Undergraduate Curriculum

Department of Computer Science

Southern™
Illinois University
Carbondale

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I. Introduction

This booklet is designed to accomplish two main purposes. First, if you are a prospective student, the information it contains should help you make an informed decision about whether or not to study Computer Science at Southern Illinois University Carbondale. Second, if you choose to attend SIUC, it assembles in a comprehensive manner all the information about the Computer Science curriculum. This information should assist in properly advising you throughout your course of study.

Section II contains the official catalog description as it appears in the current Undergraduate Catalog. As you examine the catalog description, keep in mind that to obtain either degree at SIUC you must meet University requirements, University Core Curriculum requirements, College of Science requirements, and departmental requirements.

The next four sections explain the requirements. Section III outlines the University requirements. Section IV contains detailed information about the 41-hour University Core Curriculum requirement. However, the Undergraduate Catalog is the final authoritative source and should be consulted along with an advisor, if you have any questions regarding University Core Curriculum requirements. Section V lists the College of Science requirements. Section VI details the requirements in the major.

Section VII discusses what is expected of new students in Computer Science at SIUC, including entering freshmen and transfer students. More details about the advisement process are also explained.

Section VIII contains information designed to assist you in the advisement process and help you graduate in the minimal amount of time. It begins with a listing of the courses offered by the Department of Computer Science. Tree diagrams showing the prerequisite structure of the Computer Science courses follow. These diagrams can be used to insure that you meet the prerequisites of courses you plan to take. A table listing a subjective estimate of the amount of programming (programming load) required in each course is included. You can use this table to avoid concurrently taking several courses with heavy programming loads. This table also indicates the mathematical level of sophistication (mathematical level) of each Computer Science course. A sample curriculum for both degrees in Computer Science is also presented. The sample curriculums are not necessarily recommended, they are not optimal, they are not models, nor are they suggested—they are only samples. However, they do take advantage of allowable substitutions in order to reduce the University Core Curriculum requirement. As this curriculum is examined, keep in mind the order in which Computer Science electives are taken is subject to the course offerings in a given semester. Finally, tentative course offerings in the Department of Computer Science are also listed. You can use this tentative schedule to assist in planning a course of study.

Section IX contains useful information about the availability of UNIX accounts, a recommended computer system, and scholarships. Several important and useful phone numbers are listed in the last section.

II. Program Description

Computer Science encompasses the theory, tools, and techniques by which information is derived, stored, manipulated, and communicated using computers. It deals particularly with the study of algorithms that are used to direct the computer and with the expression of these algorithms as programs. Of central concern is the study and further development of the computer systems, including both hardware and software that support the execution of these programs.

The Department of Computer Science offers two degree programs to undergraduate students – the Bachelor of Science and the Bachelor of Arts. The curriculum specified for the Bachelor of Science degree is more traditional and somewhat more flexible in that it prepares the student for a wide range of careers as well as for graduate degree programs in Computer Science. The Bachelor of Arts degree program is more specifically oriented toward the area of business applications and, in particular, is designed to enable students to pursue a fifth year of studies leading to an MBA degree.

In support of these degree programs, the department offers courses covering all the major areas of computer science including programming languages, operating systems, databases, computer networks, computer architecture, computer graphics, artificial intelligence, WEB application development, systems administration, software engineering, algorithms, and parallel programming. In addition, the department offers an undergraduate minor and service courses for students from other fields who will use computer science as a tool in their own areas. Students interested in computer science will be advised with respect to Computer Science courses by the department so they may profitably pursue their academic and professional interests.

The department enforces the following retention policy: a Computer Science major will not be permitted to enter any of the courses—220, 306, 311, 320, 330, 335, and 399—unless that student has achieved a grade point average of at least 2.00 for all required precedent Computer Science courses. Any exceptions to this policy will require the written approval of the department.

Permission to enroll in departmental courses is subject to the restriction that a student who receives a grade of F or WF three times in the same course cannot take the course again. An exception to this policy may be granted by written approval of the department, but such exceptions will be rare.

The department also enforces the following restriction on students repeating its courses: a student cannot repeat a course or its equivalent, in which a grade of B or better was earned, without the consent of the department.

Bachelor of Science Degree, College of Science

University Core Curriculum Requirements[1] 41
College of Science Academic Requirements 10
- Biological Sciences – 6 hours (Not University Core Curriculum courses)[1] 3
- Mathematics – completed with Computer Science major
- Physical Sciences – completed with Computer Science major
- Supportive Skills – at least 6 hours 7
  - Mathematics 282 or Mathematics 483 and one of English 290, 291 or 491

Requirements for Major in Computer Science[2] 61
- Computer Science Core[4] 26
  - Computer Science 202, 215, 220, 306, 311, 320, 330, 335,399 each with a grade of C or better
- Computer Science Electives[4, 5, 6] 18
  - To build on the core and to provide breadth and depth, six 400-level Computer Science courses must be chosen.
- Senior Project 498 and 499 4
- Mathematics 150[1,3], 250, 221 8
- Laboratory Science Sequence[1] 5
  - Physics 205a,b and 255a,b or Chemistry 200, 201 and 210, 211

Electives 8
Total 120

[1] A total of nine hours of biological science, mathematics and laboratory science coursework are accounted for in the 41-hour Core Curriculum requirement.

[2]The supportive skills are also required for a major.
[3]Prerequisite is Mathematics 111 or Mathematics 108 and 109. The elective hours are reduced by 3-6 hours for students who place into a course lower than calculus.
[4]At least half of the Computer Science credit hours must be taken at SIUC.
[5]300, 301, and 393 cannot be used to fulfill the elective requirement. Use of 391 requires departmental approval.
[6]Use of 490, 491, 492, or 493 requires departmental approval. At most one of 447, 449, 471, 472, 475a, and 475b can be used as an elective.

Bachelor of Arts Degree, College of Science

University Core Curriculum Requirements[1] 41
College of Science Academic Requirements 12
- Biological Sciences – 6 hours (Not University Core Curriculum courses)[1] 3
- Mathematics – completed with Computer Science major
- Physical Sciences – (3 hours in major) 3
- Supportive Skills – 6 hours 6
  - Mathematics 282 and one of English 290, 291 or 491

Requirements for Major in Computer Science[2] 63
- Computer Science Core 23
  - Computer Science 201, 202, 215, 220, 306, 320, 330, 399, each with a grade of C or better
- Computer Science Electives[4, 5, 6] 18
  - To build on the core and to provide breadth and depth, two additional 300-level and four 400-level Computer Science courses must be chosen.
- Mathematics 111[1,3] 1
- Secondary Concentration (MBA Foundation) 21
  - Accounting 220 and 230, Finance 270 and 330, Management 304 or Management 318[7], Marketing 304, and Economics 240[1] and 241

Electives 4
Total 120

[1]A total of 12 hours of biological science, economic, mathematics and laboratory science coursework are accounted for in the 41-hour Core Curriculum requirement.
[2]The supportive skills are also required for a major.
[3]Mathematics 111 can be replaced by Mathematics 108 and 109. The total hours are increased by 3-6 hours for students who place into a course lower than calculus.
[4]At least half of the Computer Science credit hours must be taken at SIUC.
[5]300, 301, and 393 cannot be used to fulfill the elective requirement. Use of 391 requires departmental approval.
[6]Use of 490, 491, 492, or 493 requires departmental approval. At most one of 447, 449, 471, 472, 475a, and 475b can be used as an elective.
[7]Management 304 allows a student to earn a minor in Business Administration. Management 318 is required for entry into the Master in Business Administration degree program.

Concentrations for BS and BA Programs

Computer Science majors can use their electives to form an optional concentration in five different computer science areas: computer graphics and game development; computer networks and security; database and systems; software engineering and application development; or artificial intelligence and robotics. Computer Science majors must take three courses (out of their 400-level electives) from a particular topic to receive a concentration in that area. Concentrations will not appear on the diploma but will be stated on a certificate issued by the department. The list of the courses for each concentration is as follows:

- Computer Graphics and Game Development: CS 484, CS485, CS 487
- Computer Networks and Security: CS 408, CS 410, CS 440, CS 441
- Database and Systems: CS 401, CS 406, CS 420, CS 430, CS 455
- Software Engineering and Application Development: CS 406, CS 412, CS 435, CS 484
- Artificial Intelligence and Robotics: CS404, CS 436, CS 437

Minor

A minor consists of Computer Science 202, 215, 220, and at least nine hours of 300-level Computer Science coursework. At least nine of these hours must be taken at SIUC.

III. University Requirements

All students seeking a Baccalaureate degree at SIUC must satisfy the following requirements for graduation:

1. Complete a minimum of 120 semester hours of credit in approved courses. Of the 120 hours, at least 60 must be earned at a senior-level institution.
2. Complete 41 hours of the 120 in the University Core Curriculum. Methods are available for reducing this number. See "Meeting University Core Curriculum Requirements" in Section IV.
3. Maintain a C average in all SIUC coursework and a C average in the major (2.0 on a 4.0 scale).
4. Satisfy residency requirements by completing 90 semester hours at SIUC or the last 30 semester hours at SIUC.

Additional details pertaining to University requirements are available in the Undergraduate Catalog.

IV. University Core Curriculum Requirements

The purpose of the University Core Curriculum is to give the student a broad educational background. The Curriculum is divided into three major areas with two to five subject areas each.

1. Foundation Skills - including English Composition, Mathematics, and Speech
2. Disciplinary Studies - including Fine Arts, Human Health, Humanities, Science, and Social Science
3. Integrative Studies - including Multicultural: Diversity in the U.S. and Interdisciplinary Studies

Meeting University Core Curriculum Requirements

Several methods are available to complete the University Core Curriculum requirements. These include:

1. Credit granted through the High School Advanced Placement Program, the College Level Examination Program, and proficiency examinations. The maximum AP, CLEP, and proficiency credit allowed is 30 hours and is considered nonresident.
2. Completing departmental courses which are approved substitutes for University Core Curriculum courses. A maximum of 12 hours of departmental courses may be substituted.
3. Completing approved University Honors courses.
4. Completing the prescribed courses as outlined on the following pages.

Foundation Skills (12 hours)

Composition (6 hours)

ENGL 101 & ENGL 102 English Composition I & II (with a grade of C or better)

OR

ENGL 120 Advanced Freshman Composition (with a grade of C or better)

Note: LING 101 and 102 will complete this requirement for international students (with a grade of C or better)

Mathematics (3 hours)

Any mathematics course numbered MATH 108 or above with the exception of MATH 114, 300i, and 120.

Speech (3 hours)

SPCM 101 Introduction to Oral Communications: Speech, Self, and Society

Disciplinary Studies (23 hours)

Fine Arts (One course - 3 hours)

AD	100a,b	Foundation Studio A,B
AD	101	Introduction to Art
CP	101	History and Analysis of Cinema
ENGL	119	Introduction to Creative Writing
ENGL	206a	Literature Among the Arts: The Visual
FL	200a,b,c	Masterpieces of World Literature
HIST	201	Art, Music, and Ideas in the Western World
MUS	103	Music Understanding
THEA	101	Theater Insight

Advanced University Core Curriculum courses:

ARC	231	Architectural History I
ARC	232	Architectural History II
MUS	357a,b	Music History
THEA	220	Freshman Theater Seminar

Human Health (One course - 2 hours)

BIOL	202	Human Genetics and Human Health
FN	101	Nutrition: Contemporary Health Issues
HED	101	Foundations of Human Health
PE	101	Current Concepts of Physical Fitness
PHSL	201	Human Physiology (3 hours)
REHB	205	Disability and Chronic Disorders

Advanced University Core Curriculum courses:

HCP	241	Introduction to Physiology of Human Anatomy
PE	201	Concepts of Physical Fitness
PHSL	310	Principles of Physiology

Humanities (6 hours)

Select two courses from the following:

AD	207a,b,c	Introduction to Art History I, II, III
CLAS	230	Classical Mythology
CLAS	270	Greek Civilization
CLAS	271	Roman Civilization
EA	102	East Asian Civilization
ENGL	121	The Western Literary Tradition
ENGL	204	Literary Perspectives on the Modern World
FR	101a,b	French Language and Culture I & II
GER	101a,b	German Language and Culture I & II
HIST	101a,b	The History of World Civilizations
LING	200	Language, Society and the Mind
PHIL	102	Introduction to Philosophy
PHIL	103a,b	World Humanities
PHIL	104	Ethics
PHIL	105	Elementary Logic

Advanced University Core Curriculum courses:

HIST	207a,b	World History
PHIL	304	Ancient Philosophy

PHIL 305a,b Modern Philosophy
PHIL 340 Ethical Theories
A 3rd semester of a foreign language or a 1st semester or more advanced course in Latin or Classical Greek

or select one of the following sequences:

I. ENGL 121, 204	II. FR 101a, b	III. GER 101a, b
IV. HIST 101a, b	V. PHIL 103a, b	VI. AD 207a,b,c (select 2)

Science (6 hours)

The College of Science physical and biological science requirements will substitute into the Core Curriculum to complete this requirement.

Social Science (Two courses - 6 hours)

Students may take no more than one course in History to satisfy this requirement.

ANTH 104 The Human Experience: Anthropology
ECON 113 Economics of Contemporary Social Issues
GEOG 100 Environmental Conservation
GEOG 103 World Geography
HIST 110 Twentieth Century America
HIST 112 The Twentieth Century World
POLS 114 Introduction to American Government and Politics
PSYC 102 Introduction to Psychology
SOC 108 Introduction to Sociology

Advanced University Core Curriculum courses:

ABE 204 Introductory Economics of Food, Fiber, and Natural Resources
ECON 240 Introduction to Microeconomics
ECON 241 Introduction to Macroeconomics
HIST 301 Modern America from 1877 to the Present

Integrative Studies (6 hours) *

Students are strongly advised to complete their Disciplinary Studies courses before enrolling in the Integrative Studies courses.

Multicultural: Diversity in the United States (One course - 3 hours)

AD 227 History of African American Art
AD 267 Picturing Difference: Native, African, and European Americans in American Art
AJ 203 Crime, Justice and Social Diversity
ANTH 202 American Cultures
ANTH 204 The Anthropology of Latino Cultures
BAS 215 Black American Experience in a Pluralistic Society
BAS 227 History of African American Art
ENGL 205 The American Mosaic in Literature
FR 200 Women in French and Francophone Literatures (WMST 200)
HIST 202 America's Religious Diversity
HIST 210 American Heritages
LING 201 Language Diversity in the USA
MCMA 204 Alternative Media in a Diverse Society
MUS 203 Diversity and Popular Music in American Culture
PE 210 Diversity in American Sport
PHIL 210 The American Mind

PHIL	211	Philosophy and Diversity: Gender, Race and Class
POLS	215	Politics of Diversity in the United States
POLS	278	Domestic Sources of American Foreign Policy
PSYC	223	Diversity in the Workplace
PSYC	233	Psychology of Gender in a Diverse Context
SOC	215	Race and Ethnic Relations in the United States
SOC	223	Women and Men in Contemporary Society
SPCM	201	Performing Culture
WMST	200	Same as FR 200
WMST	201	Multicultural Perspectives on Women
WMST	223	Same as SOC 223

**** Additional integrative studies are added periodically. Check with a Science Advisor for an up-to-date list.***

Advanced University Core Curriculum courses:

ENGL	225	Women in Literature
ENGL	325	Black American Writers
HIST	300	The Origins of Modern America, 1492-1877
HIST	368	American Religious History
WMST	225	Women in Literature

Interdisciplinary (One course - 3 hours)

AD	307i	Women in Visual Arts
AD	317i	Contemporary Native American Art and Artists
AGRI	300i	Social Perspectives on Environmental Issues (LAC 300i)
ARC	314i	Expressions in Architecture
BAS	332i	Introduction to Civil Liberties and Civil Rights (POLS 332i)
CLAS	315i	Classical Themes and Contemporary Life: Seminar Series
CLAS	316i	Reconstructing the Ancient World
ECON	302i	History and Philosophy of the World's Economic Systems
ENGL	307i	Film as Literary Art
ENGR	301i	Humans and Their Environment
ENGR	303i	The Role of Energy in Society
FL	301i	Cross-Cultural Orientation
GEOG	300i	Geography, People, and the Environment
GEOG	303i	The Earth's Biophysical Environments
GEOG	310i	Digital Earth: Geospatial Techniques
GEOL	327i	The World’s Oceans
GEOL	328i	Dinosaurs and the Age of Reptiles
GEOL	329i	Geomythology
GEOL	330i	The Planets
JRNL	306i	International Media Systems
JRNL	314i	American Politics and the Mass Media (POLS 314i)
LAC	300i	Same as AGRI 300i
LING	320i	Language, Gender, and Power
MATH	300i	History of Mathematics
MUS	303i	Women, Blues, and Literature
MUS	362i	Sound Art and Practice (RT 362i)
PHIL	303i	Philosophy and the Arts
PHIL	307i	Philosophy of Science, Nature, and Technology
PHIL	308i	Asian Philosophy
PHIL	309i	Philosophy of Politics, Law, and Justice
PLB	301i	Environmental Issues
PLB	303i	Evolution and Society
POLS	314i	Same as JRNL 314i
POLS	332i	Same as BAS 332i
POLS	352i	Ethnicity, Nationalism, and Culture in a Global Era

POLS	372i	International Political Economy
RT	362i	Same as MUS 362i
SOC	304i	Families of the World
SOC	306i	Popular Culture in Society
SPCM	301i	Communication Across Cultures
WMST	301i	Women in Science, Engineering and Technology
WMST	307i	Women in Visual Arts
WMST	320i	Same as LING 320i
ZOOL	312i	Conservation of Natural Resources

Advanced University Core Curriculum courses:

ARC	444	Architectural Field Studies (for 3 credit hours)
ZOOL	304	Evolution

Substitution

In general, students may substitute up to 12 semester hours of approved coursework for Core Curriculum courses. Computer Science majors may substitute six hours of science by taking courses required by the College of Science.

List of Approved Substitutions

The department courses which have been approved as substitutions for Core Curriculum courses are listed below. In no case does the departmental course substitute for more credit hours than the credit hours allowed in the comparable Core Curriculum course. Under no circumstances can a Core course satisfy more than one Core requirement. Students should consult their academic advisors concerning any prerequisite for these courses.

Core Curriculum Course	Approved Substitute
ARC 314I	ARC 444 (must be taken for three credit hours)
CHEM 106	CHEM 140a; CHEM 200 & 201
ECON 113	ECON 240, ECON 241,or ABE 204
ENGL 205	ENGL 225, ENGL 325 or WMST 225
GEOL 111/112	GEOL 220 and 223, or GEOL 222 and 223, or GEOL 221 and 224
GEOL 112	GEOL 211 and 224
HIST 101a, b	HIST 207a, b
HIST 110	HIST 301
HIST 202	HIST 368
HIST 210	HIST 300
MUS 103	MUS 357a or MUS 357b
PHIL 102	PHIL 304 or PHIL 305a, b
PHIL 104	PHIL 340
PE 101	PE 201
PHYS 101/103	PHYS 203a and PHYS 253a; PHYS 203b and PHYS 253b; PHYS 205a and PHYS 255a; PHYS 205b and PHYS 255b; or ASA 126
PHSL 201	PHSL 310 or HCP 241
PLB/ZOOL 115	BIOL 200a or b, MICR 201, PLB 200, ZOOL 118, ZOOL 220a, or ZOOL 220b
PLB 303i	ZOOL 304
THEA 101	THEA 220

Science Group 1	SCI 210a (for Elementary Education, Child and Family Services, and Preschool-Primary majors only)`
Science Group 2	SCI 210b or PHSL 201 and 208 (if not used for health)
Humanities	A student may substitute up to a maximum of three credit hours with either a third semester of a foreign language or a first semester or more advanced course in Latin or Classical Greek.

V. College of Science Requirements

The College of Science degree requirements, as they pertain to Computer Science majors, fall into four categories: biological sciences, physical sciences, supportive skills and general requirements. The specifics are listed below:

Biological Sciences (6 hours)

Six semester hours in courses offered by the biological sciences departments in the college (Microbiology, Plant Biology, Physiology, and Zoology) are required. Biochemistry taken from the Department of Chemistry and Biochemistry will also satisfy this requirement. This requirement cannot be satisfied in whole or in part by University Core Curriculum courses. However, certain courses chosen to meet this requirement may substitute for some of the University Core Curriculum requirements. A list of suggested courses designed to fulfill this requirement follows:

Any 2 of the following 3 courses:
- PLB 200 (General Plant Biology)
- ZOOL 118 (Principles of Animal Biology)
- PHSL 201 (Human Physiology)*

**** PHSL 201 satisfies three hours of the College of Science biological sciences requirement and substitutes for three hours of University Core Curriculum biology IF IT IS NOT USED TO SATISFY THE HUMAN HEALTH REQUIREMENT.***

Physical Sciences

Six semester hours in courses offered by the physical science departments of the college (Chemistry and Biochemistry, Geology and Physics) are required. This requirement cannot be satisfied in whole or in part by University Core Curriculum courses, but certain courses chosen to meet the requirement may also substitute for certain University Core Curriculum requirements.

Note that the Department of Computer Science requires a two-semester sequence of laboratory science courses for the B.S. degree (see Section VI) which also satisfies the College of Science physical sciences requirement.

Supportive Skills (7 hours)

Mathematics 483 (Mathematical Statistics in Engineering and Physical Sciences I) is required for the B.S. degree, while the B.A. requires Mathematics 282 (Introduction to Statistics). A third English composition course beyond ENGL 102 is required by both programs. The composition course must be chosen from the following list:

ENGL	290	Intermediate Expository Writing
ENGL	291	Intermediate Technical Writing
ENGL	491	Technical Writing
LING	290	Advanced English Composition for Foreign Students

General Requirements

At least 40 hours of the student's 120 hours for graduation must be at the 300- or 400-level. The total may include transfer credit for courses judged by the department involved to be equivalent to its upper division courses. At least 24 of these senior hours must be taken at SIUC.

VI. Major Requirements

The Department of Computer Science's major requirements subdivide into four categories for each degree program:

Computer Science Core (B.S. - 26 hours; B.A. - 23 hours)

The department requires each of the following core courses for either program and each must be completed with a grade of C or better:

- CS 202 – Introduction to Computer Science
  The department's introductory course for majors taught on Pentium-based machines; currently using the Java language as the vehicle to introduce computer programming.
- CS 215 – Discrete Mathematics
  A course in discrete mathematics which gives students the necessary mathematical foundation for subsequent CS courses.
- CS 220 – Programming with Data Structures
  A data structures course taught on Pentium-based machines using the language Java.
- CS 306 – Linux/UNIX Programming
  This course uses the UNIX operating system and provides an in-depth coverage of the C language, which is used for the system programming projects in the course.
- CS 320 – Computer Organization and Architecture
  A course in assembly language and computer organization.
- CS 330 – Introduction to the Design and Analysis of Algorithms
  This course introduces some advanced data structures as they relate to file organization.
- CS 399 – Social, Ethical, and Professional Issues in Computer Science
  This course creates an awareness of the social, ethical and professional issues important to the field of computer science.

In addition, the B.S. degree requires the following courses to be completed with a grade of C or better:

- CS 311 –The Theory and Implementation of Programming Languages
  A course based on programming language design and implementation.
- CS 335 –Operating Systems
  This course discusses different aspects of operating system design and implementation.

And B.A. degree requires the following course to be completed with a grade of C or better:

- CS 201 – Problem Solving with Computers
  An introduction to problem solving using computers

A major in Computer Science must satisfy the department's retention requirement in order to remain a major in the department. Specifically, permission to enroll in departmental courses is subject to the restriction that a student who receives a grade of F or WF three times in the same course cannot take the course again. An exception to this policy may be granted by written approval of the department, but such exceptions will be rare.

Computer Science Electives (18 hours)

Each Computer Science major pursuing a B.S. degree is required to take 18 hours of Computer Science courses in addition to those listed previously. Six 400-level Computer Science courses must be chosen from the following list:

CS	401	Computer Architecture
CS	402	Theory and Applications of Computer Aided Design
CS	404	Autonomous Mobile Robotics
CS	406	Basic Linux System Administration
CS	408	Applied Cryptography
CS	410	Computer Security
CS	412	Programming Distributed Applications
CS	416	Compiler Construction
CS	420	Parallel and Distributed Computing
CS	430	Database Systems
CS	435	Software Design and Development
CS	436	Artificial Intelligence I
CS	437	Intelligent Systems and Soft Computing
CS	438	Bioinformatics Algorithms
CS	440	Computer Networks
CS	441	Mobile and Wireless Computing
CS	451	Theory of Computing
CS	455	Advanced Algorithm Design and Analysis
CS	484	User Interface Design and Development
CS	485	Computer Graphics
CS	487	Software Aspects of Game Development

One of: CS 447 - Introduction to Graph Theory
CS 449 - Introduction to Combinatorics
CS 471 - Optimization Techniques
CS 472 - Linear Programming,
CS 475a - Numerical Analysis I

Students pursuing a B.A. degree are required to choose four Computer Science courses (12 hours) from the 400-level courses above and two Computer Science courses (6 hours) from the 300-level courses below

CS	311	The Theory and Implementation of Programming Languages
CS	304	Advanced Object-Oriented Programming
CS	315	Computer Logic and Digital Design
CS	335	Operating Systems
CS	350	Web Application Development

Senior Project (B.S. - 4 hours)

Students pursuing a B.S. degree are required to take Senior Project. To fulfill this requirement, students would have to take CS 498 (1 credit hour) and CS 499 (3 credit hours) in two consecutive semesters. To take Senior Project, senior status in Computer Science, including completion of, or concurrent enrollment in, at least two other 400-level Computer Science courses, is required.

- CS 498 & 499 – Senior Project
  Selecting, planning, and implementing a team project.

Mathematics (B.S. - 11 hours; B.A. - 4 hours)

Both degree programs require MATH 150 (Calculus I). In addition, MATH 221 (Introduction to Linear Algebra) and MATH 250 (Calculus II) are required for students pursuing a B.S. degree.

Note: MATH 282 or MATH 483, a four-hour statistics course, must be completed as part of the College of Science supportive skills requirement for both.

Science (8 hours) - Required for B.S. degree only

The department requires a two-semester sequence of laboratory science courses chosen from the following:

Sequence 1:

PHYS	205a,b	University Physics
PHYS	255a,b	University Physics Laboratory

Sequence 2:

CHEM	200	Introduction to Chemical Principles
CHEM	201	General Chemistry Laboratory I
CHEM	210	General and Inorganic Chemistry
CHEM	211	General Chemistry Laboratory II

Either sequence also satisfies the College of Science physical sciences requirement and substitutes for three hours of University Core Curriculum.

Secondary Concentration (24 hours) - Required for B.A. degree only

The department requires the following M.B.A. Foundation courses:

ACCT	220	Accounting I
ACCT	230	Accounting II
FIN	270	The Legal and Social Environment of Business
FIN	330	Introduction to Finance
MGMT	318	Production-Operations Management
MKTG	304	Marketing Management
ECON	240	Introduction to Microeconomics
ECON	241	Introduction to Macro Economics

VII. New Students and Advisement

New Students

If you are a high school graduate entering SIUC as a freshman, you can complete all degree requirements in the normal four years (or possibly less). Prior exposure to computers is not a prerequisite. However, the department does honor the Advanced Placement Test in Computer Science given by the College Board. Additionally, the department can grant proficiency credit, particularly for the first course (CS 202), through examinations given by the department's Undergraduate Program Director.

If you are transferring from a community college, you can complete the departmental requirements in five or six semesters. Less time may be required depending on time of entrance and prior preparation. More precise estimates may be given in individual cases. It should be noted, however, that an associate degree in data processing may not significantly reduce the number of semesters required.

A transfer student need not have taken calculus prior to entrance into the program, but it is desirable that the student have had suitable precalculus courses. Indeed, Math 111 (Precalculus) or its equivalent (Math 108 and Math 109) is a prerequisite to CS 215 and Math 150 (Calculus I), two courses required of all majors.

Advisement

As a Computer Science major, you have the opportunity to meet each semester with a departmental advisor to plan your schedule in Computer Science courses for the following semester. The advisor can also review your career objectives and help you outline a course of study to meet your goals. However, you can choose to be advised by one of the undergraduate advisors in the College of Science Advisement Office. **There are some Computer Science majors who must meet with the department's Undergraduate Program Director prior to being advised by a College of Science advisor. They are:**

1. **Students who are on academic probation**
2. **Students who have less than a 2.00 average in the major**
3. **Students deemed to be academically "at risk"**
4. **Graduating seniors (with Major Check forms)**

Important Facts

Classes can be dropped and added during the first week of each semester. If you foresee any problems with a class, see your advisor and ask what can be done.

If you find yourself overloaded, classes can be dropped until the end of the second week without affecting your record. Between the second week and the eighth week, classes can be dropped with a "W" (withdrawal) grade. This does not affect your grade point average. If you are having problems, talk to an advisor as early as possible.

The first two weeks of fall and spring semesters, College of Science Advisement is open for walk-ins all day. If you have problems or questions, drop in at your convenience. No appointment is necessary. After the second week, there are two or three walk-in hours everyday for problems and questions. If you need to see an advisor, call (536-5537) or stop by (Neckers A185) to see when these times are available.

Make advisement/registration appointments early. During the second week of each semester, College of Science Advisement begins making advisement/registration appointments for the next semester. Registering early can make a difference in your getting the classes you want.

SalukiNet is a web-based information system available to all SIUC students. You can use it to register, obtain class schedules and grades, inquire about financial aid, and much more. All you need is your 9-digit SIUC student ID number and your 4-digit PIN (new students are initially assigned a random PIN and are normally informed of it in writing at the time of admission or registration). You are strongly urged to change your PIN as soon as possible in order to maintain the privacy of your records. SalukiNet is available at http://salukinet.siu.edu/. More information on SalukiNet and Web Registration is available at http://registrar.siu.edu/salukinet/salukinet.htm.

At the beginning of your junior year, you should register with University Career Services to begin the job search process.

Computer Science Course Listings

105-3 Introduction to Application Software.

This course is designed to provide a detailed exposure to various computer applications software including word processing, database management, spreadsheet, presentation, Web design software, and programming concepts. The course is designed to help students to better use the computer as a tool in their own fields and to help prepare students for Microsoft Office Specialist Certification examinations.

200B-3 Computer Concepts.

The course is designed to provide participants with a broad overview of computer concepts including key terminology and components of computer hardware, software, and operating systems. Topics will include, but are not limited to computer architecture, peripheral devices, networking components, system software, information system analysis, application software including word processing, database management, spreadsheet, and presentation software. Discussion will also include the Internet and Web page development.

201-3 Problem Solving with Computers.

This course provides an introduction to problem solving using computers. It goes beyond basic computer literacy and application software experiences, but is less intensive than a first course devoted solely to programming. The course focuses on problem solving in the context of an introduction to computer programming and includes coverage of topics from computer literacy, word processing, spreadsheet and database packages. A preliminary treatment of the Internet and World Wide Web is also included.

202-4 Introduction to Computer Science.

An introduction to computers and programming using a high-level structured language including a discussion of programming constructs and data representation. Primary emphasis will be given to problem solving, algorithm design, and program development. Three one-hour lectures and one two-hour lab per week. *Prerequisite:* Mathematics 111 or equivalent with a grade of C or better.

215-3 Discrete Mathematics.

Introduction to topics from discrete mathematics relevant to the study of computer science including: binary and hexadecimal number systems, sets, logic and truth tables, functions and relations, matrix operations, combinations, permutations, counting techniques, recurrence relations, boolean algebra, simple combinational circuits, simplification techniques. *Prerequisite:* Mathematics 111 or equivalent with a grade of C or better.

220-3 Programming with Data Structures.

A course in advanced programming, data structures and algorithm design with an increased emphasis on structured design techniques and program development. Topics include advanced language features, data abstraction and object-oriented programming, classes and dynamic data, recursion, stacks, queues, linked lists, trees and graphs, sorting and searching. *Prerequisite:* 202 and 215 each with a grade of C or better.

300-3 Introduction to Linux.

A gentle introduction to the Linux operating system. Computer programming experience is not required. Students will gain the knowledge and hands-on experience needed to install, configure, and use Linux. Emphasis will be placed on administration skills and security. Software for Linux will be surveyed, particularly to identify replacements for standard Windows applications. Prior experience with Windows or Macintosh operating systems is assumed.

301-3 Introduction to Visual Basic.

This course is designed to introduce students to the fundamentals of programming in Visual Basic. The topics include, but are not limited to, design and development of the user interface, development of algorithms, and writing computer programs. The course will cover the history of programming languages, object oriented programming, data types, arrays, control structures, string manipulation and Web-based applications.

304-3 Advanced Object-Oriented Programming.

Advanced features of object-oriented programming are covered in depth. The topics covered include, but are not limited to, the following: polymorphism, inheritance, overloading, generic programming, exception handling, file I/O, GUI development. A group project is an integral part of the course. *Prerequisite:* 220 with a grade of C or better.

306-3 Linux/UNIX Programming.

This course will prepare students to develop software in and for Linux/UNIX environments. Topics to be covered include basic operating system concepts, effective command line usage, shell programming, the C language, programming development tools, system programming, network programming (client-server model and sockets), and GUI programming. *Prerequisite:* 220 with a grade of C or better.

311-3 The Theory and Implementation of Programming Languages.

Introduction to the theory and implementation of programming languages including finite automata, regular grammars, lexical analysis, parsing, syntax-directed translation, semantic analysis, binding variables, data types, static and dynamic scope, subprograms, abstraction, and concurrency. Study of object-oriented, functional, and logic programming languages. Lab work is essential. *Prerequisite:* 220 with a grade of C or better.

315-3 Computer Logic and Digital Design.

Introduction to switching algebra and its applications. Combinational logic and combinational circuit components. Sequential logic and sequential circuit components. Asynchronous sequential circuits. *Prerequisite:* 215 with a grade of C or better.

320-3 Computer Organization and Architecture.

Overview of the basic logic circuits needed in constructing a computer. Fundamental computer operations: machine and assembly language instructions, stacks, procedures and macros. The translation process: assembly, linking and loading. Hardware elements for processing, transferring, and storing information. Data path and control unit for a simple processor. *Prerequisite:* 220 with a grade of C or better.

330-3 Introduction to the Design and Analysis of Algorithms.

An advanced course in data structures including a detailed treatment of the design, analysis, and complexity of algorithms. Covers B-trees, hash tables, heaps, and advanced sorting algorithms. Explores fundamental algorithm design techniques and basic graph algorithms. *Prerequisite:* 220 with a grade of C or better.

335-3 Operating System.

An extended treatment of the components of operating systems including process management, concurrency, memory management, device management, file management, and security. *Prerequisite:* 330 with a grade C or better.

350-3 Web Application Development.

A comprehensive introduction to languages and tools used to create client side and server side Web applications. Topics include, but are not limited to, markup languages, scripting languages, dynamic web pages, processing forms, server-side technologies, and database access. *Prerequisite:* CS 202 with a grade of C or better.

391-1 to 3 Current Topics in Computer Science.

Selected current topics from various fields of computer science. *Prerequisite:* Consent of instructor.

393-1 to 6 Internship in Computer Science.

Credit for participation in a formalized internship program involving computer science related work. Hours do not count toward requirements for CS major. Mandatory Pass/Fail. *Prerequisite*: Computer Science major and prior approval of the sponsoring agency and the Department of Computer Science.

399-1 Social, Ethical and Professional Issues in Computer Science.

Issues facing the computer professionals in society and industry. Social impact of information technology. Ethical responsibilities of the computer professional. Professional organizations: availability, membership, meetings, codes of conduct. Professional communications: written reports on case studies dealing with ethical decision making, term paper and an oral presentation. *Prerequisite:* 220 with a grade of C or better. Restricted to Computer Science majors.

401-3 Computer Architecture.

Review of logical circuit design. Hardware description languages. Algorithms for high speed addition, multiplication and division. Pipelined arithmetic. Implementation and control issues using PLA's and microprogramming control. Cache and main memory design. Input/Output. Introduction to interconnection networks and multiprocessor organization. *Prerequisite:* 320 with a grade of C or better.

402-3 Theory and Applications of Computer Aided Design.

A study of algorithmic techniques which solve high complexity design rules. Graph algorithms and formulations, randomized solutions, techniques from operations research and statistics, computational geometry algorithms and data structures are introduced. The techniques are mainly applied on the physical design/automation problem for integrated circuits and systems. *Prerequisite:* 315 and 330 each with a grade of C or better.

404-3 Autonomous Mobile Robots.

This course is a comprehensive introduction to modern robotics with an emphasis on autonomous mobile robotics. Fundamental of sensors and actuators as well as algorithms for top level control are discussed. Multi-robotics and human-robot interaction issues are explored. A group project is an integral part of this course. *Prerequisite:* CS 330 with a grade of C or better.

406-3 Basic Linux System Administration.

This course will be an introduction to the administration of Linux systems, with emphasis on security for networked systems. Topics to be covered include: installation and configuration of Linux distributions, typical maintenance activities, and security measures for networked systems. Students will have access to lab machines for hands on practice. *Prerequisite:* CS 306 with a grade of C or better.

408-3 Applied Cryptography.

This course is a comprehensive introduction to modern cryptography, with an emphasis on the application and implementation of various techniques for achieving message confidentiality, integrity, authentication and non-repudiation. Applications to Internet security and electronic commerce will be discussed. All background mathematics will be covered in the course. *Prerequisites:* CS 320 with a grade of C or better and MATH 221.

410-3 Computer Security.

A broad overview of the principles, mechanisms, and implementations of computer security. Topics include cryptography, access control, software security and malicious code, trusted systems, network security and electronic commerce, audit and monitoring, risk management and disaster recovery, military security and information warfare, physical security, privacy and copyrights, and legal issues. *Prerequisite:* 306 with a grade of C or better.

412-3 Programming Distributed Applications.

This course uses advanced features of the Java programming language to develop networked, distributed, and web-based applications. Topics covered include, but are not limited to, sockets, datagrams, the Java security model, threads, multi-tier architectures, Java RMI, Java database connectivity, and Java-based mobile agents. *Prerequisite:* 306 with a grade of C or better.

416-3 Compiler Construction.

Introduction to compiler construction. Design of a simple complete compiler, including lexical analysis, syntactical analysis, type checking, and code generation. *Prerequisite:* 306 and 311 each with a grade of C or better.

420-3 Distributed Systems.

A top-down approach addressing the issues to be resolved in the design of distributed systems. Concepts and existing approaches are described using a variety of methods including case studies, abstract models, algorithms and implementation exercises. *Prerequisite:* CS 335.

430-3 Database Systems.

The course concentrates on the relational model and includes several query languages. Topics covered include normalization, database design, catalogs, transaction support, concurrency control, integrity support, backup and recovery, and security. Projects involve the use of both personal and enterprise database systems. *Prerequisite:* 330 with a grade of C or better.

435-3 Software Engineering.

Principles, practices and methodology for development of large software systems. Object-oriented principles, design notations, design patterns and coping with changing requirements in the software process. Experiences with modern development tools and methodologies. A team project is an integral part of this course. *Prerequisite:* 330 each with a grade of C or better; CS 306 with a grade of C or better recommended.

436-3 Artificial Intelligence I.

Search and heuristics, problem reduction. Predicate calculus, automated theorem proving. Knowledge representation. Applications of artificial intelligence. Parallel processing in artificial intelligence. *Prerequisite:* 311 and 330 each with a grade of C or better.

437-3 Intelligent Systems and Soft Computing.

An introduction to the field of computer intelligence and soft computing. It covers rule-based expert systems, fuzzy expert systems, artificial neural networks, evolutionary computation, and hybrid systems. Students will develop rule-based expert systems, design a fuzzy system, explore artificial neural networks, and implement genetic algorithms. *Prerequisite:* CS 330 with a grade of C or better.

438-3 Bioinformatics Algorithms.

This course is an introductory course on bioinformatics algorithms and the computational ideas that have driven them. The course includes discussions of different techniques that can be used to solve a large number or practical problems in biology. *Prerequisite:* 330 with a grade of C or better.

440-3 Computer Networks.

Design and analysis of computer communication networks. Topics to be covered include queuing systems, data transmission, data link protocols, topological design, routing, flow control, security and privacy, and network performance evaluation. *Prerequisite:* CS 330 each with a grade of C or better; CS 306 recommended.

441-3 Mobile and Wireless Computing.

Concepts of mobile and wireless systems are presented. These concepts include, but are not limited to, Routing and Medium Access for Mobile Ad hoc and Wireless Sensor Networks, Mobile IP, Wireless LAN and IEEE 802.11. Hands-on group lab experience is an integral component in the course. *Prerequisite:* CS 330 with a grade of C or better, or consent of the instructor.

447-3 Introduction to Graph Theory.

(Same as Mathematics 447.) Graph theory is an area of mathematics which is fundamental to future problems such as computer security, parallel processing, the structure of the World Wide Web, traffic flow, and scheduling problems. It is also playing an increasingly important role within computer science. Topics covered include: trees, coverings, planarity, colorability, digraphs, depth-first and breadth-first searches. *Prerequisite:* Mathematics 349 or consent of instructor.

449-3 Introduction to Combinatorics.

(Same as Mathematics 449.) This course will introduce the student to various basic topics in combinatorics that are widely used throughout applicable mathematics. Possible topics include: elementary counting techniques, pigeonhole principle, multinomial principle, inclusion and exclusion, recurrence relations, generating functions, partitions, designs, graphs, finite geometry, codes and cryptography. *Prerequisite:* Mathematics 349 or consent of instructor.

451-3 Theory of Computing.

The fundamental concepts of the theory of computation including finite state acceptors, formal grammars, Turing machines, and recursive functions. The relationship between grammars and machines with emphasis on regular expressions and context-free languages. *Prerequisite:* 311 and 330 each with a grade of C or better or graduate standing.

455-3 Advanced Algorithm Design and Analysis.

An extensive treatment of the design, analysis and complexity of algorithms. Lower bound arguments, divide-and-conquer techniques, greedy algorithms, dynamic programming, graph theoretic algorithms, PRAM algorithms and NP-completeness and approximation algorithms. *Prerequisite:* 330 with a grade of C or better or graduate standing.

471-3 Optimization Techniques.

(Same as Mathematics 471.) An elementary introduction to algorithms for finding extreme values of nonlinear functions of several variables with and without constraints. Topics include: convex sets and functions; the arithmetic-geometric mean inequality; Taylor's theorem for functions of several variables; positive definite, negative definite, and indefinite matrices; iterative methods for unconstrained optimization such as the method of steepest descent; the Kuhn-Tucker algorithm; unconstrained and constrained geometric programming; Lagrange multipliers, and penalty function methods. Students will use a computer to study the numerical properties of these algorithms. *Prerequisite:* Mathematics 221 and 250.

472-3 Linear Programming.

(Same as Mathematics 472.) An introduction to the theory for finding extreme values of linear functionals subject to linear constraints. Topics include: recognition, formulation, and solution of real problems via the simplex algorithm; development of the simplex algorithm; artificial variables; the dual problem and the duality theorem; complementary slackness; sensitivity analysis; and selected applications of linear programming to integer programming, cutting plane algorithms, the distribution problem, the transportation problem, and the assignment problem. Students will use a computer to study the numerical performance of these algorithms. *Prerequisite:* Mathematics 221.

475-6 (3,3) Numerical Analysis.

(Same as MATH 475.) A practical introduction to the theory and techniques for computation with digital computers. Topics include: the solution of nonlinear equations; interpolation and approximation; solution of systems of linear equations; numerical integration, solution of ordinary differential equations; computation of eigenvalues and eigenvectors; and solution of partial differential equations. Students will use MATLAB to study the numerical performance of the algorithms introduced in the course. *Prerequisite:* (a) Mathematics 221 and 250; (b) 475a and Mathematics 305.

484-3 User Interface Design and Development.

Problems and processes in the design of highly usable systems. Understanding stakeholders, requirements, tasks, prototyping, evaluation, guidelines and design process and heuristics. Interactive software concepts and implementation considerations. A group project is an integral part of this course. *Prerequisite:* 306 with a grade of C or better.

485-3 Computer Graphics.

Principles and techniques of computer graphics. Interactive graphics software development using a modern graphics standard. Topics include: primitives, transforms, clipping, modeling, viewing, rendering, texture, animation and ray tracing. A group project is an integral part of this course. *Prerequisite:* 306 with a grade of C or better; Mathematics 150 and 221 are recommended.

487-3 Software Aspects of Game Development.

This course focuses on software implementation and development aspects of game production including: software process, system architecture, frameworks, entity management and interaction design, game design, production and business issues as well as technical foundations in graphics modeling and rendering, collision detection, physics, artificial intelligence, and multiplayer techniques. *Prerequisite:* 330 with a grade of C or better

490-1 to 6 (1 to 3 per semester) Readings.

Supervised readings in selected subjects. Not for graduate credit. Mandatory Pass/Fail. *Prerequisite:* consent of instructor and department.

491-1 to 6 Special Topics. (1 to 3 per topic).

Selected advanced topics from the various fields of computer science. *Prerequisite:* consent of instructor.

492-1 to 6 (1 to 3 per semester) Special Problems.

Individual projects involving independent work. *Prerequisite:* consent of department.

493-1 to 4 Seminar.

Supervised study. Preparation and presentation of reports. *Prerequisite:* consent.

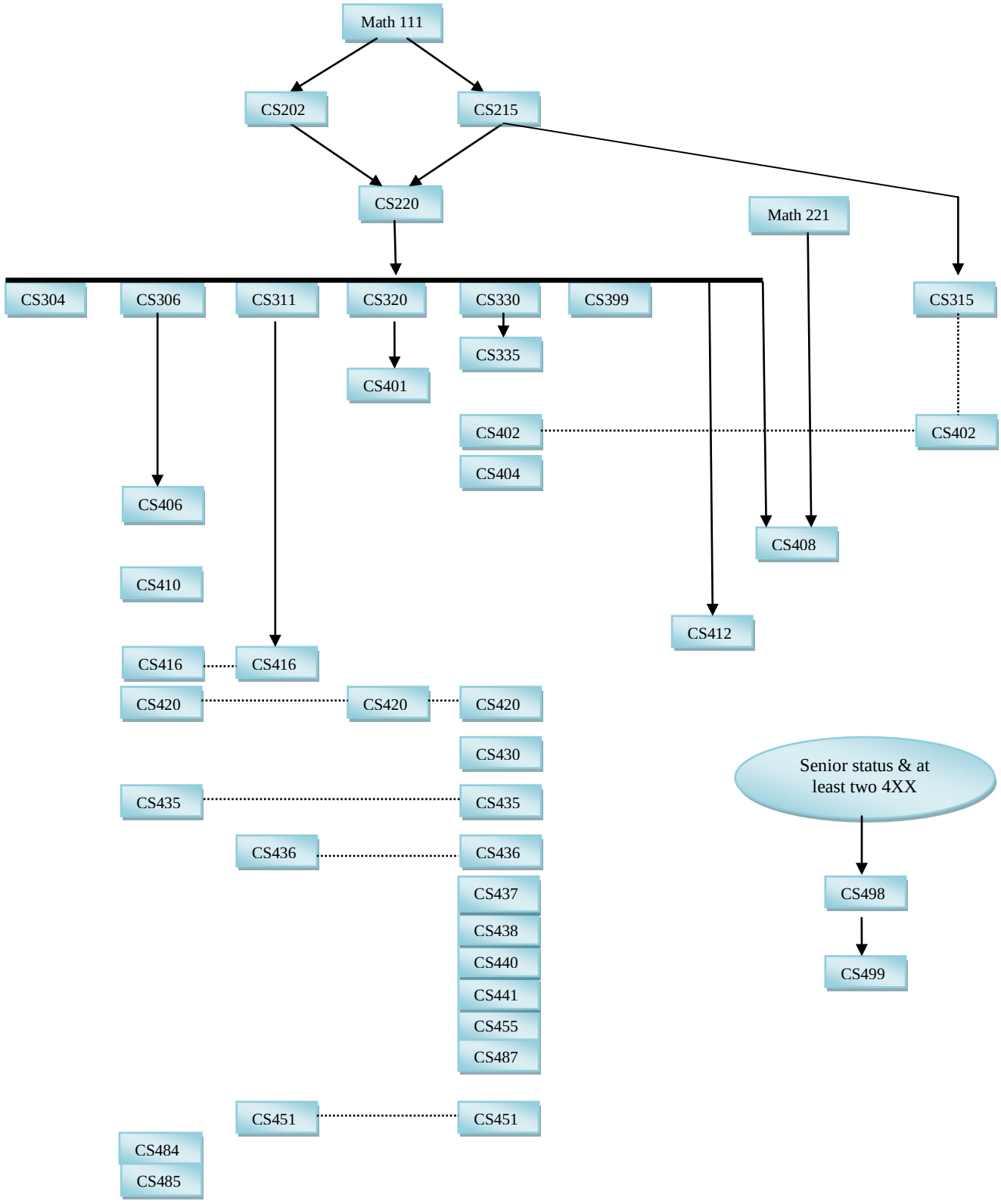
498-1 Senior Project in Computer Science I.

Selecting and planning a team project which is representative of a project graduates may encounter in their professional employment. This involves team formation, project selection, project planning, proposal writing, and proposal presentation. *Prerequisite:* Senior status in Computer Science, including completion of or concurrent enrollment in at least two other 400-level Computer Science courses.

499-3 Senior Project in Computer Science II.

A continuation of CS 498. An exercise in the design, implementation, documentation, and deployment of a group project culminating in a presentation to the computer science faculty. *Prerequisite:* CS 498.

Prerequisite Structure



Indicates a course is prerequisite for course or courses below it. (Example 311 is a prerequisite for 416,436, and 451)

Indicates course has more than one prerequisite. (Example: 420 has prerequisites of 306, 320, and 330)

All courses under the thick black line have a prerequisite of CS220

Programming Load and Mathematical Level of Sophistication

The levels in a particular course may vary from one instructor to another and may even vary from term to term with a particular instructor. The following levels should be viewed as rough estimates.

Course	Programming Load	Mathematical Level	Prerequisites
105	0	0	none
200B	0	0	none
201	1	0	none
202	2	1	Mathematics 111
215	0	2	Mathematics 111
220	3	2	202 and 215
300	0	0	None
301	2	0	None
304	3	1	220
306	3	1	220
311	2	2	220
315	0	2	215
320	1	1	220
330	3	2	220
335	2	1	330
350	2	1	202
399	0	0	220; Restricted to CS majors.
401	0	1	320
402	1	2	315 and 330
404			330
406	1	1	306
408			220 and MATH 221 or equivalents
410	1	2	306
412	3	1	220
416	3	0	306 and 311
420	2	2	306, 320 and 330
430	1	1	220 and 330
435	3	0	306 and 330
436	2	1	311 and 330
437	2	1	330
438	2	2	330
440	1	2	306
441	2	2	330
447	0	3	Mathematics 349
449	0	3	Mathematics 349
451	0	2	311 and 330
455	1	2	330
471	1	2	Mathematics 221 and 250
472	1	2	Mathematics 221
475a	1	3	202 and Mathematics 221 and 250
484	2	1	306
485	2	2	306; Mathematics 150 and 221 recommended
498			Sr status in CS with completion or concurrent enrollment in at least 2 other 400-level CS courses
499			498

Legend: 0 = none to slight 1 = slight to moderate 2 = moderate 3 = heavy

Sample Curriculum

The curriculums below are presented only as samples. In no way are these model curriculums or even recommended curriculums. These curriculums can and should be tailored to a student's background and preparation. For example, one may have the ability to take CS 202 and CS 215 the first semester of the freshman year if he/she has the background equivalent to MATH 111. These sample curriculums do take advantage of allowable substitutes for University Core Curriculum courses in order to reduce requirements. Keep in mind that the order in which Computer Science electives are taken is subject to the course offerings in a given semester.

Bachelor of Science Degree

Year 1

Semester 1 (13 cr. hrs.)

ENGL 101	English Composition I	3
MATH 111	Precalculus	4
PHIL 105	Elementary Logic	3
PHSL 201	Human Physiology	3

Semester 2 (17 cr. hrs.)

CS 202	Introduction to Computer Science	4
CS 215	Discrete Mathematics	3
ENGL 102	English Composition II	3
MATH 150	Calculus I	4
SPCM 101	Introduction to Oral Communications: Speech, Self and Society	3

Year 2

Semester 1 (17 cr. hrs.)

CS 220	Programming with Data Structures	3
ENGL 290	Intermediate Expository Writing	3
MATH 250	Calculus II	4
PHYS 205a	University Physics	3
PHYS 255a	University Physics Laboratory	1
Select	Humanities	3

Semester 2 (16 cr. hrs.)

CS 311	The Theory and Implementation of Programming Languages	3
CS 306	Linux/ Unix Programming	3
MATH 221	Introduction to Linear Algebra	3
PHYS 205b	University Physics	3
PHYS 255b	University Physics Laboratory	1
Select	Social Science	3

Year 3

Semester 1 (14 cr. hrs.)

CS 330	Introduction to the Design and Analysis of Algorithms	3
CS 320	Computer Organization and Architecture	3
HED 101	Foundations of Human Health	2
Select	Fine Arts	3
Select	Social Science	3

Semester 2 (15 cr. hrs.)

CS 335	Operating Systems	3
CS 399	Social, Ethical and Professional Issues in Computer Science	1
CS 4XX	CS Elective	3
MATH 483	Mathematical Statistics in Engineering and Physical Sciences I OR	4
MATH 282	Introduction to Applied Statistics	
PLB 200 or	General Plant Biology OR	
ZOOL 118	Principles of Animal Biology	4

Year 4

Semester 1 (16 cr. hrs.)

CS 498	Senior Project in Computer Science I	1
CS 4XX	CS Elective	3
CS 4XX	CS Elective	3
CS 4XX	CS Elective	3
Select	Multicultural	3
Select	Free Elective	3

Semester 2 (12 cr. hrs.)

CS 499	Senior Project in Computer Science II	3
CS 4XX	CS Elective	3
CS 4XX	CS Elective	3
Select	Interdisciplinary	3

Bachelor of Arts Degree

Year 1

Semester 1 (14 cr. hrs.)

ENGL 101	English Composition I	3
MATH 111	Precalculus	5
PHIL 105	Elementary Logic	3
CS 201	Problem Solving with Computers	3

Semester 2 (17 cr. hrs.)

CS 202	Introduction to Computer Science	4
CS 215	Discrete Mathematics	3
ENGL 102	English Composition II	3
MATH 150	Calculus I	4
SPCM 101	Introduction to Oral Communications: Speech, Self and Society	3

Year 2

Semester 1 (15 cr. hrs.)

CS 220	Programming with Data Structures	3
ACCT 220	Accounting I	3
ECON 240	Introduction to Microeconomics	3
HED 101	Foundations of Human Health	2
PHYS 203a	College Physics	3
PHYS 253a	College Physics Laboratory	1

Semester 2 (15 cr. hrs.)

CS 3XX	CS Elective	3
ECON 241	Introduction to Macro Economics	3
ENGL 290	Intermediate Expository Writing	3
PHYS 203b	College Physics	3
Select	Humanities	3

Year 3

Semester 1 (15 cr. hrs.)

CS 3XX	CS Elective	3
CS 320	Computer Organization and Architecture	3
CS 330	Introduction to the Design and Analysis of Algorithms	3
Select	Fine Arts	3
Select	Social Science	3

Semester 2 (16 cr. hrs.)

CS 306	Linux/UNIX Programming	3
CS 4XX	CS Elective	3
ACCT 230	Accounting II	3
MATH 282	Introduction to Statistics	3
PLB 200 or	General Plant Biology OR	
ZOOL 118	Principles of Animal Biology	4

Year 4

Semester 1 (16 cr. hrs.)

CS 399	Social, Ethical and Professional Issues in Computer Science	1
CS 4XX	CS Elective	3
FIN 270	The Legal and Social Environment of Business	3
MGMT 318	Production-Operations Management	3
MKTG 304	Marketing Management	3
Select	Multicultural	3

Semester 2 (15 cr. hrs.)

CS 4XX	CS Elective	3
CS 4XX	CS Elective	3
FIN 330	Introduction to Finance	3
PHSL 201	Human Physiology	3
Select	Interdisciplinary	3

Tentative Course Offerings
2010 – 2011

Course Number	Summer 2010	Fall 2010	Spring 2011	Summer 2011
105		✓	✓	✱
200b	✓	✓	✓	✓
201		✓	✓	
202	✓	✓	✓	✓
215		✓	✓	✱
220		✓	✓	✱
300			✓	
301				
304		✓		
306		✓	✓	
311		✓	✓	
315			✓	
320		✓	✓	
330		✓	✓	
335		✓	✓	
350			✓	
399		✓	✓	
401				
402				
404			✓	
406			✓	
408			✓	
410		✓		
412	✓			✓
416		✓	✓	
420		✓		
430		✓		
435		✓		
436				
437				
438			✓	
440			✓	
441		✓		
447		✓		
449			✓	
451				
455		✓		
471			✓	
472	✓	✓		✓
475a		✓		
475b			✓	
484			✓	
485			✓	
487				
491	✓			✓
498		✓		
499			✓	

✓ – Students should anticipate this course being offered
✱ – Course will be offered only if funding permits.

Four-Year Plan

	Fall Semester	Spring Semester	Summer Semester
Year 1			
Year 2			
Year 3			
Year 4			

Record of Courses and Grades – BS Degree[3]

UNIVERSITY CORE	Hrs.	Grade
Foundation Skills (12 hrs.)		
ENGL 101, 120 or LING 101	3	
ENGL 102 or LING 102	3	
MATH*		
SPCM 101	3	
Fine Arts (3 hrs.)		
Choose 1 of AD 100a, 100b, 101, CP 101, ENGL 119, 206a, 206b, FL 100a, b, c, HIST 201, MUS 103, THEA 101, MUS 257a, b, THEA 220	3	
Human Health (2 hrs.)		
Choose 1 of FN 101, BIOL 202, HED 101, PE 101, PHSL 201, HCP 241, PE 201, PHSL 310		
Humanities (6 hrs.)		
Choose 2 from list on page 5	6	
or choose 1 of these sequences 1. ENGL 121 and 204 2. FR 101a and 101b 3. GER 101a and 101b 4. HIST 101a and 101b 5. PHIL 103a and 103b 6. AD 207 a, b, c (choose 2)	6	
Science (6 hrs.)[1]		
COS physical and biological science requirements will substitute		
Social Science (6 hrs.)		
Choose 2 from list on page 6	6	
Multicultural (3 hrs.)		
Choose 1 from list on pages 6	3	
Interdisciplinary (3 hrs.)		
Choose 1 from list on page 7	3	
COS REQUIREMENTS		
Biological Science (6 hrs.)		
Choose 2 from: PHSL 201, PLB 200, ZOOL 118	3 3	
Supportive Skills (7 hrs.)		
Math 282 or MATH 483	4	
Choose 1 of ENGL 290, 291, 491 or LING 290	3	

CS MAJOR REQUIREMENTS	Hrs.	Grade
CS Core (26 hrs.)		
CS 202	4	
CS 215	3	
CS 220	3	
CS 306	3	
CS 311	3	
CS 320	3	
CS 330	3	
CS335	3	
CS 399	1	

All of the above require a "C" or better and a cumulative "C" average.

CS Electives (18 hrs.)		
CS 4 __ __	3	
CS 4 __ __	3	
CS 4 __ __	3	
CS 4 __ __	3	
CS 4 __ __	3	
CS 4 __ __	3	

The above must be from the approved list on pages 10-11.

Senior Project (4 hrs.)		
CS 498	1	
CS 499	3	
Mathematics (11 hrs.)		
MATH 150	4	
MATH 250	4	
MATH 221	3	
Physical Science (8 hrs.)[1, 2]		
Choose 1 of the following combinations: 1. PHYS 205 a,b and PHYS 255 a,b 2. CHEM 200, 201 and CHEM 210, 211	8	

[1] Can be reduced by courses taken to satisfy University core Curriculum requirements.

[2] Courses taken to fulfill the CS Major Science Requirement will also fulfill the COS Physical Science Requirement

[3] Some courses fulfill multiple requirements. Degree requirements are 120 hours.

Record of Courses and Grades – BA Degree[2]

UNIVERSITY CORE	Hrs.	Grade
Foundation Skills (12 hrs.)		
ENGL 101, 120 or LING 101	3	
ENGL 102 or LING 105	3	
MATH[1]		
SPCM 101	3	
Fine Arts (3 hrs.)		
Choose 1 of AD 100a, 100b, 101, CP 101, ENGL 119, 206a, 206b, FL 100a, b, c, HIST 201, MUS 103, THEA 101, MUS 257a, b, THEA 220	3	
Human Health (2 hrs.)		
Choose 1 of FN 101, BIOL 202, HED 101, PE 101, PHSL 201, HCP 241, PE 201, PHSL 310		
Humanities (6 hrs.)		
Choose 2 from list on page 5	6	
or choose 1 of these sequences 1. ENGL 121 and 204 2. FR 101a and 101b 3. GER 101a and 101b 4. HIST 101a and 101b 5. PHIL 103a and 103b 6. AD 207 a, b, c (choose 2)	6	
Science (6 hrs.)		
COS physical and biological science requirements will substitute		
Social Science (6 hrs.)		
Choose 2 from list on page 6	6	
Multicultural (3 hrs.)		
Choose 1 from list on pages 6	3	
Interdisciplinary (3 hrs.)		
Choose 1 from list on page 7	3	
COS REQUIREMENTS		
Biological Science (6 hrs.)		
Choose 2 from: PHSL 201, PLB 200, ZOOL 118	3 3	
Supportive Skills (6 hrs.)		
MATH 282	3	
Choose 1 of ENGL 290, 291, 491 or LING 290	3	
CS MAJOR REQUIREMENTS	**Hrs.**	**Grade**
CS Core (23 hrs.)		
CS 201	3	
CS 202	4	
CS 215	3	
CS 220	3	
CS 306	3	
CS 320	3	
CS 330	3	
CS 399	1	

All of the above require a "C" or better and a cumulative "C" average.

CS Electives (18 hrs.)		
CS 3 __ __	3	
CS 3 __ __	3	
CS 4 __ __	3	
CS 4 __ __	3	
CS 4 __ __	3	
CS 4 __ __	3	
English (3 hrs.)		
Choose 1 of ENGL 290, ENGL 291, ENGL 491 or LING 290	3	
Mathematics (7 hrs.)		
MATH 150	4	
Physical Science (8 hrs.)[1, 2]		
Choose 1 of the following: 1. PHYS 205 a,b and 255 a,b 2. CHEM 200, 201 and 210, 211	8	
Secondary Concentration (24 hrs.)		
ACCT 220	3	
ACCT 230	3	
ECON 240	3	
ECON 241	3	
FIN 270	3	
FIN 330	3	
MGMT 318	3	
MKTG 304	3	

[1] Can be reduced by courses taken to satisfy University core curriculum requirements.

[2] Some courses fulfill multiple requirements. Degree requirements are 120 hours.

IX. Other Important Information

Computer Science Accounts

All Computer Science majors at SIUC are entitled to an account on the department's LINUX system and Windows system. This account can be used to access the computers in the labs of the Department of Computer Science and is kept as long as the student is actively pursuing a major in Computer Science. The account will be dispatched in class by the instructor.

Departmental Scholarships

The department offers a minimum of three $800 scholarships. Each scholarship is disbursed in two equal parts of $400 each for the Fall and Spring semesters. Applications may be obtained from the department.

Two scholarships are awarded to undergraduate students who are currently enrolled at SIUC and who have made significant progress toward a major in Computer Science. These awards are based on the following criteria:

1. Completion of at least CS 202, CS 215, and CS 220 or their equivalents.
2. Current GPA of 3.25 overall.
3. Current GPA of 3.50 in the major.
4. Student must be enrolled as a full-time Computer Science major at SIUC during the award period.

The third scholarship is awarded to a transfer student from an Illinois community college who has made significant progress toward a major in Computer Science. This award is based on the following criteria:

1. Admission to SIUC for the Fall semester as a Computer Science major.
2. Completion of an associate's degree prior to enrollment at SIUC.
3. Completion of the equivalents of CS 202 and either CS 215 or CS 220 prior to enrollment at SIUC.
4. Current GPA of 3.25 overall on a 4.0 scale.
5. Student must be enrolled as a full-time Computer Science major at SIUC during the award period.

Other scholarships are available. Contact the College of Science Dean’s Office and New Student Admission Services for additional information.

Scholarship for High School Seniors

The Department of Computer Science also offers $4000 scholarships for selected high school seniors who enroll at SIUC with a major in Computer Science. Each scholarship is worth $500 per semester (Fall and Spring) for eight semesters. The funds will be applied toward tuition and /or fees.

Selection will be based on a candidate’s entire academic and extracurricular record. Minimum requirements are a composite ACT score of at least 27, a math ACT score of at least 27, and a class ranking in the top 25%.

In order to retain a scholarship, a student must do the following:

- Maintain an overall GPA of at least 3.0 (out of 4.0)
- Maintain a GPA in Computer Science (CS) courses of at least 3.25
- Pass an average of at least 27 semester hours per academic year (Fall through Summer)
- Successfully complete at least two CS courses per year
- Have successfully completed at least eight CS courses by the end of the third year
- Maintain enrollment status as a full-time student and a CS major

X. University Contact Information

Achieve Program:
Northwest Annex Bldg. C
(618) 453-2595
http://www.siu.edu/~achieve/

Bursar:
Woody B6
(618) 453-2221
http://www.siu.edu/~bursar
bursar@siu.edu

College of Science Advisement:
Neckers A185
(618) 536-5537
http://www.science.siu.edu/advisement/index.html
advise@cos.siu.edu

College of Science Dean's Office:
Neckers A157
(618) 536-6666
http://www.science.siu.edu/cos/people.html
dean@cos.siu.edu

Disability Support Services:
Woody B150
(618) 453-5738
TDD (618) 453-2293
http://www.siu.edu/~dss/

Financial Aid:
Woody Hall, B-wing, 3rd Floor
(618) 453-4334
http://www.siu.edu/~fao
fao@siu.edu

Identification Cards:
Student Center
(618) 536-3351
http://www.siucstudentcenter.org/idcard/

Information Technology:
(618) 453-5155 (Customer Service Center)
http://www.infotech.siu.edu/
custserv@siu.edu

International Programs and Services:
Northwest Annex Building B
(618) 536-7771
http://www.siu.edu/~ips/

Morris Library:
(618) 453-2531
http://www.lib.siu.edu/hp/

New Student Programs:
(618) 536-4405
http://www.newstudent.siu.edu/

Non-Traditional Student Services:
Student Center, 3rd Floor
(618) 453-5714
http://www.siu.edu/~studdev/nontraditional.htm
studdev@siu.edu

Pre-Major Advisement Center:
Woody C117
(618) 453-4351
http://www.siu.edu/~pmac

Records and Registration:
Woody A104
(618) 453-4381
http://registrar.siu.edu/
registrar@siu.edu

Saluki Express Bus Service:
(618) 536-3351
http://www.siucstudentcenter.org/salukiexpress/

SalukiNet:
http://salukinet.siu.edu/

Student Health Programs:
Kesnar Hall
(618) 453-3311
http://www.siu.edu/~shp/

University Career Services:
Woody B204
(618) 453-2391
http://www.siu.edu/~ucs/
ucsc@siu.edu

University Core Curriculum:
Faner 2512
(618) 453-3468
http://www.siu.edu/~corecurr/
jsallen@siu.edu

Undergraduate Admissions:
(618) 536-4405
http://admissions.siu.edu
joinsiuc@siu.edu

University Honors:
Faner 3341
(618) 453-2824
http://www.siu.edu/~honors/
honors@siu.edu

University Housing:
Washington Square D
(618) 453-2301
http://www.housing.siu.edu/

Veterans Affairs:
Woody B353
(618) 453-2791

XI. Departmental Contact Information

Undergraduate Program Director
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Carbondale, IL 62901-4511 USA

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SIUC home page: http://www.siuc.edu/

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