

**University of South Florida**  
**College of Business Administration**  
**Information Systems and Decision Sciences**  
**ISM 6124 - Advanced Information Systems Analysis and Design**  
**Fall Semester 2004 - Syllabus**

**Instructor:**

Professor Alan R. Hevner

Office: CIS 2076

Phone: 974-6753, Email: [ahevner@coba.usf.edu](mailto:ahevner@coba.usf.edu)

Office Hours: Monday 5:00pm – 6:00pm and by appointment

Web: [www.coba.usf.edu/hevner](http://www.coba.usf.edu/hevner)

**Course Objectives:**

Software-based information systems are the most interesting and challenging products ever invented by humans. Software has the capability to solve the most difficult problems accurately and efficiently. It is ubiquitous in all aspects of our lives. The goal of this course is to instruct you in the technical and managerial foundations of software engineering and information systems development. Based on a prerequisite understanding of basic systems concepts, you will learn to manage and perform activities throughout the information systems development life cycle, from the analysis of system requirements through system design to system implementation, testing, and maintenance. Current best practices in information systems development are presented and research challenges are discussed. State-of-the-art ICASE software development environments will be used on team projects.

**Course Readings:**

*Required:*

- Steve McConnell, **Rapid Development: Taming Wild Software Schedules**, Microsoft Press, 1996. – This book covers the most important managerial practices in software system development. The focus is on practical guidance for managing software development teams.
- Barry Boehm and Richard Turner, **Balancing Agility and Discipline: A Guide for the Perplexed**, Addison-Wesley, Inc., 2004. This book provides a balanced presentation of the tradeoffs between disciplined software development methods and the much-hyped agile methods.
- Martin Fowler, **UML Distilled**, 3<sup>rd</sup> Edition, Addison-Wesley, Inc., 2004. This book presents a basic survey of the models and techniques of the Unified Modeling Language (UML).
- Tom DeMarco and Tim Lister, **Peopleware: Productive Projects and Teams**, 2<sup>nd</sup> Edition, Dorsett House Publishing, 1999. – The classic book on people issues in software system development.

*Recommended:*

- Fred Brooks, **The Mythical Man-Month**, Anniversary Edition, Addison-Wesley, Inc., 1995.
- Alan Brown, **Large-Scale, Component-Based Development**, Prentice-Hall PTR, 2000.
- Robert Glass, **Facts and Fallacies of Software Engineering**, Addison-Wesley, Inc., 2003.
- Craig Larman, **Agile & Iterative Development: A Manager's Guide**, Addison-Wesley, Inc., 2004.
- Roger Pressman, **Software Engineering: A Practitioner's Approach**, 6<sup>th</sup> Ed., McGraw-Hill, 2004.

- Stacy Prowell, Carmen Trammell, Rick Linger, and Jesse Poore, **Cleanroom Software Engineering: Technology and Process**, Addison-Wesley, Inc., 1999.

**Course Outline:** (RD = Rapid Development, DL = Downloads)

Not all sections of the listed chapters will be covered in class discussion. Refer to the Study Sheet for the relevant chapter sections.

<b>Date</b>	<b>Topic</b>	<b>Readings</b>
Aug. 23 <i>Study Sheet 1</i>	Introduction to Course - Principles of Software Development - Software Engineering Responsibilities and Ethics	RD 1-3 DL 1-2
Aug. 30 Sept. 13 <i>Study Sheet 2</i>	Software Development Processes and Methods □ Definitions □ Plan-Driven Processes ○ Survey ○ Capability Maturity Model □ Agile Processes ○ Survey ○ Extreme Programming / Pair Programming □ Risk Management □ Designing the Right Software Development Process for Your Project	Boehm/Turner Book RD 4-10 DL 3-5
Sept. 20 <i>Study Sheet 3</i>	Quiz 1 (45 minutes) Requirements and Specification - Properties of Good Requirements - Quality Attributes - Software Architectures - Cleanroom Methods ○ Box Structure Specification	DL 6-7 DL 8 – Navy Case Study
Sept. 27 Oct. 4 <i>Study Sheet 4</i>	Design and Coding - Component Based Development (CBD) - Object-Oriented Design and UML - Web Services - Cleanroom Methods ○ Flow-Service-Quality (FSQ) Design	DL 8 – Algorithms & Elevator Case Study DL 9-12 Fowler Book
Oct. 11 <i>Study Sheet 5</i>	Testing and Maintenance - Inspections and Reviews - Testing Strategies ○ Functional (Black Box) Testing ○ Structural (White Box) Testing - Cleanroom Methods	DL 13-14

Oct. 18 Oct. 25 <i>Study Sheet 6</i>	Quiz 2 (45 minutes) Integrated Computer Aided Systems Engineering (ICASE) Software Systems Development - Introduction to ORACLE Designer - ICASE Assignment - Group Project Assignment	RD 15 DL 15
Nov. 1 <i>Study Sheet 7</i>	Peopleware - Guest Speaker – Larry Gioia	RD 11-13 Peopleware Book
Nov. 8 <i>Study Sheet 8</i>	Industry Best Practices in Software Development - Reuse, Metrics, Reengineering - ICASE Assignment Due	RD 14, 16-43 DL 16-17
Nov. 15 <i>Study Sheet 9</i>	Managing Software Development - Guest Speaker – Rob Schaaf Hot Topic Reports Due	Presentation Handouts
Nov. 22 <i>Study Sheet 10</i>	Quiz 3 (45 minutes) Hot Topic Discussions	
Nov. 29 Dec. 6 <i>Study Sheet 11</i>	Group Project Presentations, Discussion, and Feedback Group Project Reports Due Dec. 6	

### **Study Sheets:**

Study Sheets for all class sessions are available on the website for download. An outline of session topics and discussion questions are provided. (Since I continually revise all study sheets during the semester, not all study sheets will be available at the beginning of the semester.) A limited number of recommended papers and texts will appear on the Study Sheets. In our discussions, I will reference material from these sources.

### **Feedback Sheets:**

At the end of each class session, each student will complete a one-minute Feedback Sheet over the material covered that session. Completion of these sheets will support the goal of continuous quality improvement of the course materials and teaching styles.

**Grading Policy:** The Plus/Minus grading system will be used in this course.

Class Participation	10%
Three Quizzes (Each 15 %)	45%
ICASE Assignment	10%
Hot Topic Report	15%

Group Project	20%
---------------	-----

**Incompletes:**

Only in **rare cases**, such as serious illness, will an Incomplete be given. An Incomplete must be requested in writing giving the reason for the request and all appropriate documentation.

## Downloads:

Download the following documents from the class Blackboard. The documents are to be read by class on the date assigned.

1. "Software Engineering Code of Ethics and Professional Practice," download from ACM website <http://www.acm.org/serving/se/code.htm>
2. Visit the Crosstalk Web site at <http://www.stsc.hill.af.mil/crosstalk> and subscribe.
3. Capability Maturity Model information from the SEI website. Visit <http://www.sei.cmu.edu/cmm>  
From this page explore information on SW/CMM V1.1, the CMMI, and PSP/TSP. Be careful of printing full reports as they typically are very large.
4. For quick introductions to Extreme Programming and Pair Programming, scan the following websites:
  - a. <http://extremeprogramming.org>
  - b. <http://pairprogramming.com>
5. Madeline Domino's Presentation on *Three Studies of Problem Solving in Collaborative Software Development*, Ph.D. Dissertation.
6. C. LeRouge, A. Hevner, R. Collins, M. Garfield, and D. Law, "Telemedicine Encounter Quality: Comparing Patient and Provider Perspectives of a Socio-Technical System," *Proceedings of the 37<sup>th</sup> Annual Hawaii International Conference on System Sciences (HICSS37)*, Hawaii, January 2004.
7. R. Linger, "Cleanroom Process Model," *IEEE Software*, Vol. 11, No. 3, March 1994.
8. Cleanroom case study documents on the ISM 6124 class Blackboard:
  - a. Navy Supply Case Study
  - b. Cleanroom Analysis and Design Algorithms
  - c. Elevator System Case Study
9. Visit The Component-Based Development and Integration Forum website at <http://www.cbdiforum.com>. Join the forum as a Bronze member. It is free. Investigate the information on the website. Download the document "Component Based Development: Using Componentized Software," May 1999 from the site.
10. UML Documentation.
  - a. Visit <http://www.rational.com/uml>.
  - b. Visit <http://www.omg.org/technology/uml/index.htm> and review the following tutorial UML Introduction at [http://www.omg.org/gettingstarted/what\\_is\\_uml.htm](http://www.omg.org/gettingstarted/what_is_uml.htm)
11. A. Arsanijani, B. Hailpern, J. Martin, and P. Tarr, "Web Services: Promises and Compromises," *Queue*, Vol. 1, No. 1, March 2003, pp. 48-58.
12. A. Hevner, R. Linger, M. Pleszkoch, and G. Walton, "Flow-Service-Quality (FSQ) Engineering for the Specification of Complex Systems," Chapter 11 in *Practical Foundations of Business System Specifications*, Edited by H. Kilov and K. Baclawski, Kluwer Academic

Publishers, The Netherlands, 2003, pp. 215-229.

13. J. Whittaker, "What Is Software Testing? And Why Is It So Hard?" *IEEE Software*, Vol. 17, No. 1, January/February 2000.
14. B. Hungerford, A. Hevner, and R. Collins, "Reviewing Software Diagrams: A Cognitive Study," *IEEE Transactions on Software Engineering*, Vol. 30, No. 2, February 2004, pp. 82-96.
15. ORACLE Designer system documents:
  - a. Frequently Asked Questions (FAQ) Document
  - b. Tutorial Document
16. Download "The Corporate Metrics Program: A Framework for Development" from Blackboard
17. Investigate Best Practice information from the following website:  
<http://www.spmn.com> Review the 16 critical software practices.