- **Model No.12**
Course Specifications (2014-2015)
Thermodynamics (1)

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: MEP191
Course Title: Thermodynamics 1
Specialization: Mechanical Production Engineering
Course Type: Compulsory
Study Year: First year
Teaching Hours: Lecture: 3
Tutorial/ Practical: 2
Total: 5

2- Course Aim

For students undertaking this course, the aims are to:

1. Acquire theories and concepts in thermodynamics fields.
2. Identify the definitions of parameters related to the thermodynamics.
3. Study and use the properties of saturated water vapor and gases.
4. Apply the fundamentals of thermodynamics on cycles.
5. Illustrate and understand the definitions of entropy.

3- Intended Learning Outcomes of Course (ILO'S)

a- Knowledge and Understanding

On completing this course, students will be able to demonstrate the knowledge and understanding of:

a.1) Discuss the current engineering technologies in thermodynamics. (A.8)
a.2) The first and second law of thermodynamics. (A.16)

b- Intellectual Skills

At the end of this course, the students will be able to:

b.1) Apply the principles of thermodynamics in solving mechanical engineering problems. (B.13)
b.2) Evaluate and appraise processes and propose improvements. (B.15)
b.3) Use the principles of Thermodynamics in solving practical mechanical engineering problems. (B.17)

c- Professional Skills

On completing this course, the students are expected to be able to:

c.1) Differentiate between different types of thermodynamics quantities. (C.18)

d- General Skills

At the end of this course, the students will be able to:

d.1) Work in stressful environment and within constraints (D.2)
d.2) Deal with thermodynamics problems. (D.6)
d.3) Search for information and engage in life-long self-learning thermodynamic (D.7)

4- Course Contents

Week no.	Topics
1	Fundamental Definitions
2	Fundamental Concepts
3	Thermodynamic cycles
4	Thermodynamic properties of the working Fluids
5	Application on thermodynamic properties of the working Fluids
6	Work and heat
7	Applications on work and heat
8	The first law of the thermodynamics
9	Applications on the first law of the thermodynamics
10	The second law of the thermodynamics
11	Applications on the second law of the thermodynamics
12	Entropy
13	Irreversibility and Availability

5- Teaching and Learning Methods
    5.1- Lectures.
    5.2- Tutorials
    5.3- Class activity.
    5.4- Case study.
    5.5- Assignments / homework.

6- Teaching and Learning Methods of Disables
- Nothing

7- Student Assessment

a- Student Assessment Methods
1. Four assignments to assess knowledge and intellectual skills.
2. Two quizzes to assess knowledge, intellectual and professional skills.
3. Mid-term exam to assess knowledge, intellectual, professional and general skills.
4. Final exam to assess knowledge, intellectual, professional and general skills.

b- Assessment Schedule

No.	Assessment	Week
1	Assignments	2,4,6,9
2	Quizzes	4,10
3	Mid-term exam	8
4	Final exam	15

c- Weighting of Assessments

Assessment	Weight
Midterm Examination	20 %
Final Term Examination	64 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	6 %
Other types of assessment	10 %
Total	100 %

8- List of References

a- Course Notes

1- Course notes prepared by instructor.

b- Books

1. Yunus, A. C, Thermodynamics, An Engineering Approach, McGraw-Hill, third edition, 1998
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 Abdullatif

Model No.11A
Course Specifications: Thermodynamics 1

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	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	Fundamental Definitions	1	a2			d3
2	Fundamental Concepts	2	a2, a3			d3
3	Thermodynamic cycles	3	a1	b1, b3	c1	d1, d3
4	Thermodynamic properties of the working Fluids	4	a2, a3	b1		d2, d3
5	Application on thermodynamic properties of the working Fluids	5	a1, a3	b1	c1	d2
6	Work and heat	6	a2, a3	b1, b3	c1	d3
7	Applications on work and heat	7	a1, a3	b1, b3	c1	d1
8	Mid-term exam	8	a1, a2, a3	b1, b3	c1	
9	The first law of the thermodynamics	9	a13	b3	c1	d3
10	Applications on the first law of the thermodynamics	10	a1, a3	b2, b3	c1	d1
11	The second law of the thermodynamics	11	a2	b3	c1	
12	Applications on the second law of the thermodynamics	12	a1, a3	b2, b3	c1	d1
13	Entropy	13	a2	b2, b3		
14	Irreversibility and Availability	14	a1, a2	b2		d1, d2, d3

Course Coordinator: Prof. Dr. / Nabil Mohammed Shafiq Abdel Azim
Head of Department: Prof. Dr./ Osama Ezzat Abdullatif

Matrix of course aims and ILO's

Course Title: Thermodynamics (1)

Course Code: MPE191

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 First Year / Second semester

Date of specifications approval: 2014

Course aims	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
Acquire theories and concepts in thermodynamics fields.	a1	b1		d2
Identify the definitions of parameters related to the thermodynamics.	a2	b1,b3		
Study and use the properties of saturated water vapor and gases.	a3	b1	c1	d3
Apply the fundamentals of thermodynamics on cycles.			c1	
Illustrate and understand the definitions of entropy.	a2	b1,b2		d1, d2

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