

1.	Name of Course					Engineering Mathematics III				
2.	Course Code					JEMA2133				
JEMA= the first alphabet identify the faculty within which the subject is offered., JEMA = the remaining three alphabet identify the course that offers the subject, 2133 = the first digit identify level of study; in this case undergraduate level, 2133 = the second and third digits identify subject identity and 2133 = the fourth digit identify credit value or credit hours										
3.	Name(s) of academic staff					To be Assigned				
4.	Rationale for the inclusion of the course/module in the programme					Fundamental subject for engineering				
5.	Semester and Year offered					1/2				
6.	Total Student Learning Time (SLT)			Face to Face			Total Guided and Independent Learning			
	L = Lecture T = Tutorial P = Practical S=Studio Works O= Others			L	T	P/S	O	Independent Study(IS) =70		
				42	14	-	-	Total =126		
7.	Credit Value					3.0				
Lectures (3 hours per week x 14 weeks) Tutorial (1 hours per week x 14 weeks)										
8.	Prerequisite (if any)					Engineering Mathematics II (JEMA1103)				
9.	Course Objectives 1. The objective is this course is to equip the students with further strengthen the understanding and usefulness of mathematical concepts and analysis methods in linear algebra and its application. Course Learning Outcomes (CLO) At the end of the semester students should be able to: CLO1: Analyse and applications in Laplace Transformation CLO2: Critically analyse and solve Fourier series CLO3: Analyse and solve partial differential equations and BUP									
10.	Transferable Skills: This course is expected the development of the following transferable skills: a) Self-management – an ability to manage time and task b) Learning skills - An ability to learn both independently and co—operatively; - An ability to use library skills, to find and organize information ; - An ability to use a wide range of academic skills (research, analysis, synthesis etc.); - An ability to identify and evaluate personal learning strategies. c) Teamwork - An ability to take responsibility and carry out agreed task; - An ability to take initiative and lead other; - An ability to identify and evaluate personal learning strategy. d) Problem solving - An ability to analyse; - An ability to think laterally about a problem; - An ability to identify strategy options;									

	- An ability to solve the problems e) Information technologies - An ability to use specialist software where relevant to the discipline.												
11.	Teaching-learning and assessment strategy A variety of teaching strategies are used throughout the course, including the following: - Classroom Lessons; Lecturer and power point presentations - Tutorial Session; - Student-Lecturer Discussion - Collaborative and Co-operative learn; - Independent study. Assessment: <table> <tr> <td>Coursework</td><td>40%</td></tr> <tr> <td>Assignment</td><td>10%</td></tr> <tr> <td>Tutorial /Quizzes</td><td>10%</td></tr> <tr> <td>Test</td><td>20%</td></tr> <tr> <td>Examination</td><td>60%</td></tr> <tr> <td><u>Total</u></td><td><u>100%</u></td></tr> </table>	Coursework	40%	Assignment	10%	Tutorial /Quizzes	10%	Test	20%	Examination	60%	<u>Total</u>	<u>100%</u>
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Examination	60%												
<u>Total</u>	<u>100%</u>												
12.	Synopsis: This course provides the students with the knowledge of Laplace Transformation System of linear differential equation, Fourier Series, Partial differential equations and BVP												
13.	Mode of Delivery: Lectures; Tutorials.												

14.	Performance Criteria :						
	CLO-PLO	Assessment Tool	1	2	3	4	5
	Marks		0-39	40-49	50-59	60-74	75-100
	Grade		(F)	(D,D+)	(C-,C,C+)	(B-,B,B+)	(A-,A,A+)
	CLO1: Be familiar with some applications and methods of probabilistic and statistical analysis	Assignment Quizzes Tutorial Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.)	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.)	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.)	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.	Excellent to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.)
	CLO2: Critically analyse and solve some mathematical problems.	Assignment Quizzes Tutorial Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research,	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research,	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research,	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic	Excellent to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research,

			analysis, synthesis etc.)	analysis, synthesis etc.)	analysis, synthesis etc.)	skills (research, analysis, synthesis etc.)	analysis, synthesis etc.)
	CLO3: Show logical thinking in problem solving.	Assignment Quizzes Tutorial Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.)	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.)	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.)	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.)	Excellent to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Use wide range of academic skills (research, analysis, synthesis etc.)

15.	Mapping of the Programme Objectives to the Programme Learning Outcomes										
Programme Learning Outcomes (PLO) Programme Objectives (PO)	PLO1: Ability to acquire and apply knowledge of science and engineering fundamentals;	PLO2: Acquired in-depth technical competence in civil engineering discipline;	PLO3: Ability to undertake problem identification, formulation and solution;	PLO4: Ability to utilize systems approach to design and evaluate operational performance;	PLO5: Understanding of the principles of design for sustainable development;	PLO6: Understanding of professional ethics, Islamic values, social, cultural, global and environmental responsibilities of a professional engineer and commitment to them;	PLO7: Ability to communicate effectively, not only with engineers but also with the community at large;	PLO8: ability to function effectively as an individual;	PLO9: Ability to function effectively in group with the capacity to be a leader or manager;	PLO10: Recognizing the need to undertake lifelong learning, and possessing /acquiring the capacity to do so;	PLO11: ability to become Entrepreneur;
	PEO1: To produce graduates with proficient knowledge and competency in various areas in Civil/ Electrical/ Mechanical Engineering	✓	✓	✓							
	PEO2: To produce graduates with professional, generic attributes to meet the present and future global demands.			✓	✓	✓			✓	✓	
	PEO3: To produce graduates with Islamic humanistic values and reinvention skills to meet the requirement of a dynamic environment. These skills include Civil Intelligence, Moral Intelligence, Self-Reliance and Communication Skills						✓	✓	✓		✓

16.	Mapping of the course Learning Outcome to the Programme Outcome										
Programme Learning Outcomes (PLO) Course Learning Outcome (CLO)	PLO1: Ability to acquire and apply knowledge of science and engineering fundamentals;	PLO2: Acquired in-depth technical competence in civil engineering discipline;	PLO3: Ability to undertake problem identification, formulation and solution;	PLO4: Ability to utilise systems approach to design and evaluate operational performance;	PLO5: Understanding of the principles of design for sustainable development;	PLO6: Understanding of professional ethics, Islamic values, social, cultural, global and environmental responsibilities of a professional engineer and commitment to them;	PLO7: Ability to communicate effectively, not only with engineers but also with the community at large;	PLO8: ability to function effectively as an individual;	PLO9: Ability to function effectively in group with the capacity to be a leader or manager;	PLO10: Recognising the need to undertake lifelong learning, and possessing /acquiring the capacity to do so;	PLO11: ability to become Entrepreneur;
	CLO1: Be familiar with some applications and methods of sequence, advanced integration, differentiation, ordinary differential equations; Fourier series and Laplace transforms,	✓									
	CLO2: Critically analyse and solve some mathematical problems	✓									
	CLO3: Show logical thinking in problem solving.	✓	✓	✓							

17.	Content outline of the course/module and the SLT per topic						
		Details	SLT (Hour)				
	L		T	P	IS	Total	
	Topic 1	Laplace Transformation • Definition and transformation of basic functions • Property of Laplace transform ▪ Linearity property ▪ First shifting property ▪ Multiplications by t^n ▪ Second shifting property ▪ Transformation for differential and integral function • Inverse Laplace transform ▪ Properties ▪ Partial fraction convolution • Solution of differential equation	12	4	-	20	36
	Topic 2	System of linear differential equation • Introduction • Review of Cramer’s rule • Solving system of DE using Laplace transform	9	3	-	15	27
	Topic 3	Fourier Series • Odd, Even and periodic function • Introduction to Fourier series • Half range • Harmonic analysis	12	4	-	20	36
	Topic 4	Partial differential equations and BVP • Introduction • Boundary value problem • Wave equation	9	3	-	15	27
	Total (Hour)		42	14	-	70	126
18.	Main references supporting the course 1. Engineering Mathematics by K. A. Stroud and Dexter J. Booth (Feb 9, 2007)						
	Additional references supporting the course 1. STROUD:FURTHER ENGINEERING, MATH 2ND ED by K. STROUD (Oct 8, 1992)						
19.	Other additional information All materials will be available to the students in the library.						