

# 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 7.60 for Windows
- SAP BW/4HANA
- Eclipse
- SAP Analysis for Microsoft Office
- SAP Design Studio
- SAP Predictive Analytics
- SAP Crystal Reports
- SAP Lumira
- SAP Analytics Cloud
- Microsoft Excel and Access
- Teradata

## Required Reading

**Textbook:** Practical Analytics, 2<sup>nd</sup> Edition 2020, *Nitin Kalé & Nancy Jones*, Epistemy Press (epistemypress.com) ISBN: 978-0-9972092-2-8. 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 Acquisition

- 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 – Dimensional Data Modeling

- 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 – Data 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 - Data Visualization**

- 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 6*

**Assignment:** Use data visualizations to gain insights into team performance from the ERP Sim business simulation.

**Due Date:** Week 7

**Week 7 – Reporting and Dashboards**

- What are reports? Where are they used?
- Building reports from one or more data sources
- Formatting reports
- Creating summaries
- What are dashboards, cockpits, scorecards?
- How to author dashboards?
- Adding interactivity
- Deploying dashboards
- Mobile Apps for Analytics

**Reading:** *Chapter 7*

**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. 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 8

**Week 8 – Midterm**

**Week 9 – Knowledge Discovery**

- Data mining
- Accuracy in data mining
- Data mining process
- Machine learning
- Descriptive vs. predictive analytics

**Reading:** *Chapter 8*

**Assignment:** Use SAP Predictive Analytics to model a data mining process from data acquisition to model validation.

**Due Date:** Week 10

**Week 10 – Unsupervised Machine Learning**

- Models for unsupervised machine learning
- Clustering
- Association analysis

**Reading:** *Chapter 9*

**Assignment:** Use SAP Predictive Analytics to analyze various real world scenarios

**Due Date:** Week 11

**Week 11** – Time Series Analysis and Forecasting

- Time series
- Univariate and multivariate
- Exponential smoothing

**Reading:** *Chapter 10*

**Assignment:** Forecast a univariate time series. E.g. corporate revenue, global temperature, stock market

**Due Date:** Week 12

**Week 12** – Predictive Machines Learning

- Models for predictive machine learning
- Regression
- Decision trees
- Classification

**Reading:** *Chapter 11*

**Assignment:** Analyze the multibillion row database from Walmart provisioned by University of Arkansas.

**Due Date:** Week 14

**Week 13** – Analytics in Practice

- What is big data?
- Challenges and promises of big data
- Limitations and missteps of big data

**Reading:** *Chapter 12*

**Assignment:** Research a big data use case.

**Due Date:** Week 15

**Week 14** – Final Project

**Week 15** - Final Project

**Week 16** – Final Exam