



COMPUTING SCIENCES

The Department of Computing Sciences at SPU prepares students to employ critical thinking skills and 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. Our graduates are equipped for a variety of careers in engineering, business and scientific computing. The department offers three computing-related degree tracks and collaborates with the departments of Engineering and Mathematics in two others.

Which is the right major for you? The answer lies in what YOU want to do with computers!

Computing Sciences Majors:

Computer Science is the discipline which studies the representation, storage, and transformation of information utilizing computers. The computer scientist develops software and hardware to analyze data and solve problems; our graduates often begin their careers in software design, implementation and testing. Computer scientists also devise new ways of using computers and work to develop effective ways to solve difficult problems using computing technology. SPU's *Bachelor of Science in Computer Science* is the traditional degree in computer science. It provides preparation for graduate studies or professional careers in computer science, emphasizing scientific and engineering foundations. Our *Bachelor of Arts in Computer Science* emphasizes problem solving, organizing and synthesizing ideas, and applications of computing theory. This is a particularly good major for students wishing to double-major or minor in another field, and graduates are well-suited for projects that apply computing to other disciplines.

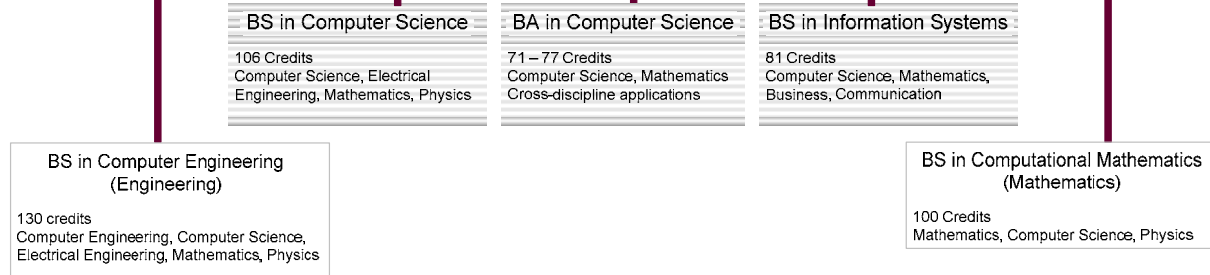
Information Systems specialists focus on integrating technology solutions and organizational processes to meet the information needs of both for-profit and nonprofit organizations. IS professionals play a key role in determining the requirements for an organization's information systems and are active in their specification, design, implementation and support. SPU's *Bachelor of Science in Information Systems* is designed to provide students with an understanding of both the technical and organizational factors surrounding information systems.

Collaborative Degree Programs:

Computer Engineering is concerned with the design and construction of computers and computer-based systems. Computer engineering students not only study software development, but also the design of digital hardware systems including communications systems, computers and devices that contain computers. The *Bachelor of Science in Computer Engineering* combines strong bases in computer science, digital electronics and engineering. The major is housed in the Department of Engineering.

Computational Mathematics emphasizes applied mathematics, mathematical modeling, and scientific programming, and is designed for students interested in interdisciplinary careers involving the application of mathematics and computer science. The *Bachelor of Science in Computational Mathematics* is housed in the Department of Mathematics, though the major contains nearly equal emphasis in computing and mathematics. Students are encouraged to explore undergraduate research opportunities combining these disciplines.

Computing Sciences at SPU



FACULTY

SPU's Computing Sciences faculty have a combined teaching experience of over 60 years. All teach the foundational freshman-level computing courses; each also brings their own special interests and expertise to upper-division courses in computer science and engineering.

Elaine Weltz, Computing Sciences Chair eweltz@spu.edu 206-281-3639
CSDP (Certified Software Development Professional)
M.S.E. Software Engineering, Seattle University; M.Mus., University of Southern California
Software engineering, system design, database management, social impacts of computing

Phil Prins, Computer Engineering Coordinator pprins@spu.edu 206-281-2738
Ph.D. Electrical Engineering, M.S. Computer Science, University of Idaho
Computer engineering, computing architectures, international computing

Michael Tindall mht@spu.edu 206-281-2945
M.S., Ph.D. Computer Science, University of Illinois
Systems software, operating systems, compilers, web and netcentric computing, algorithms

For More Information:

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

The *SPU web site* (<http://www.spu.edu>) always has a vast wealth of information on the University as a whole as well as on all University programs. Current catalog requirements and course scheduling information are available at http://www.spu.edu/acad/UGCatalog/time_schedule/cats.asp.

Contact the *Office of Undergraduate Admissions* for information on campus visits, admissions procedures and deadlines, or to connect with an admissions counselor (<http://www.spu.edu/depts/ugadm/>).

FALL 2008
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 Computing Sciences Minor
(35 Credits; 15 upper-division)

Core Courses – Both required:

| | |
|---|---|
| CSC 1230 Problem Solving and Programming..... | 5 |
| CSC 2430 Data Structures I | 5 |

Intermediate Programming – Select one of:

| | |
|---|---|
| CSC 2431 Data Structures II | 5 |
| CSC 3220 Applications Programming | 3 |

15 Approved UD Credits (minimum of 10 must be CSC 3000 – 4850)

| | |
|--|----|
| 15 approved upper-division credits | 15 |
|--|----|

Mathematics

| | |
|---|---|
| Select one of: MAT 1221, MAT 1234, MAT 1360, MAT 2700, PSY 2360, SOC 2360 | 5 |
|---|---|

| | |
|--------------------|----------------|
| Total | 33 - 35 |
|--------------------|----------------|

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 2008-2009 Catalog | B.S. CSC | B.A. CSC | 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/CSC Additional Requirements | | | |
| CSC Project or Research Course (CSC 4150, 4820, 4760, or 4970) | 5 | | |
| BS/CSC CSC Electives: 11 credits (CSC 4000 - 4850, or 4970) | 11 | | |
| BA/CSC Additional Requirements | | | |
| CSC Project or Research Course (CSC 4150, 4820, 4760, or 4970) | | 5 | |
| BA/CSC 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 1234 Calculus I * | 5 | | |
| MAT 1235 Calculus II | 5 | | |
| MAT 1236 Calculus III | 5 | | |
| MAT 2720 Discrete Mathematics | 3 | | |
| MAT 3360 Probability and Statistics | 5 | | |
| 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 4625 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 2008

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 & 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 1234 Calculus I (5) *
- ___ MAT 1235 Calculus II (5)
- ___ MAT 1236 Calculus III (5)
- ___ MAT 2720 Discrete Mathematics (3)
- ___ MAT 3360 Probability and Statistics (5)
- ___ 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 & 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 Intro. To Statistics (5) *
 - MAT 2700 Statistics for Bus. & Econ. (5) *

BS/IS – BACHELOR OF SCIENCE in INFORMATION SYSTEMS REQUIREMENTS

(Major Total = 81 credits)

- ___ CSC 1230 Problem Solving & 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 Intro. To Statistics (5) *
 - MAT 2700 Statistics for Bus. & Econ. (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 2008 – 2009

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 competencies, see the SPU Catalog online: http://www.spu.edu/acad/UGCatalog/time_schedule/cats.asp.

BS in Computer Science

| Year | Autumn | Winter | Spring | Any Quarter | Other Requirements |
|------|--|--|--|--|--|
| FR | CSC 1230 (5) MAT 1234 (5)* | CSC 2430 (5) MAT 1235 (5) | CSC 2431 (5) MAT 1236 (5) | | Apply for admission to the major. A 2.5 GPA is required, in addition to a 2.0 in CSC 2430. |
| SO | EE 1210 (5) MAT 3360 (5) | CSC 3220 (3) CSC 3760 (5) | CSC 3221 (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 years) | 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 fulfils 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) MAT 1720 (5) (even years) | CSC 3221 (3) 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) MAT 1720 (5) (even years) | CSC 3899W (3) CSC 3750 (5) (odd years) | 3 courses from CSC 3350, 4000-4850 or 4970 (spread between junior and senior years) | 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 fulfils an Exploratory Curriculum requirement

Recommended 4-year Course Sequence for Information Systems Majors
Academic Year 2008 – 2009

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 competencies, see the SPU Catalog online: http://www.spu.edu/acad/UGCatalog/time_schedule/cats.asp.

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) MAT 1720 (5) (even years) | CSC 3221 (3) CSC 3750 (5) (odd years) | MAT 1360 (5)* OR MAT 2700 (5)* BUS 3620 (5) (SO or JR year) | |
| JR | | CSC 3150W (5) MAT 1720 (5) (even years) | 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

Name: _____

SID: _____

Minor in Computing Sciences

Admission to the Minor: _____

Requirements for the COMPUTING SCIENCES Minor

(35 Credits; 15 upper-division)

Core Courses – Both required:

CSC 1230 Problem Solving and Programming 5

CSC 2430 Data Structures I 5

Intermediate Programming – Select one of:

CSC 2431 Data Structures II 5

CSC 3220 Applications Programming 3

15 Approved UD Credits (minimum of 10 must be CSC 3000 – 4850)

15 approved upper-division credits 15

Mathematics

Select one of: MAT 1221, MAT 1234, MAT 1360, MAT 2700, PSY 2360, SOC 2360 5

Total **33 - 35**

Advisor

(Signed)