



SEATTLE PACIFIC
UNIVERSITY

COLLEGE OF ARTS AND SCIENCES
DIVISION OF SCIENCE AND ENGINEERING
DEPARTMENT OF COMPUTING SCIENCES

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<http://www.spu.edu/depts/csc/>

Department of Computing Sciences Advising Brochure Effective Fall Quarter 2007

This student academic advising brochure contains information about the degree programs and courses of study that are offered by the Department of Computing Sciences at Seattle Pacific University. SPU offers both undergraduate majors and a minor in the Computing Sciences. SPU does not offer a graduate degree in the Computing Sciences.

A graduate in the Computing Sciences is awarded either the Bachelor of Science degree or the Bachelor of Arts degree from the Division of Science and Engineering in the College of Arts and Sciences. All computing sciences majors must satisfy the Major curricular requirements of one of the offered B.S. or B.A. degrees. In addition, all University general education Exploratory Curriculum, Foundation, and competency requirements must be met (described fully in the SPU Catalog).

A minor in Computer Science is designed to complement a major course of study in another discipline, providing students with computer programming and software design expertise that can be applied to solve problems relevant to the associated area.

The various degree options and requirements are presented in table and checklist formats, along with several additional diagrams and charts that describe the course sequencing prerequisite structure and recommended 4-year course scheduling plans for completing the degree requirements. Also included is a copy of the University catalog description for the Computing Sciences program, a brief summary of all CSC course offerings, and other advising information such as a list of courses from the University Exploratory Curriculum that are likely to be particularly relevant for students completing Computing Sciences degrees.

The CSC departmental web site always has the most up-to-date information about our degree programs and requirements (<http://www.spu.edu/depts/csc/>).

The SPU web site always has the most up-to-date information on Catalog requirements and course Timescheduling (<http://www.spu.edu>).

Please contact a Computing Sciences faculty advisor if you need further information.

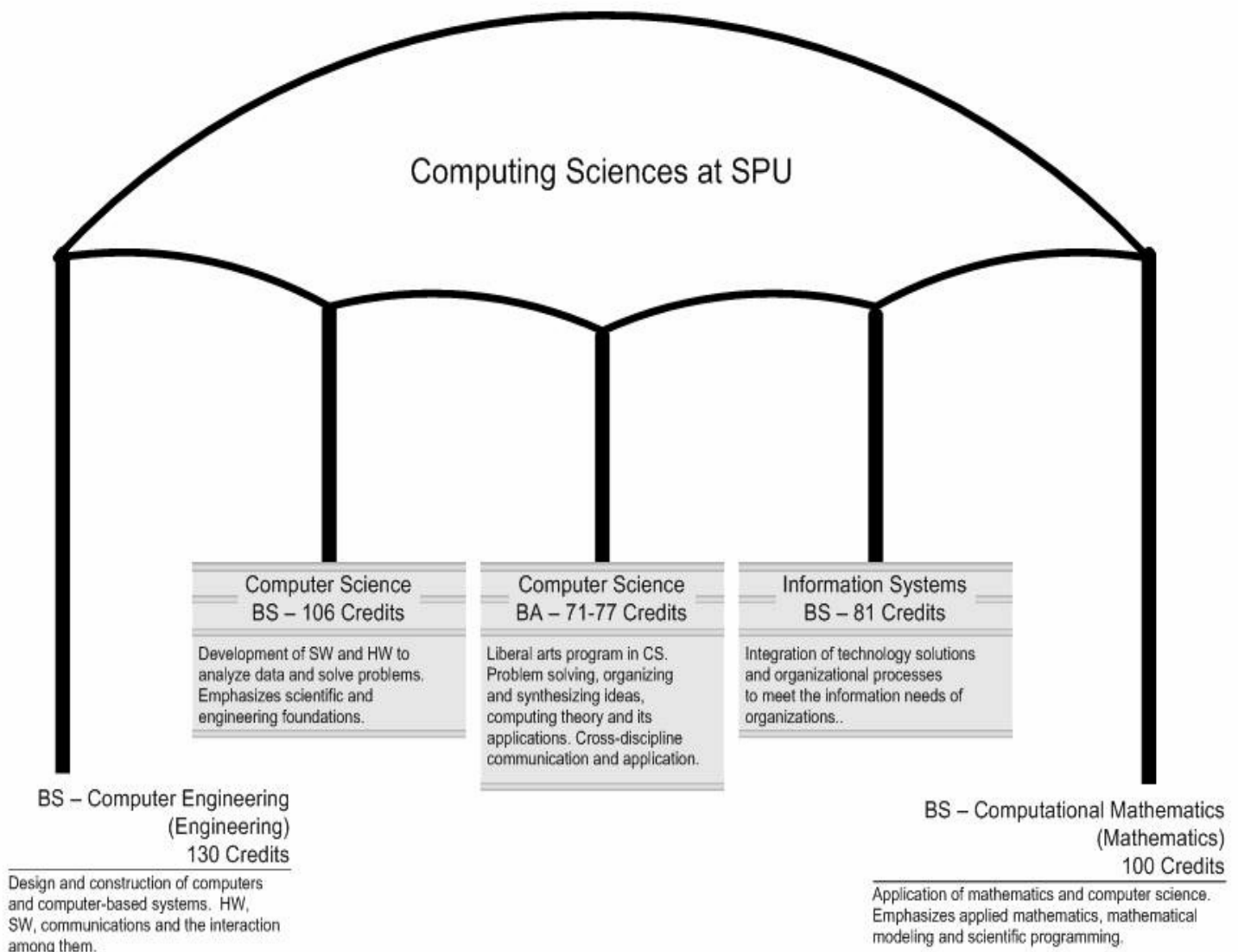
Computing Sciences at Seattle Pacific University

Departmental Web Page: <http://www.spu.edu/depts/csc/>

The Department of Computing Sciences prepares students to

- employ critical thinking skills and efficient computer-based methods to analyze and solve challenging problems,
- utilize computing technologies in a socially responsible manner, and
- apply their expertise wherever they serve in the world.

We seek to provide a well-focused program of studies in the theoretical and applied aspects of modern computing-related disciplines, informed by a Christian world view and graduating students who are equipped for continued professional development and service.



Computing Sciences at Seattle Pacific University

Bachelor Degrees Offered in the Department of Computing Sciences

B.S. in Computer Science

The **BS / CS** is a traditional computer science degree that combines full coverage of the core areas of computer science with an emphasis on scientific and engineering foundations.

B.A. in Computer Science

The **BA / CS** emphasizes problem solving, organizing and synthesizing ideas, and applications of computing theory. This option provides flexibility for students to pursue additional specializations in other academic areas. It embraces the premise that graduates working in computer-related areas will find that their careers develop in unexpected ways due to their wide range of interests aside from computer science.

B.S. in Information Systems

The **BS / IS** combines the core areas of computer science with an emphasis on integrating information technology solutions and organizational processes to meet the information needs of both for-profit and nonprofit organizations.

SPU Computing Environment

A variety of computing equipment is available to SPU to support coursework and independent study activities. A fiber-optic Ethernet network and wireless networking link all parts of the campus computing environment. The open student laboratory contains about 30 modern Windows PC systems, each with full Ethernet connectivity and with access to printers and appropriate software packages. The CSC Projects laboratory contains a configurable 8-node network cluster for student coursework and projects involving high-performance concurrent and distributed computing networks.

It is recommended that students majoring in the computing sciences obtain their own Windows-compatible PC to gain the full experience of configuring and maintaining a computer system. A suitable system would be based on a fast Pentium or Athlon processor with 1GB memory, a 200 GB hard drive, USB, Ethernet and printer. Software should include Windows Vista or XP, Microsoft Visual Studio .NET, Microsoft Word, and Adobe Acrobat Reader. Some courses may require other software which will be available in the student laboratory or for separate purchase. Most recommended software is available with educational pricing through the Computer & Information Systems department, or at the SPU Bookstore.

Faculty

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M.S.E. Software Engineering, Seattle University, 1989.
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Phil Prins
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M.S., Ph.D. Computer Science, University of Illinois, 1975.

Department of Computing Sciences – Goals and Learning Objectives

The Department of Computing Sciences has identified several goals for students enrolled in our programs.

Goal 1: Help students develop problem-solving skills, especially those required to analyze, design and implement solutions involving the use of a computer.

- Objective 1: Successful students will acquire the up-to-date technical knowledge and develop the skills needed for a successful start to careers in the computing industry.
- Objective 2: Successful students will be able to develop solutions to problems that are new to them, and implement these solutions efficiently.
- Objective 3: Successful students will be able to implement solutions utilizing different computer platforms and programming languages.
- Objective 4: Successful students will develop the skills needed to work in small groups on medium to large scale projects.
- Objective 5: Successful students will develop the ability to write technical documents that include specification, design, and implementation of major projects.
- Objective 6: Successful students will be able to effectively disseminate information and results using both oral and written communication.

Goal 2: Provide a background in modern computing systems and the theoretical aspects of computer science.

- Objective 1: Successful students will acquire the computing sciences knowledge required for graduate studies.
- Objective 2: Successful students will understand the architecture, organization and programming of modern computing systems.
- Objective 3: Successful students will understand the mathematical foundations of the computing sciences, algorithm efficiency and computational complexity.

Goal 3: Challenge students to consider the ethical and social impacts of technology, enabling them to take responsible action informed by a Christian world view.

- Objective 1: Successful students will be aware of ethical and social issues related to technology and recognize their impact.
- Objective 2: Successful students will be able to evaluate potential ethical dilemmas and apply decision-making techniques to resolve them.

Goal 4: Prepare students for continued learning in a rapidly changing discipline.

- Objective 1: Successful students will be aware of the rapid rate of change of technology and methodologies in the computing sciences.
- Objective 2: Successful students will be familiar with ways to gain knowledge and understanding of new developments in technology and the computing sciences.
- Objective 3: Successful students will be aware of alternatives for continuing education in the computing sciences.

"As a community of learners, Seattle Pacific University seeks to educate and prepare students for service and leadership. We are committed to evangelical Christian faith and values, and to excellence in teaching and scholarship for the intellectual, personal and spiritual growth of students."

– Mission Statement Seattle Pacific University

"The Department of Computing Sciences prepares students to

- (1) employ critical thinking skills and computer-based methods to analyze and solve challenging problems,*
- (2) utilize computing technologies in a socially responsible manner, and*
- (3) apply their expertise wherever they serve in the world."*

– Mission of the Department of Computing Sciences

FALL 2007
DEPARTMENT OF COMPUTING SCIENCES DEGREE REQUIREMENTS

Preliminary Prerequisites. High School Pre-Calculus or Math Analysis is required.

Admission and GPA Requirement. A minimum 2.5 GPA (cumulative in all courses required for the major taken at SPU) is required for admission to the major. Additionally, a minimum 2.0 ("C" grade) must be earned in CSC 2430, and a minimum 1.7 ("C-" grade) must be earned in each other course required for the major. An admission form and information is available from <http://www.spu.edu/depts/csc>.

Requirements for the Bachelor of Science in Computer Science
(106 Credits; 48 upper-division)

The BS/CS requires an 11-course core that provides a broad background in the topics of computer science. A project or research course plus three additional senior-level electives allow the student to explore these and other areas in greater depth, and apply their core knowledge to more advanced problems. This computing curriculum is supported by six courses of mathematics, two in electrical engineering, and one year of calculus-based physics.

Requirements for the Bachelor of Arts in Computer Science
(71 Credits; 41 upper-division)

The BA/CS emphasizes problem solving, organizing and synthesizing ideas, and applications of computing theory. Students complete 15 courses total in computer science, encompassing the major topics of the discipline. Mathematics courses in calculus, computer math, and statistics complete the major requirements.

Requirements for the Bachelor of Science in Information Systems
(81 Credits; 51 upper-division)

The BS/IS emphasizes the integration of information systems and organizational processes through studies in three areas:

- Computing Sciences – 12 courses focusing on problem solving, software and system development.
- Mathematics – calculus, computer math, and statistics provide a quantitative background.
- Organization – three courses in organizational/management topics help students make the connection between technology and the information needs of people.

Requirements for the Computer Science Minor
(35 Credits; 15 upper-division)

Core Courses

CSC 1230 Problem Solving and Programming.....	5
CSC 2430 Data Structures I	5
CSC 2431 Data Structures II	5

Electives

CSC 3000 - CSC 4999.....	15
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Mathematics

Select one of: MAT 1221 or MAT 1225 or MAT 1360 or BUS 2700	5
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Total	35
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Related Degree Programs

B.S. in Computational Mathematics: Application of mathematics and computer science. Emphasizes applied mathematics, mathematical modeling, and scientific programming. For more information, contact the Department of Mathematics.

B.S. in Computer Engineering: Design and construction of computers and computer-based systems. Hardware, software, communications and the interaction among them. For more information, contact the Department of Engineering.

Computing Sciences Degrees Required Courses for 2007-2008 Catalog	B.S. CS	B.A. CS	B.S. IS
CSC 1230 Problem Solving & Programming	5	5	5
CSC 2430 Data Structures I	5	5	5
CSC 2431 Data Structures II	5	5	5
CSC 3150W Systems Design	5	5	5
CSC 3220 Applications Programming	3	3	3
CSC 3221 Netcentric Computing	3	3	3
CSC 3310 Concepts in Programming Languages	3	3	
CSC 3350 Operating Systems Programming	3		
CSC 3430 Algorithm Design & Analysis	3	3	
CSC 3750 Computer Architecture		5	5
CSC 3760 Computer Organization	5		
CSC 3899 Social Impacts of Computing		3	3
CSC 4898 Senior Capstone in Computer Science	2	2	2
BS/IS Additional Requirements			
CSC 4410 Database Management			5
CSC Project Course (CSC 4150 or 4820)			5
BS/CS Additional Requirements			
CSC Project or Research Course (CSC 4150, 4820, 4760, or 4970)	5		
BS/CS CSC Electives: 11 credits (CSC 4000 - 4850, or 4970)	11		
BA/CS Additional Requirements			
CSC Project or Research Course (CSC 4150, 4820, 4760, or 4970)		5	
BA/CS CSC Electives: 3 courses (CSC 3350, 4000-4850, or 4970)		9-15	
Total Computing Sciences Credits Required	58	56-62	46
MAT 1221 Survey of Calculus *		5	5
MAT 1720 Math for Computer Science		5	5
MAT 1360 Introduction to Statistics * <i>or</i>			
MAT 2700 Statistics for Business and Economics *		5	5
MAT 1225 Calculus *	5		
MAT 1226 Calculus	5		
MAT 1228 Series and Differential Equations	5		
MAT 2375 Probability Theory	2		
MAT 2376 Applied Statistics	3		
MAT 2720 Discrete Mathematics	3		
PHY 1121, 1122, 1123 Physics *	15		
EE 1210 Logic System Design	5		
EE 3280 Microcontroller System Design	5		
BUS 3614 Organizational Behavior for Managers <i>or</i>			
BUS 4644 Operations Management			5
BUS 3620 Management Information Systems			5
BUS 4620 Computer Networks			5
COM 4265 Organizational Communication			5
Total Supporting-Discipline Credits Required	48	15	35
Total Credits Required	106	71-77	81
Total Upper-division Credits Required	48	41-47	51

* This course fulfills a General Education requirement

COMPUTING SCIENCES MAJOR REQUIREMENTS CHECKLIST Effective Fall 2007

Major Admission GPA. A minimum 2.5 GPA (cumulative in all courses required for the major) is required for admission to the major. Additionally, a minimum 2.0 ("C" grade) must be earned in CSC 2430, and a minimum 1.7 ("C-" grade) must be earned in each other course required for the major. [Note: Courses marked with * may fulfill a general education requirement.]

BS/CS - BACHELOR OF SCIENCE in COMPUTER SCIENCE REQUIREMENTS

(Major Total = 106 credits)

- ___ CSC 1230 Problem Solving and Programming (5)
- ___ CSC 2430 Data Structures I (5)
- ___ CSC 2431 Data Structures II (5)
- ___ CSC 3150W Systems Design (5)
- ___ CSC 3220 Applications Programming (3)
- ___ CSC 3221 Netcentric Computing (3)
- ___ CSC 3310 Concepts in Programming Lang. (3)
- ___ CSC 3350 Operating Systems Programming (3)
- ___ CSC 3430 Algorithm Design and Analysis (3)
- ___ CSC 3760 Computer Organization (5)
- ___ CSC 4898 Sr. Capstone in Computer Science (2)
- ___ 1 Project course from the following list
 - CSC 4150 Software Engineering (5)
 - CSC 4760 Adv. Computer Architecture (5)
 - CSC 4820 Adv. Issues – Project course (5)
 - CSC 4970 Directed Research in CS (5)
- ___ 11 credits: CSC 4000 – 4850, 4970
- ___
- ___
- ___
- ___ MAT 1225 Calculus I (5) *
- ___ MAT 1226 Calculus II (5)
- ___ MAT 1228 Series and Differential Equations (5)
- ___ MAT 2375 Probability Theory (2)
- ___ MAT 2376 Applied Statistics (3)
- ___ MAT 2720 Discrete Mathematics (3)
- ___ PHY 1121 Physics for Sci/Engr (5) *
- ___ PHY 1122 Physics for Sci/Engr (5) *
- ___ PHY 1123 Physics for Sci/Engr (5) *
- ___ EE 1210 Introduction to Logic System Design (5)
- ___ EE 3280 Microcontroller System Design (5)

BA/CS - BACHELOR OF ARTS in COMPUTER SCIENCE REQUIREMENTS

(Major Total = 71 credits)

- ___ CSC 1230 Problem Solving and Programming (5)
- ___ CSC 2430 Data Structures I (5)
- ___ CSC 2431 Data Structures II (5)
- ___ CSC 3150W Systems Design (5)
- ___ CSC 3220 Applications Programming (3)
- ___ CSC 3221 Netcentric Computing (3)
- ___ CSC 3310 Concepts in Programming Lang. (3)
- ___ CSC 3430 Algorithm Design and Analysis (3)
- ___ CSC 3750 Computer Architecture (5)
- ___ CSC 3899 Social Impacts of Computing (3)
- ___ CSC 4898 Sr. Capstone in Computer Science (2)
- ___ 1 Project course from the following list
 - CSC 4150 Software Engineering (5)
 - CSC 4760 Adv. Computer Architecture (5)
 - CSC 4820 Adv. Issues – Project course (5)
 - CSC 4970 Directed Research in CS (5)
- ___ 3 Courses CSC 3350, 4000 – 4850, 4970
- ___
- ___
- ___
- ___ MAT 1221 Survey of Calculus (5) *
- ___ MAT 1720 Math. for Computer Science (5)
- ___ 1 course from the following list:
 - MAT 1360 Survey of Calculus (5) *
 - MAT 2700 Statistics for Business (5) *

BS/IS – BACHELOR OF SCIENCE in INFORMATION SYSTEMS REQUIREMENTS

(Major Total = 81 credits)

- ___ CSC 1230 Problem Solving and Programming (5)
- ___ CSC 2430 Data Structures I (5)
- ___ CSC 2431 Data Structures II (5)
- ___ CSC 3150W Systems Design (5)
- ___ CSC 3220 Applications Programming (3)
- ___ CSC 3221 Netcentric Computing (3)
- ___ CSC 3750 Computer Architecture (5)
- ___ CSC 3899 Social Impacts of Computing (3)
- ___ CSC 4898 Sr. Capstone in Computer Science (2)
- ___ 1 Project course from the following list
 - CSC 4150 Software Engineering (5)
 - CSC 4820 Adv. Issues – Project course (5)
- ___ CSC 4410 Database Management (5)
- ___
- ___
- ___
- ___ MAT 1221 Survey of Calculus (5) *
- ___ MAT 1720 Math. for Computer Science (5)
- ___ 1 course from the following list:
 - MAT 1360 Survey of Calculus (5) *
 - MAT 2700 Statistics for Business (5) *
- ___ 1 course from the following list:
 - BUS 3614 Organizational Behavior (5)
 - BUS 4644 Operations Management (5)
 - BUS 3620 Management Information Systems (5)
 - BUS 4620 Computer Networks (5)
 - COM 4265 Organizational Communication (5)

Recommended 4-year Course Sequence for Computer Science Majors
Academic Year 2007 – 2008

This course sequence is meant to be used as a guideline for the completion of **major requirements**. Consult with your faculty advisor or academic counselor about modifying this plan to meet your needs, and to reflect any coursework you have already completed prior to enrolling at SPU.

For a complete plan, including Common and Exploratory curricula and competency requirements, see the SPU Catalog online (<http://www.spu.edu/acad/UGCatalog/20078/>).

BS in Computer Science

Year	Autumn	Winter	Spring	Any Quarter	Other Requirements
FR	CSC 1230 (5) MAT 1225 (5)*	CSC 2430 (5) MAT 1226 (5)	CSC 2431 (5) MAT 1228 (5)		Apply for admission to the major. A 2.5 GPA is required, in addition to a 2.0 in CSC 2430.
SO	CSC 3220 (3) EE 1210 (5) MAT 2375 (2)	CSC 3221 (3) CSC 3760 (5) MAT 2376 (3)	MAT 2720 (3)		
JR	PHY 1121 (5)* CSC 3310 (3) (odd years)	PHY 1122 (5)* CSC 3150W (5) CSC 3430 (3) (even years)	PHY 1123 (5) CSC 3350 (3) (odd years)	11 credits of electives in CSC numbered 4000-4850 (spread between junior and senior year)	Apply to graduate once 105 credits and admission to major have been earned.
SR	CSC 3310 (3) (odd years)	CSC 3430 (3) (even years)	EE 3280 (5) CSC 4898 (2) CSC 3350 (3) (odd years)	- Remaining electives in CSC numbered 4000-4850 - CSC Project Course (5): CSC 4150, 4760, 4820, OR 4970	Create a final-year plan and meet with your faculty advisor for review.

*This course fulfills an Exploratory Curriculum requirement

BA in Computer Science

Year	Autumn	Winter	Spring	Any Quarter	Other Requirements
FR	CSC 1230 (5)	CSC 2430 (5)	CSC 2431 (5) MAT 1221 (5)*		Apply for admission to the major. A 2.5 GPA is required, in addition to a 2.0 in CSC 2430.
SO	CSC 3220 (3)	CSC 3221 (3) MAT 1720 (5)	CSC 3750 (5) (odd years)	MAT 1360 (5)* OR MAT 2700 (5)*	
JR	CSC 3310 (3) (odd years)	CSC 3150W (5) CSC 3430 (3) (even years)	CSC 3899W (3) CSC 3750 (5) (odd years)	3 courses from CSC 3350, 4000-4850 or 4970 (spread between junior and senior year)	Apply to graduate once 105 credits and admission to major have been earned.
SR	CSC 3310 (3) (odd years)	CSC 3430 (3) (even years)	CSC 4898 (2)	- Remaining courses from CSC 3350, 4000-4850 or 4970 - CSC Project or Research Course (CSC 4150, 4760, 4820, OR 4970)	Create a final-year plan and meet with your faculty advisor for review.

*This course fulfills an Exploratory Curriculum requirement

Recommended 4-year Course Sequence for Information Systems Majors
Academic Year 2007 – 2008

This course sequence is meant to be used as a guideline for the completion of **major requirements**. Consult with your faculty advisor or academic counselor about modifying this plan to meet your needs, and to reflect any coursework you have already completed prior to enrolling at SPU.

For a complete plan, including Common and Exploratory curricula and competency requirements, see the SPU Catalog online (<http://www.spu.edu/acad/UGCatalog/20078/>).

BS in Information Systems

Year	Autumn	Winter	Spring	Any Quarter	Other Requirements
FR	CSC 1230 (5)	CSC 2430 (5)	CSC 2431 (5) MAT 1221 (5)*		Apply for admission to the major. A 2.5 GPA is required, in addition to a 2.0 in CSC 2430.
SO	CSC 3220 (3)	CSC 3221 (3) MAT 1720 (5)	CSC 3750 (5) (odd years)	MAT 1360 (5)* OR MAT 2700 (5)* BUS 3620 (5) (SO or JR year)	
JR		CSC 3150W (5)	CSC 3899W (3) CSC 3750 (5) (odd years)	BUS 3620 (5) (SO or JR year) BUS 3614 (5) OR BUS 4644 (JR or SR year)	Apply to graduate once 105 credits and admission to major have been earned.
SR	COM 4265 (5) (also offered Spring quarter)	CSC 4410 (5) BUS 4620 (5)	CSC 4898 (2)	BUS 3614 (5) OR BUS 4644 (JR or SR year)- CSC 4150 (5) OR CSC 4820 (5)	Create a final-year plan and meet with your faculty advisor for review.

*This course fulfills an Exploratory Curriculum requirement

Exploratory Curriculum Advising Suggestions for Computing Sciences Majors

All students completing degrees at SPU must satisfy several University requirements, in addition to the specific degree requirements for their chosen major. The **Exploratory Curriculum** is designed to introduce students to fundamental concepts across the breadth of the liberal arts disciplines, and includes a large variety of alternatives. Students are encouraged to follow their interests within the different categories and to use their choices to maximize their learning in ways most relevant to them personally.

Some thoughts about the Computing Sciences The Computing Sciences are technical disciplines that frequently also involves graphical design and language components. Problem solving skills with mathematical and logical reasoning ability are mandatory. Computing scientists are often called upon for oral and written presentations or client interactions, and effective communication skills are highly prized. The fields of computing and technology are expanding throughout the world, making it commonplace for careers in computing to involve interactions with the business and political environments of multiple cultures.

With these themes in mind, the following is a list of courses from the Exploratory Curriculum that often are particularly helpful for students majoring in the Computing Sciences.

Exploratory Curriculum: Arts and Humanities

A. Arts

ART	1180 (5)	The Visual Arts
FCS	1710 (5)	Design Fundamentals
MUS	23xx/43xx	Performing Ensembles
TRE	1310 (5)	The Actor's Art

B. Humanities

COM	1101 (5)	Introduction to Interpersonal Communication	(COM 1101 or COM 1321 is highly recommended for BS/IS)
COM	1321 (5)	Public Speaking	
HUM	3000 (5)	Other Peoples, Other Faiths	
LIN	2100 (5)	Foundations of Language Study	
PHI	1001 (5)	Power of Logic	
PHI	2500 (3)	Philosophy of Science	

Exploratory Curriculum: Social Sciences

A. Anthropology, Psychology, Sociology

ANT	2250 (5)	Cultural Anthropology
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B. Economics, Geography, History, Political Science

ECN	2101 (5)	Microeconomics	(highly recommended for BS/IS)
GEO	1110 (5)	World Regional Geography	
GEO/POL	3170 (5)	Geopolitics	
POL	2330 (5)	International Relations	

Exploratory Curriculum: Natural Sciences

A. Biological Science

BIO	1100 (5)	Blakely or other field experience course
BIO	2101 (5)	General Biology

B. Physical Science

PHY	1101 (5)	General Physics
PHY	1121 (5)	Physics for Science and Engineering

Exploratory Curriculum: Mathematics

Follow CSC degree requirements.

COURSE LISTINGS

CSC 1120 INTRODUCTION TO THE COMPUTER (1)

Explores how to use a (windows-based) computer; Description of computer hardware components; Basics of the windowing environment, including the file system, running applications, editing messages and documents, and printing; and the effects of computers in society.

CSC 1121 INTERNET AND EMAIL (1)

Prerequisite: Introductory computer concepts. Explores the following topics: Networks, electronic mail, and the Internet; How to get an email account; Logging onto and off of a computer; Using the full capabilities of email; Participating in newsgroups; Downloading files using FTP; and using the World Wide Web and the Internet.

CSC 1122 WORDPROCESSING (1)

Prerequisite: Introductory computer concepts. What is "Word Processing"? Creating, modifying, saving and printing documents. Formatting and enhancing a document. Using columns, tables, footnotes, pictures, and drawings. Using document "proofing" tools, such as spelling and grammar checkers and a thesaurus.

CSC 1123 SPREADSHEETS (1)

Prerequisite: Introductory computer concepts. What is a "Spreadsheet"? This course covers creating, modifying, saving and printing spreadsheet documents; Entering and using formulas and calculations; Editing and importing data; Incorporating graphs; and formatting and enhancing the appearance of a spreadsheet document.

CSC 1124 DATABASES (1)

Prerequisite: Introductory computer concepts. What is a "Database" and a relational database management system? Designing a database. Defining tables. Defining and editing fields. Entering and editing data. Creating and using queries using one or more tables. Creating, formatting, and enhancing forms and reports.

CSC 1126 PRESENTATION MANAGERS (1)

Prerequisite: Introductory computer concepts. What is a "Presentation Manager"? Covers designing an effective presentation; Creating and editing slides, Incorporating pictures, drawings and "graphics"; Rearranging topics and slides; Formatting and enhancing the look of a presentation; Estimating the timing and sequencing of a presentation; Printing notes and handouts.

CSC 1130 BEGINNING PROGRAMMING (5)

Prerequisite: Introductory computer concepts, two years of high school algebra. Covers designing a computerized solution to a problem, the software development lifecycle, and structured programming concepts and skills. Provides an introduction to a modern programming language.

CSC 1230 PROBLEM SOLVING AND PROGRAMMING (5)

Prerequisites: High School pre-Calculus or math analysis, or equivalent; demonstrable computer literacy. Introduction to computer science. Covers problem solving methods and algorithm development; modern programming methodologies; and fundamentals of a high-level block structured language. (Currently uses the C++ programming language.)

CSC 1800 SPECIAL TOPICS IN COMPUTER USAGE (1 - 3)

Prerequisite: Introductory computer concepts. Presentation of a topic of current interest in computer usage. Topics may vary between offerings. May be repeated for credit up to 5 credits.

CSC 2220 SCIENTIFIC AND ENGINEERING PROGRAMMING (3)

Prerequisites: MAT 1221 or MAT 1225, CSC 2430. Explores fundamentals of computer programming and problem solving for engineering and science students.

CSC 2222 PROGRAMMING TECHNIQUES (3)

Prerequisites: CSC 2430. Intermediate programming and problem solving techniques that will introduce a different programming language than used in CSC 2430.

CSC 2430 DATA STRUCTURES I (5)

Prerequisite: CSC 1230 or equivalent. Develops discipline in program design, style, debugging, testing. Introduces object-oriented design, with Classes, Methods and encapsulation. Introduces dynamic storage allocation and pointers. Examines arrays, linked linear data structures, and recursion. (Currently uses the C++ programming language.)

CSC 2431 DATA STRUCTURES II (5)

Prerequisite: Continuation of CSC 2430. Linked data structures, including trees and other non-linear representations. Introduction to graphs and networks. Explores external data structures and techniques necessary for implementing different file organizations. Covers methods of organizing and accessing data on secondary storage devices (indexing, trees and hashing).

CSC 2950 SPECIAL TOPICS IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor. An introductory course studying a special interest topic in computer science. Topics and credits may vary between offerings. May be repeated for an unlimited number of credits.

CSC 2951 INDEPENDENT STUDY - C++ PROGRAMMING (2)

Prerequisite: Previous problem solving and programming course in Pascal, Modula, Ada or Java. Fundamentals of the C/C++ programming language. Offered as a directed-study, instructor-arranged course.

CSC 3150W SYSTEMS DESIGN (5) ("W" Writing Course)

Prerequisite: CSC 2431 and CSC 3220. CSC 2431 may be taken concurrently. Surveys issues and tools used in the analysis and design of software systems. Topics include requirements gathering; feasibility, process and data analysis; architecture, user-interface and program design. Measures for the evaluation of specifications and designs.

CSC 3220 APPLICATIONS PROGRAMMING (3)

Prerequisite: CSC 2430. An implementation-oriented look at software development techniques used to create interactive applications, focusing on the use of object-oriented libraries to create user interfaces. Topics include event-driven programming, human-computer interaction (HCI), graphical user interfaces (GUI), database interfaces, and tools for interface prototyping.

CSC 3221 NETCENTRIC COMPUTING (3)

Prerequisites: CSC 3220. Introduction to networking and the internet. Topics studied include network architectures, network security, communication and networking layer protocols, and the web as an example of client-server computing. In addition, students will practice building web applications.

CSC 3310 CONCEPTS IN PROGRAMMING LANGUAGES (3)

Prerequisites: CSC 2431. Explores organization and structure of programming languages; run-time behavior and requirements of programs; and programming language specification.

CSC 3350 OPERATING SYSTEMS PROGRAMMING (3)

Prerequisites: CSC 2431 and CSC 3750 or CSC/CPE/EE3760. Introduction to operating systems and systems programming. Surveys systems software; operating system interface and functions; utilities and shell programming; linkers and loaders; translators; and processes, concurrency and concurrent programming.
Equivalent: CPE 3350.

CSC 3430 ALGORITHM DESIGN AND ANALYSIS (3)

Prerequisites: CSC 2431 and MAT 1360/2376 and MAT 1720/2720 and MAT 1221/1225. Studies algorithmic problem solving approaches such as greedy, divide and conquer, and dynamic programming. Covers the design and analysis of algorithms for searching, sorting, string processing, table management and graphs. Includes principles of computational complexity and analysis.

CSC 3750 COMPUTER ARCHITECTURE AND ORGANIZATION (5)

Prerequisite: CSC 2431 (concurrent registration allowed) and MAT 1720/2720. Digital logic, computer structure, machine language, addressing, use and operation of assemblers, microarchitectures, instruction formats, and the memory hierarchy.

CSC 3760 COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE (5)

Prerequisite: CSC 2430 and EE 1210. Recommended: CSC 2431. Studies organization and structuring of the major hardware and software components of computers; mechanics of information transfer and control within a digital computer system; networks and communication systems; microprogramming; machine instruction sets; and assembly language programming. Equivalent: CPE 3760 and EE 3760.

CSC 3899W SOCIAL IMPACTS OF COMPUTING (3) ("W" Writing Course)

Prerequisite: Junior/Senior class standing. Covers ethical, social and societal impact issues with which computer professionals and users must deal. Sample topics include invasion of privacy, computer crime, intellectual property, software theft, computer security, ethics in the workplace, and artificial intelligence. Class format is a combination of lecture and discussion.

CSC 3900 INDEPENDENT STUDY IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor and Independent Study Agreement. Independent study and research in an advanced computer science topic. May be repeated for credit up to 10 credits.

CSC 3930 PRACTICUM IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor. Studies applied computer science. Typically involves academic systems programming, teaching, grading, lab preparation of tutoring responsibilities. Includes an assessment of Christian service issues or experiences. May be repeated for credit up to 10 credits.

CSC 3940 INTERNSHIP IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor and Intern Learning Contract. Provides a significant learning experience to be obtained in a supervised work-study environment. Typically involves work in systems analysis and design, advanced applications or systems programming. Includes an assessment of Christian service issues or experiences. May be repeated for credit up to 10 credits.

CSC 3950 TOPICS IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor. Advanced or special interest topics in computer science. May be repeated for credit up to 10 credits.

CSC 3960 PROJECT IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor. Independent work on a significant project in computer science. May be repeated for credit up to 10 credits.

CSC 4150 SOFTWARE ENGINEERING (5) (Team-Project Course)

Prerequisite: CSC 3150, and Senior class standing. Covers topics in software engineering, including team programming, project planning and management, SDLC (software development life cycle) and software quality assurance. Course requirements include the design and implementation of a team software project. Equivalent: CPE 4150.

CSC 4210 THEORY OF COMPUTATION AND ALGORITHMS (3)

Prerequisites: CSC 3430. Introduction to theoretical topics in computer science. Includes formal languages, automata and parsing; computational complexity, analysis of algorithms; computability; and program correctness and verification.

CSC 4310 COMPILER DESIGN (3)

Prerequisites: CSC 3310 and CSC 3750 or CSC/CPE/EE3760. Studies programming language translation and compiler design concepts; language recognition, symbol table management, semantic analysis and code generation.

CSC 4350 ADVANCED OPERATING SYSTEMS (3)

Prerequisite: CSC/CPE 3350. Introduces the major functions of operating systems. Covers processes and concurrency; concurrent programming; resource allocation, contention and control; scheduling, memory management and device management. Equivalent: CPE 4350.

CSC 4410 DATABASE MANAGEMENT (5)

Prerequisites: CSC 3150. Introduces database concepts: data models; data description and data manipulation languages: query facilities; data security, integrity and reliability. Primary emphasis on relational data model; includes the design and implementation of database applications using a relational DBMS.

CSC 4510 GRAPHICAL USER INTERFACE DESIGN AND PROGRAMMING (3)

Prerequisite: CSC 3221. Introduction to programming in the Windows GUI environment. Comparison to other GUI environments.

CSC 4750 COMPUTER NETWORKS (5)

Prerequisite: CSC 3750 or CSC/CPE/EE 3760. Recommended: CSC 2431. Studies concepts and terminology of computer networks, equipment and protocols. Emphasis is on local area networks. A laboratory project is required.

CSC 4760 ADVANCED COMPUTER ARCHITECTURE (5) (Team-Project Course)

Prerequisite: CSC 3750 or CSC/CPE/EE 3760. Recommended: CSC 2431. Studies the architecture of multiprocessor, vector, pipelined and parallel computers. Emphasis is placed on principles of parallelism and the architecture of state-of-the-art super computers. A team project is required. Equivalent: CPE 4760.

CSC 4800 ADVANCED ISSUES IN COMPUTER SCIENCE (3-5)

Prerequisite: Permission of the instructor. An advanced course studying a special interest topic in computer science. Topics and credits may vary between offerings. Computer science minors may take this course with instructor approval. May be repeated for an unlimited number of credits. Open to: Computer Science majors.

CSC 4810W ADVANCED ISSUES IN COMPUTER SCIENCE (3-5) ("W" Writing Course)

Prerequisite: Permission of the instructor. An advanced course studying a special interest topic in computer science. Topics and credits may vary between offerings. Computer science minors may take this course with instructor approval. May be repeated for an unlimited number of credits. Open to: Computer Science majors.

CSC 4820 ADVANCED ISSUES IN COMPUTER SCIENCE: PROJECT (5) (Team-Project Course)

Prerequisite: Permission of the instructor. An advanced course studying a special interest topic in computer science. A team project is required. Topics may vary between offerings. Open to: Computer Science majors.

CSC 4898 SENIOR CAPSTONE IN COMPUTER SCIENCE (2)

Prerequisite: Senior CSC Major who has completed the CSC Base requirements. This senior capstone course will explore topics and frontiers in computer science. Students will write a significant paper or design and implement an experimental project that investigates a current topic within the computer science discipline.

CSC 4900 INDEPENDENT STUDY IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor and Independent Study Agreement. Independent study and research in an advanced computer science topic. May be repeated for credit up to 8 credits.

CSC 4930 PRACTICUM IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor. Studies applied computer science. Typically involves academic systems programming, teaching, grading, lab preparation or tutoring responsibilities. Includes an assessment of Christian service issues or experiences. May be repeated for credit up to 8 credits.

CSC 4940 INTERNSHIP IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor and Intern Learning Contract. Provides a significant learning experience to be obtained in a supervised work-study environment. Typically involves work in systems analysis and design, advanced applications or systems programming. Includes an assessment of Christian service issues or experiences. May be repeated for credit up to 8 credits.

CSC 4950 TOPICS IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor, Computer Science majors, Junior/Senior class standing.. An advanced course studying a special interest topic in computer science. Topics and credits may vary between offerings. Registration Approval: Instructor. May be repeated for credit up to 5 credits.

CSC 4960 PROJECT IN COMPUTER SCIENCE (1-5)

Prerequisite: Permission of the instructor. Independent work on a significant project in computer science. May be repeated for credit up to 8 credits.

CSC 4970 DIRECTED RESEARCH IN THE COMPUTING SCIENCES (2-5)

Prerequisite: Permission of the instructor. The student will conduct research based on a proposal prepared prior to registering for this course. Results of the research will be prepared for presentation at undergraduate or professional symposia. May be repeated for credit up to 5 credits.