

Major Course Requirements

A minimum of 76 hours (40 upper-division hours)

► **Required Core Courses (55 hours):**

CPTR 115	Introduction to Computer Programming	4
CPTR 131	Survey of Computer Science	4
CPTR 132	Data Structures and Algorithms I	4
CPTR 224	Assembly Programming	4
CPTR 246	Object-Oriented Design	3
CPTR 326	Computer Languages	4
CPTR 346	Data Structures and Algorithms II	4
CPTR 347	Database Systems	4
CPTR 357	Computer Architecture	4
CPTR 367	Communications and Networking	4
CPTR 396	Seminar (2 quarters)	.5-.5
CPTR 398	Indiv. Programming Language Study	2
CPTR 426	Software Engineering	4
CPTR 447	Operating Systems	3
CPTR 455	Theory of Computing	3
CPTR 466	Senior Project	3

► **Required Core Electives (5 hours):**

At least 5 hours from the following: 5

<i>Additional non-service CPTR courses</i>		
MATH 265	Elementary Linear Algebra (4)	
MATH 331	Probability Theory (3)	
MATH 332	Mathematical Statistics (3)	
MATH 351-352	Introduction to Abstract Algebra I-II (3-3)	
MATH 354	Number Theory (3)	
MATH 375	Numerical Analysis (4)	

► **Required Cognate Courses (16-18 hours):**

MATH 131-132	Calculus I, II	4-4
MATH 275	Logic and Sets	4
MATH 355	Combinatorics and Graph Theory	4
OFAD 111	Personal/Beginning Keyboarding*	0-2

Recommended Cognate Courses:

MATH 133	Calculus III (4)	
PHYS 211-212-213	Physics with Calculus (4-4-4)	

This curriculum follows the guidelines of the ACM (Association for Computing Machinery).

* This requirement may be met by completion of a course or satisfactory performance on a departmental waiver examination. The waiver option is available only to students with fewer than 75 credit hours and to transfer students if taken during their first quarter at Pacific Union College.

Student Learning Outcomes

Students can:

- Display an overall understanding of the breadth of the field of computer science and its relationship to other sciences, mathematics, engineering, information technology, and information systems.
- Identify career options available to computer scientists, both within and outside of the field of computer science.
- Approach the solution to a computing problem at the appropriate levels of abstraction, and be able to move between levels of abstraction.
- Choose appropriate design methodologies, languages, frameworks, and software tools to solve a given computing task.
- Work effectively in collaborative software development.
- Exhibit the writing and speaking skills necessary to communicate with others both within and outside of the field of computer science.
- Demonstrate the skills and habits needed for lifelong independent learning of new developments in computing.

Occupational Information

What can I do with this major?

Students completing this major will be prepared for scientific computing and the development of systems software and application software in both large companies and smaller vertical-market companies. Specialized areas such as networking and graphics programming are also possible.

Additional Education Required?

The B.S. in Computer Science is the entry-level degree for professional software developers. Further training can be in graduate school (either M.S. or Ph.D.) or can take the form of certified training in specific areas such as networking, software testing and quality assurance, or software development using specific packages or languages.

Public Sector vs. Denominational

While most jobs are in the public sector, there are many opportunities for denominational employment.

Job Outlook

Excellent. Every industry uses specialized software, and those with the skills and education to develop that software are in high demand. Professional societies in the field project far more jobs than qualified personnel.

General Education Requirements

To view general education requirements for this major, please refer to page A-01, Summary of General Education Requirements: BA-BS degree.

How to Construct Your Own Program

1. Counsel with your advisor.
2. Consider your aptitudes, interests, and available courses.
3. Schedule major courses and cognates first.
4. Fill the rest of your schedule with G.E. requirements.
5. For the freshman year include English, religion, and PE courses.

What the Degree Includes

A total of 192 quarter units including:

1. A minimum of 60 upper division units.
2. General Education requirements.
3. Major requirements.
4. Minimum 2.0 GPA, overall and major.

For More Information

Visit our web site:
www.puc.edu/computer-science
 Contact us at: cs@puc.edu.

Sample Four-Year Program

This sample curriculum is designed to show you how a program may be constructed and to help you select a proper sequence of courses in the major. It is not likely that these courses can always be taken in the order given. Your advisor will help you design a personalized program of studies.

First Year	A	W	S
Introduction to Computer Programming	4	-	-
Survey of Computer Science	-	4	-
Data Structures and Algorithms I	-	-	4
Keyboarding	2	-	-
Calculus	4	4	4
College English	4	4	-
Religion	-	3	3
General Ed/Electives	2	1	5
	16	16	16

Second Year	A	W	S
Assembly Programming	4	-	-
Programming in C++	-	3	-
Object-oriented Design	-	-	3
Physics with Calculus	4	4	4
Logic and Sets	-	-	4
General Ed/Electives	8	9	5
	16	16	16

Third and Fourth Years	A	W	S
Communications and Networking	4	-	-
Computer Architecture	4	-	-
Combinatorics & Graph Theory	4	-	-
Data Structures & Algorithms II	-	4	-
Theory of Computation	-	3	-
Graphics	-	-	3
Indiv. Programming Language Study	-	-	2
Computer Languages	4	-	-
Software Engineering	4	-	-
Database Systems	-	4	-
Operating Systems	-	3	-
Programming for the Internet	-	-	4
Seminar	-	0.5	0.5
Senior Project	-	-	3
CPTR and/or MATH Electives	-	-	-
General Ed/Electives	12	18	20
	32	32.5	32.5