

# **COMPUTER SCIENCE DEPARTMENT**

## **BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

*For students beginning Fall 2009 or after*

**Department of Computer Science  
University of Missouri  
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Columbia, Missouri 65211-2060  
(573) 884-6342**

<http://www.cs.missouri.edu/>

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 126 semester hours of credit including the following distribution: Computer Science (CS) course requirements - 24 hours, 30 hours of Information Technology (IT) courses, 12 hours of related math and business courses, 15-22 hours of courses in a minor, general education courses and any remaining credit hours to reach 126 total. General Education requirements (30-33 hours) include - English 1000, 9-12 hours of science, 9 hours of Social/Behavioral Sciences, and 9 hours of Humanities and Fine Arts.

The BS IT degree requires the completion of at least 9 hours of mathematics and statistics including 3 hours of business calculus. An IT student can earn a minor in an 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.

Course requirements listed apply to students beginning as freshmen in Fall 2009 and after. A student who started college before Fall 2009 and who has been continuously enrolled full-time may be pursuing the previous program and should contact the department.

While working toward their degrees, many students participate in cooperative education or internship programs. The Engineering Career Services Office, W1052C Lafferre Hall, or MU Career Center, [www.hiremizzoutigers.com](http://www.hiremizzoutigers.com), can assist students in searching for employment opportunities and for internship/co-op positions.

## REQUIREMENTS FOR A BS DEGREE IN INFORMATION TECHNOLOGY - 126 hours

The minimum university requirements for students pursuing the Bachelor of Science Degree in Information Technology are listed below. A total of 126 hours are required. Courses in parentheses are prerequisites for the course listed.

### **Core Curriculum (66 hours)**

#### **Computer Science Courses** (24 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 3380	Database Applications and Information Systems (CS 2050)	3
CS 4320	Software Engineering I – Writing Intensive (CS 2050 and English 1000)	3
CS 4970	Senior Capstone Design I – Writing Intensive (CS 4320 and senior standing)	3
CS 4980	Senior Capstone Design II (CS 4970)	2

#### **Core IT Courses** (9 hours)

InfoTc 2610	Audio/Video I	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)	<b>or</b>
IMSE 4750	Entrepreneurial Innovation Management (sophomore standing)	<b>or</b>
Mrktng 4650	e-Marketing (Mrktng 3000 and junior standing)	3

#### **Technical Electives (21 hours)** *Choose 7 courses with a minimum of 4 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	Programming in 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 2110 or instructor consent, 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**

InfoTc 1610	Intro to Entertainment Media .....	3
InfoTc 2001/3001/4001	Topics in Information Technology (prerequisites vary) .....	3
InfoTc 2600	Digital Multimedia .....	3
InfoTc 2620	Modeling and Animation I (CS 1050, CS 2050 concurrent).....	3
InfoTc 3610	Audio/Video II (InfoTc 2610) .....	3
InfoTc 3620	Modeling and Animation II (InfoTc 2620, CS 2050) .....	3
InfoTc 3630	Introduction to Game Design (CS 1050, InfoTc 2620).....	3
InfoTc 3640	Digital Effects (InfoTc 1610 or 2610).....	3
InfoTc 3850	Computer Systems Administration (CS 2050, junior standing) .....	3
InfoTc 4390	Database Administration (CS 4380).....	3
InfoTc 4630	Game Design II (InfoTc 3630).....	3
InfoTc 4640	Digital Effects II (InfoTc 3640).....	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 (21 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
Three electives of choice.....		9

#### **Media Technologies (21 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) .....	3
InfoTc 3630	Introduction to Game Design (InfoTc 2620, CS 2050).....	3
Three electives of choice.....		9

#### **Minor or Science Concentration**

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). Two laboratory courses are required. 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 (Math 1100 or concurrent enrollment)... 5  
Or Biology 1500 Intro to Biological Systems (Math 1100 and high school chemistry) ..... 5  
Biology 1200 General Botany ..... 5  
Anthropology 2050 or 2051 & 2052 Intro to Biol Anthropology w/Lab (Math 1100/sophomore).... 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 (30-33 hours)***

1. English 1000 (3 hours)  
Two Writing Intensive courses with C range grades are required. A C-range grade in English 1000 is a prerequisite for all WI courses.
2. Social/Behavioral Sciences (9 hours) Courses from two different departments are required. Missouri Constitutional Requirement (3 hours). One of the following 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) Courses from two different departments are required. Suggestions: Phil 1200: Introduction to Logic, Comm 1200: Public Speaking  
A list of MU courses that count for social/behavioral sciences and humanities can be found at: <http://generaleducation.missouri.edu/about/dc-306c.pdf>. One course from Social/Behavioral or Humanities must be at the 2000 level or higher.

### **Electives**

The student must take general electives in order to meet the total course work (126 credit hours) needed for graduation.

**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** 16 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
InfoTc Technical Elective.....	3
General Elective .....	1

**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
InfoTc Technical Elective.....	3

**Fourth Semester** 16 hours

CS 2830 Introduction to the Internet, WWW and Multimedia Systems (CS 2050).....	3
InfoTc 2610 Audio/Video I .....	3
InfoTc 3620 Modeling & Animation II (InfoTc 2620, CS 2050).....	3
Minor .....	3
Science.....	4

**Fifth Semester** 17 hours

CS 3380 Database Applications and Information Systems (CS 2050).....	3
InfoTc 2810 Fundamentals of Network Technology (CS 1050).....	3
General Elective .....	5
Minor .....	3
Social/Behavioral Science .....	3

**Sixth Semester** 16 hours

InfoTc 2910 Cyber Security (InfoTc 2810) .....	3
CS 4320 Software Engineering (CS 2050) .....	3
Minor .....	3
Science with Lab .....	5
General Elective .....	2

**Seventh Semester** 15 hours

InfoTc 3610 Audio/Video II (InfoTc 2610).....	3
InfoTc 3630 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** 16 hours

CS 4980 Senior Capstone Design II (CS 4970).....	2
InfoTc Technical Elective.....	3
Humanities/Fine Arts .....	3
Minor .....	3
General Elective .....	5

**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** 16 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
InfoTc Technical Elective.....	3
General Elective .....	1

**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** 16 hours

CS 2830 Introduction to the Internet, WWW and Multimedia Systems (CS 2050).....	3
InfoTc 2610 Audio/Video I .....	3
InfoTc 2810 Fundamentals of Network Technology (CS 1050) .....	3
Minor .....	3
InfoTc Technical Elective.....	3
General Elective .....	1

**Fifth Semester** 15 hours

CS 3380 Database Applications and Information Systems (CS 2050).....	3
CS 3530 UNIX Operating System (CS 2050 and C Programming) .....	3
CS 4320 Software Engineering (CS 2050) .....	3
Minor .....	3
Social/Behavioral Science .....	3

**Sixth Semester** 16 hours

InfoTc 2910 Cyber Security (InfoTc 2810) .....	3
CS 4380 Database Management Systems I (CS 3380).....	3
Science with Lab .....	5
CS 4830 Science and Engineering of the WWW (CS 2830).....	3
General Elective .....	2

**Seventh Semester** 16 hours

CS 4970 Senior Capstone Design I (CS 4320, senior standing).....	3
InfoTc Technical Elective.....	3
Minor .....	3
General Elective.....	4
Business course: Choice of Mgt 3000, IMSE 4750, or Mkt 4650.....	3

**Eighth Semester** 16 hours

CS 4980 Senior Capstone Design II (CS 4970) .....	2
InfoTc 4390 Database Administration (CS 4380).....	3
Humanities/Fine Arts .....	3
Minor .....	3
General Elective .....	5