Subject Description Form

Subject Code	COMP5XXX
Subject Title	Algorithmic Graph Theory
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Knowledge of Discrete Mathematics
Objectives	This subject aims to prepare students to understand advanced graph theory concepts and design graph algorithms.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) Gain a deep understanding of advanced graph theory concepts and learn to model real-world problems using graphs; b) Master advanced algorithms for solving complex graph-related problems; c) Enhance problem-solving skills by engaging in exercises and projects that apply graph theory concepts; and d) Explore current research topics and open problems in graph theory by critically reading and analyzing scholarly articles and papers.
Subject Synopsis/ Indicative Syllabus	1. Concepts: subgraphs, connectivity, trees, cuts; 2. Graph algorithms: graph searches; shortest paths, maximum flow, and minimum spanning trees; 3. Graph problems: colorings, matchings, flows; 4. Graph classes: planar graphs, perfect graphs; and Applications.
Teaching/Learning Methodology	A mix of lectures and tutorial sessions is used to deliver the various topics in this subject. Lectures are conducted to initiate students with graph theory concepts. Tutorial sessions are used to provide hands-on experience on solving graph problems.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
		a	b	c	d
Assignments	60%	✓	✓	✓	
Quizzes		✓	✓	✓	
Project		✓	✓	✓	✓
Examination	40%	✓	✓	✓	✓
Total	100 %				

Student Study Effort Expected		
	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Tutorial	13 Hrs.
	Other student study effort:	
	▪ Assignments, Quizzes, Projects, Self-study	91 Hrs.
	Total student study effort	130 Hrs.

Reading List and References

a) John Adrian Bondy and Uppaluri S. R. Murty, Graph Theory, Springer, 2008. Isbn: 978-1-84628-969-9.

b) Martin C. Golumbic, Algorithmic Graph Theory and Perfect Graphs, North-Holland, Amsterdam, 2004. Isbn: 0444515305.

Research articles to be delivered.