

# An Information Technology Capstone Course: An Assessment Implementation

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## Abstract

Many curricula require and implement a capstone experience for graduating students. This course is designed to allow for a final assessment of curriculum learning objectives. Students complete a project as a tangible demonstration of their mastery of the objectives. Our Information Technology program has outlined several additional objectives that are assessed through an Information Technology capstone course.

**Keywords:** IT education, curriculum, capstone course, project course

## 1. INTRODUCTION

Most computer and information science curricula emphasize the need for a culminating or *capstone* experience for students close to graduating (Tucker 1991; Davis 1997). Many schools provide a seminar or formal course that requires students to demonstrate their mastery of skills by completing a real or simulated software development project (Fuelling, Tuttle 2000, Temple University). An underlying assumption is that by successfully completing a project a student will have demonstrated mastery of the essential skills and knowledge they acquired during their prior course work. Demonstration of mastery of these objectives takes the form of the project deliverables, demonstrations, and presentations.

The School of Computer and Information Sciences at the University of South Alabama offers three majors: Computer Science (CS), Information Systems (IS), and The Information Technology (IT). All students in the School complete a set of common courses including a traditional capstone course. The capstone course is a two-semester course that addresses the common computing curriculum objectives. Students work in interdisciplinary teams composed of computer science, information systems and information technology majors. The teams identify, design, implement, test, and present a significant software development project.

However, the Information Technology curriculum includes

several additional objectives that are not assessed by the traditional capstone courses (Owen 2000). The IT Senior Demonstration Project course was designed to assess these additional objectives, which include:

### Technology Evaluation

An IT practitioner must be able to evaluate the technology tools to determine their capabilities and limitations. This skill is essential in the rapidly evolving computing environment. In determining the capabilities of his tools, the IT professional develops an understanding of the types of problems that the tools will solve.

### Needs Analysis

Traditional analysis techniques generally focus on the development of new systems to solve a perceived problem. Needs Analysis is a general treatment of analysis that focuses on a problem and develops wide-ranging solutions that lessen the problem (Witkin 1993). Some potential solutions include: increased training and support, upgrading systems and software, and/or custom application development.

### User Analysis:

The user is of paramount importance to successful IT solutions. Identifying the user, his/her characteristics, and problems are fundamental to IT. The IT professional seeks to assist the user in finding solutions to their problems.

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**Using Tool Power:**

The increasing power of computing tools makes it more important than ever to seek out that power and tap into it. Using a tool's power appropriately requires the IT professional to search through the vast array of tools, choose one that best fits the constraints of the problem, and develop a workable solution.

**Lifelong Learning:**

The rapid advances in computing force us to constantly learn in order to keep up. Our IT curriculum emphasizes this idea so that graduates will remain viable in the profession.

**Two-voices of Communication:**

Communication is identified as one of the most important skills a graduate must possess. The IT professional is faced with the additional challenge of communicating not only with technical peers, but also the user population. This requires good communication skills for both populations.

**Defining Information Technology:**

Information Technology is a term that means different things to different people. It is important that an IT professional understand and be able to clearly define Information Technology.

## 2. COURSE OPERATION

The Senior Demonstration Project course provides the last assessment of Information Technology objectives from each graduating student. Students are allowed to take the course during the second half of the traditional capstone course or later. The course provides each student a variety of activities to display skills mastery of the IT objectives gained throughout their course work.

The course is taught in a seminar format. During the initial class meeting after the course requirements are explained, the students set the schedule for the rest of the course meetings. Most students are initially dubious that they can actually have this level of control for a class. However, the importance of professional behavior and responsibility is stressed and a schedule is agreed upon. An email list is established to facilitate communication between all course members.

The project portion of the Senior Demonstration Project course is designed to exercise and demonstrate the first four IT objectives related above. Students tend to focus the majority of their effort on the applications development portion of project courses. However, this course places more emphasis on the IT process and less on the code generation. The syllabus links the IT objectives and project requirements to past IT courses (USA Course Syllabus). For each student, a presentation is required at the end of the course outlining his project in relation to the four IT objectives.

During the balance of the class meetings, discussions about various IT topics are held. At present, three topics are discussed: job interview strategies, work-place expectations, and lifelong learning.

**Job Interview Strategies:** As students near graduation, they begin the process of job hunting. However, our experience shows that many students are poorly prepared for the process. Many students have attempted to write a resume either for another class or because it is the *thing to do* before you graduate. In any case, they have not refined their product. Students submit a resume and cover letter for review by the course instructor.

In-class activities focus on the job interview process. Several resources are examined that can improve their success in interviewing (Kruger 1998; USA Career Center). Most university placement offices sponsor on-campus career fairs that bring students and recruiters together. Students who have participated in a career fair are asked to share their impressions and experiences with the class. Another activity is to hold mock interviews. The instructor asks *trick* interview questions of each student. This exercise forcefully demonstrates the need to be prepared for the job interview.

**Workplace expectations:** As students venture into the work force, their experiences and understanding vary greatly, ranging from those of veteran employees to those of novices (Weis 1993). The School's Industry Advisory Council has pointed out that graduates have a weak understanding of the process of business. Discussions during this course allow an opportunity for shared experiences and examination of expected behaviors.

**Lifelong Learning:** In our rapidly changing discipline, continued learning is essential for success. Students nearing the end of their formal education might conclude that their learning is nearing its end. Success in our field requires a commitment to continuous learning and training. This portion of the course requires students to develop and submit a lifelong learning plan. Discussions are held to present strategies and sources that might be employed to accomplish continuous learning.

## 3. OBSERVING IT OBJECTIVES

The goal of this course is to make a final assessment of the attainment of IT objectives. The more traditional skills and methodologies are demonstrated in portions of the assigned project. However, attitudes and behaviors can only be observed through interactions between the instructor and the student. While seminar discussion is an obvious opportunity, some students are slow to overcome shyness in expressing their opinions. Students are required to individually meet with the instructor during the term to discuss their project. During these meetings, the instructor engages the student in discussions of the various objec-

tives of the course or project.

The final requirement for the course is to develop a definition of Information Technology. Each student submits their own definition of Information Technology, requiring them to articulate their understanding of IT. The dialog continues until the instructor is satisfied that the student has adequately expressed himself. At the end of this dialog, each student is asked to email the instructor one year after graduation with a response to the questions: "One year after graduation, did the School of CIS prepare you for work? And are you still learning?"

#### 4. FUTURE OPPORTUNITIES

The opportunities for the Senior Demonstration Project course to evolve and improve are many. Additional activities can be enhanced or added such as:

**Mock interviews:** We hope to provide a more realistic interview process. With support from Career Placement personnel and Advisory Council human resources managers, the interview can simulate a *real-world* one-on-one interview.

**Increased emphasis on ethics:** When they graduate, students are expected to venture into the workforce and have ethical behavior. While it is a constant theme throughout many courses; however, it is appropriate to add more ethics discussions to the course (Townsend 1999; Fisher 1994).

**Integration in the community:** We hope that our future graduates will come to understand their responsibility to not only their job, their family, but also to their community. Developing an awareness of community, and the sense of service, is a worthy addition to this course.

**IT curriculum analysis:** To provide feedback to our curriculum development process, it is important to survey our students to collect their opinions, and observations about our program.

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