



UNIVERSITI TEKNOLOGI MARA

BDY637: RESOURCE MODELLING

Course Name (English)	RESOURCE MODELLING APPROVED
Course Code	BDY637
MQF Credit	3
Course Description	<p>Mathematical modelling is invaluable in understanding the fundamental phenomena of natural resources. This course will give students a broad introduction to modelling scientific applications using ordinary differential equations, difference equations, and stochastic processes. This is a course that either required for students in the natural and mathematical sciences or addresses problems through mathematical models. This course emphasizes mathematical rigor and abstraction, fundamental mathematical skills, and college-level mathematical concepts and techniques; teach how to develop mathematical models and draw inferences from them. This course approved for the Mathematical Modelling requirement must demonstrate and provide a system for consistency in instruction and assessment of student achievement. This course also approved for the mathematical modeling requirement should engage students with mathematical concepts and techniques that prepare them for a variety of possible future courses and degrees.</p>
Transferable Skills	<p>Skills and how they are developed and assessed, Project and practical experience and Internship</p> <p>On completion of the course the student will be able to:</p> <ol style="list-style-type: none">1. Apply the proper skill using many mathematical applications.2. Communicate effectively with others to solve some given situations and problems.3. Efficiently use the modern computing capabilities
Teaching Methodologies	Lectures, Lab Work
CLO	<p>CLO1 Apply in many applications of mathematics and also enable to use in many further applications.</p> <p>CLO2 Explain precision and direction for problem solution.</p> <p>CLO3 Demonstrate how the natural resources are being modeled.</p> <p>CLO4 Explain an efficient use of modern computing capabilities.</p>
Pre-Requisite Courses	No course recommendations
Topics	
1. Concept of State System, Environment and Variables 1.1) N/A	
2. Concept of State System, Environment and Variables 2.1) N/A	
3. A Generalized Approach to Modeling 3.1) N/A	
4. A Generalized Approach to Modeling 4.1) N/A	
5. Modeling of Physical systems 5.1) N/A	
6. Modeling of Physical systems 6.1) N/A	

7. Input output approach 7.1) N/A
8. Input output approach 8.1) N/A
9. Numerical Analysis 9.1) N/A
10. Numerical Analysis 10.1) N/A
11. The Laplace Transform 11.1) N/A
12. The Laplace Transform 12.1) N/A
13. The Fourier Transform 13.1) N/A
14. The Fourier Transform 14.1) N/A
15. The Z Transform 15.1) N/A
16. The Z Transform 16.1) N/A
17. Wavelet Transform Multi resolution Analysis and construction of wavelets 17.1) N/A
18. Wavelet Transform Multi resolution Analysis and construction of wavelets 18.1) N/A
19. Simulation 19.1) N/A
20. Simulation 20.1) N/A

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignment 1-Week 4	5%	CLO3
	Assignment	Assignment 2 (Week 8)	5%	CLO3
	Assignment	Attendance	10%	CLO3
	Test	Test 1 (Week7)	10%	CLO1
	Test	Test 2 (Week 10)	10%	CLO2
	Test	Test 3 (Week 14)	10%	CLO4

Reading List	Reference Book Resources	<ul style="list-style-type: none"> • Nicola Bellomo, Luigi Preziosi 1994, <i>Modelling Mathematical Methods and Scientific Computation</i>, CRC Press [ISBN: 0849383315] • I. J. Nagrath, M. Gopal, <i>Systems</i> [ISBN: 9780074517871] • J.C. Willems J.W. Polderman 1998, <i>Introduction to Mathematical Systems Theory</i>, Springer-Verlag New York [ISBN: 9781475729559] • Jesse Lowen Shearer, Arthur T. Murphy, Herbert H. Richardson 1971, <i>Introduction to System Dynamics</i>, 2nd Ed., Addison-Wesley [ISBN: 0201070170 97] • T. H. Glisson 1985, <i>Introduction to System Analysis</i>, McGraw-Hill College [ISBN: 9780070233911] • William J. Palm III 1999, <i>Modeling, Analysis, and Control of Dynamic Systems</i>, 2nd Ed., Wiley [ISBN: 978047107370] • Ernest O. Doebelin 1980, <i>System Modeling and Response: theoretical and experimental approaches</i>, Wiley [ISBN: 0471032115 97]
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	