FAIRFIELD UNIVERSITY GRADUATE PROGRAMS

SOFTWARE ENGINEERING

PROGRAM DESCRIPTION

The School of Engineering offers a Master of Science degree in Software Engineering (MSSE) as well as graduate-level certificate programs in select areas of software engineering. The MSSE program cultivates the skills in design, analysis, implementation, testing, and validation needed to develop sophisticated and successful software projects. Software development is a major contributor to advances in modern technology, an indispensable tool to progress.

The MSSE program is intended to serve the needs of software designers and developers, network administrators, database administrators, and other information technology professionals. Fairfield's MSSE program is designed to accommodate working people. Students will acquire the skills and real-world knowledge directly applicable to the job through an in-depth exposure to the software development methodologies and tools. A sequence of required courses and elective courses, and the final team-driven capstone project provide depth and breadth to the students' learning experiences.

Students who do not meet a minimum experience level or who have other skill deficiencies will find a number of bridge courses available to prepare them for the MSSE curriculum demands.

COURSE OF STUDY

The Software Engineering program has two components:

- Software Engineering Required Courses (21 credits)
- Specialization/Elective Courses (15 credits)

REQUIRED COURSES

The software engineering required courses cover the software development life cycle of requirements: gathering of requirements, and analysis, design, prototyping, implementation, testing, deployment, and maintenance. The required courses are:

- Software Engineering Methods
- Software Design Methods
- Software Testing and Maintenance
- Software Project Management
- Advanced Programming in Java or C#

Two options for a two-semester required course sequence:

- The MSSE program culminates with a professional equivalent capstone project, in which students execute a technical study or design and implement an IT system.
- Thesis Option

SPECIALIZATION COURSES

Students take three courses in one specialization of interest: Computer Programming, Web Technology, Database Architecture, Computer Networking, and Health Informatics.

COMPUTER PROGRAMMING

- Operating Systems and Programming
- Algorithms
- Network Programming

WEB TECHNOLOGY

- Web Client-Side Development I
- Web Development II with ASP.NET
- Enterprise Java
- High Performance Web Application
- Server Management
- Application and Web Security

DATABASE ARCHITECTURE

- Database Concepts
- Advanced Database Concepts
- Data Warehousing Systems
- Data Mining and Business Intelligence

COMPUTER NETWORKING

- Network Concepts
- Network Routing and Switching
- Network Programming
- Server Management
- Information Security Measures and Countermeasures

HEALTH INFORMATICS

- Health Information Systems
- Human Computer Interface
- Introduction to Systems Engineering
- Principles of Quality Management

ELECTIVE COURSES

Two electives may be chosen from courses listed under Software Engineering Graduate Certificate programs, as well as SW 482, Special Topics, and SW483, Independent Study, or any other Engineering Master level course.

Fairfield University

School of Engineering

THE CAPSTONE PROJECT

The MSSE program culminates with a professional-equivalent capstone project, in which students execute a technical study or design and implement an IT system. Capstone projects are compiled in a journal, Technology in Action, which can be sent upon request. Examples of recent projects include:

- Development of XDB Protocol and Prototype for NASA
- Event Monitoring and Alerting System for General Electric Company
- Simulation Exercises on Humanitarian Exercises

CERTIFICATE PROGRAMS

A key component of the School of Engineering's academic mission is to serve the knowledge and skill needs of industry and business in southern Connecticut. In this spirit, the School offers specialized certificate programs at the graduate level for members of the information technology community seeking to upgrade or acquire skills in specialized areas of the discipline.

All courses in the certificate program fall within the curriculum of the accredited M.S. degree program in software engineering. The resources at the disposal of the certificate programs – instructional, hardware, and software – are leading edge in every respect so as to provide the best possible learning environment for students.

WEB APPLICATIONS DEVELOPMENT CERTIFICATE

The pervasive use of the Internet to conduct business has further increased the demands for skilled web developers. Students learn to integrate databases with the internet, develop sophisticated web applications and surveys, and ensure secure communications and transactions. Courses examine leading technologies for web/intranet application development, and security procedures for e-commerce. A project-centered approach provides a technical foundation and hands-on experience with vital technologies that are the driving force behind many successful web applications.

WEB APPLICATIONS DEVELOPMENT CERTIFICATE

- Web Client-Side Development I
- Advanced Programming in C#
- Web Development II with ASP.NET
- Application and Web Security

  OR
- Web Client-Side Development I
- Advanced Programming in Java
- Enterprise Java
- Application and Web Security

DATABASE MANAGEMENT CERTIFICATE

Students in this certificate gain a deep understanding of modeling, designing, implementation, and testing of the complex database.

DATABASE MANAGEMENT CERTIFICATE

- Advanced Database Concepts
- Database Warehouse Systems
- Data Mining and Business Intelligence
- Application and Web Security

INFORMATION SECURITY CERTIFICATE

One of the key issues in transmitting data or executing transactions over the Internet is the ability to safeguard information exchange and guarantee its inviolability. As the use of the Internet and the Web to conduct business expands, so does the need for information security. Designed by experts in the field, the Information Security Certificate allows students to focus their software engineering skills in protecting the sensitive data in systems that support government organizations, large corporations, and small businesses. The Information Security Certificate helps students to explore security principles and theories and apply them to real-world scenarios. Taking the 4 courses required for the Information Security Certificate also prepares the student for the CISSP exam where as a student with less than 5 years of experience can earn the CISSP Associate certification.

INFORMATION SECURITY CERTIFICATE

- Introduction to Information Security
- Applications and Web Security
- Network Concepts
- Information Security Measures and Countermeasures

NETWORK TECHNOLOGY CERTIFICATE

The Network Technology Certificate prepares students for work in the business community and provides a solid academic foundation in technical theories and models of networking. During four intense courses, students work in networking laboratories and classroom settings to get hands-on experience with network operating systems; routers and switches; and local and wide area network topologies, developing in the process the skills for network capacity planning and performance monitoring. This program combines vendor independent concepts and analytical skills development using state-of-the-art equipment from Cisco, Microsoft, and other important networking industry vendors.

NETWORK TECHNOLOGY CERTIFICATE

- Network Concepts
- Network Routing and Switching
- Server Management
- Information Security Measures and Countermeasures

Students completing Network Concepts and Network Routing and Switching are eligible to take the Cisco Certification Exams and are provided the opportunity for a discount voucher for selected Cisco certification exams.

GRADUATE PROGRAM DIRECTOR

Dr. Wook-Sung Yoo
Phone: (203) 254-4000, ext. 3331
E-mail: wyoo@fairfield.edu

Dr. Wook-Sung Yoo is the advisor for the M.S. Software Engineering program. He is available to answer any specific questions you have about our program, discuss/develop a program of study for you, or to schedule an advising appointment.

For a complete faculty listing, see **www.fairfield.edu/dsbfaculty**.

ADMISSION REQUIREMENTS

Applicants for a master's degree must hold a bachelor's degree from a regionally accredited college or university (or the international equivalent) or demonstrate adequate experience as a professional software developer or programmer, whose academic and professional record suggest the likelihood of success in a demanding graduate program.

Applicants with an undergraduate degree in an area other than software engineering, computer science, or the equivalent, may need to take the following bridge courses to develop the required background for the program:

- SW 131 Fundamentals of Programming for Engineers
- SW 232 Advanced Programming and Data Structures
- SW 355 Database Management Systems

FORMAL ADMISSION PROCESS

Applications to the graduate program are accepted on a rolling basis. Applications are reviewed by the Graduate Admission Committee. Students seeking admission must complete and submit the following online:

1. A completed application.
   (Apply online at **www.fairfield.edu/soeapp**.)
2. A non-refundable $60 application fee.
3. A professional résumé.
4. Personal statement describing intent for studying in the program.
5. Official transcripts from all universities/colleges attended (All foreign transcripts must be evaluated by an approved evaluating service. A list of approved evaluators is available at **www.fairfield.edu/eval**.)
6. Two recommendation letters, one of which must be from a current supervisor or professor, completed online.
7. All international students whose native language is not English must demonstrate proficiency in the English language by taking either TOEFL or IELTS exams. For admission to the graduate school, a TOEFL composite score of 550 for the paper test, 213 for the computer-based, 80 on the internet based test or an IELTS score of 6.5 is strongly recommended. Scores must be sent directly from the Educational Testing Service (TOEFL) or **www.IELTS.org**. Fairfield's ETS code is 3390.

Submit transcripts and any other documents that cannot be uploaded to:

Fairfield University
Office of Graduate & Continuing Studies Admission
Kelley Center
1073 North Benson Road
Fairfield, CT 06824

TRANSFER STUDENTS

Transfer credit will be considered for graduate coursework earned with a grade of B or better. No more than six credits may be transferred.

MANDATORY IMMUNIZATIONS

Connecticut State law requires each full-time or matriculated student to provide proof of immunity or screening against measles, mumps, rubella, varicella (chicken pox), meningitis and tuberculosis. Certain exemptions based on age and housing status apply. Matriculating students are defined as those enrolled in a degree seeking program. More detailed information and the required downloadable forms are available online at **www.fairfield.edu/immunization**. Completed forms should be submitted directly to the Student Health Center. Although this is not required to complete an application, you must provide proof of immunity/screening prior to course registration. Please consult your private health care provider to obtain the necessary immunizations. Questions may be directed to the Student Health Center: (203) 254-4000 ext. 2241 or e-mail health@fairfield.edu.

NON-MATRICULATED STUDENT STATUS

Non-matriculated status may be granted to individuals who have not completed the admission process but wish to begin taking courses, or who are not seeking a degree or certification. Individuals wishing to enroll as non-matriculated students must submit:

1. A completed application.
   (Apply online at **www.fairfield.edu/soeapp**.)
2. A non-refundable $60 application fee.
3. A written request to the Graduate Program Director, specifying the semester for which this status is requested.
4. Official transcripts verifying that a baccalaureate (or higher) degree with a grade point average of 3.0 or higher has been earned.

Non-matriculated student status is granted for 9 credits only. Students seeking admission must complete the formal application process by the end of their 9 credit limit in order to continue with their studies. Individuals enrolled as non-matriculated students cannot enroll for more than six credits each term, cannot register on a full-time basis, and are not eligible for any tuition aid or financial support. Upon formal admission to the Graduate Program, credits earned while a non-matriculated student will be applied toward the master's degree, provided the courses were approved by the faculty advisor and the grade received in each course was a B or better. Successful completion of coursework does not automatically guarantee formal admission.

NON-DEGREE STUDENTS

Students who hold master's degrees and who are interested in taking courses for professional and/or personal continuing education may be admitted as non-degree students. Individuals wishing to enroll as non-degree students must submit:

1. A completed application.
   (Apply online at **www.fairfield.edu/soeapp**.)
2. A non-refundable $60 application fee.
3. A written request to the Graduate Program Director, specifying the semester for which this status is requested.
4. Official transcripts verifying that a master's degree has been earned.

Courses taken under this status will not be considered toward fulfillment of degree requirements.

TUITION/FINANCIAL AID

Academic Year 2014/2015
Tuition: $750 per credit hour

A graduate education can provide countless professional and personal rewards in the future. However, the costs associated with earning a master's degree may be challenging. Many students need to look beyond their own financial resources or the resources of their employer for assistance. There are many ways to finance a graduate education, including graduate assistantships, federal direct loan programs and our Veterans Pride Program, which are all discussed at **www.fairfield.edu/gradfa**.

SCHOLARSHIPS

The School of Engineering provides modest scholarships to select students on the basis of need and merit.

OFFICE OF FINANCIAL AID

Advisors from the Office of Financial Aid are committed to helping students find the options that best suit each of their needs. We encourage all Fairfield University graduate students to contact the Financial Aid office with any questions or to make an appointment to speak with a counselor.

FINANCIAL AID CONTACT INFORMATION

Phone: (203) 254-4125
Fax: (203) 254-4008
E-mail: finaid@fairfield.edu

FINANCIAL AID OFFICE OPERATIONS

Days: Monday-Friday
Hours: 8:30 a.m.-4:30 p.m.
Location: Aloysius P. Kelley, S.J. Center

MORE INFORMATION

ADMISSION QUESTIONS

Questions about the application process should be directed to the
Office of Graduate & Continuing Studies Admission
Phone: (203) 254-4184
Fax: (203) 254-4073
E-mail: gradadmis@fairfield.edu

OFFICE OPERATIONS

Days: Monday-Friday
Hours: 8:30 a.m.-4:30 p.m.
Location: Aloysius P. Kelley, S.J. Center

SCHOOL OF ENGINEERING WEBSITE

www.fairfield.edu/engineering

ONLINE CATALOG

For detailed course descriptions and other University information, please refer to our online catalog **www.fairfield.edu/catalogs**.

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