

Structural design IV

MEDIU MQA
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Abstract: Core subject for civil engineering, student must understand and be able to carry up structural design.

Contents:

1.	Name of Course				Structural design IV				
2.	Course Code				JSTD4353				
	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, 4353 = the first digit identify level of study; in this case undergraduate level, 4353 = the second and third digits identify subject identity and 4353 = 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				1/4				
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	
				28	14	14	-	Total =126	
7.	Credit Value				3.0				
	Lecture (2 hours per week x 14 weeks) Tutorial (1 hours per week x 14 weeks) Studio (2 hours per week x 7 weeks)								
8.	Prerequisite (if any)				Structural Design III(JSTD3233)				
9.	Course Objectives 1. The objective of this course is to equip the students with further knowledge on design in steel structures - in accordance with relevant standards. This will include design of plate girder and crane girder, eccentrically loaded stanchion and stanchion base, portal frames analysis of wind loading on steel structures. Course Learning Outcomes (CLO) At the end of the semester students should be able to: CLO1: To analyse the wind loading CLO2: To design the plate girder, crane girder, essentially loaded stanchion and stanchion base, in steel design. CLO3: To design steel portal frames.								
10.	Transferable Skills: This course is expected the development of the following transferable skills: ▪ An ability to manage time and task ▪ An ability to learn both independently and co—operatively; ▪ An ability to take responsibility and carry out agreed task; ▪ An ability to analyse; ▪ An ability to solve the problems ▪ 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 Works</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>	Course Work	40%	Assignment	5%	Tutorials /Quizzes	5%	Studio Works	10%	Test	20%	Examination	60%	<u>Total</u>	<u>100%</u>
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<u>Total</u>	<u>100%</u>														
12.	Synopsis: Further design in steel structures - in accordance with relevant standards. This will include design of plate girder and crane girder, eccentrically loaded stanchion and stanchion base, portal frames.														
13.	Mode of Delivery: Formal lectures and tutorial will be conducted 3 hours per week. Corporative learning is also conducted in which small group is formed which consist of student of different levels of ability.														

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: To analyse the wind loading	Assignment Tutorials Quizzes Studio works 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: To design the plate girder, crane girder, essentially loaded stanchion and stanchion base, in steel design	Assignment Tutorials Quizzes Studio works 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

	CLO3: To design steel portal	Assignment Tutorials Quizzes Studio works 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
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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							✓	✓	✓		✓

16.	Mapping of the course Learning Outcome to the Programme Outcome											
Programme Learning Outcomes (PLO)		Course Learning Outcome (CLO)										
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CLO1:	To analyse the wind loading	✓										
CLO2:	To design the plate girder, crane girder, eccentrally loaded stanchion and stanchion base, in steel design	✓										
CLO3:	To design steel portal frames.	✓	✓	✓								

17.	Content outline of the course/module and the SLT per topic					
	Details	SLT(Hour)				
		L	T	P	IS	Total
	Topic 1 Structural Steelwork Design - An analysis and design of loading and application of wind loading. - Eccentric connections for bolts and welds, high-strength friction grip bolts. Beams to beam and beam to column connections. - Analysis and design of Plate girders and crane gantry girder. - Analysis and of eccentrically loaded stanchions - cased and uncased stanchions and craned stanchions - application to building frames. - Analysis and design of Stanchion base - slab and gusset bases - grillage bases - holding down bolts	14	7	6	30	57
	Topic 2 Portal Frame Design Design of steel structure element	6	3	4	20	33
	Topic 3 Project Assignments Design of steel building.	8	4	4	20	36
	Total (Hour)	28	14	14	70	126
18.	Main references supporting the course - Design of Structural Timber by W M C McKenzie (Sep 12, 2007) - Structural Steel Design (4th Edition) by Jack C. McCormac (Jun 8, 2007) - 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 - BS 5950 : Part 1 ; 'The Use of Structural Steel in Building' 1985 - BCSA, Constrado, 'Hand Book on Structural Steelwork' - BS 8110, 'Structural Use of Concrete : Part 1, 2 & 3. 1995. - BS 4466 : 'Specification for Bending Dimensions & Scheduling of Reinforcement for Concrete', 1981. - Seminar paper, 'Design Analysis to BS 5950 : 1985', K.L. May 1986.					
19.	Other additional information All materials will be available to the students in the library.					

References:

- Design of Structural Timber by W M C McKenzie (Sep 12, 2007)
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