

IS6335: DATA VISUALIZATION

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Data Visualization

Subject Code

IS - Information Systems

Course Number

6335

Academic Unit

Information Systems (IS)

College/School

College of Business (CB)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

"A picture is worth a thousand words." The human race is wired to perceive pictorial messages and discover patterns using intuitions. In a data - driven business environment, the ability to convey hard messages with clever visualization is essential

and valuable. The goal of this course is to learn how to use visualization tools for data interpretation under the business context. We will explore ways to organize and derive meaning from vast amounts of data, with interesting visual examples from different application areas. Students will learn concepts, methods, and applications of data visualization methods. Students will also learn visualization tools from GUI-based Tableau software to more advanced programmable visualization packages in R and Python. They will be guided in creating engaging and interactive visualizations, as well as experiencing virtual reality applications. Students will apply the concepts and skills to designing a final project. The course has no prerequisite of programming background, although prior experience with coding languages will be helpful.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe and gain insight into the theory of visual presentation and the use of visual report in business communication and analytics.	40	x	x	
2	Acquire and innovatively apply skills in using GUI-based Tableau software to create compelling visual report and analysis.	20	x	x	x
3	Acquire and innovatively apply skills in using programmable visualization tools (R and Python packages) to create flexible visual presentations. Use visualization to augment machine learning and statistical analysis in applications.	40	x	x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Students will learn the basic design theory for visual presentation and cases of innovative visualization applications. Students will also learn the basic programming techniques and use of Tableau, R, and Python packages.	1, 2, 3
			1 Hour/Week

2	Tutorial	Students will do hands on experiences to use the visualization tools of Tableau, R, and Python introduced in the lectures during the tutorial.	2, 3	2 Hours/Week
3	Peer Discussion	Students apply the visualization tools to form an analytics report. They need to identify a data source and form a data driven story in the project.	1, 2, 3	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?
1	Class Participation Students are encouraged to discuss and reflect on the materials covered in lectures and tutorials.	1, 2, 3	10	-	Yes
2	Assignments Assignments will be given to assess student' s ability to apply the tools learned.	2, 3	30	-	Yes
3	Group Project A group project will be assigned. Students need to apply the visualization tools to form an analytics report. They need to identify a data source and form a data driven story in the project.	1, 2, 3	20	-	Yes

4	Individual Project Students will be assessed via an individual project, with innovative applications of visualization concepts and designs learned in class. Project will be individual based in a written report format.	1, 2, 3	40	-	Yes
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Continuous Assessment (%)

100

Minimum Continuous Assessment Passing Requirement (%)

50

Assessment Rubrics (AR)

Assessment Task

AT1: Class Participation (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

CILO 1-3

Demonstrate evidence of active learning through participating in class discussion, asking critical questions and completing extra-credit activities.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT2: Assignments (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

CILO 2-3

Demonstrate good understanding of course content and capability to apply the skills learned to create visual presentations.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT3: Group Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

CILO 1

Apply principle learned about the design theory of visual presentation.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT3: Group Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

CILO 2-3

Demonstrate capability to apply the tools (menu-based and programmable) to explore data set and create data driven story.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT4: Individual Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

CILO 1-3

Demonstrate good understanding of visualization design principles and master the skills required for innovative visualization designs.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT1: Class Participation (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

CILO 1-3

Demonstrate evidence of active learning through participating in class discussion, asking critical questions and completing extra-credit activities.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate/Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT2: Assignments (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

CILO 2-3

Demonstrate good understanding of course content and capability to apply the skills learned to create visual presentations.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate/Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT3: Group Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

CILO 1

Apply principle learned about the design theory of visual presentation.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate/Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT3: Group Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

CILO 2-3

Demonstrate capability to apply the tools (menu-based and programmable) to explore data set and create data driven story.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate/Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT4: Individual Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

CILO 1-3

Demonstrate good understanding of visualization design principles and master the skills required for innovative visualization designs.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate/Basic

Failure

(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Big Data; Visualization; Data Charts; Dashboard; Power View; Tableau; Infographics; Text Visualization; Social Network Visualization; Visualization on mobile devices.

Reading List

Compulsory Readings

Title	
1	Tony Fischetti and Brett Lantz, R: Data Analysis and Visualization Packt Publishing, 2016.
2	Mario Dobler and Tim Gromann Data Visualization with Python: Create an Impact with Meaningful Data Insights Using Interactive and Engaging Visuals Packt Publishing, 2019.

Additional Readings

Title	
1	Nathan Yau, Visualize This; The Flowing Data Guide to Design, Visualization, and Statistics Wiley, 2011.
2	Stephen Few, Show Me the Numbers: Designing Tables and Graphs to Enlighten, Analytics Press, 2012.
3	Hadley Wickham, ggplot2, Springer, 2016.
4	Daniel G. Murray, Tableau Your Data!: Fast and Easy Visual Analysis with Tableau Software, Wiley 2016.
5	Stephanie D. H. Evergreen, Effective Data Visualization: The Right Chart for the Right Data, SAGE Publication, 2016.