UCUENCA
INGENIERÍA

Computer Science Program

Program Description

The Computer Science program at Universidad de Cuenca trains highly qualified engineers in the field of Computer Science, with a solid base in Applied Mathematics, Data Modeling, Programming Languages, Software Development and Engineering, and Knowledge Management. Graduates are capable of proposing high-quality solutions and conducting research in their field of study, as well as contributing transversally to various areas of knowledge, working within interdisciplinary teams with social, economic, environmental, and ethical responsibility.

General Information

- **Degree:** Computer Science Engineer
- **Duration:** 10 semesters // 5 years
- **Level:** Undergraduate Level
- **Teaching Mode:** In-Person modality

Applicant Profile

- Hold a high school diploma
- Have fulfilled the requirements established by the National System for Leveling and Admission

Admission Process

Visit the web:
https://www.ucuenca.edu.ec/admisiones/

Program Educational Objectives (PEO)

Graduates of the Computer Science program at Universidad de Cuenca will be able to achieve the following professional accomplishments within 3–5 years after graduation:

PEO 1. Create high-quality computational and data-driven solutions based on international standards, using cutting-edge technology.

PEO 2. Achieve professional success and provide leadership in academia, and the public and private sectors.

PEO 3. Apply solid scientific and technological knowledge with ethical and sustainable responsibility.

Student Outcomes (SO)

At the end of their studies, Computer Science graduates are expected to achieve the following abilities:

SO1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.

SO2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

SO3. Communicate effectively in a variety of professional contexts.

SO4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

SO5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

SO6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

Curriculum

First Year

First Semester

Code	Courses	Credits
18580	LINEAR ALGEBRA	4
18581	DIFFERENTIAL CALCULUS	4
18582	DISCRETE MATHEMATICS	4
18974	INTRODUCTION TO ENGINEERING	1
18975	LANGUAGE AND TECHNICAL COMMUNICATION	1
18976	SOCIETY, CULTURE, AND TERRITORY	1

Second Semester

Code	Courses	Credits
17934	INTEGRAL CALCULUS	4
17935	PHYSICS I (MECHANICS)	4
17936	PROGRAMMING I: ALGORITHMS, DATA, AND STRUCTURES	4
17937	THEORY OF COMPUTATION	2
18977	RESEARCH METHODOLOGY	1

Second Year

Third Semester

Code	Courses	Credits
17948	MULTIVARIABLE CALCULUS	3
17949	DIFFERENTIAL EQUATIONS	3
17950	PHYSICS II (ELECTRICITY AND MAGNETISM)	3
17951	PROBABILITY AND STATISTICS	2
17952	PROGRAMMING II: DATA STRUCTURES AND ALGORITHM ANALYSIS	4

Fourth Semester

Code	Courses	Credits
18562	SOFTWARE ANALYSIS AND DESIGN	4
18563	APPLIED MATHEMATICS	3
18565	MICROPROCESSORS	2
18564	NUMERICAL METHODS	2
18566	PROGRAMMING III (FILE STRUCTURES)	4

Third Year

Fifth Semester

Code	Courses	Credits
18583	DATABASES I: DESIGN AND PRINCIPLES	4
18584	OPERATIONS RESEARCH	3
18585	PROGRAMMING LANGUAGES	4
18586	COMPUTER ORGANIZATION AND ARCHITECTURE	2
18587	LINEAR SYSTEMS AND SIGNALS	2

Sixth Semester

Code	Courses	Credits
40568	PROJECT MANAGEMENT	2
17944	MACHINE LEARNING	2
17945	SOFTWARE ENGINEERING	3
17946	ARTIFICIAL INTELLIGENCE	2
17947	OPERATING SYSTEMS	4
17943	DATABASES II: ADMINISTRATION AND OPTIMIZATION	4

Curriculum

Fourth Year

Seventh Semester

Code	Courses	Credits
40574	SOFTWARE VERIFICATION AND VALIDATION	2
40587	REQUIREMENTS ENGINEERING	2
17939	KNOWLEDGE REPRESENTATION	2
17938	MULTI-AGENT SYSTEMS	2
17940	EMPIRICAL SOFTWARE ENGINEERING	4
17941	COMPUTER NETWORKS	4
17942	COMPUTER SECURITY	3

Eighth Semester

Code	Courses	Credits
40589	TECHNOLOGIES FOR EDUCATION	2
40591	SOFTWARE DESIGN AND ARCHITECTURE	2
18575	DATA WAREHOUSE AND DATA MINING	2
18576	NEURAL NETWORKS	2
18577	HUMAN-COMPUTER INTERACTION	2
18578	WEB PROGRAMMING	4
18973	COMMUNITY SERVICE PRACTICES	2
18579	DISTRIBUTED SYSTEMS	3

Fifth Year

Ninth Semester

Code	Courses	Credits
40593	SOFTWARE QUALITY	2
18571	DATA SCIENCE	2
18971	ENTREPRENEURSHIP AND INNOVATION	1
18572	COMPUTER GRAPHICS	2
18972	PRE-PROFESSIONAL PRACTICES	5
18573	PROFESSIONAL RESPONSIBILITY AND REGULATIONS IN COMPUTER SCIENCE ENGINEERING	2
18574	CURRICULAR CAPSTONE COURSE 1	3

Tenth Semester

Code	Courses	Credits
40595	GEOINFORMATICS	4
40597	NEW PROGRAMMING PARADIGMS	4
18567	UNCERTAIN REASONING	4
18568	SEMANTIC WEB	4
18570	CURRICULAR CAPSTONE COURSE 2	5
18970	ACADEMIC WRITING	2

Track A - Software Engineering
Track B - Knowledge Management

Total number of credits: **150**
Total number of academic hours: **7200**

Equivalence: 1 credit is equivalent to 48 academic hours

Professional Field

- Technology companies, software startups, and technology development centers.
- Public sector organizations: ministries, municipalities, and government entities requiring computing solutions, data analysis, or process automation.
- Financial, healthcare, education, and commerce sectors, applying intelligent digital solutions.
- Technology consulting firms: requirements analysis, software development, systems auditing, cybersecurity, among others.
- Scientific research centers and universities, participating in projects related to artificial intelligence, data science, distributed systems, among others.
- Companies dedicated to the development of video games, mobile applications, web services, and augmented or virtual reality solutions.
- Independent professional practice, technology entrepreneurship, and the development of proprietary computing products.

For more information:

https://www.ucuenca.edu.ec/en/carreras/computacion/

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