The Hong Kong University of Science and Technology

UG Course Syllabus

[Course Title] Industrial Data Systems

[Course Code] IEDA3300

[No. of Credits] 3 credits

[Any pre-/co-requisites] Basic knowledge in programming language is recommended but not required

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Course Description

The course will introduce Python and databases in industry practice. Four aspects will be included: (a) Basic Python programming knowledge (b) Practical data analysis techniques with Python and Pandas (c) Database design principles; (d) SQL and Python interfaced database manipulations.

Intended Learning Outcomes (ILOs)

This course focuses on practical programming techniques in data analysis and relational database system. You will learn how to use Python, Pandas, and SQL to do data manipulation and analysis in this course. You will also learn the fundamental principle and basic theory of database system design. This course is heavy in coding. Upon the successful completion, you will learn:

• Basic Python programming grammar

• Use Pandas and NumPy to do data analysis and visualization

• Principle of relational database, e.g., Entity-Relationship models, functional dependencies

and normalization, relational algebra, etc.

• Write and use SQL to manipulate database

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation.

Assessments:

Assessment Task	Contribution to Overall Course grade (%)	Due date
Homework	20%	Be announced on Canvas
Mid-Term	30%	22/10/2025
Final examination	50%	Determined by school

* Assessment marks for individual assessed tasks will be released within two weeks of the due date.

Mapping of Course ILOs to Assessment Tasks

[add to/delete table as appropriate]

Assessed Task	Mapped ILOs	Explanation
Homework	[ILO1, ILO2, ILO3, ILO4]	[This task assesses students' ability to use python and related packages to conduct data analysis (ILO 1, ILO 2), as well as the understanding of database design (ILO3), and the ability to manipulate database system using SQL (ILO4).]
Midterm	[ILO1, ILO2, ILO3, ILO4]	[This task assesses students' ability to use python and related packages to conduct data analysis (ILO 1, ILO 2), as well as the understanding of database design (ILO3), and the ability to manipulate database system using SQL (ILO4). As an in-class exam, this task also tests students' learning quality and proficiency for the whole course.]
Final Exam	[ILO1, ILO2, ILO3, ILO4]	[This task assesses students' ability to use python and related packages to conduct data analysis (ILO 1, ILO 2), as well as the understanding of database design (ILO3), and the ability to manipulate database system using SQL (ILO4). As an in-class exam, this task also tests students' learning quality and proficiency for the whole course.]

Grading Rubrics

[Detailed rubrics for each assignment will be provided. These rubrics clearly outline the criteria used for evaluation. Students can refer to these rubrics to understand how their work will be assessed.]

Final Grade Descriptors:

[As appropriate to the course and aligned with university standards]

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	[Demonstrates a comprehensive grasp of subject matter, expertise in problem-solving, and significant creativity in thinking. Exhibits a high capacity for scholarship and collaboration, going beyond core requirements to achieve learning goals.]
B	Good Performance	[Shows good knowledge and understanding of the main subject matter, competence in problem-solving, and the ability to analyze and evaluate issues. Displays high motivation to learn and the ability to work effectively with others.]
C	Satisfactory Performance	[Possesses adequate knowledge of core subject matter, competence in dealing with familiar problems, and some capacity for analysis and critical thinking. Shows persistence and effort to achieve broadly defined learning goals.]
D	Marginal Pass	[Has threshold knowledge of core subject matter, potential to achieve key professional skills, and the ability to make basic judgments. Benefits from the course and has the potential to develop in the discipline.]
F	Fail	[Demonstrates insufficient understanding of the subject matter and lacks the necessary problem-solving skills. Shows limited ability to think critically or analytically and exhibits minimal effort towards achieving learning goals. Does not meet the threshold requirements for professional practice or development in the discipline.]

Course AI Policy

AI is allowed in this course except during the exam.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include the grades of homework. Students who have further questions about the feedback including marks should consult the TA within five working days after the feedback is received.

Resubmission Policy

Homework is allowed to be resubmitted before the due date. Late submission will not be accepted.

Required Texts and Materials

Textbook (optional):

• Fundamentals of Database Systems. R. Elmasri and S. B. Navathe. Addison-Wesley; 6 edition. 2010.

Comprehensive and systematic class notes, homework, and homework solutions will be posted

on Canvas. The book is not required but recommended.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to [Academic Integrity | HKUST – Academic Registry](#) for the University's definition of plagiarism and ways to avoid cheating and plagiarism.