The Hong Kong University of Science and Technology

UG Course Syllabus (Fall 2025-26)

[Course Title] Principles of Programming Languages

[Course Code] COMP 3031

[No. of Credits] 3 Credits

No pre-/co-requisites

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Course Description

In this course, students learn how to design programs that are reliable, maintainable, efficient, and correct by construction. This is achieved through high-level programming techniques that focus on simplicity and expressiveness, notably using declarative and higher-order programming approaches and algebraic data types. We also review important programming language paradigms and constructs, including imperative, object-oriented, logic, and concurrent programming techniques, with an overall emphasis on functional programming and the Scala programming language. The overarching goal of this course is to give students powerful new tools enabling them to solve hard problems more easily and reliably.

Required Texts and Materials

N/A

Additional Resources

Reference book:

Martin Odersky, Lex Spoon, Bill Venners. Programming in Scala, 5th edition. Artima, 2021

Intended Learning Outcomes (ILOs)

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

1. Differentiate the general paradigms of functional, object-oriented, logic, and concurrent programming; write simple programs in all these paradigms.
2. Recognize the strengths and weaknesses of the major constructs and concepts of various programming languages in the paradigms mentioned above.
3. Solve problems using pure and impure functional programming approaches in Scala, modeling the problem domain such that illegal states are unrepresentable.
4. Apply basic mathematical techniques to reason about program semantics.

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
Three programming assignments (10% each)	30%	TBA
Midterm examination	30%	TBA
Final examination	40%	TBA

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
Programming assignments	ILO 3	This task assesses the students' ability to program in Scala, based on the information and guidelines provided in the course.
Midterm and final examinations	ILO 1, 2, 3, 4	The examinations assess all intended learning outcomes by exercising the students' general knowledge of programming language paradigms and constructs, domain modeling and problem solving in Scala, and basic mathematical techniques for reasoning about program semantics.

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:

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

We generally do not allow the use of generative AI tools in the completion of the assignments in this course.

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 marks received for each item and the reasons for mark deduction. Students who have further questions about the feedback, including marks, should consult the instructor within five working days after the feedback is received.

Resubmission Policy

Except in special circumstances, resubmission for reassessment will not be allowed for any assessment.

Required Texts and Materials

Reference book: Excel and Excel VBA Programming for Beginners – 3rd Edition for Office 2013

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.

Additional Resources

Online course content to be published in HKUST canvas when the semester begins.