ITP 350: Technologies and Practices for Analytics
Units: 4
SAMPLE SYLLABUS, WILL BE UPDATED FOR SPRING 2019

Course Description
Overview of the process of data analysis. Reporting, visualization and prediction. Practical applications of analytics through case studies. 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.

Learning Objectives
“Big Data” analytics has become a highly sought after skill in business, engineering, services, science, health and other industries. This course will explore the technology and practice data of 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. Also the ability to perform “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 and climate change

Lecture
Section 1: 12 – 1:50 pm TTh, OHE 540
Section 2: 4 - 5:50 pm TTh, KAP 163

Instructor
Name: Nitin Kalé
Office: OHE 412
Office Hours: 9:45 a.m. – 11:45 a.m. MW
Contact Info: kale@usc.edu
Teaching Assistant(s)
Section 1: Rachel Longjohn, rlongjoh@usc.edu
Section 2: Ryan Chua, ryankenc@usc.edu

IT Help
IT help will be provided by Viterbi IT
Hours of Service: 8am – 5pm M-F
Contact Info: http://viterbi.usc.edu/servicedesk, 213-740-0517, engrhelp@usc.edu

Prerequisites
ITP 250 and ITP 251

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 login to the Viterbi Virtual Lab. Most of the SAP software required for the class is Windows based. The software will be provisioned through the Viterbi Virtual Lab. Specifically, you will be using
- SAP GUI 7.50 for Windows
- SAP Business Explorer Query Designer
- SAP BusinessObjects Analysis
- SAP BusinessObjects Design Studio
- SAP Predictive Analytics
- SAP Crystal Reports
- SAP Analytics Cloud
- Tableau
- Microsoft Excel and Access
- Teradata

Required Reading
http://store.epistemypress.com/books/analytics.html
A discount code will be given to students during lecture.

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 correctness. Feedback will be provided through Blackboard.
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  30%
Final Project  10%
Exam I  30%
Exam II  30%
Total  100%

**Grading Scale**
The following shows the grading scale to be used to determine the final letter grade. *No extra credit assignments will be offered.*

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**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.
Technologies and Practices for Analytics
ITP350 (4 units)

Course Outline

Week of Aug 20 – Course Introduction
• Course objectives and outcomes
• Making the case for analytics

**Reading:** *Online readings will be provided.*
**Assignment:** None

Week 2 of Aug 27 – Types of data for analytics
• Structured, unstructured
• Selecting data for analytics
• Staging data

**Reading:** *Online readings will be provided*
**Assignment:** Explore various data sources – flat files, relational database, data warehouse, in-memory database, XML
**Due Date:** Week 3

Week 3 of Sept 3 – Overview of technologies for analytics
• Reporting
• Data Visualization
• Prediction

**Reading:** *Online readings will be provided*
**Assignment:** Connect front end tools to back end databases. Utilize ODBC and other middleware to make such connections. Explore user authorization and security.
**Due Date:** Week 4

Week 4 of Sept 10 – Slicing and Dicing
• Basics of data analysis
• Working with aggregates, hierarchies
• Exceptions and conditions

**Reading:** *Online readings will be provided*
**Assignment:** Answer business questions by slicing and dicing multidimensional data from a data warehouse data source.
**Due Date:** Week 5

Week 5 of Sept 17 – Reporting
• Building reports from one or more data sources
• Formatting reports
  o Grouping
  o Sectioning
  o Graphics and charting
• Creating summaries
  o Aggregates
  o Hierarchies
Reading: Online readings will be provided
Assignment: 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 6

Week 6 of Sept 24 - Data Visualization: Charting
- Types of charts
- How to choose the right chart for displaying data
- Multi variable data display

Reading: Online readings will be provided
Assignment: Use various charts to display insights from large data sets.
Due Date: Week 7

Week 7 of Oct 1 – Data Visualization: Dashboards
- What are dashboards, cockpits, scorecards?
- How to author dashboards?
- Adding interactivity
- Deploying dashboards

Reading: Online readings will be provided
Assignment: Model and implement a dashboard for key performance indicators for a company.
Due Date: Week 8

Week 8 of Oct 8 – Data Visualization: Mobile Apps for Analytics
- Authoring apps
- Deploying apps

Reading: Online readings will be provided
Assignment: Build an analytics mobile app based on data from a data warehouse. Test it on your mobile device.
Due Date: Week 9

Oct 16 - Midterm Exam

Week 10 of Oct 22 – Data Visualization: InfoGraphics
- What are InfoGraphics?
- How to tell a data driven story

Reading: Online readings will be provided
Assignment: Build an infographic based on data of your choice. Infographic should communicate findings in a compelling way.
Due Date: Week 11

Week 11 of Oct 29 – Data mining
- Descriptive analytics
- Predictive analytics
- Prescriptive analytics

Reading: Online readings will be provided
Assignment: Use SAP Predictive analysis to analyze four different scenarios – Titanic disaster, preventative machine maintenance, climate temperature for the past 150 years, store employee turnover
Due Date: Week 12
Week 12 of Nov 5 – Data Mining contd.

Week 13 of Nov 12 – Big data: Hype or helpful?
- What is big data?
- Challenges and promises of big data
- Limitations and missteps of big data
- Introduction to Case studies

**Reading:** Online readings will be provided

**Assignment:** Analyze the multi billion row database from Walmart provisioned by University of Arkansas

**Due Date:** Week 13

Week 14 of Nov 19 – Final Project

Week 15 of Nov 26 – Exam II

Week 16 of Dec 3 – Final Project submission
Statement on Academic Conduct and Support Systems

Academic Conduct:
Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” https://policy.usc.edu/scampus-part-b/. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Support Systems:
Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. https://engemannshc.usc.edu/counseling/

National Suicide Prevention Lifeline - 1-800-273-8255
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. http://www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. https://engemannshc.usc.edu/rsvp/

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: http://sarc.usc.edu/

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086
Works with faculty, staff, visitors, applicants, and students around issues of protected class. https://equity.usc.edu/

Bias Assessment Response and Support
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. https://studentaffairs.usc.edu/bias-assessment-response-support/

The Office of Disability Services and Programs
Provides certification for students with disabilities and helps arrange relevant accommodations. http://dsp.usc.edu

Student Support and Advocacy – (213) 821-4710
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. https://studentaffairs.usc.edu/ssa/

Diversity at USC
Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. https://diversity.usc.edu/

USC Emergency Information
Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, http://emergency.usc.edu

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime.
Provides overall safety to USC community. http://dps.usc.edu