

The Hong Kong University of Science and Technology (Guangzhou)

UG Course Syllabus

[Course Title] Introduction to Computer Science

[Course Code] UFUG 1601

[No. of Credits] 3 credits

[Any pre-/co-requisites] NA

L01:

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L02:

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Course Description

This course introduces students to the world of computer science, data analysis, and artificial intelligence. Through a series of lectures and hands-on exercises, students will learn the basics of each of these disciplines, and how they can be used to solve real-world problems. It will cover the following topics: an introduction to computer science, including an overview of its principles and concepts; the basics of data analysis, including methods for collecting, organizing, and analyzing data; an introduction to artificial intelligence, including an exploration of its various applications and capabilities; and an examination of how computer science, data analysis, and artificial intelligence can be used in combination to solve real-world problems. Upon completion of this course, students will have a strong foundation on which to build more advanced knowledge in these exciting fields.

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

1. Gain an understanding of what computer science is and its potential applications.
2. Understand the basics of data analysis and how to apply them to real-world problems.
3. Understand the basics of artificial intelligence and its potential applications.
4. Understand how computer science, data analysis, and artificial intelligence can be used together to solve real-world problems.

Weekly Schedule

Week	Topic	ILOs
1	Course overview and introduction to computer organization	ILO 1
2	Introduction to computer organization	ILO 1
3	Programming concepts and Python basics	ILO 1
4	Python basics: variables and control flows	ILO 1
5	Python functions and recursion	ILO 1, ILO 4
6	Python built-in structures and mutability	ILO 1, ILO 4
7	Python OOP and performance	ILO 1, ILO 4
8	<i>Midterm exam</i>	ILO 1, ILO 4
9	Introduction to data science and its applications	ILO 1, ILO 2, ILO 4
10	Python programming for data analysis	ILO 1, ILO 2, ILO 4
11	Introduction to AI and its applications	ILO 1, ILO 3, ILO 4
12	Python programming for AI	ILO 1, ILO 3, ILO 4
13	DS/AI showcases and course review	ILO 1, ILO 2, ILO 3, ILO 4
	<i>Final exam</i>	ILO 1, ILO 2, ILO 3, ILO 4

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
In-class Test	15%	Regular class and lab quizzes
Mid-term Exam	20%	Week 8 (tentatively)
Assignments	25%	Week 4/7/10/13
Final Exam	40%	Final exam week

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

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
In-class Test	ILO1, ILO2, ILO3.	This task evaluates students on three key aspects: their understanding of foundational concepts in computer science (ILO 1), their ability to apply basic data analysis methods (ILO 2), and their capability to assess introductory AI applications (ILO 3).

Assignments	ILO1, ILO2, ILO3, ILO4	The assignments assess students' ability to integrate the concepts and skills acquired throughout the course, applying computer science, data analysis, and AI techniques to address both simulated and real-world problems (ILO 1, ILO 2, ILO 3, ILO 4).
Mid-term Exam	ILO1, ILO4	The computer-based midterm exam assesses students' practical programming skills, focusing on their ability to effectively apply concepts related to computer programming (ILO 1, ILO 4).
Final Exam	ILO1, ILO2, ILO3, ILO4	The final exam comprehensively evaluates the full spectrum of learning outcomes. It measures students' knowledge of computer science principles, data analysis, and AI, as well as their ability to apply, evaluate, and synthesize these concepts across various scenarios (ILO 1, ILO 2, ILO 3, ILO 4).

Grading Rubrics

1. In-class test (15%):

- Class quizzes, contributing 10% to the overall grade, are intended to assess students' understanding of key topics. Absences from these quizzes will only be excused upon presentation of a valid medical certificate due to illness.
- Lab quizzes, which account for 5% of the total grade, are designed to assess students' practical skills in the computer lab. Absences from these quizzes will be excused only with the submission of a valid medical certificate due to illness.

2. Assignments (25%):

- The course includes four programming assignments, with weightings of 5%, 5%, 5%, and 10%, respectively. These assignments are crafted to assess students' proficiency in applying computer science, data science, and artificial intelligence techniques to solve both simulated and real-world problems.

3. Exams (60%):

- The midterm exam, accounting for 20% of the total grade, is conducted on a computer and is designed to evaluate students' practical skills in computer programming.
- The final exam, comprising 40% of the total grade, is a closed-book written assessment featuring a mix of multiple-choice, short-answer, and long-answer questions. These questions are designed to evaluate students' understanding and mastery of the course material.

Final Grade Descriptors:

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

Allowed and encouraged with proper citations and prompt list.

Communication and Feedback

Students can provide informal feedback to the instructor and/or teaching assistant(s) through various channels, including face-to-face conversations, phone calls, emails, group discussions, or the course website.

Resubmission Policy

Resubmissions are not permitted after the deadline.

Required Texts and Materials

Not Required. Recommended reading materials will be introduced during classes.

Academic Integrity

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