

CEN 5011 – Advanced Software Engineering

Catalog Description

This course deals with the design of large scale computer programs. Included are topics dealing with planning, design, implementation, validation, metrics, and the management of such software projects. (3 credits)

Prerequisite

Knowledge of a data structure course (e.g., COP 3530), Familiarity with at least two high-level programming languages (e.g., C++ and Java) and the foundations of computing, Familiarity with the basic concepts of software engineering, including software process, requirements analysis, design, coding, and testing.

Type

Required for MSCS

Can be an Elective for MSIT, MSTN, and Ph.D. students

Course Objectives

This course provides a comprehensive coverage of software development processes and well-known methods for system requirements analysis, design, implementation, and testing. Essential software management methods will also be introduced. Students will be involved in a semester long team project, which requires the application of various management and development methods covered in the class. Students will gain real experience in developing large software systems, which are extremely useful and helpful for future employment in software industry.

Topics

Essential concepts of software engineering

Software process models

Software management techniques

Software Analysis methods

Software design methods

Software testing techniques

Advanced topics in software engineering

Textbook

Bernd Bruegge and Allen Dutoit, *Object-Oriented Software Engineering: Using UML, Patterns, and Java*, Third Edition, (Prentice-Hall, 2010).

Other References

Grady Booch, Ivar Jacobson, James Rumbaugh, *The Unified Modeling Language User Guide*, 1st Edition, (Addison-Wesley Professional, 1998).

Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides, *Design Patterns: Elements of Reusable Object-Oriented Software*, 1st Edition, (Addison-Wesley Professional, 1995)

Last Update

Xudong He 8/30/2012