Catholic Polytechnic University

Computer Science Department

Overview

This document is a proposal for a Bachelor of Science degree in Computer Science (CS) at Catholic Polytechnic University (CPU), Rosemead, CA. The primary goal of the CS curriculum is to educate and produce graduates who will be excellent programmers and software engineers, ready for careers in the industry or graduate studies.

The CS curriculum is based on the guidance developed by the Association of Computing Machine (ACM) serving as the basis for Accreditation Board of Engineering and Technology (ABET) requirements.

The structure of the curriculum is based on the following assumptions:

- For the Bachelor of Science degree, a cohort of 24 students each year and a total enrollment of 96 students when fully operational in 4 years
- For the Master of Science degree, a cohort of 20 students each and a total enrollment of 40 students when fully operational in 2 years
- A teaching staff consisting of 5 full-time faculty and 5 adjuncts lecturers
- Each course consists of a lecture (3 hours) portion and a lab session (1 hour)

In addition to classroom-based computer science classes, CPU students are required to participate in a two-course capstone sequence which is supervised by faculty (or an industry expert). For the BS degree completion, a capstone can either be a research paper or a demonstration project. For the MS degree completion, a thesis paper or a research project is required.

Faculty Areas of Expertise

Catholic Polytechnic University faculty have diverse areas of expertise. These include:

- Algorithms
- Optimization
- Parallel Computing
- Cybersecurity
- User Experience

CS Knowledge Areas and Mapping to CPU Courses

The mapping of CS topical areas to CPU offering is based on the ACM curriculum and knowledge areas.

Program of Studies - BS in Computer Science

Year 1

Fall Semester	Spring Semester
ENG100: English Composition*	ENG101: Technical Writing*
THEO100: Theology I (New/Old Testament)*	THEO101: Intro to Catholicism*
HIST100: American Origins*	HIST101: Government & Economics*
MATH100: Calculus I	MATH101: Calculus II
CS100: Introduction to Programming I	CS101: Introduction to Programming II

Year 2

Fall Semester	Spring Semester
MATH200: Linear Algebra	MATH201: Discrete Mathematics
PHIL200: Philosophy & Logic*	PHIL201: STEM Ethics*
CS200: Programming Languages	CS220: Algorithms
CS210: Data Structure	CS230: Computer Architecture
CS2XX: Intro to Artificial Intelligence	MATH3XX: Probability and Statistics

Year 3

Fall Semester	Spring Semester
CS310: Database Programming	CS340: Software Engineering
CS320: Complexity Analysis	CS350: Human-Computer Interaction/UX
CS330: Computer Networks	***EE310: Digital Logic***
EE300: Circuit Design	CS37X: CS Elective (400-level w/ approval)
CS3XX: Intro to Data Science	CS37X: CS Elective (400-level w/ approval)
THEO200: Catholic Apologetics*	CS3XX: Intro to Machine Learning
	THEO102: Introduction to the Theology of the Body*

Year 4

Fall Semester	Spring Semester
CS405: Capstone I	CS411: Capstone II
CS420: Computer Graphics	CS4XX: Advanced topics in Artificial Intelligence
CS430: Cybersecurity	CS47X: CS Elective 1
CS47X: CS Elective	CS47X: CS Elective 2
CS480: Undergraduate Research I *or* CS490: Internship I (Summer is acceptable)	CS481: Undergraduate Research II *or* CS491: Internship II

CS4XX: Computer Vision	CS4XX: Natural Language Processing PHIL4XX: Ethics of AI

*Lower division core

Program of Studies - MS in Computer Science

Year 1

Fall Semester	Spring Semester
CS500: Programming Languages Theory	CS530: Computer Architecture
CS520: Algorithms	CS540: Artificial Intelligence
CS510: Database Systems *or*	CS550: Operating Systems *or*
CS560: Cybersecurity Principles *or*	CS57X: CS Elective 1
CS57X: CS Elective	CS57X: CS Elective 2

Year 2

CS620: Computer Graphics *or*	CS640: Software Engineering *or*
CS630: Networking Theory	CS67X: CS Elective 1
CS67X: CS Elective	CS67X: CS Elective 2
CS680: Graduate Research I *or*	CS680: Graduate Research II *or*
CS690: Thesis I	CS690: Thesis II