UNIVERSITY OF THE PACIFIC
COMPUTER SCIENCE

The Bachelor of Science degree with a major in Computer Science is offered by the University of the Pacific through the Department of Computer Science (CS). Careers in computing span a wide variety of businesses and industries, since computing is integral to nearly all human activities. CS graduates might work developing fundamentally new computer systems, adapting existing systems to meet the needs of particular problem domains, or maintaining systems to support the operation of a particular business or enterprise. A successful computer scientist will understand the mathematical and scientific principles that define the operation of all computing systems, and will have the engineering design skills to develop reliable software to control computing systems. Graduates of Pacific’s CS program will have foundational knowledge to support a career adapting to new technologies as computing continues to evolve, or to continue their education through graduate studies.

PROGRAM CONCENTRATIONS
The Computer Science program offers three concentrations, which define a focused set of upper-division elective courses. Choosing a concentration allows students to gain deeper understanding of a specialized area within computer science. The concentrations offered are Software Development, Networking and Computer Security and Graphics and Simulation.

COOPERATIVE EDUCATION PROGRAM
All computer science students are encouraged to participate in the co-op program, which places students in a paid professional position for three to nine months. In addition to receiving academic credit for the experience, the co-op provides real experience that is invaluable in helping to determine a career path and academic concentration. The professional experience is also crucial in giving students a competitive edge in the computing job market after graduation.

COMPUTER SCIENCE PROGRAM OBJECTIVES
Through their careers in computing or a related profession, Pacific graduates are expected to demonstrate the following within a few years of earning their Bachelor of Science degree with a major in Computer Science:

+ Graduates employ design skills and technical knowledge that contribute to building or utilizing computing systems in a variety of professional careers

+ Graduates work effectively in team environments, utilize communication skills, and will grow and adapt to a world of evolving technology

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GENERAL EDUCATION\(^1\) (23 - 27 UNITS)

- PACS 001 \([4]\) PACIFIC SEMINAR 1
- PACS 002 \([4]\) PACIFIC SEMINAR 2
- PACS 003 \([3]\) PACIFIC SEMINAR 3
- ENGR. 030 \([3]\) (ENGR. ETHICS & SOCIETY (II-B)
- GEN. ED. \([3-4]\) (I-A, I-B, OR I-C)\(^2\)
- GEN. ED. \([3-4]\) (II-A OR II-C)

\(^1\) THESE REQUIREMENTS APPLY TO STUDENTS ENTERING AS FRESHMAN. GE REQUIREMENTS ARE SOMEWHAT DIFFERENT FOR TRANSFER STUDENTS.

\(^2\) CATEGORY 1 GEN. EDS MUST BE DIFFERENT SUBCATEGORIES

MATHEMATICS & BASIC SCIENCE (30 UNITS)

- 15 UNITS OF MATHEMATICS
- 30 UNITS COMBINED MATHEMATICS\(^3\) AND SCIENCE\(^4\)
- MATH 037 \([4]\) INTRO TO STATISTICS AND PROBABILITY\(^5\)
- MATH 051 \([4]\) CALCULUS \(^6\)
- COMP 047 \([4]\) DISCRETE MATHEMATICS
- COMP 147 \([4]\) COMPUTING THEORY
- [8-10] TWO LABORATORY SCIENCE COURSES\(^7\)

\(^3\) MATHEMATICS ELECTIVES MUST BE NUMBERED 049 OR HIGHER

\(^4\) SCIENCE ELECTIVES MAY BE ANY GE CATEGORY III-A COURSES; OTHER SCIENCE COURSES MAY BE APPROVED BY STUDENT’S ACADEMIC ADVISOR

\(^5\) MATH 039 OR ECPE 127 MAY SUBSTITUTE FOR MATH 037

\(^6\) MATH 045 MAY SUBSTITUTE FOR MATH 051

\(^7\) LAB SCIENCE COURSES MUST BE GE CATEGORY III-A COURSES

COMPUTER SCIENCE CORE (37 UNITS)

**COMPUTER SCIENCE**
- COMP 051 \([4]\) INTRO TO COMPUTER SCIENCE
- COMP 053 \([4]\) DATA STRUCTURES
- COMP 055 \([4]\) APPLICATION DEVELOPMENT
- COMP 141 \([4]\) PROGRAMMING LANGUAGES
- COMP 157 \([4]\) DESIGN AND ANALYSIS OF ALGORITHMS
- COMP 173 \([4]\) OPERATING SYSTEMS
- COMP 188 \([2]\) SENIOR PROJECT I
- COMP 189 \([2]\) SENIOR PROJECT II

**COMPUTER ENGINEERING**
- ECPE 071 \([3]\) DIGITAL DESIGN
- ECPE 170 \([4]\) COMPUTER SYSTEMS AND NETWORKS

**GENERAL ENGINEERING**
- ENGR 010 \([1]\) DEAN’S SEMINAR
- ENGR 025 \([1]\) PROFESSIONAL PRACTICE SEMINAR

**SOFTWARE DEVELOPMENT CONCENTRATION**
- COMP 129 \([4]\) SOFTWARE ENGINEERING
- COMP 135 \([3]\) HUMAN-COMPUTER INTERFACE DESIGN
- COMP 137 \([3]\) PARALLEL COMPUTING
- COMP 163 \([4]\) DATABASE MANAGEMENT SYSTEMS

**NETWORKING AND COMPUTER SECURITY CONCENTRATION**
- COMP 127 \([4]\) WEB APPLICATIONS
- COMP 175 \([3]\) SYSTEM ADMIN. AND SECURITY
- COMP 177 \([4]\) COMPUTER NETWORKING
- COMP 178 \([3]\) COMPUTER NETWORK SECURITY

**COMPUTER AND SIMULATION CONCENTRATION**
- COMP 151 \([3]\) ARTIFICIAL INTELLIGENCE
- COMP 153 \([3]\) COMPUTER GRAPHICS
- COMP 155 \([4]\) COMPUTER SIMULATION
- COMP 159 \([4]\) COMPUTER GAME TECHNOLOGIES

\(^8\) CO-OP, INTERNSHIP, INDEPENDENT STUDY OR UNDERGRADUATE RESEARCH UNITS MAY BE USED AS CS ELECTIVE UNITS

THE CS PROGRAM REQUIRES 120 ACADEMIC UNITS TOTAL.

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