

# **ENERGY101A FOUNDATION STUDIES IN RENEWABLE ENERGY AND SUSTAINABILITY**

## **PART (1) CLASS LESSON NOTES FOR BASIC CONCEPTS AT FOUNDATION/ADVANCED DIPLOMA LEVEL**

In this subject you will learn about the areas of renewable energy technologies and sustainability. You will develop foundation knowledge relating to:

- Defining sustainability and renewable energy
- Non-technical issues in sustainability and renewable energy
- Energy basics efficiency and calculations
- Solar energy systems
- Wind energy systems
- Hydro energy systems
- Biomass energy systems
- Ocean energy systems
- Principles of sustainable living
- Moving to a sustainable economy.

[K131 + EE 308](#)

[http://www.filefactory.com/file/7hvv22gtz2lx/n/K131\\_zip](http://www.filefactory.com/file/7hvv22gtz2lx/n/K131_zip)

[http://www.filefactory.com/file/1mr75xfm92ux/n/K032\\_zip](http://www.filefactory.com/file/1mr75xfm92ux/n/K032_zip)

## **PART (2) REFERENCE TEXT BOOKS & WEEKLY –LESSONS AT ASSOCIATE DEGREE LEVEL (SELF STUDY)**

**TEXT BOOK- Textbooks can be copied from USBs & DVD.**

### **Prescribed Texts:**

Mackay, D.J.C. 2008, *Sustainable Energy without the Hot Air*, UIT, Cambridge, England

WEEK NO:	TOPICS AND ACTIVITIES
<b>Orientation Week</b>	<b>Orientation activities</b> Review of syllabus and assessment activities.
<b>Week 1</b>	<ul style="list-style-type: none"> <li>• Introduction to the Subject.</li> <li>• The cause of Climate Change.</li> <li>• Global and Australian Figures.</li> <li>• Climate Change - The Impacts and the imperative for change.</li> </ul> <b>Reading List:</b> <ul style="list-style-type: none"> <li>• <i>Sustainable Energy Without the Hot air</i>, pp. 5-18</li> <li>• <i>ZCA Stationary Energy Plan</i>, pp. 2-3</li> </ul>
<b>Week 2</b>	<ul style="list-style-type: none"> <li>• Energy use in Australia.</li> <li>• Energy conversion and efficiency.</li> <li>• Primary, Secondary and End Use energy.</li> </ul> <b>Reading List:</b> <ul style="list-style-type: none"> <li>• Dept. of Energy Resources and Tourism, <i>Energy in Australia 2012</i>, pp. 15-28</li> </ul>
<b>Week 3</b>	<ul style="list-style-type: none"> <li>• Coal, Oil, Gas and Nuclear Energy Systems.</li> </ul> <b>Reading List:</b> <ul style="list-style-type: none"> <li>• Course notes</li> </ul>
<b>Week 4</b>	<ul style="list-style-type: none"> <li>• Solar Energy Systems – The Solar Resource – Photovoltaics.</li> </ul> <b>Reading List:</b> <ul style="list-style-type: none"> <li>• <i>Sustainable Energy Without the Hot air</i>, pp. 38-49</li> </ul>
<b>Week 5</b>	<b>Field Trip</b> <ul style="list-style-type: none"> <li>• Solar Energy Systems - Solar Hot Water, Solar Air conditioning and Solar Thermal Electricity.</li> </ul> <b>Reading List:</b> <ul style="list-style-type: none"> <li>• <i>Sustainable Energy Without the Hot air</i>, pp. 38-49</li> <li>• <i>ZCA Solar Thermal Power Basics and Solar Thermal Power fact sheets</i></li> </ul>
<b>Week 6</b>	<ul style="list-style-type: none"> <li>• Wind Energy Systems – size of the resource, principles of operation, World and Australian wind energy.</li> </ul> <b>Reading List:</b> <ul style="list-style-type: none"> <li>• <i>Sustainable Energy Without the Hot air</i>, pp. 32-34, 186-189</li> <li>• <i>Clean Energy Council Fact sheet on Wind Energy</i></li> </ul> <b>Assessment 1 due: Individual written report - 10%</b>
<b>Week 7</b>	
<b>Week 8</b>	<ul style="list-style-type: none"> <li>• Hydro Energy Systems – size of the resource, principles of operation, World and Australian Hydro energy.</li> </ul> <b>Reading List:</b>

WEEK NO:	TOPICS AND ACTIVITIES
	<ul style="list-style-type: none"> <li>• <i>Sustainable Energy Without the Hot air</i>, pp. 55-56 and pp. 190-194</li> <li>• <i>Clean Energy Council Fact sheet on Hydro Electricity</i></li> </ul> <p><b>Assessment 2 due: Written report on field trip - 5%</b></p>
<b>Week 9</b>	<ul style="list-style-type: none"> <li>• Biomass</li> <li>• Geothermal</li> </ul> <p><b>Reading List</b></p> <ul style="list-style-type: none"> <li>• <i>Clean Energy Council Fact sheet on Geothermal Energy</i></li> <li>• <i>Clean Energy Council Fact sheet on Bio Energy</i></li> <li>• <i>Sustainable Energy Without the Hot air</i>, pp. 96-99</li> </ul>
<b>Week 10</b>	<ul style="list-style-type: none"> <li>• Ocean Energy – Wave and tidal</li> </ul> <p><b>Reading List:</b></p> <ul style="list-style-type: none"> <li>• <i>Sustainable Energy Without the Hot air</i>, pp. 73-75; pp. 81-87; pp. 307-321</li> <li>• <i>Clean Energy Council Fact sheet on Marine Energy</i></li> </ul>
<b>Week 11</b>	<ul style="list-style-type: none"> <li>• The imperative for Sustainability</li> <li>• Moving to Renewable Energy</li> </ul> <p><b>Reading List:</b></p> <ul style="list-style-type: none"> <li>• <i>Less is More</i>, pp. 205-235</li> </ul>
<b>Week 12</b>	<ul style="list-style-type: none"> <li>• Sustainable Building Design</li> <li>• Sustainable Food and Farming</li> </ul> <p><b>Reading List:</b></p> <ul style="list-style-type: none"> <li>• <i>Sustainable Energy Without the Hot air</i>, pp. 76-80</li> <li>• <a href="http://www.yourhome.gov.au">www.yourhome.gov.au</a> <i>Technical Manual</i>, pp. 69-127</li> </ul>
<b>Week 13</b>	<ul style="list-style-type: none"> <li>• Sustainable Transport</li> <li>• Sustainable Mining and Manufacturing</li> </ul> <p><b>Reading List:</b></p> <ul style="list-style-type: none"> <li>• <i>Sustainable Energy Without the Hot air</i>, pp. 29-31; 35-37; 118-139; 88-95 and 322-326</li> <li>• <i>ZCA Stationary Energy Plan</i>, pp. 16-19</li> </ul> <p><b>Assessment 3 due: Collaborative written report – 30%</b></p> <p><b>Assessment 4: Presentation based on collaborative written report – 10%</b></p>
<b>Week 14</b>	<b>Study Week</b>
<b>Week 15</b>	<p><b>Examination Week B:</b></p> <p><b>Assessment 5: Written examination - 45%</b></p>