City University of Hong Kong
Course Syllabus

offered by School of Energy and Environment
with effect from Semester B 2019/20

Part I Course Overview

Course Title:	Engineering Thermofluids I
Course Code:	SEE2101
Course Duration:	One semester
Credit Units:	3
Level:	B2
Proposed Area: *(for GE courses only)*	☐ Arts and Humanities ☐ Study of Societies, Social and Business Organisations ☐ Science and Technology
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	PHY1201 General Physics I; MA1200 Calculus and Basic Linear Algebra I or MA1300 Enhanced Calculus and Linear Algebra I; MA1201 Calculus and Basic Linear Algebra II or MA1301 Enhanced Calculus and Linear Algebra II; AND SEE1003 Introduction to Sustainable Energy and Environmental Engineering
Precursors: *(Course Code and Title)*	SEE2001 Electromagnetic Principles for Energy Engineers or equivalent; AND MA2181 Mathematical Methods for Engineering
Equivalent Courses: *(Course Code and Title)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

The course aims to give students an introduction to the basic principles of thermodynamics, fluid mechanics and heat transfer. These basic principles will help the students build a strong foundation for further innovative studies of energy and environment applications.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe the basic principles of thermodynamics, fluid mechanics and heat transfer.	50%		√	
2.	Apply the basic principles to study energy conversion and transfer in energy and environment engineering, and other related innovative applications	30%		√	
3.	Apply the basic principles to evaluate the performance of energy cycles.	20%		√	
** If weighting is assigned to CILOs, they should add up to 100%.*		100%			

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.			Hours/week (if applicable)
		1	2	3	
Lectures and Tutorials	Explain theories and concepts	✓	✓	✓	
Tutorials	Apply theories and concepts on practical examples	✓	✓	✓	
Lab-based experiment	Apply theories and concepts on hands-on experiments	✓	✓	✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.			Weighting*	Remarks
	1	2	3		
Continuous Assessment: __50__%					
Assignments	✓	✓	✓	18%	
Labs	✓	✓	✓	12%	
Quiz	✓	✓	✓	20%	
Examination: __50__% (duration: 2 hours , if applicable)					
** The weightings should add up to 100%.*				100%	

Examination duration: 2 hrs
Percentage of coursework, examination, etc.: 50% by coursework; 50% by exam

To pass a course, a student must do ALL of the following:
1) obtain at least 30% of the total marks allocated towards coursework (combination of assignments, pop quizzes, term paper, lab reports and/ or quiz, if applicable);
2) obtain at least 30% of the total marks allocated towards final examination (if applicable); and
3) meet the criteria listed in the section on Assessment Rubrics.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Assignments	Ability to analyse and solve problems related to thermodynamics, fluid mechanics and heat transfer for energy conversion	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Labs	Ability to perform experiments related to thermodynamics, fluid mechanics and heat transfer for energy conversion	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Quiz	Ability to analyse and solve problems related to thermodynamics, fluid mechanics and heat transfer for energy conversion	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Examination	Ability to analyse and solve problems related to thermodynamics, fluid mechanics and heat transfer for energy conversion	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

First law of thermodynamics; Second law of thermodynamics; Enthalpy; Entropy; Phase equilibrium; Carnot cycle; Refrigeration cycle; Heat pump; Steam turbines; Power cycles; Continuity equation; Bernoulli's equation; Potential flow; Laminar flow; Turbulent flow; Internal flow; External flow; Conductive, convective and radiative heat transfer.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

Nil

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Cengel, Y.A., Turner, R.H., Cimbala, J.M., Fundamentals of Thermal-Fluid Sciences, McGraw-Hill, 2008.
2.	Bruce Munson, Donald F. Young, Theodore H. Okiishi, Fundamentals of Fluid Mechanics, 5th ed., Wiley, 2006.