

## *ENGR 292 Fluids and Thermodynamics*

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**Mechanical Engineering Technology**  
**Camosun College**

**Jan.10, 2017**

### *Welcome to ENGR 292*

- **Happy New Year !**



### *Contact Information*

- **Scott Li, Instructor**
- **Email: [Scott.Li@camosun.bc.ca](mailto:Scott.Li@camosun.bc.ca)**
- **Office: TEC 238 (Meeting Room)**  
**Temporary Office**
- **Cell Phone: (306)716-5262 (Texting)**
- **Office Hour: Anytime, best to make an appointment via email**

### *Introduce Myself*

- **Background**
- **Experience**

### *Introduce Yourself*

- **The advantage of the small class size**
  - **Number of registered students: 16**
- **I want to know everyone by name not just a student number**

### *ENGR 292*

- **Course Abbreviation and Number: ENGR 292**
- **Course Title: Fluids and Thermodynamics**
- **Open only to students in Engineering Bridge programs (UBC)**

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## ENGR 292

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- **Course outline**
  - **Description**
  - **Objectives**
    - Fluid Mechanics
    - Thermodynamics
  - **Outline of the learning outcomes**

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## Requisites

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- **Pre-requisites:**
  - **MATH 250A Intermediate Calculus 1**
- **Pre/Co-requisites:**
  - **MATH 250B Intermediate Calculus 2**
  - **MATH 252 Applied Differential Equations**
  - **PHYS 295 Physics**

*Note: Pre-requisite: take either previously  
Co-requisite: take concurrently*

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## Lectures

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- **2 Lectures per week, No Labs**
- **Lecture 1: Tuesday, 12:30 pm – 02:20 pm at CBA 121**
- **Lecture 2: Friday, 02:30 pm – 03:50 pm at CBA 120**

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## Text Book

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- **Text book:**
  - **Not Required.**
- **References:**
  - **Applied Fluid Mechanics by Mott 5<sup>th</sup> Ed; 6<sup>th</sup> Ed; 7<sup>th</sup> Ed**
  - **Introduction to Thermodynamics and Heat Transfer by Yunus A. Cengel, 2nd edition**

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## ENGR 292 Website

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- [http://www.fireflylabs.com/disted/courses/e292\(2017\)e292-index.html](http://www.fireflylabs.com/disted/courses/e292(2017)e292-index.html) (under constant updating as the class goes along, with the support of Prof. Spaulding)
- **Week by week calendar**
- **Notes, References**
- **Assignments and solutions**
- **Extras**
- **No D2L at this point**

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## Evaluation

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Assignments	30%	<b>Note:</b> <ul style="list-style-type: none"> <li>• A weighted average of 50% must be attained on tests/examinations and a 50% must be attained on the final examination, otherwise an F will be awarded.</li> <li>• All assignments will have marks deducted; if handed in after assignments have been returned to the class, no mark will be given – but all assignments must be submitted in order to qualify to write the final exam</li> </ul>
Midterm	30%	
Final	40%	

## Grading System

- See Camosun College website for official grading policy:

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

## Course Schedule

- Jan. 10 Review and Class Information

*Note: subject to modification, as required*

## Course Schedule

- Jan. 13 General
- Fluid Properties
  - Equation of State

*Note: subject to modification, as required*

## Course Schedule

- Jan. 17 Fluid Statics
- Pressure
  - Buoyancy
  - Hydrostatic forces
  - Pressure measurement

*Note: subject to modification, as required*

## Course Schedule

- Jan. 20 Fluid Statics
- Pressure
  - Buoyancy
  - Hydrostatic forces
  - Pressure measurement

*Note: subject to modification, as required*

## Course Schedule

- Jan. 24 Fluid Statics
- Pressure
  - Buoyancy
  - Hydrostatic forces
  - Pressure measurement

*Note: subject to modification, as required*

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### Course Schedule

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- **Jan. 27 Fluid Statics**
  - Pressure
  - Buoyancy
  - Hydrostatic forces
  - Pressure measurement

*Note: subject to modification, as required*

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### Course Schedule

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- **Jan. 31 Fluid Dynamics**
  - Conservation of mass
  - Momentum and energy
  - Bernoulli's equation & Navier-Stokes equations
  - Laminar & Turbulent flow in pipes
  - Turbo-machinery

*Note: subject to modification, as required*

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### Course Schedule

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- **Feb. 03 Fluid Dynamics**
  - Conservation of mass
  - Momentum and energy
  - Bernoulli's equation & Navier-Stokes equations
  - Laminar & Turbulent flow in pipes
  - Turbo-machinery

*Note: subject to modification, as required*

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### Course Schedule

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- **Feb. 07 Mid-Term Review**

*Note: subject to modification, as required*

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### Course Schedule

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- **Feb. 10 Mid-Term Review**

*Note: subject to modification, as required*

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### Course Schedule

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- **Feb. 14 No Class**

*Note: subject to modification, as required*

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### Course Schedule

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- **Feb. 17 No Class**

*Note: subject to modification, as required*

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### Course Schedule

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- **Feb. 21 Mid-Term**

*Note: subject to modification, as required*

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### Course Schedule

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- **Feb. 24 Fluid Dynamics**
  - Conservation of mass
  - Momentum and energy
  - Bernoulli's equation & Navier-Stokes equations
  - Laminar & Turbulent flow in pipes
  - Turbo-machinery

*Note: subject to modification, as required*

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### Course Schedule

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- **Feb. 28 Fluid Dynamics**
  - Conservation of mass
  - Momentum and energy
  - Bernoulli's equation & Navier-Stokes equations
  - Laminar & Turbulent flow in pipes
  - Turbo-machinery

*Note: subject to modification, as required*

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### Course Schedule

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- **Mar. 03 Fluid Dynamics**
  - Conservation of mass
  - Momentum and energy
  - Bernoulli's equation & Navier-Stokes equations
  - Laminar & Turbulent flow in pipes
  - Turbo-machinery

*Note: subject to modification, as required*

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### Course Schedule

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- **Mar. 07 Thermodynamics & Heat Transfer**
  - Conduction
  - Convection

*Note: subject to modification, as required*

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*Course Schedule*

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- **Mar. 14 Thermodynamics & Heat Transfer**
  - *Conduction*
  - *Convection*

*Note: subject to modification, as required*

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*Course Schedule*

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- **Mar. 17 Thermodynamics & Heat Transfer**
  - *Conduction*
  - *Convection*

*Note: subject to modification, as required*

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*Course Schedule*

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- **Mar. 21 Thermodynamics & Heat Transfer**
  - *Conduction*
  - *Convection*

*Note: subject to modification, as required*

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*Course Schedule*

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- **Mar. 24 Thermodynamics & Heat Transfer**
  - *Conduction*
  - *Convection*

*Note: subject to modification, as required*

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*Course Schedule*

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- **Mar. 28 Thermodynamics & Heat Transfer**
  - *Conduction*
  - *Convection*

*Note: subject to modification, as required*

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*Course Schedule*

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- **Mar. 31 Thermodynamics & Heat Transfer**
  - *Conduction*
  - *Convection*

*Note: subject to modification, as required*

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### Course Schedule

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- **Apr.04 Analytical Tools**
  - Dimensional analysis
  - Modeling
  - LaGrange Multipliers
  - Second derivative test
  - Multiple Integrals and applications
- Other topics as required to ensure the student has a rounded knowledge of fluid Dynamics, Thermodynamics & Heat Transfer

*Note: subject to modification, as required*

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### Course Schedule

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- **Apr.07 Analytical Tools**
  - Dimensional analysis
  - Modeling
  - LaGrange Multipliers
  - Second derivative test
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*Note: subject to modification, as required*

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### Course Schedule

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- **Apr.11 Final Review**

*Note: subject to modification, as required*

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### Course Schedule

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- **Apr.14 Holiday, No Class**

*Note: subject to modification, as required*

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### Course Schedule

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- **Apr.18 Final**

*Note: subject to modification, as required*

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### Teaching Style

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- **PPT**
- **Chalk Board / White Board**
- **D2L**

### *Assignments*

- ❑ **Assignments must be submitted on time, late assignments will not be marked.**
- ❑ **Each student must submit his/her assignment independently.**
- ❑ **Do assignments by yourself after reading related examples, notes although discussion with others is helpful.**
- ❑ **Do assignments gradually instead do them just on the due day**

### *How to study this course*

- ❑ **Attempt to attend all lectures, tutorials (problem solving sessions), and labs.**
- ❑ **Besides the lecture and tutorial time, students are expected to spend at least 4 hours/week on reading text book, notes and doing assignments.**
- ❑ **Visit the course website regularly**
- ❑ **See the Instructor if you have any question (best to make an appointment via email)**

### *Academic Honesty*

- ❑ **Students are expected to:**
  - **Do their own work on assignments**
  - **Properly cite the work of others**
  - **Follow examination regulations**
- ❑ **Please see Camosun website for more information:**  
<http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf>

### *Attendance and Participation*

- ❑ **Regular and punctual attendance is expected of students in lectures and tutorials / laboratories**

### *Cell Phone Policy*

- ❑ **Turn cell phones off and put it away during the classes, tutorials ...**



- ❑ **The bottom line: Do not distract others, turn off ringers or change ringers to "mute" or "vibrate" during class.**

### *Thank you*

- ❑ **Any Questions?**
- ❑ **See you this Friday (Jan.13) at 02:30 pm at CBA 120**