Program Faculty

Ning Chen, PhD, Professor
Computer Science

- Internet and Enterprise Computing
- Software Architecture and Engineering
- Software Testing

James Choi, PhD, Professor
Computer Science

- Software Development Methodology
- Reverse Engineering
- Configuration Management

Bin Cong, PhD, Professor
Computer Science

- Software Process and Quality Control
- CMMI based Process Improvement
- Software Architecture and Engineering

Chang-Hyun Jo, PhD, Professor
Computer Science

- Software Process
- Software Architecture and Design
- Object-Oriented Software Engineering

Christopher Ryu, PhD, Professor
Computer Science

- Software Project Management
- Software Architecture
- Machine Learning, Data Science, and Artificial Intelligence

Contact Information

For more information, please visit our website:
http://www.fullerton.edu/ecs/mse/
Contact the MSE Office (657) 278-5674:
mse@fullerton.edu

Comments from Students

"I like the flexibility of not being on-site for the courses/exams, this gives me an ability to cover the material at my own pace and time while working for an organization that is consistently keeping me on its own schedule."

"Audio lectures provide great helps for MSE online students. Sometimes, reading textbooks and other reference material still confuses me, but the audio lectures that professor explains more about certain topic is a big HELP. Really thanks for that."

"I really appreciate the MSE's online characteristics, because if I had to go into class I probably would not be able to pursue my Master's degree at this point, since I travel. This makes it very difficult to regularly attend classes on campus. I also like that I can 'work at my own pace' more so than if I were attending classes on campus."

"While face-to-face communication is often more efficient, the use of email and discussion boards is still an effective way to resolve problems and have questions answered. My questions were always answered promptly, and it was nice to see other students' questions and the subsequent answers on the discussion board."

Master of Science in Software Engineering

Online Program

ENGINEERING & COMPUTER SCIENCE
CALIFORNIA STATE UNIVERSITY FULLERTON

General Information

This entirely online program prepares individuals for careers as software engineers and software process managers in industry and government agencies. The program emphasizes a comprehensive and thorough process-oriented approach to software development and its curriculum is fundamentally grounded in software engineering research, theory, principles, and practice (e.g. CMMI, RUP, UML and design patterns). Students will also gain valuable experience with software engineering tools from Rational, Parasoft and open source software organizations. The emphasis on process-oriented methodologies makes this program unique among professional master's degrees.

This program is designed for professionals working in the field of computer science who wish to further their skills and pursue graduate level education in Software Engineering. The program incorporates the following strands of assessment and evaluation:

- **Implementation of Software Process** – The ability to define and apply a software process to real-world problems
- **Process Assessment/Appraisal** – The ability to evaluate and improve a software process
- **Software Standard Comprehension** – the ability to identify, analyze and apply software standards in software engineering practice
- **Critical Thinking and Problem Solving** – The ability to analyze, evaluate and synthesize information as well as generate and apply appropriate solutions to solve problems based on reasoned rationale
- **Collaboration and Team Work** – The ability to work productively in team or collaborative settings to achieve common goals or purposes
- **Research** – The ability to conduct, evaluate and synthesize research and apply theoretical ideas to practical settings
- **Communication –** The ability to effectively present ideas in a logical framework in a variety of forms with proper language structure and mechanics

Requirements & Course List

The program requires 30 units (10 courses) of online coursework to be completed over a 22-month-long, year-round program with students taking two courses per semester. Students are grouped in cohorts that follow the same class schedule throughout the program. The courses are paired both theoretically and practically with learning goals integrated throughout the entire curriculum.

Admission Requirements

- Baccalaureate degree from an accredited institution
- Minimum 2.5 GPA in the last 60 semester units
- CS362 (Software Engineering) course or equivalent work experience
- TOEFL score (iBT 80 total) for foreign students

Study Plan Requirements

- Initial orientation
- Midpoint workshop
- Software engineering course work in terms of 4 P's (Product, Process, People, Project)

Engineering Areas (Product)
CPSC 541 Systems and Software Standards and Requirements
CPSC 542 Software Verification and Validation
CPSC 543 Software Maintenance
CPSC 545 Software Design and Architecture

Process and Management Areas (Process)
CPSC 544 Advanced Software Process
CPSC 546 Modern Software Management
CPSC 547 Software Measurement

Project Areas (People/Project)
CPSC 548 Professional, Ethical and Legal Issues for Software Engineers
CPSC 589 Seminar in Computer Science
CPSC 597 Graduate Project

Course Descriptions

CPSC 541 **Systems and Software Standards & Requirements**
Introduces students to the SESC framework and the IEEE Software Engineering Standards. e.g., Software Life Cycle Processes, Work Product Standards, Process Standards, Requirement Analysis and Management, and System Integration.

CPSC 542 **Software Verification and Validation**
An advanced level study of verification and validation strategies and techniques as they apply to the development of quality software. Topics include test techniques, test processes (organization test process, test management processes, dynamic test processes), test documentation, agile testing, key word driven testing and test automation. The contents will reflect latest research topics as well as industry practices.

CPSC 543 **Software Maintenance**
Learns the principles of generating maintainable software and the theory and practice of maintaining large scale software and application of maintenance metrics. Also some management issues in maintenance are discussed.

CPSC 544 **Advanced Software Process**
Provides practical guidance for improving the software development and maintenance process. Students will learn how to establish and improve a software process using agile processes and CMMI/ISO process models.

CPSC 545 **Software Design and Architecture**
Learns how to analyze and design large-scale software systems and apply different architectural patterns to software design. Case studies and projects are assigned as a practical component of this course.

CPSC 546 **Modern Software Management**
Learns how to plan and control the development activities of a project, including schedule and cost estimation, development of a master program plan, defining task interrelationships and tracking and measuring the progress of a project.

CPSC 547 **Software Measurement**
This course explores current software measurement practices. Topics include measuring software specifications and designs, measuring software code and implementation and measuring software testing and evaluation.

CPSC 548 **Professional, Ethical and Legal Issues**
This course explores professional, legal and ethical issues pertaining to software engineering. Topics include professional codes of ethics, intellectual property laws, computer privacy, and human-computer interaction.