MIST 7770

**Business Intelligence and Analytics**

# Fall Semester 2019

**Instructors:** Dr. Hugh Watson

**Office:** Benson Hall C429

**Office Hours:** MW 9:30-10:30 and by appointment

**Phone:** 706-338-2126

**E-mail:** hwatson@uga.edu

**COURSE DESCRIPTION**

 This course focuses on business intelligence and analytics (BI/A), which is a broad category of technologies, applications, and processes for gathering, storing, accessing, and analyzing data to help users make better decisions and improve organizational performance.

 It explores BI/A at both micro and macro levels. At the micro level, the development of individual applications is covered. Special attention is given to getting BI/A projects approved, with coverage of ROI for BI/A. At the macro level, implementing BI/A enterprise-wide is explored, including software selection and BI/A maturity models.

 Decision Support Systems (DSS) were the first BI/A applications. They provide information to support a particular decision-making task. A development framework, methodology, and implementation issues for DSS is provided, along with specific company (e.g., Southwire) examples.

Executive Information Systems (EIS) supply an organization’s executives and other organizational personnel with the information needed to perform their jobs. Experiences at organizations such as the Lockheed-Georgia and the World Bank are used to illustrate development concepts, frameworks, and methodologies that apply not only to EIS but to all enterprise-wide applications.

Analytical portals use the latest technologies to supply much of the same kinds of information that were associated with EIS. The system developed at Mozilla provides a good example of an analytics portal, including how technology and governance can be combined to provide trusted information.

The course also covers Business Performance Management (BPM) and the use of dashboards and scorecards. The performance dashboards at 1-800 CONTACTS are covered to illustrate the development of effective performance metrics and linking them to employee incentive plans.

Critical to the success of decision support is a specially prepared repository of data. The reference architectures for decision support data management are given, with coverage of data sources, data integration, data lakes, data warehouses and marts, non SQL databases, data access and analysis tools, and users. Experiences at companies like Harrah’s Entertainment are given.

An important decision support development is the movement to real-time; that is, updated data and analytics almost as soon as events occur. The concepts are discussed and illustrated using Continental Airlines as an example.

Big Data (i.e., high volume, variety, and velocity) is increasing important to organizations. The technologies for storing and analyzing big data are covered, as well as potential applications. The need to provide data pipelines is discussed, along with DataOps and AnalyticsOps.

Predictive modeling is increasingly important to organizations. Concepts and hands-on experience with data source selection, data preparation, model building and testing, and model implementation are covered.

Expert Systems (ES), which capture human decision-making expertise in a computer application, are also covered and illustrated. The processing of bank overdrafts is used as an example.

The emerging artificial intelligence (AI) area called cognitive computing is discussed, including applications such as chatbots and facial recognition systems. The importance of algorithmic transparency and accountability is covered.

Prescriptive analytics techniques such as simulation and linear programming are increasingly used to optimize operations and decision making. These techniques are studied through hands-on applications.

Hands-on experience is provided through software projects that use several leading-edge technologies, including Tableau and Dataiku.

Outside speakers are used to better understand current practices and trends.

###### COURSE LEARNING OBJECTIVES

* To become familiar with BI/A concepts and frameworks
* To learn about descriptive, predictive, discovery, and prescriptive analytics
* To learn how to develop BI/A applications
* To learn how to implement BI/A enterprise-wide
* To learn how to create a BI/A data and software infrastructure
* To learn how to select and use a variety of BI/A software products
* To learn the business uses and value of BI/A
* To learn about big data and analytics
* To learn about career opportunities in BI/A
* To learn the future trends and directions for BI/A

###### COURSE LEARNING MATERIALS

###### *TEXTBOOK*

 There is no textbook for this course.

### *TERADATA STUDENT NETWORK*

The class will use resources on the Teradata Student Network. Its URL is <http://www.teradatastudentnetwork.com>. The password to access materials is: analytics (not case sensitive).

##### eLEARNING COMMONS

eLearning Commons is the learning platform for the course. Its functionality includes the ability to post materials, make announcements, and communicate with class members. Most reading materials and all PowerPoint slides used in the course are posted on eLearning Commons. Its URL is [www.elc.uga.edu](http://www.elc.uga.edu).

### LAPTOP POLICY

Laptops, tablets, and smartphones are a tempting distraction. Consequently, all electronic devices are to be turned off during class, unless told differently by the instructor.

### COURSE GRADING

 Student performance will be evaluated on the following basis:

 Class attendance, participation, and assignments 20%

 Software projects 20%

 Quizzes 10%

 Midterm exam 25%

 Final exam 25%

 100%

###### *CLASS ATTENDANCE, PARTICIPATION, AND ASSIGNMENTS*

Students are expected to attend all class sessions unless excused. The Terry College of Business (and your instructor) works hard to help students find jobs but our primary responsibility is to ensure that you get a great education. As a result, do not schedule on-campus interviews that conflict with this class. Off campus interviews should be discussed with your instructor. Students who frequently miss class can expect to drop a letter grade, independent of the quality of other work. “A” students must attend (nearly) all classes, complete all assignments, and actively provide thoughtful and relevant comments to class discussions.

***SOFTWARE PROJECTS***

The course requires the completion of software projects using products such as Tableau and Dataiku. Unless told otherwise, all projects are completed individually. Projects take more time than assignments and are weighted accordingly in determining final grades.

***QUIZZES***

Graduate programs are very demanding and it is easy to only focus on what is due tomorrow. As a result it is easy to fall behind in course readings. To motivate students to keep up, quizzes will be given every couple of weeks. There will be no make-up quizzes unless permission is given in advance but the lowest quiz grade will be dropped.

***EXAMS***

The midterm exam will be conducted during the regular class period. The final exam will be given during the scheduled final exam schedule. All exams contain both objective (e.g., T/F, multiple choice) and essay questions. The final exam is non-cumulative and covers only material from the midterm exam on.

**WITHDRAWING FROM THE COURSE**

 The last day for withdrawing from the course with a grade of WP is October 21.

###### UNIVERSITY HONOR CODE AND ACADEMIC HONESTY POLICY

As a University of Georgia student, you have agreed to abide by the University’s academic honesty policy, “A Culture of Honesty,” and the Student Honor Code. All academic work must meet the standards described in “A Culture of Honesty” found at: [www.uga.edu/honesty](http://www.uga.edu/honesty). Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

**CAVEAT**

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

**CLASS ACVIVITIES AND ASSIGNMENTS**

|  |  |
| --- | --- |
| **Date** | **Activity/Assignment**  |
| August 14 | * Introduction to the course
* “Why Future Jobs Will Require Data Analytics Skills,” *Knowledge@Wharton*, July 2019, <https://knowledge.wharton.upenn.edu/article/evolution-of-chief-data-officer/?utm_source=kw_newsletter&utm_medium=email&utm_campaign=2019-07-25>
 |
| August 19 | * Watson, “All about Analytics,” *International Journal of Business Intelligence Research*, (January-March 2013). (Available on eLC)
* “Bryan’s Amazing Animals” in-class exercise (No preparation required before class)
 |
| August 21 | * Watson, "An Introduction to Decision Support Systems," 2018. (Available on eLC)
* Architecture and Methodology. (No preparation required before class)
* Online analytical processing (OLAP). (No preparation required before class)
* Optional: Attend the MIS Welcome Back Social, on the lawn between Correll Hall and the Special Collections Building, 5-7:00 (must have registered in advance)
 |
| August 26 | * Houdeshel, and Watson, "The Management Information and Decision Support (MIDS) System at Lockheed-Georgia," *MIS Quarterly,* 1987. (Available on eLC)
* “The Management and Decision Support System (MIDS) at Georgia Lockheed” assignment due
* Quiz #1
 |
| August 28 | * Watson, Houdeshel, and Rainer, “The Birth of an EIS at the World Bank,” *Building Executive Information Systems and Other Decision Support Applications,* 1998. (Available on eLC)
* Count Things project due
 |
| September 2 | * No class; Labor Day
 |
| September 4 | * Watson, “What Happened to Executive Information Systems,” *Business Intelligence Journal,* September 2011, (Available on eLC)
* Watson, Crince, and Tonen, “The Analytics Portal at Mozilla,” *Business Intelligence Journal*,” December 2017. (Available on eLC)
* Is the Analytics Portal at Mozilla an EIS? assignment due
 |
| September 9 | * Hardin, “Which Chart or Graph is Best for You?” Tableau. (Available on eLC).
* Introduction to the Tableau software. (Available on eLC, download the Tableau software before class.)
 |
| September 11 | * Few, “Dashboard Design: Beyond Meters, Gauges, and Traffic Lights,” *Business Intelligence Journal*, Winter 2005. (Available on eLC)
* Barth and Peters, “Dashboard Design: Why Design Is Important,” *DMReview*, October 2004. (Available on eLC)
* Quiz #2
 |
| September 16 | * 1-800 CONTACTS assignment due
* Complete “Introduction to Tableau Software” videos
* Tableau Quick Warm-up Assignment due
 |
| September 18 | * Guest Speakers: Eric Gramlich and Eddie Sloan, Delta Airlines
* Watson and Jackson, “Piedmont Healthcare: Using Dashboards to Deliver Information,” *Business Intelligence Journal*, September 2016. (Available on eLC)
 |
| September 23 | * Watson, “Addressing the Top Concerns of BI and Analytics Managers,” *Business Intelligence Journal*, June 2019. (Available on eLC)
* Genericorp assignment due
 |
| September 25 | * Howson, “Selecting the Best BI Tool,” *BIScorecard*, 2007. (Available on eLC)
* Quiz #3
 |
| September 30 | * Watson, “Understanding BI Users’ Value Proposition,” *Business Intelligence Journal*, June 2007. (Available on eLC)
* Conducting User Interviews assignment due
* Using Tableau for Problem Solving project due
 |
| October 2 | * Review for Midterm Exam
 |
| October 7 | * Midterm Exam
 |
| October 9 | * Watson, “Recent Developments in Data Warehousing,” *Communications of AIS*, 2001. (Available on eLC)
 |
| October 14 | * Watson, "Tutorial: Big Data Analytics: Concepts, Technologies, and Applications," *Communications of AIS*, May 2014. (Available at <https://aisel.aisnet.org/cais/vol34/iss1/65/>)
 |
| October 16 | * Watson, "Update: Tutorial: Big Data Analytics: Concepts, Technologies, and Applications," *Communications of AIS*, January 2019. Available at <https://aisel.aisnet.org/cais/vol44/iss1/21/>)
* Using Tableau for Creating Interactive Dashboards project due
 |
| October 21 | * Zaima and Kashner, “A Data Mining Primer for the Data Warehousing Professional,” *Business Intelligence Journal*, Spring 2003. (Available on eLC)
* Introduction to Dataiku software
* Quiz #4
 |
| October 23 | * Online class: “Real Time Data Warehousing,” A presentation made at Oklahoma State University (Available as a video on the Teradata University Network) (No face-to-face class)
* Watch Dataiku videos
 |
| October 28 | * Guest Speaker: Matt McGivern, Protiviti
* Watson, and McGivern, “Getting Started with Business-Driven Data Governance,” *Business Intelligence Journal,* March 2016. (Available on eLC)
 |
| October 30 | * Watson, “ROI: Getting Projects Approved,” *Business Intelligence* Journal, 2015. (Available on eLC)
* Watson, et al, ““BI Project Success Is in the Eye of the Beholder,” *Business Intelligence Journal*, January, 2017. (Available on eLC)
 |
| November 4 | * Belcher and Watson, "Assessing the Value of Conoco's EIS," *MIS Quarterly*, September 1993. (Available on eLC)
* Making the Financial Case for Deploying a Credit Card Chatbot assignment due
* Dataiku software project due
 |
| November 6 | * Introduction to Monte Carlo Simulation. (Available on eLC)
* Quiz #5
 |
| November 11 | * Introduction to linear programming (No preparation required before class)
* Monte Carlo simulation assignment due
 |
| November 13 | * Introduction to AI and Expert Systems (No preparation required before class)
* Liner programming assignment due
 |
| November 18 | * Watson, “Preparing for the Cognitive Generation of Decision Support,” *MISQ Executive*, 2017. (Available on eLC)
* Expert systems assignment due
* Quiz #6
 |
| November 20 | * AI-infused BI (No preparation required before class)
* Watson and Nations, “Addressing the Growing Need for Algorithmic Transparency: What Are You Doing with My Personal Data?” *Communications of AIS*, (forthcoming). (Available on eLC)
 |
| November 25 | * Burkhardt, Hohn, and Wigley, “Leading Your Organization to Responsible AI,” *McKinsey Analytics*, 2019. (Available on eLC)
 |
| November 27 | * No class; Thanksgiving break
 |
| December 2 | * “Robotic Process Automation (RPA),” at <https://www.youtube.com/watch?v=loOR-nz9DGY>
* TED Talk, Anthony Goldbloom, “The jobs we'll lose to machines - and the ones we won't” at <https://www.ted.com/talks/anthony_goldbloom_the_jobs_we_ll_lose_to_machines_and_the_ones_we_won_t>
* TED Talk, Zeynep Tafekci, “We're Building a Dystopia Just to Make People Click on Ads” at [www.ted.com/talks/zeynep\_tufekci\_we\_re\_building\_a\_dystopia\_just\_to\_make\_people\_click\_on\_ads#t-15885](http://www.ted.com/talks/zeynep_tufekci_we_re_building_a_dystopia_just_to_make_people_click_on_ads#t-15885)
* TED Talk, Ken Jennings, “Watson, Jeopardy, and Me the Obsolete Know-It-All,” at [www.ted.com/talks/ken\_jennings\_watson\_jeopardy\_and\_me\_the\_obsolete\_know\_it\_all](http://www.ted.com/talks/ken_jennings_watson_jeopardy_and_me_the_obsolete_know_it_all)
 |
| December 4 | * Watson, “BI Director: How to Become One, Succeed, and Know When to Leave,” *Business Intelligence Journal*, Vol. 20, No. 4, 2015. (Available on eLC)
* Review for Final Exam
* Course wrap up
* Quiz #7
 |
| December 9 | * Final Exam
 |