College of Engineering

Bachelor of Computer Science

CALIFORNIA NATIONAL UNIVERSITY
FOR ADVANCED STUDIES
This brochure details the Bachelor of Computer Science program available through CNU’s College of Engineering. For our most up-to-date course listings, please visit us at our web site: www.cnuas.edu

California National University for Advanced Studies

Provides an online learning environment where students receive one-on-one instruction from an esteemed faculty, personalized student service, and the flexibility to achieve their lifelong learning goals while balancing career and family responsibilities.

CNU is nationally accredited by the Accrediting Commission of the Distance Education and Training Council (DETC), Washington, D.C. (www.detc.org, 1601 18th Street, N.W., Washington, D.C. 20009, Phone: (202) 234-5100).

All CNU programs are approved for veterans’ benefits under the G.I. Bill and Veterans Educational Assistance Program (VEAP). If you are eligible and wish to receive tuition assistance under one of these programs, contact your local VA office or education office to receive an eligibility certificate.

California National University for Advanced Studies is approved to participate in the voluntary education tuition assistance program administered by the Defense Activity for Non-Traditional Education Support (DANTES). Active duty military personnel and reservists should contact their education office for more information.

CNU adheres to the standards of the SOC (Servicemembers Opportunity Colleges).
California National University

College of Engineering

CNU offers Bachelor and Master of Science in Engineering degrees with electives in computer, electrical, environmental, quality, and mechanical engineering, as well as a Bachelor of Computer Science and a Master of Engineering Management degree.

Our undergraduate programs highlight the basic sciences and general engineering courses to help students evolve into well-rounded engineers with strengths in the area of his/her elective choice. In our graduate programs, students and faculty work closely together to choose a sub-discipline that complements the work environment for real-world application.

For example, a computer engineering student could specialize in microprocessors or switching theory; an electrical engineering student could specialize in electronics power distribution, control systems, or communications; an environmental engineering student could specialize in hazardous waste management, transport phenomena, or air pollution control; a mechanical engineering student could specialize in thermodynamics or mechanical design; and a computer science student could specialize in advanced computer architecture or programming languages. Graduates are expected to possess sufficient knowledge to achieve professional certification.

CNU’s Online Campus* delivers high quality academic programs with the flexibility and personalized support you need to achieve your education goals without compromising work and family responsibilities. With a computer, internet, and e-mail access, you can participate in your online classroom anytime, from anywhere.

Complete and submit assignments online. Communicate with professors in one-on-one interactions for feedback and support from an expert in the field. Engage with virtual classmates through threaded discussion forums to enrich your learning.

CNU puts you in control of your learning. With no campus visits required and 15-week trimesters starting every Friday, you can study at the time, the place, and the pace that work best for your lifestyle.

* The minimum recommended computer requirements for using CNU’s Online Campus are:

Platform:
• PC (Windows 2000 or XP)
• Mac (10.2, 10.3, 10.4)

Hardware:
• 128 MB of RAM
• 2 GB of free disk space
• CD ROM and DVD drive
• Sound card with speakers (for courses with multimedia)
• Ethernet or Wireless network card (for high-speed Internet connection)
  or 56K modem (for dial-up Internet connection)
• T1, DSL, Cable, or Satellite high-speed connection
• A monitor capable of at least 800x600 resolution
The Bachelor of Computer Science curriculum is designed to provide a formal body of knowledge for students interested in careers in the ever-evolving computer industry. The curriculum includes a foundation in basic sciences, which includes courses related to both software and hardware fundamentals, and selected electives to allow students to specialize in areas of their interest.

BCS PROGRAM OBJECTIVES:

- An understanding of the math and science skills required by the computer science professional.
- An understanding of the fundamentals of software and hardware design.
- An ability to program effectively in at least one high level language.
- An understanding of operating systems and principles related to networks.
- An ability to apply knowledge learned in coursework to a Capstone Project related to the student’s area of interest.

DEGREE PROGRAM REQUIREMENTS

A High School Diploma or GED equivalent is required for admission. Applicants to the Bachelor of Computer Science degree program are expected to have a background in algebra, plane geometry, trigonometry, physics and chemistry. If an applicant lacks this background, prerequisite courses will be assigned from the CNU Basic Sciences Curriculum.

The Bachelor of Computer Science degree program requires satisfactory completion of 121 units of academic work with a cumulative GPA of 2.0 or better in the following areas:

- General Education 30 units (lower division)
- Basic Sciences 25 or 26 units (lower division)
- Computer Science Core 45 units (lower/upper division)
- Computer Science Electives 30 units (upper division)
- Capstone Project 3 units (upper division)

**TOTAL 121 units**

Courses are offered in a systematic manner, i.e., where applicable, prerequisites will be completed before the student can enroll in subsequent high level offerings.
GENERAL EDUCATION
30 UNITS (LOWER DIVISION)

Students pursuing a Bachelor of Computer Science degree must complete a breadth requirement of 30 General Education units. Students may elect to take the College-Level Examination Program (CLEP) exams to meet this requirement instead of or in combination with courses. Students have the option to fulfill general education requirements by choosing courses related to the following subject areas:

1. Communications (written/oral)
2. Computation (quantitative reasoning/concepts)
3. Social Science (history, sociology, economics, and politics)
4. Computer Technology & Practice
5. Humanities (literature, philosophy, language, culture, the arts)
6. Life/Physical Sciences

BASIC SCIENCES
25–26 UNITS (LOWER DIVISION)

The Bachelor of Computer Science requires a strong foundation in mathematics and science. Applicants needing additional preparation in mathematics prior to taking Calculus I will be assigned prerequisite courses from CNU’s curriculum and/or placement exams.

COMPUTER SCIENCE CORE
45 UNITS (LOWER/UPPER DIVISION)

The Computer Science core and elective courses consist of a mixture of guided instruction and lab formats. Laboratory courses in Computer Science are those courses in which the majority of time is spent writing and using software on a personal computer. You will need to acquire access to a PC or Macintosh computer capable of supporting a programming language environment such as C or Visual Basic. Internet access and an e-mail address are required.

COMPUTER SCIENCE ELECTIVES
18 UNITS (UPPER DIVISION)

ELECTIVE AREAS
- Computer Engineering
- Computer Science

CAPSTONE PROJECT
3 UNITS (UPPER DIVISION)

In addition, a Capstone Project is required which begins with an approved proposal on a relevant and current subject. The Capstone Project should demonstrate the student’s ability to apply the principles of Computer Science to a practical problem. The Capstone Project will entail one trimester of work requiring 4 hours of practicum per week for 15 weeks and culminate in a formal report.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL EDUCATION (30 UNITS)</strong></td>
<td>Advisement for General Education courses is offered on an individual basis.</td>
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<tr>
<td><strong>BASIC SCIENCES (25-26 UNITS)</strong></td>
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<tr>
<td>BSCI 101</td>
<td>Calculus I (3 units)</td>
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<tr>
<td>BSCI 102</td>
<td>Calculus II (3 units)</td>
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<tr>
<td>BSCI 103</td>
<td>Calculus III (3 units)</td>
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<tr>
<td>BSCI 104</td>
<td>Ordinary Differential Equations (3 units)</td>
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<tr>
<td>BSCI 105</td>
<td>Probability and Statistics (3 units)</td>
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<tr>
<td>BSCI 113</td>
<td>Discrete Mathematics (3 units)</td>
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<tr>
<td><strong>SELECT TWO</strong></td>
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<tr>
<td>BSCI 206</td>
<td>Physics I Mechanics (4 units: 3 guided instruction/1 lab)</td>
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<tr>
<td>BSCI 207</td>
<td>Physics II Electricity and Magnetism (4 units: 3 guided instruction/1 lab)</td>
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<tr>
<td>BSCI 208</td>
<td>Chemistry I (4 units: 3 guided instruction/1 lab)</td>
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<tr>
<td>BSCI 209</td>
<td>Chemistry II (3 units)</td>
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<tr>
<td><strong>COMPUTER SCIENCE CORE (SELECT 45 UNITS)</strong></td>
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<tr>
<td>CS 200</td>
<td>Fundamental Concepts of Information and Computer Technology (3 unit)</td>
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<tr>
<td>CS 201</td>
<td>Introduction to Algorithms and Programming (3 units: 2 guided instruction/1 lab)</td>
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<tr>
<td>MIS 202</td>
<td>Principles of Management Information Systems (3 units)</td>
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<tr>
<td>CS 202B</td>
<td>Programming in Visual Basic (3 units)</td>
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<td>CS 202C</td>
<td>Computer Programming in C (3 units)</td>
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<td>CS 202J</td>
<td>Introduction to HTML and Java (3 units)</td>
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<tr>
<td>CS 203</td>
<td>Data Structures and Analysis of Algorithms (3 units)</td>
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<tr>
<td>CS 204</td>
<td>Introduction to Computer Architecture (3 units)</td>
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<tr>
<td>CS 205</td>
<td>Computer Systems and Interfaces (3 units)</td>
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<td>CS 208</td>
<td>File and Database Systems (3 units)</td>
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<tr>
<td>CS 209</td>
<td>Principles of Programming Languages (3 units)</td>
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<tr>
<td>ENGR 307</td>
<td>Introduction to Logic Design (4 units: 3 guided instruction/1 lab)</td>
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<tr>
<td>CS 306</td>
<td>Introduction to Software Engineering (3 units)</td>
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<td>CS 307</td>
<td>Introduction to Operating Systems (3 units: 2 guided instruction/1 lab)</td>
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<td>CS 310</td>
<td>Network Principles (3 units)</td>
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<tr>
<td>ME 309</td>
<td>Numerical Analysis of Engineering Problems (3 units)</td>
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<td>MIS 301</td>
<td>Business Data Communications (3 units)</td>
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<td>MIS 305</td>
<td>Systems Development I (3 units)</td>
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<tr>
<td><strong>COMPUTER SCIENCE ELECTIVES (SELECT 18 UNITS)</strong></td>
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<tr>
<td>CE 430</td>
<td>Computer Design (3 units)</td>
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<td>CE 440</td>
<td>Microprocessor Systems Design (3 units)</td>
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<tr>
<td>CS 302</td>
<td>Programming in Java (3 units)</td>
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<td>CS 305</td>
<td>Computer Organization and Assembly Language (3 units)</td>
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<tr>
<td>CS 411</td>
<td>Artificial Intelligence (3 units)</td>
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<tr>
<td>CS 412</td>
<td>The Unix Environment for Programmers (3 units: 2 guided instruction/1 lab)</td>
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<tr>
<td>CS 413</td>
<td>Programming Languages and Software Methodology (3 units: 2 guided instruction/1 lab)</td>
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<tr>
<td>CS 414</td>
<td>Principles of Operating Systems (3 units)</td>
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<tr>
<td>CS 415</td>
<td>Object-Oriented Programming Languages (3 units)</td>
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<tr>
<td>CS 416</td>
<td>Graphics and Computers (3 units)</td>
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<tr>
<td>CS 417</td>
<td>The Windows Environment (3 units)</td>
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<tr>
<td>CS 418</td>
<td>Graphical User Interfaces Concepts (3 units)</td>
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<tr>
<td>CS 419</td>
<td>Advanced GUI (Graphical User Interfaces) Concepts (3 units)</td>
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<tr>
<td><strong>REQUIRED (3 UNITS)</strong></td>
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<tr>
<td>CS 499</td>
<td>Capstone Project (3 units)</td>
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Admissions Checklist

(GREEN INDICATES REQUIRED)

- Completed Application
- Application Fee
- Admissions Essay
- Resume

INSTITUTIONAL

- Transcripts
  (all postsecondary schools attended)
- Tuition Assistance Forms
  (if applicable)
- Diplomas
- Test Scores
  (CLEP, PEP, DANTES, SAT, ACT, GRE, etc.)

EXPERIENTIAL

- Professional Licenses/Certifications
- Certificates of Completion
- Patents/Projects
- Honors/Awards

OTHER

- Workplace Supervisor’s Evaluation
- Letters of Recommendation
- Articles/Publicity

DEGREE PROGRAM

**COLLEGE OF ENGINEERING**

<table>
<thead>
<tr>
<th>U.S. &amp; CANADIAN RESIDENTS</th>
<th>NON U.S. &amp; NON CANADIAN RESIDENTS</th>
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<tbody>
<tr>
<td><strong>BACHELOR OF SCIENCE IN ENGINEERING</strong></td>
<td>$270 PER UNIT</td>
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<tr>
<td><strong>BACHELOR OF COMPUTER SCIENCE</strong></td>
<td>$270 PER UNIT</td>
</tr>
<tr>
<td><strong>MASTER OF SCIENCE IN ENGINEERING</strong></td>
<td>$300 PER UNIT</td>
</tr>
<tr>
<td><strong>MASTER OF ENGINEERING MANAGEMENT</strong></td>
<td>$300 PER UNIT</td>
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</tbody>
</table>

CLICK [HERE](#) TO APPLY ONLINE

FOR FURTHER INQUIRIES OR COMMENTS, E-MAIL: [cnuadms@mail.cnuas.edu](mailto:cnuadms@mail.cnuas.edu)

“My studies at CNU have given me a much better understanding of the design of our products as well as how the specifications are determined.”

George Wilson
Bachelor of Science in Engineering

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