Course Specifications

Program(s) on which this course is given:	B.Sc. in Aerospace Engineering
Department offering the program:	Aerospace Department
Department offering the course:	Aerospace Department
Academic Level:	2014-2015 / 2nd year
Date	November, 2014
Semester (based on final exam timing)	☐ Fall ☐ Spring

A- Basic Information

1. Title:	**Thermodynamics (3+2)**			**Code:**	**AER 205**			
2. Units/Credit hours per week:	Lectures	3	Tutorial	2	Practical	**included**	Total	5

B- Professional Information

1. Course description:

2. Intended Learning Outcomes of Course (ILOs):

a) Knowledge and Understanding

The students successfully completing this course will:

1. understand the thermodynamic considerations for different cycle analysis (like gas turbine analysis (Ideal and real Brayton cycle),
2. differentiate between ideal and real Otto, Diesel, and Dual cycles) etc.)
3. Know the thermodynamic laws to help in evaluating the operation and overall engine performance

b) Intellectual Skills

4. The student should Hypothesize and synthesize the modeling process
5. The student should have to analyze results and draw conclusions

c) Professional and Practical Skills

6. The student will construct and use software codes
7. The student will be able to present finding to fellow students through an oral presentation in a formal classroom setting

d) General and Transferable Skills

3. Contents

Topic	Total hours	Lectures hours	Tutorial/ Practical hours
Power Cycles	1	1	0
Carnot	4	2	2

Rankine	5	3	2
Otto	5	3	2
Diesel	5	3	2
Dual	5	3	2
Ericson, Stirling	5	3	2
Brayton	6	4	2
Reversed Cycles	5	3	2
Applications on Power Stations,	5	3	2
Propulsion System	3	2	2
Refrigeration	2	1	2
Thermodynamic Relations	7	5	2
Mixtures and Solutions	7	3	4
Chemical Reactions	7	3	4
Introduction: to Chemical Equilibrium	6	4	2
Introduction to Statistical Thermodynamics	1	1	0
	∑ 81	47	34
4. Teaching and Learning Methods	Lectures ( )	Practical Training/ Laboratory ( )	Seminar/Workshop ( )
	Class Activity ( )	Case Study ( )	Projects ( )
	E-learning ( )	Assignments /Homework ( )	Other:
5. Student Assessment Methods			
• **.Assessment Schedule**		**Week**	
-Assessment 1; Class test			
-Assessment 2; Project Assignment			
-Assessment 3; Presentations			
-Assessment 3; Midterm Exam			
-Assessment 4; Final Exam			
• **Weighting of Assessments**			

-Mid-Term Examination	15 %
-Final-term Examination	60 %
-Project	15%
-Class Test	5%
-Presentation	5%
-Total	100%

6. List of References

Course Notes

Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of Thermodynamics, John Wiley and Sons Inc., 1998.

Cengel, Y. A. and M. A., Thermodynamics: An Engineering Approach, WCB/McGraw Hill, 1998.

Eastop & McConkey; Applied Thermodynamics for Engineering Technologists; Longman, 1996.

Milton; Thermodynamics, Combustion and Engines; Chapman & Hall, 1995.

Van Wylen, Gordon J. and Sonntag, Richar E., Fundamentals of Classical Thermodynamics, John Wiley and Sons Inc., 1965.

7. Facilities Required for Teaching and Learning

- Lecture rooms
- Projector and overhead projectors
- PC computer and internet connection

Course Coordinator:	**Prof. Ibrahim Shabaka**
Head of Department:	**Prof. Ayman Hamdy Kassem**