



COURSE OBJECTIVES: GRADUATE CERTIFICATE IN SOFTWARE ENGINEERING

Software Architecture

This course will focus on two major areas. The first part of the course will cover software requirements analysis and development as well as software architecture and the soft skills needed by high level software architects. The second part of the course will cover how persistent data fits into different types of software systems. The primary focus of the second part of the course will be on incorporating larger scale enterprise data systems into software systems and will be an application of the first part of the course material. This course will explore:

- Chronic software production problems
- Derived functional and non-functional requirements
- Problem and solution space mapping and complexity
- Architecture (the product) and architecting (the practice)
- Object and component based software architecture techniques
- Architectural styles and how to apply them
- Architectural views and their relationship to requirements
- Application data systems vs. Enterprise data systems
- The different quality attribute requirements between application and enterprise data systems
- Software architectures for enterprise data systems
- Architecting domain models for data systems

Software Project Management Support

This course will cover software planning, estimation, staffing and scheduling. This course will explore:

- Software work breakdown structures
- Software project dependencies and effort schedules
- Estimation techniques
- Comparisons between different project models (waterfall, agile, iterative, ...) and when one might be preferred over the others

Operating Systems

This course provides an in-depth study of the principles of computer operating systems and their essential components. Team projects expose students to a variety of system design issues as they relate to the functionality and performance of the system. Topics include I/O devices, disk scheduling, file system organizations, directory systems, sequential and concurrent process, CPU scheduling, memory management, deadlock, process and threading, and review of some related articles in the literature.

Advanced Computer Architecture

This course covers concepts in the structural design of computer systems important to software designers. Topics include memory hierarchy, super pipelining and super scalar techniques, dynamic execution, vector computers and multiprocessors and performance impacts of software design.