Course Title: ITAP 3382: Business Intelligence

Semester Credit Hours: 3 (3,0)

I. Course Overview

The objective of this course is to give students an understanding of key issues involved in business intelligence applications in organizations. The course is designed so as to cover topics that are relevant from a business intelligence perspective. It is oriented toward the provision of online access to aggregate data analysis results to a variety of physically distributed organizational users. It includes a mix of lectures (some of which are conducted in the laboratory) and discussions on contemporary articles from industry publications.

II. PMU Competencies and Learning Outcomes

This course helps students develop the ability to become conversant on business intelligence topics and understand the related terms and issues that are important for business intelligence professionals around the world. Additionally, the course provides the students with the communication, leadership and teamwork skills necessary to effectively work as professionals in teams, or in charge of teams, responsible for business intelligence projects and applications. Finally, the course goes beyond looking at business intelligence as a "toy" tool, by imparting on the students an understanding of business intelligence as a key competitiveness-enhancing tool for organizations, both large and small.

III. Detailed Course Description

The course begins with a discussion of ethical issues, legal issues, and aspects conducive to effective teamwork, in the context of business intelligence applications and projects. It then proceeds with an introductory discussion of business intelligence applications in organizations. This covers several fundamental topics such as qualitative vs. quantitative data analysis, data warehousing for business intelligence applications, analytical data processing, and data mining. Next the course covers key concepts and methods. These include graphical and statistical analyses, time series analyses, cluster analysis, exploratory factor analysis, simple and multiple regression analyses, exploratory structural equation modeling, and multidimensional scaling. The course concludes with a discussion of advanced issues in connection with business intelligence applications, particularly Web-based applications. The emphasis in this course is more on data collection and analysis issues than on database design or programming issues, whose coverage here is minimal.

IV. Requirements Fulfilled

This course is required for all students majoring in Information Technology in the College of Information Technology.

V. Required Prerequisites

- GEIT 1411: Computer Science I
- GEIT 1412: Computer Science II
- GEIT 1311: Computer Organization I
- GEIT 3341: Database Design.

VI. Learning Outcomes

In this course, students learn:

- To become conversant with business intelligence topics and understand the related terms and issues relevant to business intelligence professionals around the world.
- To acquire the communication, leadership and teamwork skills necessary for effectively work as professionals in teams, or in charge of teams, responsible for business intelligence applications and projects.
- To understand the role of business intelligence as a key competitiveness-enhancing tool for organizations, both large and small.

VII. Assessment Strategy

Students are assessed based on: their performance in two exams (midterm and final); their class participation, which includes the discussion of recent articles taken from online industry publications; and the quality of a final team project and related oral presentation. The relative weights of each of these items on the final grade are as follows:

- The midterm and final exams each account for 25% of the grade. Combined, they account for 50% of the grade.
- Class participation accounts for 10% of the grade, and is evaluated based on the ability of students to add to the material already provided by the instructor to them.
- The final team project accounts for 40% of the grade. It is evaluated based on a project document, oral presentation, and client perceptions of the team project. The project must be conducted in collaboration with a client organization (for example, a department at a large company or non-profit organization). A letter from the main contact person at the client organization, discussing and evaluating the project and its outcomes, must be provided to the instructor. The letter should contain the contact information of the person writing so the instructor can call him/her up and inquire about the project.

The exams encourage the students to review all of the concepts and methods discussed in class, which are primarily based on textbook material. This is complemented by the class discussions on recent articles taken from online industry publications, which allow the students to become conversant with the industry-specific lingo related to business intelligence issues. The final project provides an experience in which concepts, methods, and industry-relevant issues are all brought together in a very applied manner to solve a real problem faced by a real organization. While this project is not as extensive as a program capstone project, it gives the students the necessary exposure to industry-relevant issues to prepare them for the future challenge of conducting a final program capstone project, and subsequently pursuing a successful career as IT professionals.

VIII. Course Format

Four of the course's class meetings are used for laboratory demonstrations and activities geared at helping the students learn the several steps involved in using business intelligence methods and techniques in the context of a business process redesign project; from data gathering to analysis and decisions regarding business process redesign. The other class meetings are split into two main components: lectures, and class discussions. The lectures cover topics outlined in this syllabus. The class discussions are based on recent articles taken from online industry publications such as the *Intelligent Enterprise* and *CTO* magazines, which are freely available from the Web. The instructor provides the links to the articles, which are then downloaded by the students and read prior to class. In class, the students discuss the articles in small teams for about 20 minutes, developing three provocative questions per team. This is followed by a discussion involving the whole class, where each team asks one of the questions they developed, and other teams answer them, until all teams asked at least one of their questions. This discussion format is likely to lead to lively debate on topics that are directly addressed by the article, as well as on topics that are indirectly related to the article.

Classroom Hours (3 hours per week) **Class/lab: 3**

IX. Topics to be Covered

A. Ethical issues, legal issues, and effective teamwork
   1. Ethical and legal issues in business intelligence (BI)
   2. Typical BI team composition
   3. Conflict resolution in BI teams
   4. Effective teamwork in BI teams

B. Business intelligence for the enterprise
   1. Identifying data for BI applications
   2. Qualitative vs. quantitative data analysis
   3. Data warehousing for BI applications
   4. Analytical data processing
   5. Data mining

C. Concepts and methods
   1. Graphical and statistical analyses
   2. OLAP cubes
   3. Time series analyses
   4. Cluster analysis
   5. Exploratory factor analysis
   6. Simple and multiple regression analyses
   7. Exploratory structural equation modeling
   8. Multidimensional scaling

D. Advanced issues
   1. Using the Web for BI applications
   2. Key institutional Web-based data sources and uses in BI applications
   3. Conducting Web-based comparative analyses
   4. Mining Web logs
   5. E-commerce applications of BI techniques

X. Laboratory Exercises

This course has four laboratory sessions, which are scheduled using time from standard class meetings. In the laboratory sessions, students learn the several steps involved in using business intelligence methods and techniques in the context of a business process redesign project; from data gathering to analysis and decisions regarding business process redesign. A business intelligence software suite (for example, SPSS) is used by students to compile and analyze data provided by the instructor in connection with a key business process of a fictitious organization.

XI. Technology Component

A. In class, the instructor makes use of state-of-the art multimedia projection equipment and software. These are used to project slides and Web-based content, as well as play freely available Web-based video clips from Web sites covering topics relevant to the class (for example, CNN.com Technology).

B. Outside class, the instructor uses Web-based course management software to interact with students, provide feedback on their performance, make available links to online articles, as well as receive documents (for example, draft versions of project reports) and provide feedback on them.

C. Outside class, in the laboratory setting, the instructor makes use of industry-strength commercial business intelligence software to illustrate, in a simulated way, the application of key techniques to the improvement of business processes in real organizations.

XII. Special Projects/Activities

The team project consists of meeting with members of a client organization (for example, a department at a large company or non-profit organization), gathering relevant information from them, and developing a document containing the following elements:

- A set of organizational problems that could potentially be solved through a business intelligence project. For example, a team may study an online retailer, and find out that a data-mining project could solve key problems facing the organization – for example, the clustering of online customers may lead to significant savings in connection with advertising.
- A detailed description of a business intelligence solution to the problems above.
- A detailed description of the costs and potential benefits, from an organizational perspective, associated with the business intelligence solution.

XIII. Textbooks and Teaching Aids

A. Required Textbook

Elizabeth Vitt, Michael Luckevich and Stacia Misner; *Business Intelligence*; 1 edition (April 17, 2002); Microsoft Press
ISBN: 0735616272.

B. Alternative Textbooks

Marija J. Norusis; *SPSS 11.0 Guide to Data Analysis* Book and CD-ROM edition (April 10, 2002); Prentice Hall
ISBN: 0130348309.

C. Supplemental Print Materials

SPSS, Inc.; *SPSS 11.0 for Windows* (Student Version), Book and CD-ROM edition (November 26, 2001); Prentice Hall
ISBN: 0130348465.

D. Supplemental Online Materials

Recent articles taken from online industry publications such as the Intelligent Enterprise and CTO magazines. The instructor provides the links to the articles, which are freely available from the Web.