

**ISE 543: Enterprise Business Intelligence
and Systems Analytics**

4 Units

Day/Time: TBA

Location: TBA

Instructor: Bruce Wilcox

Office: GER 203

Office Hours: TBA (in person)

Virtual office hours by appointment

Contact Info: brucewil@usc.edu

Teaching Assistants/Course Producers:

TBA

Catalog Course Description

Overview of data management and analytical techniques used in corporate environments and their practical implementation using a state-of-the-art analytics software.

Expanded Course Description

This class broadly divides into two major topics:

- Data visualization and dashboard development using Tableau.
- Cloud analytics platforms using the Google Cloud Platform with an emphasis on its Vertex AI system.

Business Intelligence (BI) combines analytics, data mining, data visualization, and statistical methods to enable large organizations to make improved data-driven decisions by extracting important information from complex enterprise systems. Modern BI platforms bring all the components of a project lifecycle from data preparation through discovery and modeling to assessment, deployment, and governance together in a single, integrated environment that requires minimal to no low-level coding (“low-code/no-code”).

The primary objectives of this course are to provide the student a theoretical overview of the entire lifecycle of a data science initiative in commercial settings and to provide the opportunity to get experience implementing these techniques using advanced Business Intelligence software currently used by large corporate and public sector entities.

Prerequisite(s): None.

Recommended Preparation: It is recommended that students have an undergraduate-level familiarization with statistics. Previously or concurrently taking ISE-529 is strongly recommended.

Learning Objectives and Outcomes

The overall course objective is to learn the latest technologies and methodologies used in large enterprises to perform a broad range of business intelligence and systems analytics activities.

- The latest generation of business intelligence and analytics software is moving towards a cloud-based "no-code/low-code" data and analytics platform. We will be using leading commercial tools including the Tableau data visualization/dashboard development environment and the Google Cloud Platform/Vertex AI cloud analytics platform.
- Techniques covered will include data preparation and management, data exploration and reporting/dashboarding, advanced analytical modeling (descriptive and predictive), free text analytics, forecasting, and deployment of analytical products in a large enterprise.
- The course will focus on developing an advanced understanding of setting model hyperparameters, interpreting and assessing model results, and deploying and managing data and analytics products in an enterprise environment.

Course Overview and Schedule

The course is structured into modules that correspond to many of the components of a typical analytics project. In general, each module will consist of lecture material to introduce (or refresh for the student) the theoretical basis of the technique being covered, a case study with sample data for classroom discussion, and instruction in the use of the corresponding BI software to perform the techniques. Readings will be assigned prior to each module and there will generally be a hands-on assignment.

Course Notes

All course materials (PowerPoints, assigned readings, etc) will be distributed via Blackboard.

Technological Proficiency and Hardware/Software Required

An advanced BI Analytics software platform will be used. The hardware/software required is a laptop or other personal computer and a browser. Accounts will be established for each student and a basic orientation to the software will be provided in the first session with each platform.

Required Readings and Supplementary Materials

There are no mandatory texts for this class. Required readings and supplementary materials will be assigned for each module and distributed via Blackboard and will include the following:

- Mastering Tableau, Meier and Baldwin, 2021, O'Reilly
- Engineering MLOps, Raj, 2021, Packt Publishing
- Selected journal papers of significance in the field of data science

Grading Breakdown

Assignment	% of Grade
Assignments (approx. 9)	40
Midterm 1 (Tableau)	20
Midterm 2 (GCP)	20
Final Project	20

Grading Scale

Course final grades will be determined using the following scale:

A	95-100
A-	90-94.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	75-79.9
C	70-74.9
C-	50-69.0
F	Below 50

Assignment Submission Policy

Assignments will be posted on Blackboard and submitted for grading on GradeScope (student instructions will be provided).

Assignments turned in after the due date will be penalized 10%. Assignments not turned in within 48 hours of the due date will not be accepted.

If you feel that your submission was not graded correctly, use the GradeScope "Request Regrade" button and type an explanation of why you feel the grade should be changed. I will accept requests for one week after grades published, after which the request regrade function will be disabled.

Course Schedule: A Weekly Breakdown

A detailed course schedule by week is still under development and will be published prior to the start of the semester. The broad outline of topics and timelines is summarized below:

- Introduction to topic and tools to be used for the semester (1 week)
- Data visualization with Tableau (2 weeks)
- Data loading and preparation with Tableau (1 weeks)
- Interactive dashboard development with Tableau (2 weeks)
- Mid-term 1 (Tableau)
- Introduction to cloud analytics platforms and the Google Cloud Platform for data scientists (2 weeks)
- Machine learning pipelines (1 week)
- Introduction to GCP Vertex AI (1 week)
- Vertex AI custom pipelines (3 weeks)
- Mid-term 2 (GCP) and final project assigned
- MLOps and Vertex AI (2 weeks)
- Final project due

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 S-Campus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in Campus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call

studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298
equity.usc.edu, titleix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplcity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Campus Support and Intervention - (213) 821-4710
campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101
diversity.usc.edu

Information on events, programs and training, the Provost’s Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
dps.usc.edu, emergency.usc.edu