

1.	Name of Course					Structural Design II				
2.	Course Code					JSTD2163				
	JSTD= the first alphabet identify the faculty within which the subject is offered., JSTD= the remaining three alphabet identify the course that offers the subject, 2163 = the first digit identify level of study; in this case undergraduate level, 2163 = the second and third digits identify subject identity and 2163 = 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 for civil engineering, student must understand and be able to carry up structural design.				
5.	Semester and Year offered					2/2				
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 Total =126		
				28	14	14	-			
7.	Credit Value					3.0				
	Lectures (2 hours per week x 14 weeks) Tutorial (1 hour per week x 14 weeks) Studio (2 hours fortnightly x 7 weeks)									
8.	Prerequisite (if any)					Structural Design I (JSTD2083)				
9.	Course Objectives 1. This course includes the Civil Engineering design of steel and timber in accordance with relevant standard. Course Learning Outcomes (CLO) At the end of the semester students should be able to: CLO1: Understand the principles of steel design CLO2: Able to carry out steel design for trusses, beam, column and collection CLO3: Understand the principle of timber design CLO4: Able to carry out timber design for floor joist, axially loaded solid and joints.									
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>5%</td></tr> <tr> <td>Tutorials /Quizzes</td><td>5%</td></tr> <tr> <td>Studio Work</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	5%	Tutorials /Quizzes	5%	Studio Work	10%	Test	20%	Examination	60%			<u>Total</u>	<u>100%</u>
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12.	Synopsis: The Course provides the student with the knowledge of Steel Design and Timber Design																
13.	Mode of Delivery: Lectures; Tutorial; Studio.																

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: Understand the principles of steel design.	Assignment Tutorials Quizzes Studio work 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: Able to carry out steel design for trusses, beam, column and collection.	Assignment Tutorials Quizzes Studio work Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out	Excellent to: • To: Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out

			• Manage time and task	• Manage time and task	laboratory test • Manage time and task	laboratory test • Manage time and task	laboratory test • Manage time and task
	CLO3: Understand the principle of timber design.	Assignment Tutorials Quizzes Studio work 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: Able to carry out timber design for floor joist, axially loaded solid and joints.	Assignment Tutorials Quizzes Studio work 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

Bachelor of Civil Engineering (Hons)

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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											
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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 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: To design steel structures in accordance with relevant standard.	✓									
	CLO2: To design timber structures in accordance with relevant standard.	✓									
	CLO3: Understand the principle of timber design.	✓	✓	✓							
	CLO4: Able to carry out timber design for floor joist, axially loaded solid and joints.	✓	✓	✓							

17.	Content outline of the course/module and the SLT per topic						
		Details	SLT (Hour)				
			L	T	P	IS	Total
	Topic 1	Steel Design Introduction to design process Basic concept of steel structure elements and frames; Elastic and Plastic design methods; Basic consideration in materials and loading. Partial safety factors, Introduction to relevant code of practice. introduction to limit states concepts in steel design steel element behaviour steel trusses simple steel beam design simple steel column design simple steel connection design	14	7	7	35	63
		Timber Design Timber as Engineering Material Basic concepts of timber structural applications; allowable stresses for timber, characteristic of timber, moisture contents, grain influence and strength, reducing characteristics. Introduction in accordance with relevant standard. Deformation of Timber Strength of Timber Design of timber structures Design methods, strength classes and modification factors. Joint of timber Supports, nailed joints, bolted joints, split- ring, connector joints and ties. Floor joists and simply supported beams Tension and compressive trusses Axially loaded solid	14	7	7	35	63
Total (Hour)		28	14	14	70	126	
18.	Main references supporting the course						
	1. Design of Structural Timber by W M C McKenzie (Sep 12, 2007) 2. Structural Steel Design (4th Edition) by Jack C. McCormac (Jun 8, 2007) 3. Structural Steelwork, Third Edition: Design to Limit State Theory - Paperback (Apr. 1, 2004) by Dennis Lam, Thien-Cheong Ang and Sing-Ping Chiew						
	Additional references supporting the course						
	1. BS 5950: Part I, 1985 The Use of Structural Steel in Building, Code of Practice for Design in Simple and Continuous Construction: Hot rolled sections. 2. Graham W. Owens, Peter R. Knowles and Patrick J. Dowling, Steel Designer's Manual, Steel Construction Institute. 1994 3. BS 5268: Part 2 : 1991, Structural Use of Timber, Code of Practice for Permissible Stress Design, Materials and Workmanship.						

	4. MacGinley, T.J & Ang, T.C., Structural Steelworks Design to Limit State Theory. Butterworth & Co. Ltd. 1990. 5. C.J. Mettem, Structural Timber Design and Technology, Longman Scientific & Technical, 1985. 6. Ozelton, E.C and Baird J.A. (2003). Timber designers manual, 3rd ed. Blackwell.
19.	Other additional information All materials will be available to the students in the library.