

SE460T

Software Engineering Capstone Project

[Onsite]

Course Description:

A final team project that incorporates the use of theories and skills taught in core courses of the program to develop a technology solution for solving a business problem by responding to a case study or an RFP. The team project will simulate professional and business situations.

Prerequisite(s) and/or Corequisite(s):

Prerequisites: Completion of a minimum of 164 credits earned in the program of study including SE421T Secured Programming or equivalent and SE450T Software Engineering Process I or equivalent

Credit hours: 4

Contact hours: 60 (36 Theory Hours, 24 Lab Hours)

ITT TECHNICAL INSTITUTE

SET CAPSTONE PROJECT

STUDENT SYLLABUS

Instructor

Office hours

Class hours

I. MAJOR INSTRUCTIONAL AREAS

- Discussing the Request for Proposal (RFP) document
- Evaluating the business need defined in the RFP document
- Creating a team-based project plan
- Doing research for the proposal
- Creating a proposal as a response to the RFP document
- Maintaining a project logbook
- Creating the documentation
- Creating the final presentation and handouts
- Presenting the proposal

II. COURSE OBJECTIVES

Upon successful completion of this course, the student is expected to:

- Demonstrate understanding of the project requirement set forth in the RFP.
- Conduct a complete process of research, business system design (BSD), and technical system design (TSD) to be included in the response to the RFP.
- Develop a software application to solve the business problems by following the BSD and TSD as proposed in the response to the RFP.
- Demonstrate technical capabilities by building the application using software engineering processes.
- Demonstrate the ability to plan and manage the production and implementation of the application.
- Demonstrate the ability to work in a team with leadership vision.
- Present the software solution to an audience in a simulated business environment.

III. TEACHING STRATEGIES

Curriculum is designed to promote a variety of teaching strategies that support the outcomes described in the course objectives and that foster higher cognitive skills. Delivery makes use of various media and delivery tools in the classrooms.

IV. TEXT AND SUPPLIES

These are the same as those for all the other technical courses of the SET program. All equipment and software that have been used in the previous quarters may be needed for this course.

V. EVALUATION

Software functionality	50 %
Documentation	25 %
Teamwork	15 %
Presentation	10 %

Final grades will be calculated from the percentages earned in class as follows:

A	90 - 100%	4.0
B+	85 - 89%	3.5
B	80 - 84%	3.0
C+	75 - 79%	2.5
C	70 - 74%	2.0
D+	65 - 69%	1.5
D	60 - 64%	1.0
F	<59%	0.0

VI. FACILITY/EQUIPMENT/TOOLS/SUPPLIES

Students can use the infrastructure in the various SET labs. They should use the components and tools issued to them at various stages of the SET curriculum.

Hardware List

The instructor computer should have the following configuration:

- A multimedia computer with Microsoft Windows 2000 Professional

- A Pentium II or higher processor (recommended)
- 128-MB RAM (minimum) or 256-MB RAM (recommended)
- 4-GB (minimum) or 10-GB (recommended) hard disk space
- A CD-ROM drive
- An SVGA monitor with a 800 x 600 (minimum) or 1024 x 768 (recommended) resolution
- A floppy disk drive
- A LAN connection

Software List

The instructor computer should have the following software configuration:

- Windows 2000 Server
- J2EE 1.3.1
- J2SDK 1.4.2
- Visual Studio.NET 2002 Professional
- Microsoft Project 2000
- Microsoft Visio 2000 Professional
- Internet Explorer 5.0 or later
- Microsoft SQL Server 2000
- IIS 5.0 or later

VII. INTENT/ INTERFACE/ INTEGRATION

The goal of this course is to help students design and create a real-life Web application. This course will build upon the knowledge and skills acquired in previous courses, such as Programming in VB.NET and C#, Advanced Java II, and Software Engineering Process I. After doing this course, students will be able to analyze, design, and develop a software application that simulates a Web solution for a university. This course will consist of brief instructor-led discussions at the beginning, with most of the time devoted to student team activities. The activities will focus on the software development process. The instructor(s) for this course will act mainly as advisor(s) and/or consultant(s) on the one hand and supervisor(s) for the project on the other. Students in each group will perform the role of a professional software developer serving customers in a real-life situation. The instructor(s) need to meet the student teams to provide consultation and guidance on their project. These meetings should be defined. The instructor(s) must work with all the teams together at the beginning to explain the project requirements, set up milestones, and regularly supervise and assess the process based on the requirements and milestones.

VIII. INSTRUCTOR NOTES

1. Initiating the Project

An introductory session should be arranged just before the start of the 15th quarter to inform students about the aim and scope of the capstone project. In the session, inform students about the responsibilities of team members and the importance of teamwork. Suggest a team composition of four to five students based on the total size of the class.

In addition, a brief lecture on time and resource management will enable students to understand how to make the best use of the available resources within the given time.

2. Explaining the Project Schedule

Emphasize that students must develop a project schedule using a professional project planning tool such as Microsoft Project and follow the schedule meticulously. You can take a brief session on how to use Microsoft Project or ask students to go through the Help file for the same. They can also read a Microsoft Project tutorial from <http://www.itlearningmaterials.com/msproject.htm>.

The schedule must define the project activities, the timelines for performing them, and the name of the team member(s) responsible for each activity. Students must constantly monitor their progress against the schedule and take corrective measures, if required.

3. Explaining the RFP Document

Provide each team with a copy of the RFP document and conduct a session with each team to explain it. During the session, invite and answer the doubts of students. State that their project will be challenging (to check their level of understanding) but realistic enough to be completed within the available time and resources.

An RFP document is created keeping in mind the specific requirements that a business wants. The RFP document that will be provided to students in this project is only a model.

Explaining the Proposal Template

Explain to students that the intent of the proposal is to provide a comprehensive plan for executing a task or tasks. The proposal describes the plan, how you intend to implement it, and the effort and research involved in the project to meet the client requirement in the given time frame.

Similar to the RFP document, the sample proposal provided in this project is only a model. The proposal must be developed in a similar way. Encourage students to develop proposals using their own style but keeping the following factors in mind:

1. The proposal should be clearly divided into logical headings, such as Company Background, Technical Solution, and Cost Analysis.
2. The font style used should be uniform across the document. The ideal font style to use is Times New Roman or Arial.
3. The font size should be standardized. For example:
 - First-level headings can be of font size 14.
 - Second-level headings can be of font size 12.
 - The text within the headings can be of font size 11.
4. The presentation and layout of the proposal should be professional and free from any spelling and grammatical errors. Encourage students to look at sample proposals on the Internet before working on their own proposal.
5. The proposal should contain diagrams, component lists, charts, and tables, where applicable, so that it is easy to understand and has a professional look. The proposal should be submitted as a bound copy along with a cover page. The cover page must provide a list of the team members, their student IDs, the school number, and the name of the instructor. Students may include an appendix to document any specific technical inputs, reference material, bibliography, glossary, and acknowledgements.

4. Consultation

This course will require a leading instructor to serve as the primary advisor for project management and to guide student teams on the choice of technology, such as the designing method and the programming language. A few other instructors might be needed to serve as team advisors to assist the leading instructor in providing technical consultation to the student teams when required. The following are the major responsibilities of the leading instructor and the team advisor:

Leading Instructor:

- Overseeing the planning and management of the whole course as a project manager
- Planning and scheduling the course hours for the class, the student teams, and the other instructors who serve as team advisors
- Organizing weekly class meetings of about 30 minutes for a discussion on requirements analysis, designing, coding, and testing issues
- Providing most of the consultation to student teams
- Performing a requirements inspection for each team
- Coordinating with other instructors to serve as team advisors to meet the needs of student teams
- Performing the role of the chief evaluator of student outcome and course outcome

©ITT Educational Services, Inc.
02/14/2005

SET Capstone Project,

Team Advisor:

- Assisting the leading instructor in providing technical consultation to student teams in, for example, choosing designing methods and programming language reference
- Assisting the leading instructor to form a panel to evaluate the software and presentations of student teams
- Assisting in other areas when required

The project team structure can look like the one in Figure 1.1.

To derive the maximum benefit from this course, the leading instructor must plan in advance for the resources required – chiefly the instructors and the time required. The instructor and/or the instructor team must be a good project-management body. It is advisable that an instructor well versed in software engineering or development and project management be the leading instructor with the organized participation of other instructors (as needed) to guide student teams through the project. Each team should present the deliverables of the final product (both the software and the documentation) at the end of the course. Regular office hours should be granted for students to seek guidance in their project. In the first class session, it is important for the leading instructor to help students form teams and set up team functions such as team leader, individual responsibilities, work load, and time frames. Much of the first class session should be devoted to a discussion on project planning, and the management process and skills.

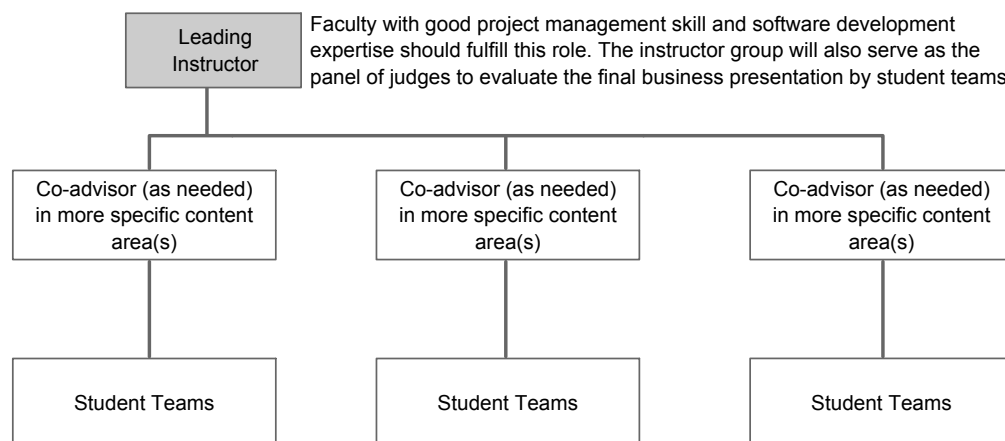


Figure 1.1: Project Team Structure

5. Understanding the Presentation

In addition to submitting their proposals, students must create a presentation on their project and demonstrate it to the class. To create the presentation, they must follow these guidelines:

1. The presentation slides must represent information from the proposal.
2. Each slide should contain no more than four or five points for easy readability and comprehension.
3. Each presentation should have a title slide and a summary slide.
4. The font style and size used should be consistent.
5. The presentation layout should be professional, formal, and free from any spelling and grammatical errors. Encourage students to look at sample presentations on the Internet before working on their presentation.
6. The presentation should contain diagrams, component lists, charts, and tables, where applicable, so that it is easy to comprehend and has a professional look.

©ITT Educational Services, Inc.
02/14/2005

SET Capstone Project,

6. Evaluation

Students will be evaluated on team effort, such as the presentation of the final project. In addition, they will be evaluated on individual performance and participation. In their logbook, students should record how they spent their hours during the lab exercise. They should record any difficulty they encountered during an assigned activity and the time spent outside the lab in activities such as research in the library or on the Internet. The final presentation of the project should be submitted collectively by the team. Every student should assume responsibility for the presentation submitted by the team. This includes the successful activities, the activities that did not yield results, and the effort to solve specific problems. The students' deliverables include two elements:

- A CD-ROM containing the program source code and the executable file of the project
- A bound copy of the complete documentation with a transparent cover

Note

A complete list of the components to be included in the documentation is given on page 24.

IX. INSTRUCTOR RESOURCES

Textbooks

All textbooks issued in previous courses of the SET program as needed

X. STUDENT DELIVERABLES

Students need to submit the following:

- The project schedule
- The proposal
- Documentation
- A sample working model of the solution
- The final presentation

©ITT Educational Services, Inc.

SET Capstone Project, 02/14/2005