

IS5336P: DATA VISUALIZATION AND IMAGE ANALYSIS

Effective Term

Semester A 2026/27

Part I Course Overview

Course Title

Data Visualization and Image Analysis

Subject Code

IS - Information Systems

Course Number

5336P

Academic Unit

Information Systems (IS)

College/School

College of Business (CB)

Course Duration

Non-standard Duration

Other Course Duration

Intensive mode: 3 days

Credit Units

1.5

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

Other Languages

Other Languages for Medium of Instruction

Putonghua supplemented by English

Medium of Assessment

Chinese

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details**Abstract**

This course explores the practical applications of data visualization and image analysis in the context of business. Students will learn how to leverage a variety of techniques and models to visualize structured and unstructured data, aimed to extract useful information, recognize data patterns, and enhance decision-making. The course will cover theoretical foundations, hands-on practical exercises, and case studies to provide students with a comprehensive understanding of data visualization and image analysis. On completion of the course students should be able to:

1. understand the target and requirements of a selection of fundamental data visualization techniques for data analysis.
2. manage the data visualization and image analysis methods to model different formats of data and extract data patterns from visualization and analysis.
3. implement the models into a software package, such as Python, and adapt the models through programming capabilities.
4. analyze and interpret the outputs of models to support decision making in different business case studies.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe and gain in-depth understanding of visual presentation theories and the use of visual reports in business communication and analysis.	20	x	x	
2	Master and creatively apply static visualization tools in Python to produce compelling visual reports and analyses.	40	x	x	x
3	Master and creatively apply dynamic visualization tools (Python packages) to create flexible visual presentations.	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	Lectures introduce the fundamental design theories of visual representation, showcase innovative visualization application cases, and cover basic programming techniques and software usage skills.	1, 2, 3	
2	Software Tutorial	Software tutorials provide practical guidance on using the visualization tools and code introduced in the lectures.	1, 2, 3	
3	Group Project	Students are required to identify data sources, create data-driven descriptions, and apply visualization tools to produce analytical reports in their project work.	1, 2, 3	

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks	Allow Use of GenAI?
1	Class Quiz Students are encouraged to actively participate in class discussions and review the material covered in lectures and assigned readings. Class participation will be assessed based on class quiz. An in-class quiz (and a signup sheet) will be conducted during the class. The portion of times that you conduct quizzes correctly (and in class) will be used to assess your quiz grade.	1, 2, 3	20	-	Yes

2	Individual Assignments Assignments will be distributed after classes, in which they are highly related to the lectures and the tutorials conducted in class.	1, 2, 3	40	-	Yes
3	Group Project The project report will be graded according to the quality of the report. Detailed guidance about the report will be discussed in the class.	1, 2, 3	40	-	Yes

Continuous Assessment (%)

100

Assessment Rubrics (AR)**Assessment Task**

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

Excellent

(A+, A, A-) Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base. Able to suggest new ways of resolving the issues at stake, provide a substantial analysis of the new ways, and provide new solutions to the issues.

Good

(B+, B, B-) Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature. Able to suggest new ways of resolving the issues at stake and provide a preliminary analysis of the new ways.

Fair

(C+, C, C-) Students who demonstrate adequate competence in presenting the main issues and giving solutions to the case study assigned.

Marginal

(D) Students who demonstrate a basic understanding of the topics covered.

Failure

(F) Little evidence of familiarity with the subject matter; weakness in critical and analytic skills.

Assessment Task

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

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(A+, A, A-) Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base. Able to suggest new ways of resolving the issues at stake, provide a substantial analysis of the new ways, and provide new solutions to the issues.

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(F) Little evidence of familiarity with the subject matter; weakness in critical and analytic skills.

Assessment Task

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

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Marginal

(D) Students who demonstrate a basic understanding of the topics covered.

Failure

(F) Little evidence of familiarity with the subject matter; weakness in critical and analytic skills.

Assessment Task

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

Excellent

(A+, A, A-) Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base. Able to suggest new ways of resolving the issues at stake, provide a substantial analysis of the new ways, and provide new solutions to the issues.

Good

(B+, B) Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature. Able to suggest new ways of resolving the issues at stake and provide a preliminary analysis of the new ways.

Marginal

(B-, C+, C) Students who demonstrate adequate competence in presenting the main issues and giving solutions to the case study assigned.

Failure

(F) Little evidence of familiarity with the subject matter; weakness in critical and analytic skills.

Assessment Task

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

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Assessment Task

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

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(A+, A, A-) Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base. Able to suggest new ways of resolving the issues at stake, provide a substantial analysis of the new ways, and provide new solutions to the issues.

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Part III Other Information

Keyword Syllabus

Big Data; Data Visualization; Python; Data Charts; Dashboard; Static Visualization; Interactive Visualization; Numpy; Matplotlib; SeaBorn; Pandas; Bokeh; Plotly; Temporal Visualization; Geographical Visualization.

Reading List

Compulsory Readings

Title	
1	Lecture slides, tutorial materials and other readings will be distributed throughout the semester.

Additional Readings

Title	
1	Munzner, Tamara. Visualization analysis and design. CRC press, 2014
2	陈为, 沈则潜. 《数据可视化》. 电子工业出版社, 2013