

COURSE INFORMATION - THERMODYNAMICS

Department/ Faculty:	Energy Engineering Chemical & Energy Engineering	Page:	1 of 5
Course code:	SKTG 1333	Academic Session/Semester:	20182019/2
Course name:	Thermodynamics	Pre/co requisite (course name and code, if applicable):	
Credit hours:	3		

Course synopsis	Thermodynamics is a basic engineering subject where thermodynamic system, boundaries, mass, heat, work, internal energy and enthalpy are explained. These are then related to the concepts of 1 st Law of Thermodynamics for energy balance calculations. To analyze whether a process is possible or nor requires a knowledge of 2 nd Law of Thermodynamics where another thermodynamic property known as entropy is introduced. Properties of common fluid, such as water, air, and refrigerants are determined either using tables of properties or equations. The concepts are then applied to power and refrigeration cycle systems.			
Course coordinator (if applicable)				
Course lecturer(s)	Name	Office	Contact no.	E-mail
	Mohsin Mohd Sies	N01-324		mohsin@utm.my
	Dr Zalilah Sharer	N01-269	35492	zalilah@utm.my

Prepared by: Name: Assoc Prof Dr Azeman Mustafa Signature: Date: 05 Feb 2018	Certified by: Name: Dr Hasrinah Hasbullah Signature: Date: 05 Feb 2018
-------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------

Department/ Faculty:	Energy Engineering Chemical & Energy Engineering	Page:	2 of 5
Course code:	SKTG 1333	Academic Session/Semester:	20182019/2
Course name:	Thermodynamics	Pre/co requisite (course name and code, if applicable):	
Credit hours:	3		

Mapping of the Course Learning Outcomes (CLO) to the Programme Learning Outcomes (PLO), Teaching & Learning (T&L) methods and Assessment methods:

No.	CLO	PLO (ICGPA CODE)	Weight (%)	*Taxonomies and **generic skills*	T&L methods	***Assessment methods
1	Apply thermodynamic properties of pure substances in thermodynamic systems.	PLO1 (KW)	23.5	C3	Lecture Active learning	T,Q,F
2	Apply the 1 st Law of Thermodynamics to calculate heat, work, and energy for both closed and open systems	PLO2 (THPA)	23.5	C3	Lecture Active learning	T,Q,F
3	Apply the 2 nd Law of Thermodynamics for entropy balance on various systems.	PLO2 (THPA)	25	C3	Lecture Active learning	T,Q,F
4	Analyze the performance of power and refrigeration cycles using first and second laws of thermodynamics.	PLO2 (THPA)	23	C4	Lecture Active learning	T,Q,F
5	Collectively solve thermodynamic related-group assignments/projects	PLO10 (TW)	5	A3	Lecture Active learning	In-Class group discussion and assignments
Refer *Taxonomies of Learning and **UTM's Graduate Attributes, where applicable for measurement of outcomes achievement ***T – Test; Q – Quiz; HW – Homework; PR – Project; Pr – Presentation; F – Final Exam etc.						

Details on Innovative T&L practices:

No.	Type	Implementation
1	Active Learning	In-class activities

Department/ Faculty:	Energy Engineering Chemical & Energy Engineering	Page:	3 of 5
Course code:	SKTG 1333	Academic Session/Semester:	20182019/2
Course name:	Thermodynamics	Pre/co requisite (course name and code, if applicable):	
Credit hours:	3		

Weekly Schedule:

Week 1	Introduction to Thermodynamics
Week 2	Energy and Energy Analysis
Week 3	Properties of Pure Substance
Week 4	Properties of Pure Substance
Week 5	First Law of Thermodynamics for closed and open system
Week 6	First Law of Thermodynamics for closed and open system
Week 7	First Law of Thermodynamics for closed and open system
Week 8	Mid-Semester Break
Week 9	The Second Law of Thermodynamics
Week 10	Entropy
Week 11	Second Law analysis for open system
Week 12	Second Law analysis for open system
Week 13	Power and Refrigeration Systems
Week 14	Power and Refrigeration Systems
Week 15	Power and Refrigeration Systems

Transferable skills (generic skills learned in course of study which can be useful and utilised in other settings):

Team working

Student Learning Time (SLT) details:

Distribution of SLT course outline content	Guided Learning (face to face)				Teaching and Learning Activities			Total SLT
	L	T	P	O	Guided Learning (non face to face)	Independent Learning (non face to face)		
CLO								
CLO1	12	4			6	3		24
CLO2	9	3			6	3		21
CLO3	12	4			6	3		25
CLO4	9	3			6	3		21
CLO5				8				8
Total SLT	42	14		8	24	12		100

Department/ Faculty:	Energy Engineering Chemical & Energy Engineering	Page:	4 of 5
Course code:	SKTG 1333	Academic Session/Semester:	20182019/2
Course name:	Thermodynamics	Pre/co requisite (course name and code, if applicable):	
Credit hours:	3		

	Continuous Assessment	PLO	Percentage	Total SLT (hr)
1	Quiz 1 (CLO1)	KW	2.5	0.3
2	Quiz 1 (CLO1)	KW	2.5	0.3
3	Quiz 2 (CLO2)	THPA	2.5	0.3
4	Quiz 3 (CLO2)	THPA	2.5	0.3
5	Quiz 4 (CLO3)	THPA	2.5	0.3
6	Quiz 5 (CLO3)	THPA	2.5	0.3
7	Quiz 6 (CLO4)	THPA	2.5	0.3
8	Quiz 6 (CLO4)	THPA	2.5	0.3
9	Test 1 (CLO1)	KW	8.5	0.8
10	Test 1 (CLO2)	THPA	8.5	0.8
11	Test 2 (CLO3)	THPA	10	1
12	Assignment 1-CLO1	TW	2	3
13	Assignment 1-CLO2	TW	2	3
14	Assignment 1-CLO3	TW	2	3
15	Assignment 1-CLO4	TW	2	3
16	Team Working-CLO5	TW	5	
	Final Assessment	PLO	Percentage	Total SLT
17	Final 1	KW-CLO1	8	0.6
18	Final 2	THPA_CLO2	8	0.6
19	Final 3	THPA_CLO3	8	0.6
20	Final 4	THPA_CLO4	8	0.6
21	Final 5	THPA_CLO4	8	0.6
Grand Total SLT				120 hrs

Special requirement to deliver the course (software, computer lab etc):

-

Learning resources:

<p>Text book Çengel , Yunus, <i>Thermodynamics: An Engineering Approach</i>; 5,6 7 or 8 edition, Mc Graw Hill.</p> <p>Online http://elearning.utm.my</p>

Department/ Faculty:	Energy Engineering Chemical & Energy Engineering	Page:	5 of 5
Course code:	SKTG 1333	Academic Session/Semester:	20182019/2
Course name:	Thermodynamics	Pre/co requisite (course name and code, if applicable):	
Credit hours:	3		

Academic honesty and plagiarism:

Assignments are individual tasks and not group activities (UNLESS EXPLICITLY INDICATED AS GROUP ACTIVITIES). Copying of work (assignment, project etc) from other students/groups is not allowed. Any student caught plagiarising others' work or cheating in quiz, test or final examination will get zero mark and may subject to disciplinary action. UTM academic rules and regulations are strictly applied.

Other additional information (course policy, any specific instruction etc):

-

Disclaimer:

All teaching and learning materials associated with this course are intended for educational purpose in UTM only. Reproduction of the materials requires prior approval from the course owner. While effort has been made to ensure the accuracy of the information, UTM will not be responsible for any inaccuracies, errors and omissions.

Textbook Study Guides (Cengel, Thermodynamics, 7th edition)

CLO	CHAPTER	REMARKS
1	1	All sections except 1-5, 1-10 & 1-11
	2	All sections except 2.7 & 2.8
	3	All sections except 3.7 & 3.8
2	4	All sections
	5	All sections except 5.5
3	6	All sections except 6.5
	7	All sections except 7.7, 7-10, 7-11
4	10	Sections 10-1 to 10-4
	11	Sections 11-1 to 11-4