# IS 605: Systems Analysis and Design
# Marshall University, Fall 2004

## Course Description

This course provides you with an in-depth treatment of *practical* techniques and tools required to succeed in developing contemporary information systems. The topics you will learn are the current practices in the industry. You will work on *real world problems* in a *team environment*. This is a *project-centered* course and helps you gain mastery in bringing the concepts learned in the course to bear on practical problems.

## Prerequisites

- An intermediate-level expertise in computer programming is required. The actual experience is important rather than the programming language used.
- Basic knowledge of introductory data structures and algorithms is required.

## Instructor Information

**Name:** Dr. Venkat N. Gudivada.

**Phone and Email:** 304-696-5452; gudivada@marshall.edu.

**Office Location:** Gullickson Hall, Room 205.

**Office Hours:** 2.00 PM – 4.00 PM, MW. Other times by appointment.

## Course Objectives

- Provide an in-depth exposition to requirements elicitation and analysis, system specification, preliminary and detailed system design.
- Provide a learning environment where students can learn by doing — think-pair-share, class discussion of open-ended questions, homework problems that probe the student for deeper insight, and a semester-long team project.
- Demonstrate how the techniques and tools discussed in the class can be brought to bear on real-world, practical problems.

## Learning Outcomes

- Students understand information systems life cycle and related issues.
- Students can perform object-oriented analysis and design successfully on real-world problems.
- Students have gained proficiency in documenting the analysis, design, and construction artifacts in Unified Modeling language (UML) — the Object Management Group (OMG) standard for documenting information systems.
- Students can explain in detail the internals of the Unified Process (UP), and Rational Unified Process (RUP).
- Students have learned how to bring the above tools and techniques to bear on practical problems.

## Course Assessment

The course assessment components include: homeworks (10%), class participation (5%), two exams (40%), and a team project (45%). Maximum possible score is 100. Course grade is awarded based on the following scheme:

| *Score* | *Letter Grade* |
|---|---|
| $> 90$ | A |
| $> 80$ & $< 90$ | B |
| $> 70$ & $< 80$ | C |
| $< 70$ | F |

## Instructional Materials

**Required Textbook** J. Whitten, L. Bentley, and K. Dittman, *Systems Analysis and Design Methods* ($6^{th}$ edition), McGraw-Hill, 2004.

**Recommended Reference** I. Bray, *An Introduction to Requirements Engineering*, Addison-Wesley, ISBN 0201767929, 2002.

**Another Recommended Reference** M. Fowler and K. Scott, *UML Distilled*, Addison-Wesley, ISBN 0-201-65783-X, 2000.

**Additional Resources** Course notes and other handouts will be available on the course WebCT Vista. URLs for additional resources will also be listed on the WebCT.

## Course Topics

1. System Life Cycle
2. Development Methodologies
3. Unified Modeling Language
4. Feasibility and Return on Investment (ROI)
5. Project Management
6. Analysis Techniques
    - Requirements Analysis: Workflow Analysis, Interviewing, Joint Applications Design (JAD), Prototyping and Rapid Applications Development (RAD)
    - Analysis Models: Data Dictionary, Data Modeling and Analysis, Use Cases and Use Case Diagrams, Conceptual Class Diagrams, CRC Cards, and Context Diagrams.
7. Design Techniques
    - Object-Oriented Design: Design Class Diagrams, Interaction and Activity Diagrams, State Chart Diagrams, Package and Deployment Diagrams.
    - System Architecture Design
    - Database Design
    - Test Case Design
    - User Interface Design
8. System Development Methodologies
    - Unified Process
    - Rational Unified Process
9. Deployment, Maintenance, and Operational Issues

## Class Participation

Every student is required to actively participate in class discussions.

## Team Projects

Students are required to complete a real-world, practical problem of limited scope from inception to deployment and operation. Students work in small teams of size 3 to 4. Following are suggested projects for this semester:

- Marshall University Enrollment Management
- IEEE CS Curriculum Assessment
- Faculty Instruction Assessment
- CITE Web Portal
- eCommerce Systems
- Multimedia Information Retrieval Systems

You are not limited to choose from the above projects. However, your project needs to be approved by the instructor before you start working on it. Handouts about project milestones and deliverable will be posted on the course WebCT Vista.

## Course WebCT Vista

It is important to visit the course WebCT for all the up to date information about the course. It hosts all the course materials including homeworks, handouts, lecture notes, and reading materials. Also, you will use the Vista for submitting all your work.