.

Electives (5 to 24 hours)

The student can take technical or non-technical courses as electives in order to meet the total course work needed for graduation.

TOTAL: 120 hours

IT SAMPLE DEGREE PROGRAM (Prerequisites are in parentheses)
MEDIA TECHNOLOGIES FOCUS

First Semester 15 hours

CS 1000	Introduction to Computer Science	1
CS 1040	Introduction to Problem Solving and Programming	3
Math 1320	Elements of Calculus (Math 1100).....	3
	Constitutional Elective	3
	Social/Behavioral Science	3
	General Elective	2

Second Semester 15 hours

CS 1050	Algorithm Design & Programming I (Math 1100 & CS 1040/entrance exam).....	3
Math 1300	Finite Math (see prerequisites on page 2)	3
	English 1000.....	3
	Humanities/Fine Arts	3
	General Elective	3

Third Semester 15 hours

CS 2050	Algorithm Design & Programming II (CS 1050).....	3
Stat 2500	Probability and Statistics (Math 1320)	3
InfoTc 2620	Modeling & Animation I (CS 1050, CS 2050 concurrent).....	3
	Humanities/Fine Arts	3
	General Elective	3

Fourth Semester 16 hours

CS 2830	Introduction to the Internet, WWW and Multimedia Systems (CS 2050).....	3
CS 3310	Systems Analysis (CS 2050 and English 1000).....	3
InfoTc 3620	Modeling & Animation II (InfoTc 2620, CS 2050)	3
	Minor	3
	Science.....	4

Fifth Semester 15 hours

CS 3380	Database Applications and Information Systems (CS 2050).....	3
InfoTc 2810	Fundamentals of Network Technology (CS 1050).....	3
InfoTc 2610	Audio/Video I (CS 1050, Math 1300 or 1320)	3
	Minor	3
	Social/Behavioral Science	3

Sixth Semester 14 hours

InfoTc 2910	Cyber Security (InfoTc 2810)	3
CS 4320	Software Engineering (CS 3310)	3
	Minor	3
	Science with Lab	5

Seventh Semester 15 hours

InfoTc 3610	Audio/Video II (InfoTc 2610, CS 2050).....	3
InfoTc 3710	Intro to Game Design (InfoTc 2620, CS 2050).....	3
CS 4970	Senior Capstone Design I (CS 4320, senior standing)	3
	Business course: Choice of Mgt 3000, IMSE 4750, or Mkt 4650.....	3
	Minor	3

Eighth Semester 15 hours

CS 4980	Senior Capstone Design II (CS 4970).....	2
	InfoTc Technical Elective.....	3
	Humanities/Fine Arts	3
	Minor	3
	General Elective	4

IT SAMPLE DEGREE PROGRAM (Prerequisites are in parentheses)
INFORMATION SYSTEMS FOCUS

First Semester 15 hours

CS 1000	Introduction to Computer Science	1
CS 1040	Introduction to Problem Solving and Programming	3
Math 1320	Elements of Calculus (Math 1100).....	3
	Constitutional Elective	3
	Social/Behavioral Science	3
	General Elective	2

Second Semester 15 hours

CS 1050	Algorithm Design & Programming I (Math 1100 & CS 1040/entrance exam).....	3
Math 1300	Finite Math (see prerequisites on page 2)	3
	English 1000.....	3
	Humanities/Fine Arts	3
	General Elective	3

Third Semester 16 hours

CS 2050	Algorithm Design & Programming II (CS 1050)	3
Stat 2500	Probability and Statistics (Math 1320)	3
	Minor	3
	Humanities/Fine Arts	3
	Science.....	4

Fourth Semester 15 hours

CS 2830	Introduction to the Internet, WWW and Multimedia Systems (CS 2050).....	3
CS 3310	Systems Analysis (CS 2050 and English 1000).....	3
InfoTc 2610	Audio/Video I (CS 1050, Math 1320 or Math 1300)	3
	Minor	3
	General Elective	3

Fifth Semester 15 hours

CS 3380	Database Applications and Information Systems (CS 2050).....	3
InfoTc 2810	Fundamentals of Network Technology (CS 1050).....	3
CS 4320	Software Engineering (CS 3310).....	3
	Minor	3
	Social/Behavioral Science	3

Sixth Semester 14 hours

InfoTc 2910	Cyber Security (InfoTc 2810)	3
CS 3530	UNIX Operating System (CS 2050 and C Programming Language)	3
CS 4380	Database Management Systems I (CS 3380)	3
	Science with Lab	5

Seventh Semester 15 hours

CS 4970	Senior Capstone Design I (CS 4320, senior standing)	3
CS 4830	Science and Engineering of the World Wide Web (CS 2830)	3
InfoTc 4390	Database Administration (CS 4380).....	3
	Minor	3
	Business course: Choice of Mgt 3000, IMSE 4750, or Mkt 4650.....	3

Eighth Semester 15 hours

CS 4980	Senior Capstone Design II (CS 4970).....	2
	InfoTc Technical Elective.....	3
	Humanities/Fine Arts	3
	Minor	3
	General Elective	4

INFORMATION TECHNOLOGY SAMPLE DEGREE PROGRAM (Prerequisites are in parentheses)
NO FOCUS AREA

First Semester 15 hours

CS 1000	Introduction to Computer Science	1
CS 1040	Introduction to Problem Solving and Programming	3
Math 1320	Elements of Calculus (Math 1100).....	3
	Constitutional Elective	3
	Social/Behavioral Science	3
	General Elective	2

Second Semester 15 hours

CS 1050	Algorithm Design & Programming I (Math 1100 & CS 1040/entrance exam).....	3
Math 1300	Finite Math (see prerequisites on page 2)	3
	English 1000.....	3
	Humanities/Fine Arts	3
	General Elective	3

Third Semester 16 hours

CS 2050	Algorithm Design & Programming II (CS 1050).....	3
Stat 2500	Probability and Statistics (Math 1320)	3
	Minor	3
	Humanities/Fine Arts	3
	Science.....	4

Fourth Semester 15 hours

CS 2830	Introduction to the Internet, WWW and Multimedia Systems (CS 2050).....	3
CS 3310	Systems Analysis (CS 2050 and English 1000).....	3
InfoTc 2610	Audio/Video I (CS 1050, Math 1320 or Math 1300)	3
	Minor	3
	General Elective	3

Fifth Semester 15 hours

CS 3380	Database Applications and Information Systems (CS 2050).....	3
InfoTc 2810	Fundamentals of Network Technology (CS 1050).....	3
CS 4320	Software Engineering (CS 3310)	3
	Minor	3
	Social/Behavioral Science	3

Sixth Semester 14 hours

InfoTc 2910	Cyber Security (InfoTc 2810)	3
	InfoTc Technical Elective.....	3
	InfoTc Technical Elective.....	3
	Science with Lab	5

Seventh Semester 15 hours

CS 4970	Senior Capstone Design I (CS 4320, senior standing)	3
	Business course: Choice of Mgt 3000, IMSE 4750, or Mkt 4650.....	3
	InfoTc Technical Elective.....	3
	InfoTc Technical Elective.....	3
	Minor	3

Eighth Semester 15 hours

CS 4980	Senior Capstone Design II (CS 4970).....	2
	InfoTc Technical Elective.....	3
	Humanities/Fine Arts	3
	Minor.....	3
	General Elective	4