Subject Description Form

Subject Code	COMP1001
Subject Title	Problem Solving Methodology in Information Technology
Credit Value	3
Level	1
Pre-requisite / Co-requisite / Exclusion	
Objectives	The subject aims to equip students with no prior experience on computer programming with fundamental computational and skills. In particular, the students will learn how to formulate solutions to computable problems and how to implement them in a high-level programming language.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: (a) develop computer solutions to basic and standard problems and implement them using Python; and (b) acquire some specialised Python programming skills to implement solutions using suitable data types and constructs.
Subject Synopsis/ Indicative Syllabus	**Topic** 1. **Introduction to computational thinking** Formulating problems for computers to solve them; logically organizing and analysing data; representing data through abstractions; automating solutions through algorithmic thinking; implementing efficient solutions; generalizing the problem-solving process. 2. **Problem solving through Python** Computing with numbers and strings; lists and files; functions; decision structures; loop structures and Booleans; data collections; graphic objects. 3. **Program design** Problem analysis and specification; top-down design; bottom-up implementation.
Teaching/ Learning Methodology	The 39-hour lecture will cover the main concepts and ideas in solving problems with computers and illustrate them using many examples. The students will also be given time to practice those concepts and ideas right away. The 12-hour laboratory will be used to mainly cover graphic objects and program design.

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed	
			a	b
	1. Continuous Assessment (such as assignments, quizzes and mini-projects)	55%	✓	✓
	2. Examination	45%	✓	✓
	Total	100%		

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignments and quizzes are designed to help achieve learning outcome (b), whereas the two mini-projects are designed for achieving (a).

The examination will cover both (a) and (b).

Student Study Effort Expected	Class contact:	
	▪ Lectures	39 Hrs.
	▪ Tutorials	0 Hrs.
	▪ Laboratory	13 Hrs.
	Other student study effort:	
	▪ Self-Studying	53 Hrs.
	Total student study effort	105 Hrs.

Reading List and References

Reference Books:

1. John Zelle, *Python Programming: An Introduction to Computer Science*, 2nd Edition, Franklin, Beedle & Associates Inc., Wilsonville, OR, USA, 2010.

2. Allen B. Downey, *Think Python: How to Think Like a Computer Scientist,* Green Tea Press, 2014.

3. William F. Punch and Richard Enbody, *The Practice of Computing Using Python*, 2nd Edition, Addison Wesley, 2012.

4. Paul Gries, Jennifer Campbell and Jason Montojo, *Practical Programming: An Introduction to Computer Science Using Python 3*, Pragmatic Bookshelf, 2013.

5. R. G. Dromey, *How to Solve It by Computer*, Prentice-Hall International, Englewood Cliffs, NJ, USA, 1982.