Calendar Description

MENG 264 Thermodynamics

With a focus on the first law of thermodynamics, various energy conversion technologies will be examined: Gas processes and cycles (Otto, Diesel, Brayton) and two-phase cycles (Rankine, Vapour-Compression Refrigeration). Students will explore the usefulness and implications of Entropy, Exergy, isentropic efficiency and the second law of thermodynamics. Sustainable and non-sustainable energy conversion applications will be studied in detail.

OFFERED:	2st Academic Semester
CREDIT:	3
IN-CLASS WORKLOAD:	3 hours lecture, 2 hours lab
OUT-OF-CLASS WORKLOAD	4 hours
PREREQUISITES	MENG 263

LEARNING OUTCOMES;

Upon successful completion of this course a student will be able to:
- Calculate the performance of a variety of thermodynamic cycles, including, in part:
    1. Otto Cycle, Diesel Cycle, Brayton Cycle, Vapour-compression refrigeration/heat-pump cycle, Rankine cycle: super-heated, re-heat, open and closed feed water heaters, regeneration
- Plot out these thermodynamic cycles on P-v and T-s diagrams.
- Identify where these cycles are used and how they are applied to specific energy and Thermodynamic applications.
- Interpolate values needed to solve problems from tables of working fluid properties.
- Apply component isentropic efficiency to make more realistic predicted outputs and inputs.
- Predict if a proposed cycle is thermodynamically possible using the second law of thermodynamics.
- Identify and recommend appropriate sustainable energy generation technologies.

Distribution of Marks:

Midterm Test	**25%**	A+	90 → 100%	B-	70 → 72%
Assignments/Quizes/Labs	**35%**	A	85 → 89%	C+	65 → 69%
Final Exam	**40%**	A-	80 → 84%	C	60 → 64%
		B+	77 → 79%	D	50 → 59 %
		B	73 → 76%	F	< 50 %

Labs must be complete within two weeks of being assigned, otherwise the student forfeits the marks. All Assignments must be submitted prior to the student sitting the final examination. Late assignments will have marks deducted; if handed in after assignments returned to class, then no mark will be given.

Instructor:

Jeffrey Stephen, P.Eng.		Telephone:	370-4514
Office :	TEC 120	Email:	stephen@camosun.bc.ca

Required Textbook:
Fundamentals of Thermal-Fluid Sciences 5th ed. Cengel/Cimbala/Turner. McGrawHill.