



# Course Specifications

Institution:	College of Education at Zulfi
Academic Department :	Department of Physics
Programme :	B.Edu. Degree in Physics
Course :	Thermodynamics
Course Coordinator :	Dr. Emad Alhami
Programme Coordinator :	Dr. Fatema Alzaraa'
Course Specification Approved Date :	1/ 1 / 1438 H



## A. Course Identification and General Information

1 - Course title : Thermodynamics	Course Code: PHYS. 214	
2. Credit hours : 3		
3 - Program(s) in which the course is offered: B.Edu. Degree in Physics		
4 – Course Language : Arabic		
5 - Name of faculty member responsible for the course: Dr. Emad Alhami		
6 - Level/year at which this course is offered : Second Year / Third Level		
7 - Pre-requisites for this course (if any) : • .....		
8 - Co-requisites for this course (if any) : • .....		
9 - Location if not on main campus :		
10 - Mode of Instruction (mark all that apply)		
A - Traditional classroom	<input checked="" type="checkbox"/> What percentage?	80 %
B - Blended (traditional and online)	<input type="checkbox"/> What percentage?	
D - e-learning	<input checked="" type="checkbox"/> What percentage?	10 %
E - Correspondence	<input type="checkbox"/> What percentage?	
F - Other	<input checked="" type="checkbox"/> What percentage?	10 %
Comments : .....		

## B Objectives

**What is the main purpose for this course?**

The study thermodynamics has played a major role in the development of physics and in the development of our understanding of the structures of matter as it is encountered in everyday life. The course outline as:

1. System definition with thermodynamics properties
2. Heat transfer in thermodynamics systems
3. Pure substance properties
4. Thermodynamics cycles

**Briefly describe any plans for developing and improving the course that are being implemented** (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

5. Giving class lectures to summarize course content.
6. Solving problems and examples.
7. Outlining important applications and significance of topics covered. Solving the monthly tests and discussion to take advantage of mistakes.
8. Update the content periodically.
9. Using new references.
10. Using web references.
11. increase use of IT
12. increase use of video material    13. exploring the possibility of introducing students to a specialized software
14. Increased use of power-point and projector in class





## C. Course Description

### 1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Thermodynamic units	1	3
Kinetic Theory of Gases	1	3
Zeroth Law of Thermodynamics	1	3
First Law of Thermodynamics	1	3
Transformations at Constant Volume & Pressure, Internal Energy Function, Thermal Work	1	3
Problems	1	3
Mid Exam	1	3
Reversible Processes & Irreversible Processes	1	3
Applications	1	3
Problems	1	3
Ideal & Real Gases, Carnot Cycle, Second Law of Thermodynamics	2	6
The Entropy and its applications in Different Thermal Systems	1	3
Third Law of Thermodynamics	1	3
Problems	1	3

### 2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
<b>Contact Hours</b>	<b>45</b>		.....	.....	.....	45
<b>Credit</b>	<b>3</b>		.....	.....	.....	3

### 3. Learning hours expected for students per week.

3
---





## 4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
<b>1.1</b>	System definition with thermodynamics properties	<ul style="list-style-type: none"> <li>• Developing basic communicative</li> <li>• Ability through short and varied situated discourse.</li> <li>• Lecturing</li> <li>• Team work</li> <li>• Exercises</li> </ul>	<ul style="list-style-type: none"> <li>• Homework.</li> <li>• Group Discussion</li> <li>• Presentation</li> <li>• Mid-term exam</li> <li>• Final test</li> </ul>
<b>1.2</b>	Heat transfer in thermodynamics systems		
<b>1.3</b>	Pure substance properties		
<b>1.4</b>	Thermodynamics cycles		
<b>1.5</b>	System definition with thermodynamics properties		
<b>2.0</b>	<b>Cognitive Skills</b>		
<b>2.1</b>	To differentiate between laws of thermodynamics		<ul style="list-style-type: none"> <li>• Class Participation</li> <li>• Presentation</li> <li>• Essay Question</li> <li>• Research</li> </ul>
<b>2.2</b>	To believe the importance of thermodynamic principles in understanding. our universe		
<b>2.3</b>	To solve the related problems		
<b>2.4</b>	To differentiate between reversible processes & irreversible processes		
<b>2.5</b>	To apply the gained mathematical and experimental knowledge in any physical related topic.		
<b>2.6</b>	To conclude the entropy and its applications in different thermal systems		
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
<b>3.1</b>	Work in a group and learn time management.	<ul style="list-style-type: none"> <li>• Discussion with students</li> <li>• Making students aware about time management in completing their assignments and projects.</li> <li>• Counsel students how to make a good presentation in French.</li> <li>• Encourage students to help each other</li> <li>• Group presentation</li> <li>• Group assignments</li> </ul>	<ul style="list-style-type: none"> <li>• Respecting dead lines.</li> <li>• Showing active class participation.</li> <li>• Helping other students to understand tasks in the class.</li> <li>• Giving clear and logical arguments</li> <li>• Performing seriously on midterms and final exams</li> </ul>
<b>3.2</b>	Learn how to search for information through library and internet		
<b>3.3</b>	Present a short report in a written form and orally using appropriate scientific language		
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
<b>4.1</b>	Communicate with teacher, ask questions, solve problems, and use computers.	<ul style="list-style-type: none"> <li>• Exercises</li> <li>• Problem solving</li> <li>• oral quizzes</li> <li>• Essay questions</li> <li>• Encourage students to use program soft</li> </ul>	<ul style="list-style-type: none"> <li>• Write reports</li> <li>• Exercises related to specific topics</li> </ul>
<b>4.2</b>	Illustrate deal with confidence with differential equations, integrations, and differentials.		





	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
4.3	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended		
4.4	Students use information technology in the classroom		
5.0	<b>Psychomotor</b>		

## 5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	<b>attendance</b>	All weeks	10 %
2	<b>Homework, Quizzes, Discussions, Team Group, Projects, .....</b>	All weeks	10 %
3	<b>Midterm Exam</b>	8	20%
4	<b>Final Exam</b>	17	60%

### D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Four office hour per week

### E. Learning Resources

#### 1. List Required Textbooks :

#### 2. List Essential References Materials (Journals, Reports, etc.)

1-Thermodynamics, Philip S. Schmidt, Ofodike A. Ezekoye, John R.Howell and Derek K. Baker

#### 3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

2- Thermodynamics, kinetic theory, and statistical thermodynamics, 3<sup>rd</sup> edition. F.W.Sears and.G.L.Salinger

#### 4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

Software are available with the lecturer





**5. Other learning material** such as computer based programs/CD, professional standards or Regulations and Softw are. Microsoft Office

## **F. Facilities Required**

### **1. Accommodation**

Lecture room, a smart board to write on and computer

### **2. Computing resources**

Computer Lab. and internet lab.

### **3. Other resources**

Library, and Seminar Room , Wi-Fi internet connections

## **G Course Evaluation and Improvement Processes**

### **1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:**

Student evaluation electronically organized by the University

### **2 Other Strategies for Evaluation of Teaching by the Program/Department**

#### **Instructor :**

There is a department committee

### **3 Processes for Improvement of Teaching :**

1. Course report.
2. Program report

### **4. Processes for Verifying Standards of Student Achievement**

Efficiency of course will be reflected on the results of the class, which reviewed by members of the teaching staff in addition to other duties such as discussing ideas and ways of teaching and learning. The course should be developed periodically to ensure that it contains the latest developments in the field of study. Development could be put as an objective in the report of the course to be achieved each semester

### **5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :**

- 1- Course Evaluation
- 2- Exam Evaluation
- 3- Improvement plan
- 4- Program Outlearning with course outlearning
- 5- Outlearning from the pre-requisite course

## **Course Specification Approved**

**Department Official Meeting No ( 2 ) Date 1 / 1 / 1438 H**

### **Course's Coordinator**

**Name :** Dr. Emad Alhami  
**Signature :** Dr. Emad Alhami  
**Date :** 1/ 1 / 1438 H

### **Department Head**

**Name :** Dr. Fatema Alzaraa'  
**Signature :** Dr. Fatema Alzaraa'  
**Date :** 1/ 1 / 1438 H



