SU3xx: Practical Analytics

Units: 4

Spring semester 20xx, Monday and Wednesday, 10-12 pm

Location

SU Hall 100

Instructor

Name: Nina Kane
Office: SU Hall 200
Office Hours: 4 hours per week. Schedule varies by semester
Contact Info: ninakane@su.edu, (xxx) 555-5555

Teaching Assistant

Name: TBD
Office Hours: TBD
Contact Info: TBD

IT Help

IT help will be provided by central IT services
Hours of Service: 8am – 5pm M-F
Contact Info: (xxx) 555-4444, ithelp@su.edu

Course Description

Overview of the process of data analysis. Data analytics have moved out of the academic world of statisticians to the practical world of technology. A variety of user friendly technologies bring powerful analytical capabilities to end users. Three major areas that comprise analytics are reporting, visualization and prediction. This course uses the latest in technology to show the practice of data analytics in the real world. You will experience practical applications of analytics through guided exercises and case studies.

Learning Objectives

Data analytics has become a highly sought after skill in business, engineering, economics, government, services, science, health care and other domains. This course will explore the technology and practice of data analytics.

After completing the course, students will be able to
- Analyze data to generate information and knowledge that lead to informed decisions for businesses
- Author enterprise dashboards that are used to summarize and visualize data in a way that supports insight into trends and "what-if" analysis in real time.
- Show how business intelligence can be derived from data warehouses

- Create standard reports for business users
- Derive insightful trends using data mining techniques
- Apply the latest in analytics technology in real world case studies in the areas of business, entertainment, climate change etc.

Prerequisites

- Basic computer literacy
- An introductory course in information technology covering information systems, internet, technology-enabled business, spreadsheets, databases, digital representation of data, basics of hardware and software, and business processes.
- Basic skills in Microsoft Excel – working with tables, formulae, sorting, filtering and charting
- Introductory course on statistics

Course Notes

All course materials will be made available through Blackboard. Blackboard discussion forums will be used for out-of-class discussions. Lectures are delivered face to face in classroom.

Technology Proficiency and Hardware/Software Required

Students can use their own computers or use lab computers. Most of the SAP software required for the class is **Windows** based**. Specifically, you will be using

- SAP GUI 7.40 for Windows
- SAP BW
- SAP Business Explorer Query Designer
- SAP BusinessObjects Analysis for Microsoft Office
- SAP BusinessObjects Design Studio
- SAP Predictive Analytics
- SAP Crystal Reports
- SAP Explorer
- SAP Lumira
- Microsoft Excel and Access
- Teradata

Required Reading

Textbook: Practical Analytics, 1st Edition 2015, *Nitin Kalé & Nancy Jones,* Epistemy Press (epistemypress.com) ISBN: 978-0-9856008-9-1. Available for purchase here - http://epistemypress.com/books/practical-analytics/

Description and Assessment of Assignments

Homework – Most homework is computer based. Homework should be turned in to Blackboard on time. Grading will be based on completeness, accuracy, and timeliness. Feedback will be provided through Blackboard.
Case Studies – require students to read, assess, compare, and evaluate a real business case. Then they have to use the tools they have learned in the class to argue their findings and recommendations in the form of a quantitative report.
Exams – are written, in-class tests. They are based on concepts and not on particular tools.

Grading Breakdown

The weight of graded material during the semester is listed below.
No extra credit assignments will be offered.

Homework	25%
Case Studies	15%
Midterm	30%
Final Exam	<u>30%</u>
Total	100%

Assignment Submission Policies

It is the responsibility of the student to make sure case studies and assignment are turned in on time. Make sure you follow the procedures outlined in each assignment or case study (Blackboard submissions).

Late assignment submissions will be subject to a late penalty of 25% per day. No assignments will be accepted later than four days from the due date.

Additional Policies

No make-up exams (except for documented medical or family emergencies) will be offered nor will there be any changes made to the Final Exam schedule, except as permitted by university rules. Lecture attendance is not mandatory however it is recommended that students not miss any lecture.

Practical Analytics
SU3xx (4 units)

Course Outline

Week 1– Course Introduction
- Course objectives and outcomes
- Making the case for analytics
- Data driven decision making
- Introduction to data analytics

Reading: *Chapter 1*
Assignment: None

Week 2 – Data provisioning
- Source systems
- Data collection and staging
- Data representation for structured and unstructured data

Reading: *Chapter 2*
Assignment: Explore various data sources – flat files, relational database, data warehouse, in-memory database, XML
Due Date: Week 3

Week 3 – Data modeling for data staging
- Transactional systems vs. informational systems
- Data warehouses
- Multidimensional modeling
- Star schema and snowflake schema
- Fact and dimension tables

Reading: *Chapter 3*
Assignment: Explore and understand the extended star schema for GBI in SAP BW.
Due Date: Week 4

Week 4 – Extraction, transformation and loading
- Extraction from source systems
- Data cleansing and transformation
- Loading data and automation

Reading: *Chapter 4*
Assignment: Explore the ETL process for GBI's data warehouse
Due Date: Week 5

Week 5 – Slicing and Dicing
- Basics of slicing and dicing
- Pivot tables
- Working with aggregation functions, hierarchies
- Exceptions and conditions
- Slicing and dicing multidimensional data (from cubes)

Reading: *Chapter 5*
Assignment: Answer business questions by slicing and dicing multidimensional data from a

data warehouse data source.
Due Date: Week 6

Week 6 - Reporting
- What are reports? Where are they used?
- Building reports from one or more data sources
- Formatting reports
- Creating summaries

Reading: *Chapter 6*
Assignment: Create a formatted report based on live financial data (from SAP ERP) using SAP Crystal reports. Use SAP Crystal Reports to connect to a data warehouse, then author a monthly report that show the accounts receivables from customers.
Due Date: Week 7

Week 7 – Data Visualization: Basic Charts
- Visualization as a powerful tool for analytics
- Types of charts
- How to choose the right chart for displaying data
- Multi variable data display

Reading: *Chapter 7*
Assignment: Use data visualizations to gain insights into team performance from the ERP Sim business simulation.
Due Date: Week 8

Week 8 – Dashboards:
- What are dashboards, cockpits, scorecards?
- How to author dashboards?
- Adding interactivity
- Deploying dashboards
- Mobile Apps for Analytics

Reading: *Chapter 8*
Assignment: Model and implement a dashboard for key performance indicators for a company. Build an analytics mobile app based on data from a data warehouse. Test it on your mobile device.
Due Date: Week 9

Week 9 – Advanced Visualization:
- Advanced chart types
- Infographics: How to tell a data driven story
- Mashups

Reading: *Chapter 9*
Assignment: Build an infographic based on data of your choice. Infographic should communicate findings in a compelling way.
Due Date: Week 10

Week 10 - Midterm Exam

Week 11 – Knowledge Discovery
- Data mining
- Accuracy in data mining
- Data mining process
- Machine learning

- Descriptive vs. predictive analytics

Reading: *Chapter 10*
Assignment: Use SAP Predictive Analytics to model a data mining process from data acquisition to model validation.
Due Date: Week 12

Week 12 – Descriptive data mining
- Models for descriptive data mining
- Clustering
- Association analysis

Reading: *Chapter 11*
Assignment: Use SAP Predictive Analytics to analyze various real world scenarios
Due Date: Week 13

Week 13 – Predictive data mining
- Models for predictive data mining
- Regression
- Decision trees
- Classification
- Forecasting, time series analysis

Reading: *Chapter 12*
Assignment: Analyze the multibillion row database from Walmart provisioned by University of Arkansas.
Due Date: Week 14

Week 14 – Big data: Hype or helpful?
- What is big data?
- Challenges and promises of big data
- Limitations and missteps of big data

Reading: *Chapter 13*
Assignment: Research a big data use case.
Due Date: Week 15

Week 15 – Analytics in the Decision Cycle
- How does data analysis support decision making?
- Automating analysis using advanced technologies.
- Business cases using manual and semi-automated analysis

Assignment: Use skills from the previous 13 chapters to analyze data and make recommendations to improve business operations.
Due Date: Week 16

Week 16 – Final Exam