

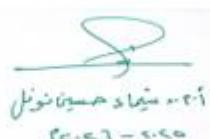
# MODULE DESCRIPTION FORM

Module Information			
Module Title	Heat and Thermodynamics		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory Lab
Module Code	MPH2021		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	2	Semester of Delivery	1
Administering Department	Information Technology	College	College of Science
Module Leader	Alhanouf Salam Shakir	e-mail	<a href="mailto:alhanouf.salam@uowa.edu.iq">alhanouf.salam@uowa.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.S.C
Module Tutor	Alhanouf Salam Shakir	e-mail	<a href="mailto:alhanouf.salam@uowa.edu.iq">alhanouf.salam@uowa.edu.iq</a>
Peer Reviewer Name	Ismail Mohammed Al-Dessouki	e-mail	<a href="mailto:Ismail.M@uowa.edu.iq">Ismail.M@uowa.edu.iq</a>
Scientific Committee Approval Date	1 - 9 - 2025	Version Number	V1.0

Relation with other Modules			
Prerequisite module	None		Semester
Co-requisites module	None		None



Department Head Approval

  
أ.د. مصطفى حسين دسوقي  
٢٠٢٣ - ٩ - ٢٥



Dean of the College Approval

<b>Module Aims, Learning Outcomes and Indicative Contents</b>	
<b>Module Aims</b>	<ol style="list-style-type: none"> <li>1. Providing the student with knowledge of the system and laws of thermodynamics.</li> <li>2. Providing the student with knowledge of heat, temperature, and heat capacity.</li> <li>3. Providing the student with knowledge of temperature measurement methods and systems.</li> <li>4. Providing the student with knowledge of the relationship between types of heat capacities and how to measure and calculate them.</li> <li>5. Providing the student with knowledge of the three laws of thermodynamics.</li> <li>6. Providing the student with knowledge of the methods and laws of heat transfer.</li> <li>7. Providing the student with knowledge in the operation of the refrigerator and heat pump.</li> <li>8. Providing the student with knowledge of the various gas laws and the ideal gas.</li> <li>9. Providing the student with experience in energy conversions.</li> </ol>
<b>Module Learning Outcomes</b>	<p>Important: Write at least 6 Learning Outcomes, better to be equal to 10.</p> <ol style="list-style-type: none"> <li>1. Introducing the student to the distinction between the properties of different gases and the laws that govern the relationships between them.</li> <li>2. Introducing the student to the factors affecting the behavior of gases.</li> <li>3. Introducing the student to the possibility of converting matter into energy.</li> <li>4. Introducing the student to the operations that can be performed on different gases.</li> <li>5. Introducing the student to temperature scales and how to convert between them.</li> </ol>
<b>Indicative Contents</b>	<p>Learning concepts of each theoretical lecture or groups of lectures. [SSWL= 28hrs]  Lab. Lectures</p> <p>Learning concepts of each laboratory lecture or groups of lectures. [SSWL=30 hrs]</p> <p>Mid Exam =1hrs</p> <p>Final Exam =3hrs</p> <p>Total hrs = 62</p>

Learning and Teaching Strategies	
<b>Strategies</b>	<p>1- General and qualifying transferable skills (other skills related to employability and personal development).</p> <p>2- The ability to analyze, deduce and describe.</p> <p>3- To understand and comprehend the laws of energy conversion and transfer.</p> <p>4- Providing scientific material that relates to the scope of their work and is specialized as a medical physics department. see the strategy from the attached word file.</p>

Student Workload (SWL)			
<b>Structured SWL (h/sem)</b>	78	<b>Structured SWL (h/w)</b>	5.2
<b>Unstructured SWL (h/sem)</b>	97	<b>Unstructured SWL (h/w)</b>	6.5
<b>Total SWL (h/sem)</b>	175		

Module Evaluation							
		Time/Number		Weight (Marks)		Week Due	Relevant Learning Outcome
		TH	LAB	TH	LAB		
Formative assessment	Quizzes	2	2	4	10	4,8	1,2,3,4,5,6,7
	Homework assignment	2	1	4	10	6,10	All
	Onsite Assignments	-	-	-	-	-	-
	Projects	1	7	2	10	14	All
Summative assessment	Midterm Exam	1		10		7	
	Final Exam	3hr		50		15	
Total assessment				100 Marks			

Delivery Plan (Weekly Syllabus)	
	Material Covered
<b>Week 1</b>	Introduction to Thermodynamics and Thermodynamic Concepts
<b>Week 2</b>	Behavior of Gases, Ideal and real gas
<b>Week 3</b>	Zeroth Law of Thermodynamics, Temperature and Temperature scales
<b>Week 4</b>	First Law of Thermodynamics
<b>Week 5</b>	Heat capacities of Ideal gas
<b>Week 6</b>	Heat Engines and second law of thermodynamic
<b>Week 7</b>	Mid. Exam
<b>Week 8</b>	Heat Pumps
<b>Week 9</b>	The Carnot Engine, Internal Combustion engine
<b>Week 10</b>	Entropy and Second Law of Thermodynamics
<b>Week 11</b>	Entropy and Performance of Heat Engines
<b>Week 12</b>	Third Law of Thermodynamics
<b>Week 13</b>	Maxwell's Relations, Cyclic rule, Applications of Maxwell's Relations
<b>Week 14</b>	Phase Transitions
<b>Week 15</b>	First order phase changes

Delivery Plan (Weekly Lab Syllabus)	
	Material Covered
<b>Week 1</b>	Find heat capacity of calorimeter
<b>Week 2</b>	Find volumetric expansion coefficient of liquid
<b>Week 3</b>	Find longitudinal expansion coefficient of metal
<b>Week 4</b>	Joule equivalent
<b>Week 5</b>	Find the latent temperature of melt ice
<b>Week 6</b>	Find specific heat of rigid body
<b>Week 7</b>	Find energy by using current and voltage
<b>Week 8</b>	Find heat capacity of calorimeter
<b>Week 9</b>	Find volumetric expansion coefficient of liquid
<b>Week 10</b>	Find longitudinal expansion coefficient of metal
<b>Week 11</b>	Joule equivalent
<b>Week 12</b>	Find the latent temperature of melt ice

<b>Week 13</b>	Find specific heat of rigid body
<b>Week 14</b>	Find energy by using current and voltage
<b>Week 15</b>	Find energy by using current and voltage

Learning and Teaching Resources		
	Text	Available in the Library?
<b>Required Texts</b>	Fundamentals of 1. Thermodynamics, by claus borgnakke Richard e. Sonntag	
<b>Recommended Texts</b>	Thermodynamics: Principles and Applications, by Frank C. AndrewsYear, Publisher.n,	
<b>Websites</b>	<a href="https://www.google.iq/books/edition/Thermodynamics_Principles_and_Applicatio/LOZpxJH0HeMC?hl=en&amp;gbpv=1&amp;bsq=thermodynamics+principles+and+applications+by+frank&amp;dq=thermodynamics+principles+and+applications+by+frank&amp;printsec=frontcover">https://www.google.iq/books/edition/Thermodynamics_Principles_and_Applicatio/LOZpxJH0HeMC?hl=en&amp;gbpv=1&amp;bsq=thermodynamics+principles+and+applications+by+frank&amp;dq=thermodynamics+principles+and+applications+by+frank&amp;printsec=frontcover</a>	

Grading Scheme				
Group	Grade	Grade	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	Excellent	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	Very Good	80 - 89	Above average with some errors
	<b>C - Good</b>	Good	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	Satisfactory	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	Sufficient	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX - Fail</b>	Fail	(45-49)	More work required but credit awarded
	<b>F - Fail</b>	Fail	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.