

1.	Name of Course				Structural Analysis I			
2.	Course Code				JSTA1073			
	JSTA= the first alphabet identify the faculty within which the subject is offered., JSTA= the remaining three alphabet identify the course that offers the subject, 1073 = the first digit identify level of study; in this case undergraduate level, 1073 = the second and third digits identify subject identity and 1073 = 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				Core subject in civil 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 hour per week x 14 weeks)							
8.	Prerequisite (if any)				Strength of material (JSTM 1203)			
9.	Course Objectives							
	1. The objective of this course is to equip the students with the basic principles of structural analysis of statically indeterminate structures.							
	Course Learning Outcomes (CLO)							
	At the end of the semester students should be able to:							
	CLO1: Analyse statics force and moment, stress and strain							
	CLO2: Analyse axial force for statically determinate pinned-jointed structure							
	CLO3: Analyse axial force, shear force and bending moment for statically determinate structure.							
	CLO4: Analyse deformation for statically determinate structures.							
	CLO5: Analyse statically intermediate structure using slope deflection and moment distribution method.							
	CLO6: Analyse statically intermediate structure using slope deflection and moment distribution method.							
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>Course Work</td><td>40%</td></tr> <tr> <td>Assignment</td><td>10%</td></tr> <tr> <td>Tutorials /Quizzes</td><td>10%</td></tr> <tr> <td>Test</td><td>20%</td></tr> <tr> <td>Examination</td><td>60%</td></tr> <tr> <td colspan="2"> </td></tr> <tr> <td><u>Total</u></td><td><u>100%</u></td></tr> </table>	Course Work	40%	Assignment	10%	Tutorials /Quizzes	10%	Test	20%	Examination	60%			<u>Total</u>	<u>100%</u>
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Test	20%														
Examination	60%														
<u>Total</u>	<u>100%</u>														
12.	Synopsis: This course provides the student with the knowledge of Statically determinate structure Influence line for statically determinate beam, Definition of statically determinate of structure Slope deflection method and Moment distribution method														
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: Analyse statics force and moment, stress and strain	Assignment Tutorial Quizzes Test Examination	Fail to: - Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test - Manage time and task	Poor to: - Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test - Manage time and task	Satisfactory to: - Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test - Manage time and task	Good to: - Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test - Manage time and task	Excellent to: - To: Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test - Manage time and task
	CLO2: Analyse axial force for statically determinate pinned-jointed structure	Assignment Tutorial Quizzes Test Examination	Fail to: - Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test - Manage time	Poor to: - Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test - Manage time	Satisfactory to: - Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test - Manage time and	Good to: - Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test	Excellent to: - To: Learn both independent and cooperatively - Use library skills, to find and organize information - Take responsibility and carry out laboratory test - Manage time and

			and task	and task	task	• Manage time and task	task
	CLO3: Analyse axial force, shear force and bending moment for statically determinate structure.	Assignment Tutorial Quizzes Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Excellent to: • To: Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task
	CLO4: Analyse deformation for statically determinate structures.	Assignment Tutorial Quizzes Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Excellent to: • To: Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task

	CLO5: Analyse statically intermediate structure using slope deflection and moment distribution method.	Assignment Tutorial Quizzes Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Excellent to: • To: Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task
	CLO6: Analyse statically intermediate structure using slope deflection and moment distribution method.	Assignment Tutorial Quizzes Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Excellent to: • To: Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task

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										
Course Learning Outcome (CLO) / Programme Learning Outcomes (PLO)	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;
	CLO1: Analyse statics force and moment, stress and strain	✓									
	CLO2: Analyse axial force for statically determinate pinned-jointed structure	✓									
	CLO3: Analyse axial force, shear force and bending moment for statically determinate structure.	✓	✓	✓							
	CLO4: Analyse deformation for statically determinate structures	✓	✓	✓							
	CLO5: Analyse statically intermediate structure using slope deflection and moment distribution method.	✓	✓	✓							

17.	Content outline of the course/module and the SLT per topic					
	Details	SLT (Hour)				
		L	T	P	IS	Total
Topic 1	Introduction - Introduction to Statics - Introduction to Stress and strain - Stress and strain transformations	3	1	-	5	9
Topic 2	Statically determinate structure - Portal frame - Calculation of Bending Moment, Shear Forces & axial force 3-Hinged Arch - Calculate Bending Moment, Shear Forces and axial force - Pinned-jointed structures - To determine axial force values in members by applying method of sections, method of joint and tension coefficient. - Suspended Cable - Introduction on cable. - To determine general formulation and simplest method of calculating internal force.	15	5	-	25	45
Topic 3	Influence line for statically determinate beam - Influence line sand their uses - Calculation of influence line for reaction, shear force and bending moment for simply supported beam under moving limit load.	6	2	-	10	18
Topic 4	Definition of statically determinate of structure Using energy method/ (unit load method for beam, portal frame and pin jointed structure).	6	2	-	10	18
Topic 5	Slope deflection method Calculation of internal forces for statically indeterminate (fixed end & continuous) beam and portal frame.	6	2	-	10	18
Topic 6	Moment distribution method Calculation of internal forces for statically indeterminate (fixed end & continuous) beam and portal frame.	6	2	-	10	18
Total (Hour)		42	14	-	70	126

18.	Main references supporting the course 1. Engineering Mechanics 2: Mechanics of Materials by Dietmar Gross, Werner Hauger, Jörg Schröder and Wolfgang Wall (Jun 29, 2011) 2. Structures (6th Edition) by Daniel Lewis Schodek and Martin Bechthold (Aug 4, 2007)
	Additional references supporting the course 1. J.D. Todd, Structural and Analysis, Macmillan Press, 1974. 2. H.N. West, Analysis of Structures, John Wiley & Sons. 1980. 3. W.T. Marshall, H.M. Nelson, Solution of Problems in Structure, Pitman Publishing Ltd., ELBS, 1978. 4. W. Morgan, D.T. Williams, Structural Mechanics, Sir Isaac Pitman & Sons Ltd., 1974. 5. Y.Y. Hsieh, Elementary Theory of Structures, Prentice-Hall, 1995.
19.	Other additional information All materials will be available to the students in the library.