

1.	Name of Course				Civil and Structural Engineering Design
2.	Course Code				JICE4414
	JICE = the first alphabet identify the faculty within which the subject is offered., JICE = the remaining three alphabet identify the course that offers the subject, 4414 = the first digit identify level of study; in this case undergraduate level, 4414 = the second and third digits identify subject identity and 4414 = 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				Enable student to carry out complete design process of a project in Civil and Structural engineering
5.	Semester and Year offered				2/4
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	S	Independent Study (IS)= 70 Total =168
		-	-	84	
7.	Credit Value				4.0
	Supervising (1 hour per week x 14 weeks) Studio (6 hours per week x 14 weeks)				
8.	Prerequisite (if any)				Structural Design IV (JSTD4353)
9.	Course Objectives 1. The objective of this course is to equip the students with theory, tools and techniques of engineering design and creative problem solving as well as design issues and practices in civil engineering. It is meant to expose students to real world environmental engineering projects through capstone design projects. Course Learning Outcomes (CLO) At the end of the semester students should be able to: CLO1: To familiarize the students on the method of analysis and design of tall buildings with respect to appropriate codes of practice and building by-laws. CLO2: To apply knowledge of civil engineering theories and technologies which had been taught in the earlier semesters CLO3: To train the students on solving real life practical design problems under design office environment. CLO4: Demonstrate effective communication skill through presentation and defense of design project. CLO5: Demonstrate leadership skills, ability to work independently and in a team through project design, presentation and defense of project finding.				
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>Project I (Tall building)</td><td>70%</td></tr> <tr> <td>Project II (Capstone Project)</td><td>30%</td></tr> <tr> <td>Project I (70%)</td><td></td></tr> <tr> <td>Log Book</td><td>30%</td></tr> <tr> <td>Industry and Presentation</td><td>30%</td></tr> <tr> <td>Report</td><td>40%</td></tr> <tr> <td colspan="2"> </td></tr> <tr> <td>Total</td><td><u>100%</u></td></tr> <tr> <td>Project II (30%)</td><td></td></tr> <tr> <td>Log Book</td><td>30%</td></tr> <tr> <td>Presentation</td><td>20%</td></tr> <tr> <td>Report</td><td>50%</td></tr> <tr> <td colspan="2"> </td></tr> <tr> <td>Total</td><td><u>100%</u></td></tr> </table>	Project I (Tall building)	70%	Project II (Capstone Project)	30%	Project I (70%)		Log Book	30%	Industry and Presentation	30%	Report	40%			Total	<u>100%</u>	Project II (30%)		Log Book	30%	Presentation	20%	Report	50%			Total	<u>100%</u>
Project I (Tall building)	70%																												
Project II (Capstone Project)	30%																												
Project I (70%)																													
Log Book	30%																												
Industry and Presentation	30%																												
Report	40%																												
Total	<u>100%</u>																												
Project II (30%)																													
Log Book	30%																												
Presentation	20%																												
Report	50%																												
Total	<u>100%</u>																												
12.	Synopsis: Designs to be given in the final year course will print guidance material with design office environment. Design projects will be set which will require students to put into design practice and integrated in nature whereby design practice material learned in other civil engineering methods such as structural design, Geotechniques, infrastructure design including roads, sewage, drainage, earthwork taking off quantity will be used. Students will work in teams and individually to design projects and develop feasible solution producing calculation and drawing. Students will use software to design and compare the result manually.																												
13.	Mode of Delivery: Lecturers; Assignments;																												

	Projects; Presentation.
--	----------------------------

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 familiarize the students on the method of analysis and design of tall buildings with respect to appropriate codes of practice and building by-laws strain	Test Tutorial Design work	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 apply knowledge of civil engineering theories and technologies which had been taught in the earlier	Test Tutorial Design work	Fail to: - Learn both independent and cooperatively - Use library skills, to find and	Poor to: - Learn both independent and cooperatively - Use library skills, to find and	Satisfactory to: - Learn both independent and cooperatively - Use library skills, to find and	Good to: - Learn both independent and cooperatively - Use library skills,	Excellent to: - To: Learn both independent and cooperatively - Use library skills, to find and

	semesters		organize information • Take responsibility and carry out laboratory test • Manage time and task	organize information • Take responsibility and carry out laboratory test • Manage time and task	organize information • Take responsibility and carry out laboratory test • Manage time and task	to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	organize information • Take responsibility and carry out laboratory test • Manage time and task
	CLO3: To train the students on solving real life practical design problems under design office environment.	Test Tutorial Design work	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: Demonstrate effective communication skill through presentation and defense of design project.	Test Tutorial Design work	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize	Good to: • Learn both independent and cooperatively • Use library skills, to find and	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	information • Take responsibility and carry out laboratory test • Manage time and task	information • Take responsibility and carry out laboratory test • Manage time and task	organize information • Take responsibility and carry out laboratory test • Manage time and task •	information • Take responsibility and carry out laboratory test • Manage time and task
	CLO5: Demonstrate leadership skills, ability to work independently and in a team through project design, presentation and defense of project finding.	Test Tutorial Design work	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											
	Programme c 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: To familiarize the students on the method of analysis and design of tall buildings with respect to appropriate codes of practice and building by-laws.	✓										
	CLO2: To apply knowledge of civil engineering theories and technologies which had been taught in the earlier semesters	✓										

	CLO3: To train the students on solving real life practical design problems under design office environment.	✓	✓	✓								
	CLO4: Demonstrate effective communication skill through presentation and defense of design project.	✓	✓	✓								
	CLO5: Demonstrate leadership skills, ability to work independently and in a team through project design, presentation and defense of project finding.	✓	✓	✓								

17.	Content outline of the course/module and the SLT per topic					
	Details	SLT (Hour)				
		L	T	P	IS	Total
Topic 1	Guided design project A small group of students is given an open-ended problem. They are guided to the solution by instructions to perform each step in the decision-making process and feedback on what should have been found. Students must learn new material to solve problem.	7	-	42	35	84
	Integrated design project (1st week to 10th weeks) Open-ended problem requiring student to work at or slightly above his/her present development. May require new material to be investigated. Compare student solution with the actual design. Professional or authentic (real life). When problem is encountered there are no clues, no 'tools' are identified and no certainty that an acceptable solution even exists, i.e. 'no feasible solution with present technology' is a possible conclusion.					
Topic 2	Capstone design project week 11th to week14th design of single support span bridge or other design project from other discipline	7	-	42	35	84
	Syllabus For the first ten weeks, a complete Tall Building design (multi-storey building and foundation) will be tackled by the students working in groups of not more than five and other four weeks as design of a simple single span bridge or other design form from other disciplines. The finished work will normally include drawings, calculations, quantity measurements and skeleton work programme and specifications. During lectures detailed approach to each design will be suggested, along with review of common problems. The following are the possible designs lectures to be given: Lectures few 1st week to 10th week ; • Architecture layout • Structure layout • Loading • Method of construction • Infrastructure • Cost of (Bill quantities) • M and E consideration • Detailing • Environmental issues Lectures from 11th week to 14th week • Design of simple bridge Or other design project from other discipline					

	Total (Hour)	14	-	84	70	168
18.	Main references supporting the course 1. Wan Mahmood Et al. 'Structural Design Lo', UPENA UiTM 2010 2. BS 8110 : Part I, II & III : 1995, 'Structural Use of Concrete', London. 3. Reynolds and Steedman, "Reinforced Concrete Designer's Handbook", 11th Edition, E & FNSpon Ltd., London. 4. The Concrete Society, the Institution of Structural Engineers. "Standard Method of Detailing Reinforced Concrete".					
	Additional references supporting the course 1. Design recommendation for multi-storey and underground car parks (2nd Ed), JT Committee I Structure and IHT, Jan. 1984. 2. Design of Shear Wall Buildings. Foundation and Earth Structures Design Manual 7.1 and 7.2 Dept. of Navy, NAFAC, May 1982.					
19.	Other additional information All materials will be available to the students in the library.					