UNIVERSITY OF TORONTO
Department of Civil Engineering

2013-2014 **MECHANICS - CIV 100F**

Lecturer: Prof. Oya Mercan, Room GB 331, 416-978-5971, oya.mercan@utoronto.ca
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Lectures:
Mon.: 14:00-15:00 BA 1170
Tue. : 16:00- 17:00 MC 252
Thu. : 14:00-15:00 MC 252

Tutorial: Fri. : 14:00-16:00 SF 3202

Evaluation:			
	Weekly **tutorial** problems sets	5%	**40% term work component (will be normalized to a class average of 28/40)**
	Quiz 1- Oct. 4 - (2:10pm in SF3202)	2.5% (1 hour)	
	Term Test – Oct. 22-(12-2pm, common)	30% (1.5 hours)	
	Quiz 2- Nov. 22 - (2:10pm in SF3202)	2.5% (1 hour)	
	Final Examination (TBA)	**60%**	**(common for Year I)**
		100%	

Text and notes:
Engineering Mechanics: Statics, 13th Edition in SI units, R.C. Hibbeler, Pearson Prentice-Hall, 2013, and the associated study pack. Complementary notes, dated July, 2010, on three topics in strength of materials are shrunk-wrapped with the texts. Complementary notes are also available as pdf file on the Portal/Blackboard. Students taking MIE100S will purchase both the statics and dynamics text, along with the shrunk-wrapped notes.

Quizzes, test and exam will be "closed-book" i.e., no aids allowed except for a non-programmable calculator.

Permissible non-programmable calculators are: **Casio FX991, Sharp EL520** (Trailing letters after a model number are irrelevant.) In class you may use **only** one of the three calculators listed.

For each of the teaching sections of CIV 100F, the 40% term work component will be **normalized** to a class average of **28/40** (i.e., 70%). This may require either raising or lowering the actual marks obtained.

Portal/Blackboard (http://portal.utoronto.ca) is going to be used for the posting of marks.

Plagiarism is an academic offence. Sanctions range from a zero for the work to an expulsion from the university and a notation on the transcript.

Petitions for missing exams or remarks are handled by first year office.

Eating, drinking, any kind of disruptive behaviour (talking, the use of laptop, mobile phone etc.) are not permitted in lectures and tutorials.

Some Notes on Tutorials:

1. Attendance may be taken at tutorials.
2. The tutorial problem sheets will be handed out at the beginning of a tutorial period. The pages of the completed problem set, including the original problem sheet as the last page, **MUST** be stapled together - problem sets fastened with paper clips or folds will not be accepted.
3. Problem sets must be done **neatly in pencil** on one side only of the engineering problem paper. (Do not write on the back of the pages.) Pads of this paper are sold in the Eng. Society Store, in the basement of the Sandford Fleming Bldg. A straight edge and eraser are required for drawings.
4. The completed problem set is to be submitted before the beginning of the Tuesday lecture. **Late submission will not be accepted.**
5. A problem set will be marked (2 = excellent, 0 = unsatisfactory) and returned at the next tutorial period.
6. A problem set with a mark of 0 can be resubmitted again for remarking before the beginning of the next lecture.

Class schedule

Week of:	Chapter	Tentative Lecture Topics & Pages (from the 13th edition)
Sept. 2	1	Introduction, engineering design, units, housekeeping
Sept. 9	2& 3	**Scalar approach - 2D** Concept of a force, scalar addition of forces (p. 16-37) Equilibrium of a particle, free body diagram of concurrent forces (p.85-p.93)
Sept. 16	4	Moment of a force (p.117-120), principle of moments (p.128-130), moment of a couple (p.148-153), force-couple resultant (p.160-165), a single resultant force and its location (p.170-175)
Sept. 23	4 & 5	Distributed and concentrated loading on beams (p.186-188) Equilibrium of a rigid body, two and three force members, Free body diagrams, equations of equilibrium (p. 199-236)
Sept. 30	2, 3, 4	**Vector approach - 3D** Cartesian vector (p.43), Equilibrium of a particle in 3D (p.103-108) Position vector (p.56), vector along a line (p.59), dot product (p.69,71) Cross product (p.121), moment of a force about at point (p.124-127)
Oct. 7	4& 5	Moment of a force about a specified axis (p.139-), triple mixed product (p.140-), Equilibrium of a rigid body in 3D (p.237-); Support reactions (p.238-239)
Oct.14	6	**Structural analysis: Trusses (No Space Trusses)** Method of joints, zero force members, method of sections (p. 263-289)
Oct. 21	6; Complementary notes (pdf)	**Structural analysis: Frames** Frames, free body diagrams, analysis; machines, pulleys (p.294,324) **Strength of materials, design of axially loaded bars** Stress-strain in axially loaded bars, Hooke's law, design of sections
Oct.28	7	**Internal forces in beams** Examples of shear (V), diagrams and moment (M) diagrams, relationship between W, V, M (p.330, 366)
Nov. 4	9	**Centre of gravity** Centroids (p. 450), composite bodies (p. 474) (*Note: only regular shapes; no integration*)
Nov.11	9	**Hydrostatic Pressure**: Resultant of pressure distribution over a surface (p.498-508), (*only regular shapes; no integration*)
Nov.18	10; Complementary notes (pdf);	**Strength of materials, design of beams** Moment of inertia of an area, I (p.516, 517), Stresses due to bending
Nov.25	Complementary notes (pdf)	Section modulus (S); stress blocks, bending stress formula.
Dec .2		Review problems

Note: The following topics/sections are omitted:

- Reduction of a force system to a wrench (p. 173);
- Space trusses (section 6.5);
- Cables (section 7.4);
- Chapter 8
- Chapter 11
- Buckling (supplementary notes);

With regards to the topics of centroids, area moment of inertia, hydrostatic pressure, and the shapes of distributed loads on beams, we will only use simplified/regular shapes (rectangles and triangles or their compositions). The use of calculus is not required for analyzing these topics.