Course Syllabus

CVLE 211 Mechanics of Materials

Course Syllabus – Spring 2015-2016

Curricular Area		Civil Engineering – Structural Sequence
Type of Course		Mandatory - Major
Catalogue Description		Center of Gravity. Moments of Inertia. Stresses, strains, and stress-strain relationships. Temperature effect. Stresses due to axial loads. Axial deformations. Torsion of circular bars. Stresses due to bending. Stresses due to axial and biaxial bending. Shear stresses. Combined stresses. Stress transformation and Mohr's circle. Buckling of columns.
Prerequisites by Courses		CVLE111 – STATICS, PHY282- Material Properties and Heat
Prerequisites by Topics		----------
Instructors		Oussama BAALBAKI (obaalbaki@bau.edu.lb) Engineering Building F – Department of Civil Engineering Office, second floor, F113 (Phone Ext 3429)
Office Hours		Monday: 10:30 –12:30 ; Wednesday: 10:30 –12:30; or by appointment.
Load		3 credits; 2 Lecture-sessions/week – 75min per session
Textbook		Beer, F.P., Johnston, E.R., DeWolf, J.T, "Mechanics of Materials", McGraw-Hill 4th Edition or latest.
Reference Books		Egor P. Popov, "Engineering Mechanics of Solids", Prentice-Hall, 2nd Edition or latest. R.C. Hibbeler, "Mechanics of Materials", Seventh Edition, Prentice Hall, Pearson,
Topics	**Week [1]**	1. Introduction to the mechanics of solids 2. Review of principles of Statics • Equilibrium principles
	Week [2-3]	3. Concepts of stress and strain • Axial and shear stresses/strains • Stress-Strain relationships • Generalized Hooke's Law` • Temperature • Design criteria and safety factors
	Week [4-5]	4. Axial members • Axial stress, strain/deformation, and displacement • Lateral strain: Poisson's ratio • Introduction to design • Applications • Statically indeterminate systems
	Week [6-7]	5. Torsion of circular members • Limitations to circular/tubular bars • Shear stress, strain/deformation, and rotation • Analogy with axial systems • Applications
	Week [8-9]	6. Bending problems • Pure bending • Axial stress, strain/deformation, and curvature • Composite beams: Transformed section • Bending with axial load (load combination) • Biaxial bending w/o axial load • Applications \
	Week [10-12]	**7. Shear stresses in beams** **• Shear stress and strain** **• Applications**

	Week [13-14]	**8. Stress transformation** **• Stress transformation equations** **• Mohr's circle graphical representation**
	Week [15]	9. Buckling of columns.

Learning Outcomes Correlation with	**Program Outcomes**	**Program Objectives**
To apply the principles of statics to determine the external and internal resultant loadings in a body.	a	1
To describe and determine the state of stress due to axial forces, torsion, shear forces, and bending, and determine the resulting deformations associated with these effects.	a	1
To analyze, and determine the stresses that result from combined loads such as axial forces, torsion, shear forces, and bending.	a	1
To perform stress and strain transformation.	a	1
To design components to meet desired needs in terms of strength and deformation.	c	1-3

Learning Outcomes Assessment Tools	**Exams**	**HW s**	**Lab Reports**	**Project Report**	**Course Survey**
To apply the principles of statics to determine the external and internal resultant loadings in a body.	✓	✓			✓
To describe and determine the state of stress due to axial forces, torsion, shear forces, and bending, and determine the resulting deformations associated with these effects.	✓	✓			✓
To analyze, and determine the stresses that result from combined loads such as axial forces, torsion, shear forces, and bending.	✓	✓			✓
To perform stress and strain transformation.	✓	✓			✓
To design components to meet desired needs in terms of strength and deformation.	✓	✓			✓

Assessment:

1. homework assignments and Quizzes: (20%)
2. Test 1 (20%)
3. Test 2 (20%)
4. Final Exam: (40%)
5. **ZERO-TOLERANCE** policy on cheating and plagiarism.

Attendance: Attendance is **mandatory**. Class attendance will be taken and students will be penalized for absences according to the rules set by BAU regulations, and specified in the CE Student Manual; i.e. students who miss more than one-fifth of the sessions of any course in the first ten weeks of the semester will be required to withdraw from the course with a grade of "W".

Assessment Dates:

Test 1: 7th week
Test 2: 12th week
Final Exam: Assigned later by BAU registrar

Course Coordinator	Prof. Oussama BAALBAKI
Date	Feb, 2016

Copies of assignments with samples of students work

Copies of quizzes and tests with keys and samples of students work

Sample of PowerPoint presentations

Final exam and copies of students' worksheets

Students’ attendance record and copies of warnings given to students

Grades Report

Instructor's Course Assessment

CVLE 211– Instructor's Assessment

I. Course Information

Instructor Name: Dr. Wahib Arairo **Course Code/Number: CVLE 211** **Term**: **Fall 2015/2016**

II. Learning Outcomes and Performance Measures

Highlight the level that best describe the course's contribution to the associated student learning outcome[+]. Circle NA if the attribute does not apply to this course.

	Learning Outcome (or Course Objectives)	Level of Course Contribution to Outcome[+]					Performance measure*
a	To apply the principles of statics to determine the external and internal resultant loadings in a body.	1	2	3	4 ✓	**5**	Homework assessment, exam 1 and final exam were sufficient to show a very good comprehension of topic
b	To describe and determine the state of stress due to axial forces, torsion, shear forces, and bending, and determine the resulting deformations associated with these effects.	1	2	3 ✓	4	**5**	Average grade of exam 2 indicated acceptable comprehension level of the studied topics
c	To analyze, and determine the stresses that result from combined loads such as axial forces, torsion, shear forces, and bending.	1	2	3	4 ✓	**5**	Average grade of exam 1 and final exam as well as final exam indicated acceptable comprehension level of the studied topics
d	To perform stress and strain transformation.	1	2	3 ✓	4	**5**	Average grade of assessment 1as well as project presentation indicated acceptable comprehension level of the studied topics
e	To design components to meet desired needs in terms of strength and deformation.	1	2	3	4 ✓	**5**	The average grade of the final exam and the project presentation indicated acceptable comprehension level of the studied topics

[+] 1 = No contribution to the outcome; 5 = Major contribution to the outcome

[*] Example: Class performance or grades on a related question in an exam(s), quiz, homework, project, oral presentation, etc. to quantify the level of course contribution to outcome.

III Course/Instructor Evaluation

Average Rating

Students written Comments on

In what ways did the instructor enhance your learning in the course?

Were there particular impediments to your learning in the course?

Do you think the course has developed your intellectual skills and interests: In what ways, specifically?

Please give any specific suggestions you have for improving the course.

IV Instructor's Course Assessment

1) Strengths
2) Deficient Learning outcomes
3) Insights
4) Recommended Actions

Instructor: Name **Date**: Month/Day/Year.

Course Report Form

CVLE 211 – Course Report

Course Code/Title/Section	CVLE 211	Semester/Year	Fall/2015-2016
Instructor Name	Dr. Wahib Arairo	Department	Civil and Env.
Number of Students	150	Course grade average	71.95

Deviation from Course Contents

List the topics stated in the syllabus but were not covered in the course and state the reasons

List the topics that were covered but were not included in the syllabus and state the reasons
N/A

Revise Learning Outcomes

List changes to be made to the course learning outcomes from what was proposed in the course syllabus and explain why.

Course resources

a) Textbook: Beer, F.P., Johnston, E.R., DeWolf, J.T, "Mechanics of Materials", McGraw-Hill 4th Edition or latest.

b) References: Egor P. Popov, "Engineering Mechanics of Solids", Prentice-Hall, 2nd Edition or latest.
R.C. Hibbeler, "Mechanics of Materials", Seventh Edition, Prentice Hall, Pearson,

c) Other resources and teaching tools:

d) Recommended changes: *No changes*

Course assessment tools used

a	Number of assignments (A)	**07**	grade percentage	**5**
b	project		grade percentage	
c	Number of lab assignments (L)		grade percentage	
d	Number of quizes (Q)	**1**	grade percentage	**10**
e	Number of tests (T)	**2**	grade percentage	**25-20**
f	Final examination (F)	☒Yes ☐No	grade percentage	**40**
Formula used for tallying final grade				

Grade distribution

Grade Range	# Students
>90	
< 90 and ≥ 80	
< 80 and ≥ 70	
< 70 and ≥ 60	
< 60	
Dropped	

Students' Instructor/Course Evaluation Report

Course File Assessment Form

CVLE 211 – Course File Assessment

This assessment shall be conducted by the Chairperson of the Department and verified by the Dean of the Faculty. A copy of this form is given to the concerned Faculty member for future improvement. A copy is also kept in the Faculty member's file. The quality of the course file will be used as a component in the overall assessment of teaching effectiveness.

Instructor's Name	Dr. Wahib Arairo
College Department	Civil and Environmental
Course Code and Title	Mechanics of Materials CVLE 211
Term & year course taught	Fall 2015/2016

Please evaluate the quality/relevancy/comprehensiveness of the following components by providing a grade from 1 to 5 (5 = Outstanding, 1 = Inadequate, 0 = Not Included)		
Component	**Grade**	**Comments**
1) Cover page		
2) Table of Contents		
3) Faculty Schedule		
4) Course syllabus		
5) Assignments with Samples of student work (High, Average, Low)		
6) Projects with samples of students reports (High, Average, Low)		
7) Quizzes with keys and samples of students work (High, Average, Low)		
8) Tests with keys and samples of student work (High, Average, Low)		
9) Handouts (samples)		
10) PPT Presentations (Samples)		
11) Final Exam with key and samples of student work (High, Average, Low)		
12) Attendance log with copies of warning letters given to students		
13) Grades reports		
14) Teaching innovation methods used		
15) Course Report Form		
16) End-of-Term Instructor's Course Assessment		
17) Instructor's/Course Assessment Form		

Chairperson's Comments and Recommendations to the Faculty member
Signature: Date:

Dean's Comments and Recommendations to the Faculty member
Signature: Date: