

SCHEME OF WORK / LESSON PLANNER

Session:

2015/ 2016

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SEMESTER BASED



NATIONAL DIPLOMA CONSTRUCTION unit 14 --STRUCTURAL MECHANICS

Teachw eek No.	Lesson Count	Date	Topic to be covered in class	Type of Teaching to take place (eg Pedagogic, Practical, Self Directed Research, Tutorial, Assessment)	Special Care eg Differentiation, Grouping, Special Support etc	Assignments & Submission Dates	
1	1	11-Sep	Introduction to Topic, static v dynamic loading, forces: weight, reactive forces. Units. Action & Reaction. Tension, Compression. Density, Mass. Dead loads, Live loads, wind loads, snow loads. Probability and limit state design. Partial safety factors, overloading vs variability of strength of materials	Reading material on VLE. Recommended book: "Structural Mechanics" - by DURKA, MORGAN, WILLIAMS. ISBN: 0-582-01851-X Discussion + pedagogic + questions at end	Student to write answers to questions and submit. Use to check ability/ listening/ understanding abilities.		
	2		Forces, Action, Reaction, Units: kg, kN, Density of common materials. Dead, Imposed & Wind loads,	Powerpoint presentation 1, Peadagogic. Questions and answer discussion at end.	Write down list of common building materials and find density		
2	3	18-Sep	Vectors , Equilibrant, Resolution of forces, Parallelogram and triangle of forces. Graphic solution. Polygon of forces.	Powerpoint presentation 2, Peadagogic. Questions and answer discussion at end.	Discuss forces acting in cathedral cross section - last slide		
	4		Principle of the Lever, Determination of reaction, simple moment calculations, Graphical solution to reaction calcs	Powerpoint presentation 3, Peadagogic. Student based calculation to determine reaction at end.	One to one interaction. Collect student work at end to analyse competence.	SET ASSIGNMENT 1	
3	5	25-Sep	Deformation of beams, cantilevers, frames. Column and end restraint. Demonstrate deformed shapes with flexible plastic ruler. Tension, compression, struct, tie.	Pedagogic + discussion based on demonstration with plastic rule. Draw on board deformed shape, add stressess.	Ask able students to demonstrate with ruler and write on board the stresses involved.		
	6		Simple Beam Reaction, Point Loads, UDL. Clockwise moment = anticlockwise, sum of vertical forces.	Demonstrate simple calculations on board. Student to repeat	Set in groups, Check correct setting out of work.		
4	7	02-Oct	REACTIONS, SFD, BMD FOR BEAMS & CANTILEVERS WITH MULTIPLE LOADS	Demonstrate simple calculations on board. Student to repeat. Check work individually	Put less able students with more competant help	SUBMIT ASSIG 1	
	8		CONTINUE REACTIONS, SFD, BMD FOR BEAMS & CANTILEVERS WITH MULTIPLE LOADS	Demonstrate assignment type scenarios with beams -- check individual students work	Put less able students with more competant t help		
5	9	09-Oct	CONTINUE REACTIONS, SFD, BMD FOR BEAMS & CANTILEVERS WITH MULTIPLE LOADS	Demonstrate assignment type scenarios with cantilevers -- check individual students work	students to finish off assignment in class with individual & peer help		
	10		Demonstrate algebraic solution of simple beam point load problems. Show how to use formula	work on board, student to repeat similar	explain application to merit work		
6	11	16-Oct	Demonstrate algebraic solution of simple beam UDL problems. Show how to use formula. Repeat with combined loads.	work on board, student to repeat similar	explain application to merit work	IN CLASS TEST = ASSIGNMENT 2	
	12		Reminder of SFD, BMD as applied to cantilevers.	Demonstrate assignment type scenarios with cantilevers -- check individual students work	Student to start assignment in class, individual help as necessary		
7	13	23-Oct	Reminder of vectors forces and graphical solutions. Apply to simple frames. Struts and Ties, tension & Compression .Demonstrate Bows Notation and show graphical solution to frame problem	Student to do exercise on graphical solution in class	Less competant students to watch peers do drawing of forces vectors		
	14		Application of resolution of forces applied to frames.	Student exercise in class. Similar scenario to assignment.	Ensure grouping to put able with less able students.		
8		30-Oct	AUTUMN HALF TERM BREAK				
9	15	06-Nov	Axial loading of columns & stresses involved. Short columns and long columns. Eccentric loading and resultant stress. Stress indicator diagram.	Student exercise in class. Similar scenario to assignment.	Ensure grouping to put able with less able students.		
	16		Effective length of column, Slenderness ratio, End restraint.	Practical examples of end restraint to be researched on line by students.	Do in groups and present findings to class.	IN CLASS TEST = ASSIGNMENT 3	

10	17	13-Nov	Tutorial time to allow assignments to be started in class	Individual feedback as requested	Commence work in class and request help as needed	
	18		Bending Theory for simple beams. Calculating simple beam section in elastic material to resist bending.	Pedagogic: timber design + research on Internet re BS on timber	Group work and research. Help individual as needed	SET ASSIGNMENT 4
11	19	20-Nov	Calculating Section Modulus and 2nd moment of area for simple sections.	PP slides + Do calc on Board	Try calculations - check progress individually	
	20		Sizing Timber columns and posts. Do example on Board	PP slides, Set example to work out then present answer	Try calculations - check progress individually	
12	21	27-Nov	Sizing Steel column and struts. Do example on Board	PP slides, Set example to work out then present answer	Try calculations - check progress individually	SUBMIT ASSIG 4
	22		Sizing short RC columns. Do example on Board	PP slides, Set example to work out then present answer	Try calculations - check progress individually	SET ASSIGNMENT 5
13	23	04-Dec	Example of computer software	Peagogic and exercise on PC	individual help as necessary	IN CLASS, ON PC, DO ASSIGNMENT 9
	24		Tutorial to allow to finish assignment	Student based assignment	individual help as necessary	
14	25	11-Dec	Calculating Section Modulus and 2nd moment of area for simple sections. --reminder	PP slides + Do calc on Board	Try calculations - check progress individually	SUBMIT ASSIG 5
	26		Calculating Section Modulus and 2nd moment of area for more complex sections. Use of tables.	PP slides, Set example to work out then present answer	Try calculations - check progress individually	SET ASSIGNMENT 6
15	27	18-Dec	Timber design overview, BS standards. Modification factors	PP slides, Set example to work out then present answer	Try calculations - check progress individually	
	28		Steel design, overview, BS standards, tables for RSJ, UB, UC steel sections.	PP slides, Set example to work out then present answer	Try calculations - check progress individually	SET ASSIGNMENT 7
16		25-Dec	CHRISTMAS BREAK			
17		01-Jan				
18	29	08-Jan	Reinforced Concrete design. Elastic, permissible stress and Limit state design. Use of formula and tables in codes of practice.	PP slides. Design on board. Use of tables in codes.	Research Eurocodes. Use tables	
	30		Tutorial time to allow assignments to be completed in class	Student based assignment	individual help as necessary	SUBMIT ASSIG 6
19	31	15-Jan	Retaining wall design	PP slides, Set example to work out then present answer	Try calculations - check progress individually	
	32		Retaining wall design	PP slides, Set example to work out then present answer	individual help as necessary	SUBMIT ASSIG 7
20	33	22-Jan	Tutorial time to allow assignments to be completed in class	Student based assignment	individual help as necessary	IN CLASS TEST = ASSIGNMENT 8
	34		ADVISE TODAY FINAL DATE OF SUBMISSION	NO MORE TIME	FIN!	COLLECT OUTSTANDING ASSIGNMENTS
21	35	29-Jan	NEW MODULE: STRUCTURAL ANALYSIS			
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