

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Energy Resources		Module Delivery	
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar	
Module Code	UOMU0206054			
ECTS Credits	5			
SWL (hr/sem)	150			
Module Level	UGIII	Semester of Delivery		
Administering Department	Fuel and energy Engineering Techniques	College	Engineering Technical College	
Module Leader	Fatimatulzahraa adnan rahi		e-mail	<a href="mailto:fatimatulzahraa.adnan.rahi@uomus.edu.iq">fatimatulzahraa.adnan.rahi@uomus.edu.iq</a>
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Msc. Mechanical Engineering – Thermal Engineering	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date		Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	

Co-requisites module	None	Semester	
----------------------	------	----------	--

<b>Module Aims, Learning Outcomes and Indicative Contents</b> <b>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</b>	
<b>Module Aims</b> <b>أهداف المادة الدراسية</b>	1- Understand the difference between renewable and nonrenewable energy resources. 2- Demonstrate understanding of the different types of renewable energy technologies that are currently available, and how they are used to provide energy. 3- Identify the current major uses of energy (i.e., in agriculture, manufacturing, transportation, 4- residential, etc.). 5- Distinguish between an energy source, a resource and a carrier. 6- Differentiate between energy reserves and resource base.
<b>Module Learning Outcomes</b> <b>مخرجات التعلم للمادة الدراسية</b>	<ul style="list-style-type: none"> <li>Students are expected to be able to demonstrate understanding of:  Make interpretation about the energy sources.</li> <li>Comprehend the energy and energy types.</li> <li>Make interpretation about the solar energy.</li> <li>explain the solar energy power plants.</li> <li>Explain the solar energy collectors.</li> <li>Make interpretation about the geothermal energy.</li> <li>Explain the production of electricity from geothermal fluid.</li> <li>Explain the potential of geothermal energy.</li> <li>Make interpretation about the wind energy.</li> <li>Explain the production of electricity from wind energy.</li> <li>Make interpretation about the hydrogen energy.</li> <li>Explain the production of energy method from hydrogen.</li> <li>Explain the production of Biogas and CH<sub>4</sub> from <b>Biomass</b> . <ul style="list-style-type: none"> <li>Nuclear Energy: (3 Weeks)</li> <li>Make interpretation about the Kinds of nuclear energy, Kinds of Nuclear reactors</li> </ul> </li> </ul>
<b>Indicative Contents</b> <b>المحتويات الإرشادية</b>	Indicative content includes the following: -Energy resources are all forms of fuels used in the modern world, that can produce heat, power life, move objects, generate electrical energy, or for other forms of energy conversion processes. Energy resources can be roughly classified in three categories: <b>Non-Renewable Sources-Renewable Sources -Alternate Emerging Energy Sources.(8hr)</b>

	<p>Advantages and Disadvantages for energy resources (8hr)</p> <p>Agricultural residue or agro-residue describes all organic material produced as by-products after harvesting and processing of agricultural crops. Agro-residues are non-wood and a rich source of cellulose with lignin. These may include stalk, cane, seed pod and leaves etc. Agro-residues are annually renewable and abundantly available at lower price. Agro-residues are of two types: (12 hr)</p> <p>Nuclear power is a clean and efficient way of boiling water to make steam, which turns turbines to produce electricity. In all nuclear power plants, the process of making electricity causes radioactivity. The radioactivity comes from the atom. Atom consists of nucleus and electrons in orbits.</p> <p>Energy is obtained from the nucleus in the following methods:</p> <ol style="list-style-type: none"> <li>1. Nuclear Fusion: Breaking a heavy nucleus into 2 or more than 2 smaller lighter nuclei.</li> <li>2. Nuclear Fission: Combining 2 lighter nuclei to form a heavy nucleus. (10 hr)</li> </ol>
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>Assessment is based on hand-in assignments, written exam, Quizzes, reports, seminars, and Online testing.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	74	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	76	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3,6, 9,12	
	Assignments	2	10% (10)	6, 12	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	14	
Summative assessment	Midterm Exam	2 hr	10% (10)	7	
	Final Exam	2hr	50% (50)	15	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	<b>Introduction</b> The importance of energy
Week 2	<b>Fuel</b> Fuel, fuel classifications, Energy,
Week 3	renewable and non-renewable energy,
Week 4	characteristics of energy resources, energy conversion.
Week 5	<b>Non Renewable Sources of Energy</b>
Week 6	Petroleum, oil reservoirs, compositions
Week 7	volumetric calculation of oil reserve and recovery factor

<b>Week 8</b>	<b>Solid fossil fuel</b> Definitions, Characteristics, kinds, ,
<b>Week 9</b>	Coal analysis
<b>Week 10</b>	Heating value calculation for coal.
<b>Week 11</b>	Wood Characteristics, kinds, and Wood Heating value
<b>Week 12</b>	<b>Natural Gas</b> Definitions, characteristics, kinds, Heating value for gaseous fuel.
<b>Week 13</b>	<b>Renewable Sources of Energy: Hydrogen Energy</b> Methods of Hydrogen generations, Hydrogen storage and fuel cells, applications
<b>Week 14</b>	<b>Biomass Energy</b> Biogas, Biogas utilization units, Biodiesel, Recycling Energy corps, Applications and limitations of Bio energy
<b>Week 15</b>	<b>Nuclear Energy</b> Kinds of nuclear energy, Kinds of Nuclear reactors, applications <b>Energy Economics</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
<b>Week</b>	<b>Material Covered</b>
<b>Week 1&amp;</b>	Safety in laboratory

<b>Week 2-3-4</b>	<p>How to write a scientific report:</p> <p>The seven hands-on laboratory experiments demonstrated the principles of the; flywheel, solar pathfinder, photovoltaic powered motor, hydroelectricity, wind turbine, thermoelectricity, and a fuel cell. In order to record the level of improvement of the class,</p>
<b>Week 5 &amp; 6</b>	
<b>Week 7</b>	
<b>Week 8-9</b>	
<b>Week 10</b>	
<b>Week 11</b>	
<b>Week 12</b>	
<b>Week 13</b>	
<b>Week 14</b>	
<b>Week 15</b>	Final exam

<b>Learning and Teaching Resources</b> <b>مصادر التعلم والتدريس</b>		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	1. Goldmberg J., Johansson, Reddy A.K.N. , Energy for a Sustainable World, John Wiley 2. Bansal N.K., Kleeman M. & Meliss M., Renewable Energy Sources &	no

	Conversion Tech.,Tata ,McGraw Hill.	
<b>Recommended Texts</b>		no
<b>Websites</b>		

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