

Course Syllabus

Accounting and Management Information Systems 4650 – Decision Support Systems

Spring 2016

Class Meetings

Tuesdays, 5:30 – 8:15 p.m.

Location

215 Schoenbaum Hall (SB)

Instructor

Professor Chris Debo

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Description/Rationale

This course is an approved elective for the undergraduate Accounting and Management Information Systems curriculum. It is a fifteen-week comprehensive course designed to give students a strong foundational understanding of the concepts and design of business intelligence and decision support systems.

Data forms the core of 21st century decision making for all organizations. Effective business leadership relies heavily on relevant, timely, accurate and actionable information. As such, information technology departments are beholden to store, manage, and provide information-rich data and reporting to business leaders. The key to IT success in this area is twofold: 1) consolidating, processing and storing data in a manner that permits rapid access and transformation when needed, and 2) providing information to decision-makers in a format that is easy to understand yet complex enough to inform. At the crux of the problem is that many business leaders and analysts are not “data savvy”; simply giving them data does not always result in good decisions. Therefore, IT departments must also take the time to understand their organization’s data and present it in a meaningful way. This forms the core of the business intelligence concept and, as such, it is incumbent upon the information technology professional to have a strong foundation in business intelligence.

Course Objectives

The objectives for this course are centered on data usage for decision-making within a business environment. As such, students are expected to be able to develop both the technical and soft skills necessary to build a business intelligence function. IT personnel that specialize in BI must be able to liaise with both business and technology leadership and demonstrate effective communication and presentation skills. Therefore, the content of this course will be divided evenly between business intelligence concepts, problem-solving skills, technical ability, and communication skills.

By the conclusion of this course, participants will:

- Have a strong understanding of data warehousing and business intelligence concepts, and understand the differences therein;
- Be familiar with the universe of technologies used to support data warehousing and BI within organizations, and the specific strengths and weaknesses of select software;
- Know the differences between various data structures, including big data;
- Have gained hands-on experience building databases, ETL packages, and business intelligence software;
- Have learned data analysis skills using Excel and SQL that will be useful in a data warehouse setting;
- Know the different stages of the data warehouse lifecycle and the purpose of each;
- Know the different stages of data flow in a data warehouse environment;
- Understand the star schema, including purpose and design;
- Know how to build and deploy an data warehouse and business intelligence package;
- Familiarize themselves with OLAP, data cubes, and aggregates;
- Understand the purpose of metadata and the importance of good documentation in a healthy data governance structure; and
- Enhance their written and oral presentation skills.

Topical Outline & Schedule

This course has been organized to emulate the standard development lifecycle of a business intelligence system. At a high level, the topics to be discussed are as follows:

- Introduction to business intelligence, data structures, data analysis and quality (weeks 1-2)
- Extract-transform-load software/methods, data staging and loading, and operational data stores (weeks 3-5)
- OLAP, cubes, and aggregates (week 6)
- Data warehouse concepts, dimensional modeling and star schema design (weeks 7-9)
- Data warehouse lab due (Spring break week)
- Business intelligence, reporting and dashboarding (weeks 10-14)
- Final lab presentations (week 15)
- Final exam (May 3)

Course Format

Given that this class only meets one each week, a significant amount of content will be covered in each class, and students will also be expected to spend a significant amount of time outside of class further exploring and learning the concepts discussed and performing technical tasks to demonstrate mastery of those concepts. Although the structure of each specific class will vary, all will generally follow this standard layout:

5:30 – 6:00	Announcements, assignment collection, quizzes, student presentations, technical review and Q&A
6:00 – 7:30	Lecture
7:30 – 8:00	Technology demonstration and review
8:00 – 8:15	Review assignments for next class

Carmen

We will be using Carmen extensively in this course. On the site you will find the course slides, reading list, technical data and assignments outlined for each week. You will also find resources based on each day's discussion, links to class activities, instructions for all assignments, and discussion forums. We will be using the drop-box function for all assignments and the quiz functionality for all quizzes. I will post grades, along with applicable feedback, in Carmen. If additional feedback or explanation is desired, please set aside time to meet with me before or after class.

Reading Material

There is no textbook to purchase for this course. The primary content will be provided via slide decks that will be used for each session. Readings will also be assigned from publicly available material that will either be published to the course portal on Carmen or will be distributed in class. To ensure that emphasis is being placed on the applicable course material at the time, readings and assignments will be distributed on a weekly basis. You are expected to come to each class having read all items assigned for that day. Class activities and discussion will rely heavily on your reading and understanding of the items due for that day.

Course Requirements and Evaluation

BI concepts are difficult to grasp and as such my expectations of student effort are high; therefore attendance at each class is mandatory (especially given that we only meet once a week). Students unable to attend must inform the instructor prior to class and have a valid excuse.

Quizzes

There will be ten quizzes given during the course of the semester; these will be administered via Carmen during class and will be based on the prior week's reading material and lecture. The specific days that quizzes will be given will be verbally disclosed during class, along with the expected quiz content, in the week preceding the quiz. Quizzes will consist of 5 randomized questions (no students will have the same quiz). Quizzes will comprise 10% of the student's final grade.

Data Analysis Assignments

Students will also be given four data problem-solving assignments during the semester. These assignments will require students to manipulate data in various formats using tools such as Excel and SQL. The datasets to be used by each student will vary (no students will have the same data set) and it is expected that students work independently and develop their own solution. Students are required to submit their solution via Carmen no later than 11:59pm on the Monday evening preceding the next class. Late submissions will not be accepted. Written assignments will be graded based on the viability of the approach, the organization of the final solution, and comprehensiveness of associated documentation. In addition, at the beginning of each class following an assigned data problem, 1-2 students will be randomly selected from the class to discuss their solution and how they arrived at their result. Students should be prepared to display their solution on the presentation screen in front of the class. Data assignments will comprise 10% of the student's final grade.

Written Assignments

Written communication is an essential skill for business intelligence professionals. Students are therefore expected to learn and demonstrate their ability to effectively communicate concepts and present descriptions of data in a clear and concise fashion. There will be four written assignments throughout the semester, requiring students to either explain their position on a topic or to provide technical documentation for a solution they've developed. Assignments will be graded based on the soundness of the student's position and approach, grammar, organization, and thoroughness. Students are required to submit their written assignments via Carmen no later than 11:59pm on the Monday evening preceding the next class. Late submissions will not be accepted. Plagiarism will be closely monitored; students are expected to develop their own thoughts on each assigned topic. Written assignments will comprise 10% of the student's final grade.

In-Class Presentations

At the conclusion of each class, two students will be randomly chosen to each make a short, 3-5 minute presentation to the class the following week. The topic to be discussed will be chosen by me and will require each student to investigate a potential scenario or technology, develop an opinion on the topic, and support their stance. Students are expected to put together a couple of visual slides and submit those to me for review prior to the start of class. Each student will make two presentations during the course of the semester. Presentations

will be evaluated based on the quality of the slide deck, thoroughness of research, and the overall presentation ability of the student. In-class presentations will account for 10% of the student's final grade.

Data Warehouse Lab

Students will be required to build a data warehouse prototype using a source data set provided by me. No student will have the same data set and students should work independently to build their system. The system must, at a minimum, comprise the following:

- Three separate but related data sources (e.g. a sales data source, a customer data source, and a product data source);
- A SQL Server database with staging tables to load the source data into;
- A SQL Server Integration Services (SSIS) package to load the source data into the staging environment;
- A SQL Server data warehouse star schema that is optimized for reporting and based on the original source data;
- A SSIS package to transform the staging table data and load it into the star schema; and
- A compiled SSIS package that can be deployed and executed by Windows Scheduler.

This assignment should be completed by each student by the Sunday prior to spring break; however, assignments can be submitted as late as 11:59 on the Monday before classes resume. The specific submission requirements will be detailed during class in the first half of the semester. Students may also be required to schedule time with me to demonstrate that their software operates as intended and to demonstrate ownership of the solution. This lab will comprise 20% of the student's final grade.

Final Lab and Presentation

Students will be required to build a business intelligence reporting presentation that demonstrates their ability to present information in a way that provides insight to business users. The students will have their choice of using reporting software, although Tableau will be recommended as this will be what is covered during class. Students will use two separate, unrelated data sets and create two separate dashboards:

- Data from the star schema created in the data warehouse lab
- Data chosen by the student from publicly available data sources that are of interest to the student

For each, the students must import the data into the reporting engine and build at least three data visualizations. Each student will then make a 3-5 minute presentation as-if they were explaining the data to a business decision maker. The final lab will be graded based on functionality, originality, output quality, accuracy, and the overall presentation quality. The final lab will comprise 20% of the student's final grade.

Final Exam

A final exam will be administered on May 3 and will consist of 40 multiple choice questions. The exam will consist of material covered during course lectures and reading assignments. The final exam will comprise 20% of the student's final grade.

Technical Requirements

This course will utilize several software tools, many of which are not available in the Fisher or Ohio State computer labs. As such, each student **MUST** have their own laptop, running a Windows operating system. If a student has a Mac workstation they can obtain Parallels from the University OCIO to run Windows applications. There may be a nominal cost associated with this, but it is mandatory to complete the requirements of this course. If you are unsure as to whether you can run a Windows workstation, please inform me immediately. If you do not have a laptop, one can be provided by the Fisher College of Business.

Your laptop and version of Windows must be capable of running the following software, which is also required for the course:

- Adobe Reader (free from Adobe)
- Microsoft Excel (can be obtained from OCIO at a nominal cost)
- Microsoft Word (can be obtained from OCIO at a nominal cost)
- Microsoft Powerpoint (can be obtained from OCIO at a nominal cost)
- Microsoft Visio (can be obtained free via DreamSpark)
- Microsoft Project (can be obtained free via DreamSpark)
- Microsoft SQL Server (can be obtained free via DreamSpark)
- Microsoft Visual Studio Enterprise (can be obtained free via DreamSpark)
- Microsoft SQL Server Data Tools (free from Microsoft at <https://www.microsoft.com/en-us/download/details.aspx?id=42313>)
- Tableau (can be downloaded for free as a student from Tableau's web site at <http://www.tableau.com/products/desktop/download?os=windows>)

DreamSpark is a Microsoft Program that provides student and faculty access to Microsoft software and no cost. Details will be provided during the first class, but students are welcome to attempt to download and install the software prior to the start of the semester.

Many of these programs have minimum hardware and operating system requirements. Each student is required to evaluate their laptop to determine if they can run the required software; inability to complete lab assignments due to malfunctioning software or hardware will not serve as a valid excuse for not completing assignments.

Backups

Students are required to back up their data. Data can be backed up to whatever location the student prefers (cloud, disk, another laptop, etc.), but failure to complete assignments and

labs due to malfunctioning software or hardware, or because of data loss, is unacceptable and makeups will not be accepted.

Technical Knowledge

Although not a required prerequisite for this course, it is highly recommended that students have taken CSE 3241 (Introduction to Database Systems) prior to enrolling in the course. Students are expected to have a working knowledge of databases, structures, and SQL. If you did not take CSE 3241 and do not feel comfortable with the content of the course, please let me know as soon as possible so that alternative arrangements can be explored.

Student/Instructor Code of Conduct

As a student in this course, you are an integral part of the learning community we will create. To support this community, we each have a responsibility to contribute to it in a positive and productive way. I expect the following conduct from each student:

1. There are NO GROUP ASSIGNMENTS in this course. All students are expected to perform their own work.
2. All cell-phones must be turned OFF during class (not on vibrate). Any phones going off during class will be confiscated and returned at the end of class, and points will be deducted from the student's grade for each disturbance. Any students caught using their phone during class will receive the same disciplinary action.
3. Your wireless network card must be disabled during class. There will be no need to access the internet unless otherwise instructed (e.g. during quizzes).
4. Attend class and submit assignments on-time. If you must miss a meeting, you are expected to let me know in advance. There will be no make-up quizzes and late homework will not be accepted unless the student can provide documented evidence of events that prohibited them from attending class.
5. Prepare for each meeting. Readings and activities assigned to class sessions will help you reflect on the issues and articulate your ideas. The materials are meant to help you prepare for the class.
6. Take time to learn outside of class. Many of the concepts discussed are highly technical in nature and as such, will require a significant investment of time and effort to master them. As with a real-world business setting, not all answers to technical problems will be given in class. It is up to each student to hold themselves accountable and apply their knowledge to solve the problems placed before them.
7. Participate in class discussions and activities. This course will include discussion within an collaborative learning environment. Although there will not be group work, you will participate in several hands-on activities, including making short presentations.
8. Respect each other. Communities thrive when each member respects all others, demonstrated not just in what we say, but also in listening intently, sharing ideas, and supporting each other when challenges arise.

As the instructor, I promise you that I will work hard to maintain a supportive environment, be available both in person and electronically when needed, take into account each student's individual needs, use a variety of teaching techniques, keep the material for this class organized, accessible, and meaningful. I do take feedback very seriously; if you feel that the course can be improved in any way, or if you are struggling to meet the demands of the course, please let me know immediately.

Statement of Student Rights

This syllabus and course materials are available in alternative media on request. The Ohio State University encourages qualified persons with disabilities to participate in its programs and activities. If you anticipate needing any type of accommodation for this course or have questions about the physical access provided, please contact me privately to discuss your specific needs as early in the semester as possible to receive effective and timely accommodations. Please also contact the Office for Disability services at 292-3307, 150 Pomerene Hall, to coordinate reasonable accommodations and to document disabilities.

Statement of Academic Integrity

You are expected, at all times, to act with academic integrity.

At its core, academic integrity requires honesty. This involves giving credit where it is due and acknowledging the contributions of others to one's own intellectual efforts. It also includes assuring that one's own work has been completed in accordance with the standards of one's course or discipline. Without academic integrity, neither the genuine innovations of the individual nor the progress of a given field of study can adequately be assessed, and the very foundation of scholarship itself is undermined. Academic integrity, for all these reasons, is an essential link in the process of intellectual advancement.

The values that underpin the concept of academic integrity go beyond simply not cheating or plagiarizing. Embracing these values means that you are responsible for your own learning; you have an obligation to be honest — with yourself and others; and you have the responsibility to treat other students and your professors with respect and fairness. Per University Rule 3335-31-02, "Each instructor shall report to the committee on academic misconduct all instances of what he or she believes may be academic misconduct." Ignorance of the University's Code of Student Conduct is never considered an "excuse" for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Taking Care of Yourself

A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other and alcohol use among the top ten health impediments to academic performance. Students experiencing personal problems or situational crises during the quarter are encouraged to contact the **OSU Counseling and**

Consultation Services (614-292-5766) for assistance, support, and advocacy. This service is free and confidential