

The Hong Kong Polytechnic University

Subject Description Form

Subject Code	AMA2202
Subject Title	Introduction to MATLAB
Credit Value	1
Level	2
Pre-requisite	AMA1751 or equivalent
Objectives	<ul style="list-style-type: none">• To provide students with knowledge on the fundamental elements in MATLAB and other relevant mathematical software.• To introduce techniques in using mathematical software necessary for applied mathematics and statistics.• To introduce application of mathematical software such as simulation, data analytics and computational method.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: (a) understand key features and usage of MATLAB as a mathematical software tools; (b) design and develop MATLAB scripts and user-defined functions to solve mathematical problems; (c) foster concepts and techniques in computational methods and data analytics; (d) apply MATLAB for modelling and simulation; (e) demonstrate the ability to learn and use new information technologies/tools.
Subject Synopsis/ Indicative Syllabus	1. Fundamentals of MATLAB MATLAB environment, arithmetic operations, fundamental functions. 2. Programming in MATLAB Flow control (selection, loop), function and script. 3. Data structure in MATLAB Vector, matrix, matrix operations. 4. Data analytics in MATLAB Statistical tools, data processing, data visualization. 5. Computational tools in MATLAB System of linear equations, differential equations, optimization. 6. Simulation in MATLAB Random numbers, random simulation.

Teaching/Learning Methodology	This subject emphasizes practical experiences in using MATLAB. The lectures are combined with lab session taught in a workshop mode with hands-on exercises reinforcing taught concepts. These exercises reinforce the skills learned for applications and hence develop the knowledge of using mathematical software for problem solving.																																												
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1" data-bbox="516 373 1393 846"> <thead> <tr> <th data-bbox="516 373 821 562" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="821 373 1008 562" rowspan="2">% weighting</th> <th colspan="5" data-bbox="1008 373 1393 499">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="1008 499 1084 562">a</th> <th data-bbox="1084 499 1161 562">b</th> <th data-bbox="1161 499 1237 562">c</th> <th data-bbox="1237 499 1313 562">d</th> <th data-bbox="1313 499 1393 562">e</th> </tr> </thead> <tbody> <tr> <td data-bbox="516 562 821 625">1. Lab assignments</td> <td data-bbox="821 562 1008 625">40%</td> <td data-bbox="1008 562 1084 625">✓</td> <td data-bbox="1084 562 1161 625">✓</td> <td data-bbox="1161 562 1237 625"></td> <td data-bbox="1237 562 1313 625"></td> <td data-bbox="1313 562 1393 625">✓</td> </tr> <tr> <td data-bbox="516 625 821 688">2. Quizzes</td> <td data-bbox="821 625 1008 688">20%</td> <td data-bbox="1008 625 1084 688"></td> <td data-bbox="1084 625 1161 688">✓</td> <td data-bbox="1161 625 1237 688">✓</td> <td data-bbox="1237 625 1313 688">✓</td> <td data-bbox="1313 625 1393 688"></td> </tr> <tr> <td data-bbox="516 688 821 783">3. Final assignment / mini-project</td> <td data-bbox="821 688 1008 783">40%</td> <td data-bbox="1008 688 1084 783">✓</td> <td data-bbox="1084 688 1161 783">✓</td> <td data-bbox="1161 688 1237 783">✓</td> <td data-bbox="1237 688 1313 783">✓</td> <td data-bbox="1313 688 1393 783">✓</td> </tr> <tr> <td data-bbox="516 783 821 846">Total</td> <td data-bbox="821 783 1008 846">100 %</td> <td colspan="5" data-bbox="1008 783 1393 846"></td> </tr> </tbody> </table> <p data-bbox="516 867 1393 930">Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p data-bbox="516 951 1393 1098">The continuous assessment may include quizzes and lab assignments to assess students' progress of learning on different topics. The final assignment will be in the form of a project or structured programming task to assess students' overall ability in coordinating the knowledge covered in the whole course. There is no final exam due to the natural of this course.</p>					Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					a	b	c	d	e	1. Lab assignments	40%	✓	✓			✓	2. Quizzes	20%		✓	✓	✓		3. Final assignment / mini-project	40%	✓	✓	✓	✓	✓	Total	100 %					
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Student Study Effort Required	Class contact:																																												
	▪ Lecture and Lab		13 Hrs.																																										
	Other student study effort:																																												
	Self-learning and practicing		14 Hrs.																																										
	Preparation for assignment and quizzes		18 Hrs.																																										
	Total student study effort		45 Hrs.																																										
Reading List and References	<p data-bbox="516 1581 1393 1644">MathWorks. (2025). <i>MATLAB R2025a Documentation</i>. MathWorks. https://www.mathworks.com/help/matlab/</p> <p data-bbox="516 1675 1393 1738">Weeks, M. (2020). <i>Programming Fundamentals Using MATLAB</i> (1st ed.). Mercury Learning and Information. https://doi.org/10.1515/9781683925538</p> <p data-bbox="516 1770 1393 1864">Xue, D., & Pan, F. (2024). <i>MATLAB and Simulink in Action: Programming, Scientific Computing and Simulation</i> (1st ed.). Springer. https://doi.org/10.1007/978-981-99-1176-9</p>																																												