



## Chapter 2

# An Advanced Course In Application Programming and Design

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*The continuing evolution in state-of-the-art business applications such as those that support e-commerce, advancements in programming language design such as Java™, and the requirements for persistent data access mechanisms have all significantly impacted the required knowledge-base of computer information science graduates. As such these individuals should have a strong background in the design and implementation of client/server applications in both traditional and Web-based environments. Application design should emphasize object-oriented techniques that can take full advantage of the most recent enhancements to programming languages. Also, alternative file structures and data access methods should be explored. This chapter gives an overview of a new course offering which will address these issues.*

## INTRODUCTION

Knowledge of client-server application alternatives, data access alternatives, and object-oriented design techniques are all requirements of computer information science graduates looking for state-of-the-art job opportunities. Enhancements to traditional programming languages and the development of new ones such as Java™ enable a software developer significant leverage in the creation of a whole new class of applications. Thus, it is important that computer information science (CIS) graduates understand these new types of applications, the software

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behind them, and the proper design techniques used in developing these applications. Therefore we must develop a curricula, which stresses both these new application alternatives along with a significant emphasis in object-oriented design. “Advanced Application Programming and Design” is a course that has been developed to meet this need. It is a course that has been built as a replacement for both the traditional file structures course and a course that focuses on client-server applications. Students are expected to have mastered topics in logic, structured programming, and introductory material in Java™ before taking this course.

## **PURPOSE OF COURSE**

The purpose of this course is to provide the student with a fundamental understanding of client/server applications utilizing an object-oriented design framework. The following is the catalog description that has been developed for this course:

Advanced topics in application programming and design using state of the art design techniques and implementation language. Topics include design and implementation of alternative file structures and supporting data access methods, user interface design and implementation, and exception handling.

The prerequisites for this course include:

- CM111 Introduction to Structured Programming
- CM245 Contemporary Programming Methods
- PH110 Logic for Computer Programming

It is assumed that the student possess sufficient skills in logic, structured programming, and object oriented programming so that he or she is able to focus appropriately on the advanced topics of this course. By successfully completing the prerequisites listed above, we are confident that the student has the sufficient background.

## **OBJECTIVES**

The following is a list of the high-level objectives of this course:

- Understand and apply HI/PD/DM design framework
- Foundational knowledge of client/server applications with specific applications to the Web
- Identify and utilize alternative file structures including sequential and indexed files, and database tables
- Design and implement advanced GUI interface components
- Understand the alternatives of designing with composition versus inheritance

The HI/PD/DM framework refers to the separation of the human interface (HI), problem domain (PD), and the data manager (DM) classes as described by Coad, et al. (1997).

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