



BENHA UNIVERSITY



FACULTY OF ENGINEERING AT SHOUBRA

Model No.12 Course Specifications (2014-2015) 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: MPE292

Course Title: 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 Aims

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- Intended Learning Outcomes of Course (ILO's)

a. Knowledge and Understanding Skills: On completing this course, students will be able to demonstrate the knowledge and understanding of:

a.1) Current engineering technologies of thermodynamics and power generating system. (A.8)

a.2) The mechanical power generating systems and energy engineering contemporary issues. (A.13)

a.3) Thermodynamic laws and principles of mechanical engineering on internal combustion engines, compressors and turbines providing support to mechanical power and energy systems. (A.16)

b. Intellectual Skills: At the end of this course, the students will be able to:

b.1) select appropriate solution for mechanical engineering problems based on analytical thinking. (B.15)

b.2) Evaluate mechanical power and energy engineering performance. (B.13)

b.3) develop solutions to practical mechanical engineering problems such as internal combustion engines, steam power cycles and gas turbines. (B.17)

c. Practical and Professional Skills: On completing this course, the students are expected to be able to:



BENHA UNIVERSITY



FACULTY OF ENGINEERING AT SHOUBRA

- c.1) apply basic thermodynamics knowledge to solve mechanical engineering problems. (C.16)
- c.2) construct design for internal combustion and steam engines, and solve their operational problems. (C.18)
- d. General and Transferable Skills:** At the end of this course, the students will be able to:
 - d.1) Work in stressful environment and within constraints. (D2)
 - d.2) Effectively manage tasks, time, and resources. (D.6)
 - d.3) Search for information and engage in life-long self-learning thermodynamics. (D.7)

4- Course Contents

Week no.	Topics
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
9	Refrigeration Systems
10	Gas and Gas - Vapor Mixtures
11	Gas and Gas - Vapor Mixtures
12	Introduction to fuel
13	Combustion of Fuels

5- Teaching and Learning Methods

- 5.1 Lectures
- 5.2 Class activity
- 5.3 Assignments/reports (self-learning)
- 5.4 Tutorial problem session

6- Teaching and Learning Methods of Disables

- Nothing.

7- Student Assessment

a- Student Assessment Methods

- 1. Five Assignments to assess knowledge and intellectual skills.
- 2. Two to assess knowledge, intellectual and professional skills.
- 3. Midterm exam to assess knowledge, intellectual, professional and general skills.
- 4. Oral exam to assess knowledge, intellectual, professional and general skills.
- 5. Final exam to assess knowledge, intellectual, professional and general skills.

b- Assessment Schedule

NO.	Assessment	Week
1	Assignments	2, 4, 6, 9, 11
2	Quiz	6, 12
3	Midterm exam	8
4	Oral exam	14
5	Final exam	15



BENHA UNIVERSITY



FACULTY OF ENGINEERING AT SHOUBRA

c- Weighting of Assessments

Assessment	Weight (%)
Mid Term Examination	15 %
Final Term Examination	60 %
Oral Examination	20 %
Practical Examination	0 %
Semester work	5 %
Total	100

8- List of References

a- Course Notes prepared by instructor

b- Recommended Books

1. Yunus, A. C, Thermodynamics, An Engineering Approach, McGraw-Hill, 8th edition, 2010.
2. Van Wylen, G. Sonntag R. and Borgnakke, C. Fundamentals of Classical Thermodynamics, John Wiley & Sons, Inc. 4th edition.

Course Coordinator: Prof. Dr. Nabil Mohammed Shafiq Abdel Azim

Head of Department: Prof. Dr. Osama Ezzat Abdelatif



BENHA UNIVERSITY



FACULTY OF ENGINEERING AT SHOUBRA

Model No.11A

Course Specifications: 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

Matrix of Knowledge and Skills of the Course

no.	Topics	Week no.	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General and Transferable Skills
1	Thermodynamics cycles	1	a1		c1	
2	Thermodynamics cycles	2		b1		
3	Steam power cycles and their modifications	3	a1,a2		c1	
4	Steam power cycles and their modifications	4	a1	b1		d1
5	Steam power cycles and their modifications	5		b2	c2	
6	Gas Power systems	6	a2			d1
7	Gas Power cycles and Air-standard cycles	7	a2	b1,b2	c1,c2	
8	Midterm Exam	8				
9	Refrigeration Systems	9		b2		d2,d3
10	Gas and Gas - Vapor Mixtures	10	a2,a3		c1	
11	Gas and Gas - Vapor Mixtures	11				d2
12	Introduction to fuel	12	a3	b3		d3
13	Combustion of Fuels	13			c2	
14	Oral Exam	14				
15	Final Exam	15				

Course Coordinator: Prof. Dr. Nabil Mohammed Shafiq Abdel Azim

Head of Department: Prof. Dr. Osama Ezzat Abdelatif



BENHA UNIVERSITY



FACULTY OF ENGINEERING AT SHOUBRA

Matrix of Course Aims and ILO's

Course Title: Thermodynamics (2)

Course Code: MPE292

Teaching Hours: Lecture: 3 Tutorial: 2 Total: 5

Major or minor element of program: Major

Program on which the course is given: B.Sc. Mechanical Production Engineering

Department offering the program: Mechanical Engineering Department

Department offering the course: Mechanical Engineering Department

Academic year / level: 2014-2015 Second Year / First Semester

Date of specifications approval: 2014

Course aims	a	b	c	d
1. Apply knowledge of engineering thermodynamics on different cycles.	a1	b1 b3	c1	d1 d3
2. Enhance practical skills in the fields of thermal engineering such as steam and gas turbines power plants to increase ability for employment.	a1 a2	b2		d2
3. Increase the ability to define, analyze and solve mechanical power engineering problems to reach proper conclusions, and to communicate these conclusions with others.	a2 a3	b2	c2	d2
4. Understand the concepts and basic principles of gas-vapor mixture and combustion.	a3	b3		

Course Coordinator: Prof. Dr. Nabil Mohammed Shafiq Abdel Azim

Head of Department: Prof. Dr. Osama Ezzat Abdelatif