Programming & Simulation (MSM4424)

Course Code	MSM4424								
Course Name	PROGRAMMING & SIMULATION								
Credit Hour	4								
Prerequisite Course	None								
Contact Hours	Lecture:			3	units	(3 hour(s) per week)			
	Tutorial:			0	unit	(0 hour(s) per week)			
	Laboratory:			2	units	(2 hour(s) per week)			
Course Rationale	Programming & Simulation is a one of powerful problem-solving tools which is capable in handling scientific computing involving: modelling, simulation and visualization that are common in science, engineering and industrial practices. Towards this course it enhances student's abilities to develop algorithms, solve and analyse problems especially on those areas using Microsoft Visual C++.								
Course Objective	To equip students with the concepts and computing skills in solving real-life problems.								
Course Synopsis	This course introduces programming concepts using Microsoft Visual C++ and its usefulness in supporting simulation for solving mathematical problems. Object-oriented approach using class and objects, and abstraction with properties on inheritance, polymorphism and overloading. Strong emphasis on mathematical models, their theoretical and numerical methods for solutions, and the algorithm buildup for implementation. Discussion on the graphical visualisation and friendly graphical-user interface designs using tools in Microsoft Foundation Class (MFC). Finally, case studies and programming exercises on selected problems such as applied graph theory, optimisation and numerical methods are presented for some of today's current problems.								
Program Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**
	/	/	/						/
Soft Skills	**Code**		**CTPS**	**CS**	**TS**	**LL**	**ES**	**EM**	**LS**
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Course Outcomes	By the end of semester, students should be able to:								
	CO1	Develop analytical skills in solving mathematical problems.							
	CO2	Develop algorithmic solutions to the problems from the given mathematical methods.							
	CO3	Manipulate numerically intensive mathematical problems using C++.							
	CO4	Perform the works collaboratively and promote teamwork among group members to solve the given projects.							
Assessment Methods	**Methods**		**Weighting**	**CO1**	**CO2**	**CO3**	**CO4**		
	Test		20%	/	/				
	Project/Assignment		40%	/	/	/	/		

	Final	40%	/	/			
	Total	**100%**					

Learning References	1	C++ Numerical Programming, Shaharuddin Salleh, Shazirawati Mohd Puzi, Farhana Johar and Wan Rohaizad Wan Ibrahim. 2017 Edition. (Main Reference for Chapter N1-N7)
	2	C++ Visual Simulation. Shaharuddin Salleh. 2016 Edition. (Main Reference for Chapter V1-V5)
	3	Introduction to MFC Programming with Visual C++, Richard M. Jones, Prentice-Hall, 2000 (latest version).
	4	Computing for numerical methods using Visual C++; Shaharuddin Salleh, Albert Zomaya and Sakhinah A.Bakar, Wiley-Interscience (Hoboken, New Jersey), 2008 (latest version).
	5	Getting Started with Visual C++ 6: With an Introduction to MFC: 2nd (second) Edition, T. R. Nieto, P. J. Deitel, E. T. Strassberger and Paul J. Deitel H. M. Deitel , Pearson, 2000 (latest version).