



Course Specifications: Engineering Thermodynamics (2)

University: Benha University

Faculty: Faculty of Engineering at Shoubra

Department offering the program: Mechanical Engineering Department

Department offering the course: Mechanical Engineering Department

1- Course Data

Course Code: MEP292

Course Title: Engineering Thermodynamics (2)

Specialization: Mechanical Production Engineering

Course Type: Compulsory

Study Year: Second Year

Teaching Hours: Lecture: 3

Tutorial: 2

Practical: 0

Total: 5

2- Course objectives

For students undertaking this course, the aims are to:

1. Apply knowledge of engineering thermodynamics on different cycles.
2. Enhance practical skills in the fields of thermal engineering such as steam and gas turbines power plants to increase ability for employment.
3. Increase the ability to define, analyze and solve mechanical power engineering problems to reach proper conclusions, and to communicate these conclusions with others.
4. Understand the concepts and basic principles of gas-vapor mixture and combustion.

3- Course competencies

Level (A) Engineering Competencies: On completing this course, students will be able to demonstrate the knowledge and understanding of:

- 1) Identify formulate and solve the power cycles , gas mixture and combustion by applying engineering fundamentals **(A 1)**
- 2) Apply engineering design processes to produce cost-effective solutions produces high performance in power generation system **(A3)**

Level (B) Mechanical Engineering Competencies : At the end of this course, the students will be able to:

- 1) Select conventional mechanical equipment according to the required performance **(B3)**
- 2) Analyze and design physical systems applicable to generating power system by applying the concepts of Thermodynamics **(B1)**

Level (C) production Mechanical Engineering: On completing this course, the students are expected to be able to:

- 1) Manage, design and evaluate for power generating systems and combustion **(C5)**

**4- Course Contents****a) Course Description** (As indicated in program Bylaw)

Thermodynamics cycles
Thermodynamics cycles
Steam power cycles and their modifications
Steam power cycles and their modifications
Steam power cycles and their modifications
Gas Power systems
Gas Power cycles and Air-standard cycles
Refrigeration Systems
Gas and Gas - Vapor Mixtures
Gas and Gas - Vapor Mixtures
Introduction to fuel
Combustion of Fuels

b) Topics to be Covered weekly & Matrix of Competencies

Week	Topics	Course Competencies				
		A1	A3	B1	B3	C5
1	Thermodynamics cycles	√				
2	Thermodynamics cycles	√	√		√	
3	Steam power cycles and their modifications		√	√	√	√
4	Steam power cycles and their modifications	√	√	√	√	√
5	Steam power cycles and their modifications		√	√	√	
6	Gas Power systems	√	√	√	√	
7	Gas Power cycles and Air-standard cycles	√	√	√	√	
8	Refrigeration Systems		√	√	√	√
9	Gas and Gas - Vapor Mixtures	√	√	√	√	
10	Gas and Gas - Vapor Mixtures	√	√	√	√	
11	Introduction to fuel	√	√	√	√	
12	Combustion of Fuels	√	√	√	√	√
13	Thermodynamics cycles	√	√	√	√	√

5- a) Teaching and Learning Methods



Course Competencies		Teaching and Learning Methods									
		Face-to-face Lecture	Online Education	Tutorial / Exercise	Group Discussions	Laboratory	Site Visit	Presentation	Mini Project	Research and Reporting	Brain Storming
Level A	A1	√		√							
	A3	√		√							√
Level B	B1	√		√							√
	B3	√		√							√
Level C	C5	√		√							√

5- b) Teaching and Learning Methods of Disables

None

6- Student Academic Counseling and Support

- Students are directed to contact teaching staff for academic support during specific office hours.
- Regarding this course, I will be available for students for two hours a week as indicated on my time table declared for students from the beginning of the semester.

7- Student Assessment**a- Student Assessment Methods**



Course Competencies		Assessment Methods									
		Written Exams	Online Exams	Oral Exam	Quizzes	Lab Exam	Take-Home Exam	Research Assignments	Reporting Assignments	Project Assignments	In-class Questions
Level A	A1	✓		✓					✓		✓
	A3	✓			✓				✓		✓
Level B	B1	✓			✓				✓		✓
	B3	✓			✓				✓		✓
Level C	C5								✓		✓

b- Assessment Schedule and Weight

Assessment	Week	Weight
Midterm Examination	7	20 %
Final Term Examination	(As Schedule)	60 %
Oral Examination	12	10 %
Semester Work	2, 4, 8, 11	10%
Total		100 %

8- Facilities

The following facilities are needed for this course:

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> Classroom | <input type="checkbox"/> Smart Board | <input type="checkbox"/> Computer with software |
| <input type="checkbox"/> Lecture Hall | <input type="checkbox"/> White Board | <input type="checkbox"/> MIS system |
| <input checked="" type="checkbox"/> Sound and Microphone | <input checked="" type="checkbox"/> Data Show | <input type="checkbox"/> Internet Access |
| <input type="checkbox"/> Other: | | |

9- List of References

a- Course Notes

Lectures Notes in PDF

**b- Books**

1. Yunus A. Cengel and Michael A. Boles, "Thermodynamics, an Engineering Approach" 8th Edition, 2014.

c- Recommended Books

1. Van Wylen, G. Sonntag R. and Borgnakke, C. Fundamentals of Classical Thermodynamics, John Wiley & Sons, Inc. 4th edition.

d- Web Sites

<http://www.bu.edu.eg/staff/>

10- Matrix of Course Objectives and Competencies

Course Objectives	Course Competencies				
	A1	A3	B1	B3	C5
Course Objective #1	√	√	√		√
Course Objective #2	√	√	√	√	√
Course Objective #3	√	√	√	√	√
Course Objective #4	√	√	√		√

- Course Coordinator:

Prof. Dr. Ragab Khalil Ali
Dr. Mahmoud Sharf Eldean

Signature:**- Program Coordinator:**

Prof. **Ahmed Gafer**

Signature: