

WOOSONG UNIVERSITY
ENDICOTT COLLEGE OF INTERNATIONAL STUDIES

Data Analytics for Management

Fall 2022

Section: 001

Professor: Iegor Vyshnevskiy

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Class hours and location:

Fridays 9:00-12:00, Building S2, Room 401 - computer lab (TBU)

Office Hours: email for appointment (TBU)

COURSE DESCRIPTION

This course aims to equip students with the knowledge and skills required for data analytics for evidence-based decision making in the business world. These skills and understanding will help students make informed decisions based on evidence. Students will be able to assess the quality of evidence given for their decision-making.

The students will be introduced to data collection, wrangling, analysis, interpretation and presentation via various software: MS Excel, Tableau and R.

COURSE OBJECTIVES

Upon the completion of this course, the students will be able to understand how to:

1. *define the problem*, determine the client needs (dashboards, reports, product analysis). Create an action plan, and communicate the plan to the team.
2. *collect data*. Getting and combining data from multiple sources (database, backups, flat files, APIs). Work with programmers to create ETL - pipelines process. Developing processes that bring data in a standardized format. Aggregate data.
3. *clean data*. Data validation, normalization and standardization.
4. *set data up for reports/visualizations*, format data for its specific purpose, filter data to subset you need.
5. *create reports and visualizations*. Automated reports. Connect data and data visualizations tools (Tableau and Excel, R).

Students who successfully complete this course will be able to use Excel, Tableau, and R to transform unstructured raw data into organized datasets to prepare any analytical report. The course will also assist students in creating a foundation for understanding computational approaches and working with data.

COURSE LOGISTICS

The most efficient way of studying this type of course is to make one's hand dirty. As such, the course would be heavily loaded with some practical cases and doing many applications.

Starting from Week 2, every other week you will get links to KSS surveys. There will be only 3 questions there (What should I Keep / Start / Stop doing during class?) This is the way to get your feedback and suggestions on classes and make some adjustments if needed and possible.

It is completely voluntarily.

COURSE MATERIALS

This course encourages students to learn from a variety of resources (books, web, videos, etc.). Links to needed sources will be referred to, in particular lecture notes.

COURSE REQUIREMENT AND ASSESSMENT

Class participation: 20%

Based on students' participation in the class activities.

4 short assignments: 20% (5 % for each).

These assignments are designed to 1) facilitate classroom activities and students' understanding of covered materials, 2) apply the concepts you studied, and 3) to build up to developing a project and being ready for the exams. Please submit via e-mail by 8:00 am before the next class. -5 (out of 100) points for late submission. No submissions are allowed after 9am. Group work is encouraged.

- Assignment #1 (Week 4): data processing using Excel.
- Assignment #2 (Week 6): data processing using Tableau.
- Assignment #3 (Week 12): cleaning, structuring, and illustrating data using R.
- Assignment #4 (Week 13): preparing analytical report with R Markdown.

The mid-term examination (Week 8): 20%

In week 8, students are required to present their projects (Project 1) that should have been developed throughout the first half of the course. A group project (up to 5 people in a group) relates to collecting, cleaning, structuring, and illustrating data using *Excel and/or Tableau*. Your grade on the group project is a "team grade" that will be assigned equally to all members of the team. You are therefore encouraged to use your team-working abilities.

Make a succinct 10-minute presentation (about 7 slides). Ask questions and assess your groupmates' presentations. (Total 20 points).

Individual Project (Week 14): 20%

In week 14, students are required to present one data analysis method, which they have independently learned. Make a succinct 5-minute presentation (about 3 slides). Ask questions and assess your groupmates' presentations. (Total 20 points).

Final exam (Week 15): 20%

In week 15, students are required to present their projects (Project 2) that should have been developed throughout the second half of the course. A group project (up to 5 people in a group) relates to collecting, cleaning, structuring, and illustrating data using *R*.

Make a succinct 10-minute presentation based on R markdown (about 7 slides). Ask questions and assess your groupmates' presentations. (Total 20 points).

COURSE SCHEDULE

The following schedule is not written in stone and is thus subject to change, tailoring the proper understanding of materials.

<i>Week</i>	<i>Coverage</i>
1 Week	Introduction to data analytics Student presentations on their interest in data analysis
2 Week	Data Analysis Workflow Types of data and ways to describe data Data collection / Project 1 speed dating + pitching Computer lab activity
3 Week	Data cleaning, structuring, merging and appending, reshaping with Excel Computer lab activity / Project 1 group discussions
4 Week	Data grouping and visualization using Excel pivot tables Useful Excel functions, conditional formatting in Excel Computer lab learning by doing activity / Project 1 group discussions Assignment #1
5 Week	Data analysis in Excel and data dashboards Computer lab learning by doing activity / Project 1 group discussions
6 Week	Tableau – data preparation, cleaning, structures Computer lab activity / Project 1 group discussions Assignment #2
7 Week	Tableau – data manipulation and visualization Computer lab activity / Project 1 group discussions
8 Week	Project 1 presentations - mid-term exam Project 1 presentations - mid-term exam
9 Week	Data analytics workflow with R Computer lab activity / Project 2 speed dating + pitching
10 Week	Reshaping and cleaning data using tidyverse Computer lab activity / Project 2 group discussions
11 Week	Summarizing data using tidyverse Computer lab activity / Project 2 group discussions
12 Week	Visualizing data using tidyverse Computer lab activity / Project 2 group discussions Assignment #3
13 Week	Reports with R Markdown Computer lab activity / Project 2 group discussions Assignment #4
14 Week	Individual Project Presentations Individual Project Presentations
15 Week	Project 2 presentations - Final exam Project 2 presentations - mid-term exam