CARLETON UNIVERSITY
Department of Civil and Environmental Engineering

Course Outline
CIVE 5101 – Solid Mechanics — Fall 2017

Time: **Monday 6:00-9:00 pm**
Place: **UC 279**

Instructor: **Khoo, H.A.** **Room 3364 ME**
Phone 520-2600 Ext. 5798 **heng.khoo@carleton.ca**
Office Hour: **open door policy**

Objective: **This course is intended as an introduction to continuum mechanics and theory of elasticity. It will serve also as a foundation for advanced studies in solid mechanics.**

Course Webpage: **cuLearn** ***(Check course webpage at least once a week. Notes relevant to the upcoming lecture will be posted on the webpage; normally at least one day ahead of the class.)***

Course Outline:

1. Vectors and tensors (basic tools)
2. Stress: stress tensor, transformation, differential equations of equilibrium, principal stresses and invariants
3. Strain: strain – displacement equations, transformation, relative displacement and rotation
4. Constitutive equations for linear elasticity
5. Plane stress and plane strain problems in linear elasticity
6. Energy principles and variational methods
7. Mathematical theory of plasticity

Marking:

Assignments:	40%
Final Exam:	60%

Notes:

1. The instructor may modify the outline during the term as the course progresses.
2. Final examination is for evaluation purposes only and will not be returned to the student.
3. Academic Accommodation

   You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:
   Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).

4. Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).
5. You may discuss with others, but you are required to submit your own work for Homework. You may not complete the submitted work collaboratively. See the institutional policy on the academic integrity (http://carleton.ca/studentaffairs/academic-integrity/)

Some References:

1. Chou and Pagano: *Elasticity: Tensor, Dyadic and Engineering Approaches*
2. Timoshenko and Goodier: *Theory of Elasticity*
3. Fung: *Foundations of Solid Mechanics*
4. Sokolnikoff: *Mathematical Theory of Elasticity*
5. Wang: *Applied Elasticity*
6. Nadeau: *Introductory to Elasticity*
7. Jeffreys: *Cartesian Tensors*
8. Westergaard: *Theory of Elasticity and Plasticity*
9. Fung: *A First Course in Continuum Mechanics*
10. Hodge: *Continuum Mechanics*
11. Malvern: *Introduction to the Mechanics of a Continuous Medium*
12. Prager: *Introduction to Mechanics of Continua*
13. Spencer: *Continuum Mechanics*