

## Program Faculty

### **Ning Chen, PhD, Professor** **Computer Science**

- Internet and Enterprise Computing
- Software Architecture and Engineering
- J2EE Technology/JBoss

### **James Choi, PhD, Professor** **Computer Science**

- Software Development Methodology
- Reverse Engineering
- Configuration Management

### **Bin Cong, PhD, Professor** **Computer Science**

- SEI Authorized CMM&CMMI Lead Assessor, Instructor
- Internet and Enterprise Computing
- Software Architecture and Engineering

### **Chang-Hyun Jo, PhD, Professor** **Computer Science**

- Programming Languages
- Mobile Agent Computing
- Object-Oriented Software Engineering

### **Christopher Ryu, PhD, Professor** **Computer Science**

- Software Project Management
- Software Architecture
- Data Mining and Internet Computing

## Contact Information

For more information, please visit our website

- <http://mse.fullerton.edu>

Contact Dr. James Choi at (657) 278-7257

- [jchoi@fullerton.edu](mailto:jchoi@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



## 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 analyze and estimate software process costs
- **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 of 550 for foreign students

### Study Plan Requirements

- Initial orientation
- Midpoint symposium

#### Core Courses (12 units)

CPSC 541 – Systems and Software Standards and Requirements  
CPSC 543 – Software Maintenance  
CPSC 544 –Advanced Software Process  
CPSC 545 – Software Design and Architecture

#### Advanced Software Process Evaluation Courses (6 units)

CPSC 542 – Software Verification and Validation  
CPSC 547 – Software Measurement

#### Advanced Software Engineering Management Courses (6 units)

CPSC 546 – Modern Software Management  
CPSC 548 – Professional, Ethical and Legal Issues for Software Engineers

#### Capstone Experience (6 units)

CPSC 597\* – Graduate Project in Computer Science (CPSC 597 will be offered in two, subsequent 3 unit segments)

## Course Descriptions

**CPSC 541 – 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**  
Covers the theory and practice of V&V methods such as walkthroughs, inspections, and CleanRoom covers the creation of functional test cases, structural test cases, degrees of coverage, and perform data flow analysis.

**CPSC 543 – Software Maintenance**  
Teaches 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**  
Advanced guidance for defining and improving the software development process. Concepts of software maturity framework, principles of process improvement and software process assessment. Current topics such as CMMI and SCAMPI..

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

**CPSC 546 – Modern Software Management**  
Modern project management methodologies and techniques. Software development process. Planning, estimating, organizing, directing, monitoring, controlling software projects and managing risks. Other related software management issues, such as infrastructure, quality software development, project and product metrics, and external factors.

**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.