

**WOOSONG UNIVERSITY
ENDICOTT COLLEGE OF INTERNATIONAL STUDIES**

Data Analytics for Management

Fall 2022

Section: 001

Professor: Iegor Vyshnevskyi

E-mail: ievysh@wsu.ac.kr

Class hours and location:

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

Office Hours: Monday, Tuesday, Friday by appointment (email in advance)

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

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

In week 8, students will have a take-home exam (Data Report). A data file with the relevant questions and instructions would be provided. The assignment would require to provide a Report and relates to cleaning, structuring, and illustrating data using *Excel and/or Tableau*. The evaluation would be done on the individual basis. Students would be required to provide the report and all other working files.

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) 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 Computer lab activity
3 Week	Data cleaning, structuring, merging and appending, reshaping with Excel Computer lab activity
4 Week	Data grouping and visualization using Excel pivot tables Useful Excel functions, conditional formatting in Excel Computer lab learning by doing activity Assignment #1
5 Week	Data analysis in Excel and data dashboards Computer lab learning by doing activity
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
8 Week	Report - mid-term exam Report - mid-term exam
9 Week	Data analytics workflow with R Computer lab activity / Project speed dating + pitching
10 Week	Reshaping and cleaning data using tidyverse Computer lab activity / Project group discussions
11 Week	Summarizing data using tidyverse Computer lab activity / Project group discussions
12 Week	Visualizing data using tidyverse Computer lab activity / Project group discussions Assignment #3
13 Week	Reports with R Markdown Computer lab activity / Project group discussions Assignment #4
14 Week	Individual Project Presentations Individual Project Presentations
15 Week	Project presentations - Final exam Project presentations - mid-term exam