Seattle Pacific University

COMPUTING SCIENCES

Programs in the Computing Sciences provide knowledge and problem-solving skills in the theoretical and applied aspects of computing-related disciplines. Our students learn to 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 Computing Sciences at SPU include three computing-related degree tracks, a minor, and, in cooperation with Electrical Engineering, a major in Computer Engineering. All of these programs are housed in the Department of Engineering and Computer Science.

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.

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.

Minors in Computing Sciences and Computer Engineering are also available.

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

3307 Third Avenue West
Seattle, Washington 98119

T 206.281.2140
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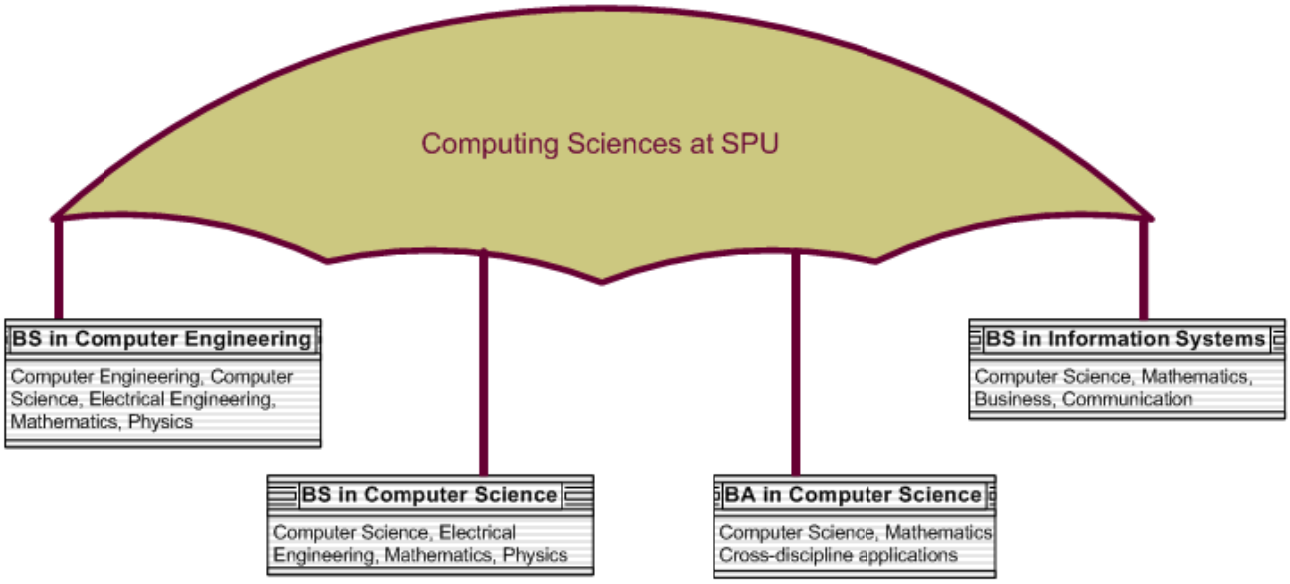
http://www.spu.edu/depts/csc/



FACULTY

SPU's computing sciences faculty have a combined teaching experience of over 50 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, Computer Science Chair; Information Systems Coordinator
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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

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Computing architecture, AI and robotics, emerging technologies

Kevin Bolding, ECS Director; Computer Engineering Coordinator
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M.S., Ph.D. Computer Science, University of Washington

For More Information:

Visit the ***Computer Science 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/).

Seattle Pacific University

FALL 2014
SEATTLE PACIFIC UNIVERSITY
DEPARTMENT OF ENGINEERING AND COMPUTER SCIENCE
COMPUTER SCIENCE and INFORMATION SYSTEMS DEGREES and POLICIES

The Engineering and Computer Science Department offers several Computer Science program degree tracks:

- a Bachelor of Science in Computer Science degree
- a Bachelor of Arts in Computer Science degree
- a Bachelor of Science in Information Systems degree
- a minor in Computer Science

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

MAJOR and MINOR Admission: A student must apply to the department for admission to any of the major or minor programs of study. For the CS and IS degrees, this is recommended after completing the first 3 CSC-labeled courses that apply to the program. An admission form is available from http://www.spu.edu/depts/csc.

MAJOR Admission and GPA Requirement:
Admission to any major in Computer Science or Information Systems requires:

- a minimum SPU cumulative GPA of 2.0 (C).
- A GPA of 2.5 or above in 10 credits of CSC-labeled courses taken at SPU that apply to the chosen major.

MINOR Admission and GPA Requirement:
Admission to a minor in Computer Science requires:

- a minimum SPU cumulative GPA of 2.0 (C).
- A GPA of 2.0 or above in 10 credits of CSC-labeled courses taken at SPU that apply to the minor.

Double-majoring: A student cannot double-major in multiple Computer Science or Information Systems degrees. Also, a student cannot complete both a major in Computer Science or Information Systems degree and a minor in Computer Science.

Multiple Degrees: A student cannot complete both a BA and a BS degree in Computer Science. However, a student who completes either Computer Science degree MAY pursue an Information Systems degree as a 2nd Baccalaureate degree. Similarly, a student completing a degree in Information Systems MAY pursue either of the Computer Science degrees as a 2nd Baccalaureate degree. All SPU rules governing additional Baccalaureate degrees apply.

The Department of Engineering and Computer Science also offers:

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 and Computer Science.

FALL 2014
SEATTLE PACIFIC UNIVERSITY
DEPARTMENT OF ENGINEERING AND COMPUTER SCIENCE
COMPUTER SCIENCE PROGRAM DEGREE REQUIREMENTS

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 five courses in 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

(82 Credits; 52 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

(33-35 Credits; 15 upper-division)

A CS Minor requires a minimum of a 15-credit differential from any major or minor being earned by the student.

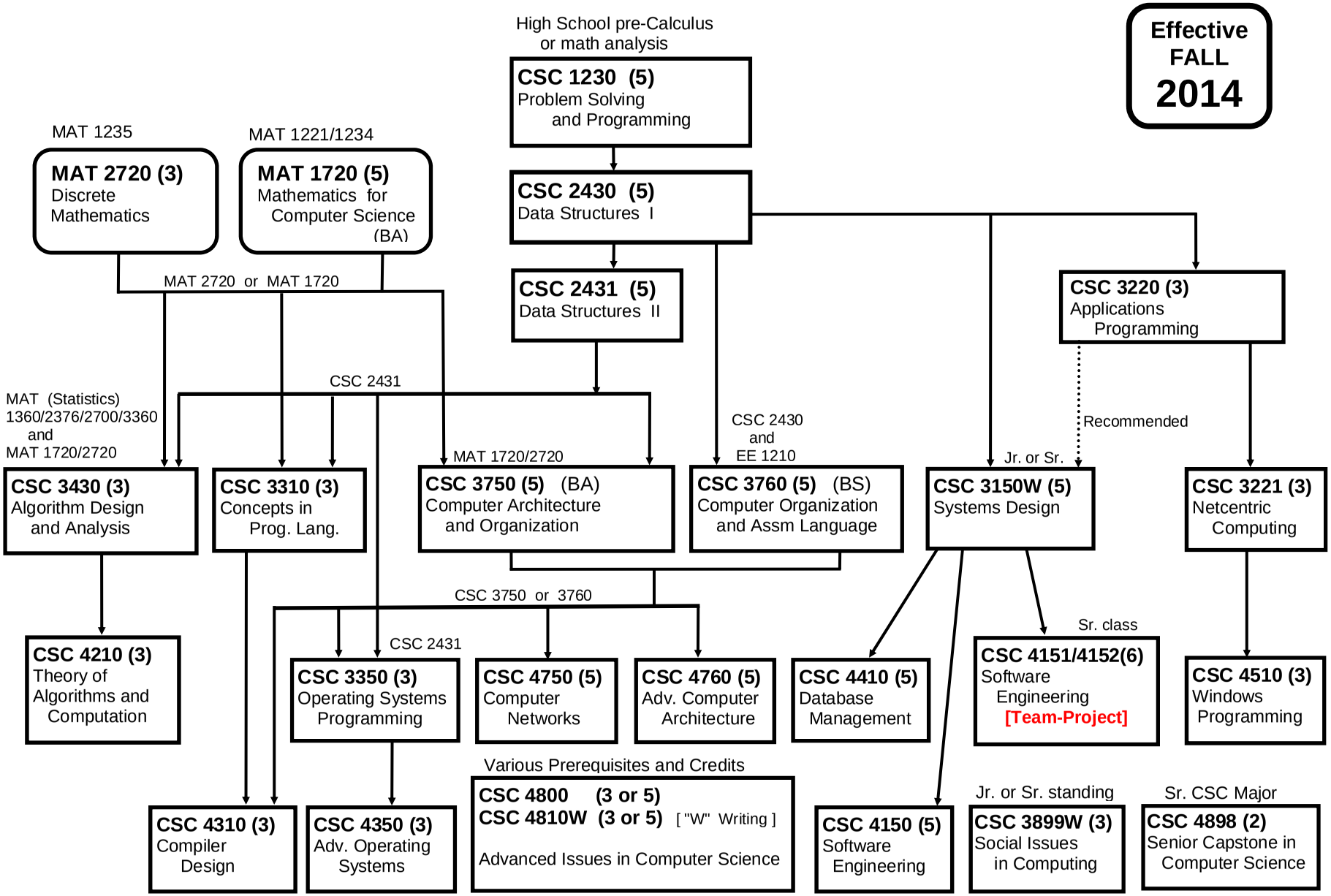
Core Courses – Both required:
CSC 1230 Problem Solving and Programming 5
CSC 2430 Data Structures I 5
Intermediate Programming – Select one of:
CSC 2431 Data Structures II 5
CSC 3220 Applications Programming 3
15 Approved UD Credits (minimum of 10 must be CSC 3000 – 4850)
15 approved upper-division credits 15
Mathematics
Select one of: MAT 1221, MAT 1234, MAT 1360, MAT 2700, PSY 2360, SOC 2360 5
Total ..... **33 - 35**

Computer Science Degrees **Department of Engineering and Computer Science** **Required Courses for 2014-2015 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	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 CSC Requirements			
CSC 4151/4152 Software Engineering			6
CSC 4410 Database Management			5
BS/CSC Additional CSC Requirements			
CSC Project or Research Course (CSC 4151/4152 Software Engineering, or 4970)	5		
BS/CSC CSC Electives: 11 credits (CSC 4000 – 4850, or 4970)	11		
BA/CSC Additional CSC Requirements			
CSC Project or Research Course (CSC 4151/4152 Software Engineering, or 4970)		5	
BA/CSC CSC Electives: 2 courses (CSC 4000 – 4850, or 4970)		6-10	
Total Computer Science Credits Required	**58**	**56-60**	**47**
MAT 1221 Survey of Calculus *		5	5
MAT 1720 Math for Computer Science		5	5
MAT 1360 Introduction to Statistics * *or* MAT 2700 Statistics for Business and Economics *		5	5
MAT 1234*, 1235, 1236 Calculus I, II, III	15		
MAT 2720 Discrete Mathematics	3		
MAT 3360 Probability and Statistics *or* MAT 2200 Engr. Probability & Stats *AND* MAT 2401 Linear Algebra *or* MAT 2200 Engr. Probability & Stats *AND* MAT 3237 Differential Equations	5		
Physical Science: Select 3 courses, 2 must be from the same discipline. PHY 1121, 1122, 1123 Physics * (recommended sequence) CHM 1211, 1212, 1330 Chemistry * BIO 2101, 2102, 2103 Biology *	15		
EE 1210 Logic System Design	5		
EE 3280 Microcontroller System Design	5		
BUS 3614 Organizational Behavior for Managers *or* BUS 4644 Operations Management			5
BUS 3620 Management Information Systems			5
BUS 4625 Organization's Presence on Net			5
COM 4265 Organizational Communication			5
Total Supporting-Discipline Credits Required	**48**	**15**	**35**
Total Credits Required	**106**	**71-75**	**82**
Total Upper-division Credits Required	**48**	**41-45**	**52**

* This course fulfills a General Education requirement

Seattle Pacific University

Computer Science Curriculum PREREQUISITE Diagram



COMPUTER SCIENCE PROGRAM - MAJOR REQUIREMENTS CHECKLIST

Effective Fall 2014

Major Admission GPA. Admission to a major in computer science or information systems requires: A minimum SPU cumulative GPA of 2.0, and a GPA of 2.5 or above in 10 credits of CSC-labeled courses taken at SPU that apply to the chosen 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)
_____ Minimum 5 credits from the following list
CSC 4151/4152 Software Eng. I & II (6)
CSC 4970 Directed Research in CS (5)
_____11 credits: CSC 4000 – 4850, 4970

_____ _____ _____ _____

_____MAT 1234 Calculus 1*
_____MAT 1235 Calculus 2
_____MAT 1236 Calculus 3
_____MAT 2720 Discrete Mathematics (3)
_____1 alternative from the following list:
MAT 3360 Probability and Statistics (5)
MAT 2200(3) and MAT 2401 Linear Alg(3)
MAT 2200(3) and MAT 3237 Diff. Eq,. (3)
_____15 credits: Physical Science
Select 3 courses, 2 must be from same discipline

_____ _____ _____

Physics for Sci/Engr	PHY	1121*,1122*,1123*
Chemistry	CHM	1211*,1212,1330*
Biology	BIO	2101*,2102*,2103*

_____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 3350 Operating Systems Programming (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)
_____ Minimum 5 credits from the following list
CSC 4151/4152 Software Eng. I & II (6)
CSC 4970 Directed Research in CS (5)
_____ 2 Courses CSC 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 = 82 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)

_____ CSC 4151/4152 Software Eng. I & II (6)

_____ 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 4625 Organizations's Presence on Net (5)
_____COM 4265 Organizational Communication (5)

COMPUTER SCIENCE Program
COMPUTING SCIENCES MINOR REQUIREMENTS CHECKSHEET

Name: _____ Student ID: _____

Minor in Computing Sciences

Admission to the Minor: _____

Requirements for the COMPUTING SCIENCES Minor

(35 Credits; 15 upper-division)

A CS Minor requires a minimum of a 15-credit differential from any major or minor being earned by the student.

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**

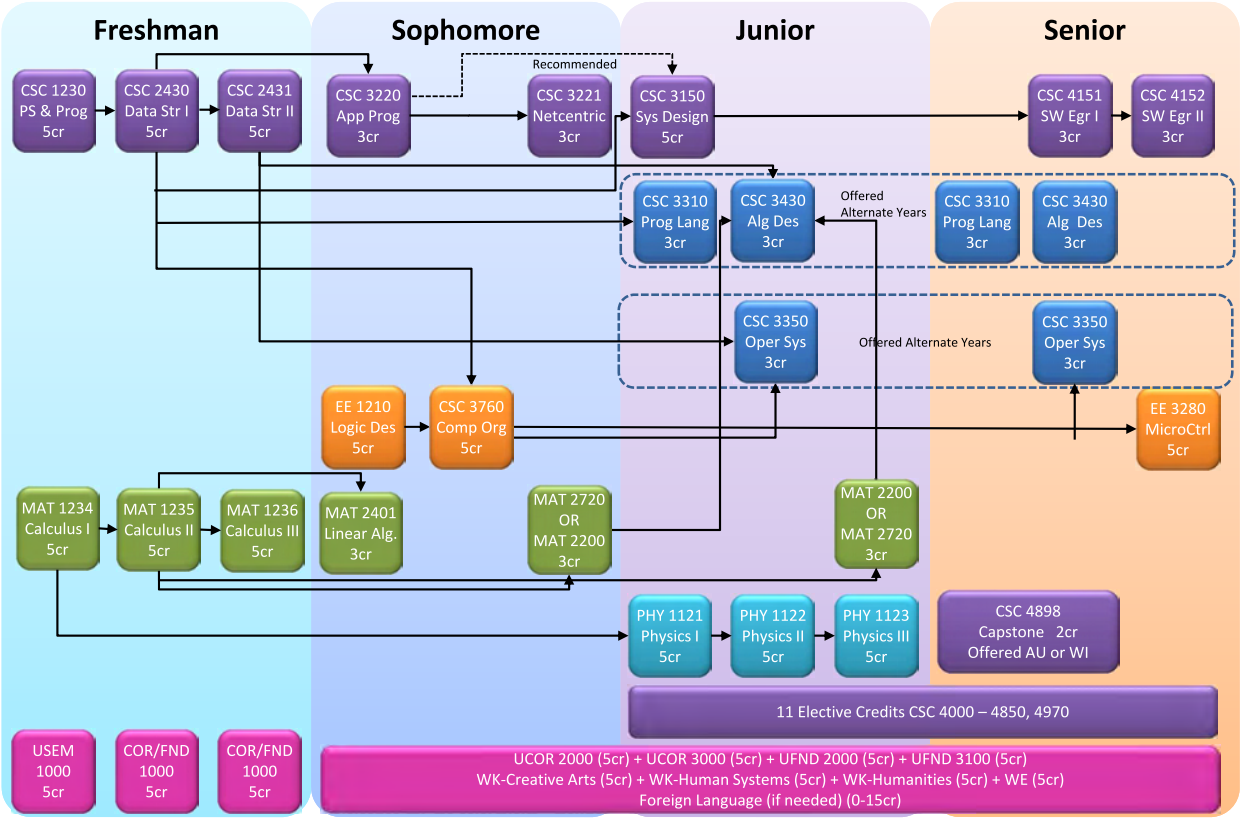
Select one of: MAT 1221, MAT 1234, MAT 1360, MAT 2700, PSY 2360, SOC 2360 5

Total ..... **33 - 35**

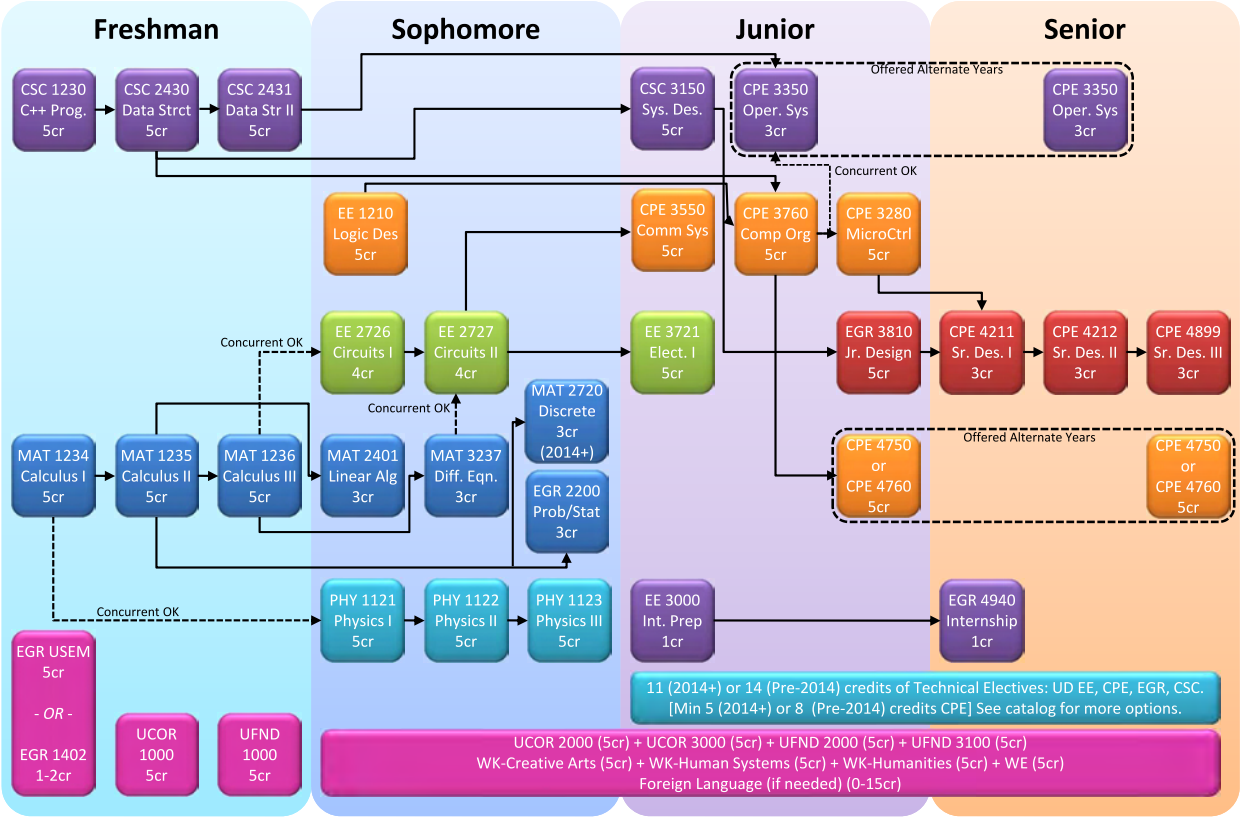
_____ Advisor

_____ (Signed)

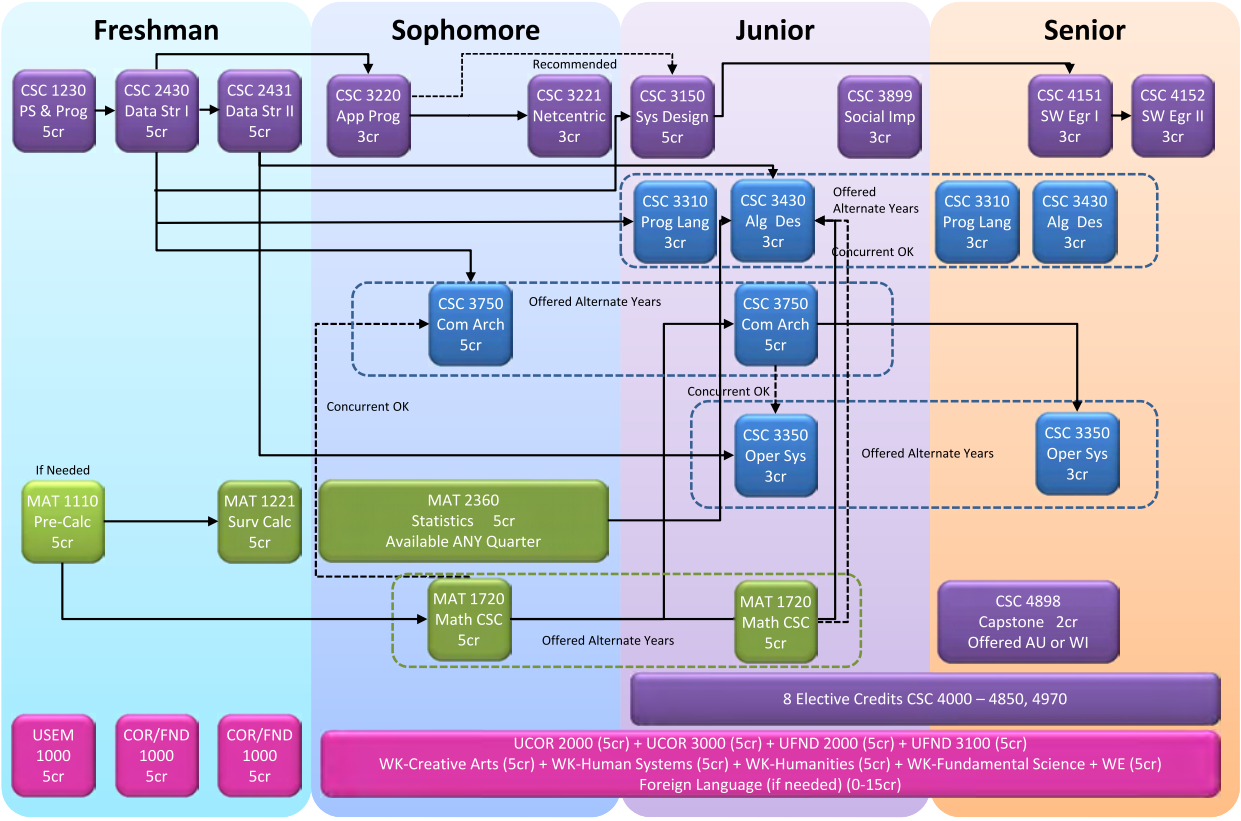
BS in Computer Science - Flow Chart and Suggested Schedule
See Current Time Schedule for Exact Quarters and Times



Computer Engineering Flow Chart and Suggested Schedule
See spu.edu/engineering for more options



BA in Computer Science - Flow Chart and Suggested Schedule
See Current Time Schedule for Exact Quarters and Times



BS in Information Systems - Flow Chart & Suggested Schedule
See Current Time Schedule for Exact Quarters and Times