<table>
<thead>
<tr>
<th>م. سمير داود علي</th>
<th>البريد الإلكتروني: <a href="mailto:Enineering_sameer@yahoo.com">Enineering_sameer@yahoo.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermodynamics</strong></td>
<td></td>
</tr>
<tr>
<td>3 hrs per week, theory: 2 hrs, tutorial: 1 hrs</td>
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<tr>
<td><strong>Definition and fundamental Aspects of thermodynamics</strong></td>
<td></td>
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<tr>
<td>Definition and fundamental Aspects of thermodynamics, pure substance and phase change, work and heat, first and second low of thermodynamics, different standard cycles and their calculation</td>
<td></td>
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<tr>
<td><strong>Fundamental of Thermodynamics- solution, Bonntag, Bornakke and Van Wylen</strong></td>
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<tr>
<td><strong>Engineering Thermodynamics, work and heat transfer, by Rogers, C.F.C and Mayhew.</strong></td>
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<tr>
<td><strong>A couple of quizzes have to be done during the both semesters</strong></td>
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# Course weekly Outline-Semester(1)

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<thead>
<tr>
<th>الملاحظات</th>
<th>المادة النظرية</th>
<th>محتوى المادة</th>
<th>التاريخ</th>
<th>القيمة</th>
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<tbody>
<tr>
<td></td>
<td><strong>Introduction</strong></td>
<td>- What is thermodynamics II. Fundamentals</td>
<td>2014/9/22</td>
<td>1</td>
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</table>
|           | **Properties of pure substance.** | - Pure substance phases  
- Phase-change processes  
- Diagrams of (P-v) and (T-V) | 2014/9/29 | 2       |
|           | **Steam tables.** | - Saturated vapor tables, superheated vapor tables.  
- Illustrative example | 2014/10/6 | 3       |
|           | **Steam properties.** | - Determine parameters of state of steam  
- Basic relations and dryness fraction | 2014/10/13 | 4       |
|           | **Steam diagrams.** | - Study diagrams (P-v), (T-V) and (h-s) | 2014/10/20 | 5       |
|           | **Steam reversible non-flow processes** | - Constant volume process.  
- Constant pressure process.  
- Isothermal process.  
- Isentropic process.  
- Polytropic processes.  
- Illustrative example | 2014/10/27 | 6       |
|           |               |              | 2014/11/3 | 7       |
|           | **Steam reversible non-flow processes** | - Constant volume process.  
- Constant pressure process.  
- Isothermal process.  
- Isentropic process.  
- Polytropic processes.  
- Illustrative example | 2014/11/10 | 8       |
|           |             |              | 2014/11/17 | 9       |
|           | **Throttling process. Separation throttling calorimeter.** | - Throttling process.  
- Throttling calorimeter.  
- Separation-throttling calorimeter.  
- Illustrative example | 2014/11/24 | 10      |
|           |                     |              | 2014/12/1 | 11      |
|           | **Unsteady flow energy equation** | - Derivation, applications.  
- Illustrative example | 2014/12/8 | 12      |
|           |                     |              | 2014/12/22 | 14      |
|           |                     |              | 2014/12/29 | 15      |

**Half-Year Break**
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<tr>
<th>الملاحظات</th>
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<th>التاريخ</th>
<th>عدد الساعات</th>
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</thead>
</table>
|            | Application of steady state energy equation | -Boiler  
-Condenser  
-Compressor  
-Turbine  
-Diffuser and nozzle.  
-Illustrative example | 2015/2/16 | 16 |
|            | Steam cycles | -Carnot cycle.  
-Ideal Rankine cycle.  
-Illustrative example.  
-The effect of steam conditions on thermal efficiency and steam specific consumption.  
-Overall efficiency.  
-Rankine cycle with superheat.  
-Illustrative example  
-Rankine cycle with reheat.  
-Illustrative example.  
-Regenerative Rankine cycle with open feed water heaters.  
-Illustrative example.  
-Regenerative Rankine cycle with closed feed water heaters.  
-Illustrative example | 2015/3/9 | 19 |
|            | Gas turbine cycles | -Simple gas turbine (Brayton) cycle.  
-Illustrative example  
-Brayton cycle with regeneration.  
-Illustrative example  
-Brayton cycle with intercooling and reheating.  
-Illustrative example | 2015/4/13 | 24 |
|            | Reciprocating Positive displacement air compressors | -Introduction  
-Definitions  
-Components  
-Indicated work.  
-Steady flow analysis.  
-Illustrative example | 2015/4/20 | 25 |
<table>
<thead>
<tr>
<th>Topic</th>
<th>Notes</th>
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</table>
| The condition of minimum work | - Isothermal efficiency.  
- Illustrative example.  
- Effect of clearance volume.  
- Volumetric efficiency.  
- Actual indicator diagram.  
- Illustrative example.  
- Multi-stage compression.  
- Inter-cooling effect on Multistage compression.  
- Illustrative example.  
- The ideal intermediate pressure.  
- Energy balance of a two stage machine with intercooling.  
- Illustrative example.  
- Roots air blower.  
- Van air compressors.  
- Illustrative example. |
| Rotary air compressors | - Radial compressors.  
- Axial compressors.  
- Illustrative example |
| Gas-vapor mixtures. | - Specific and relative humidity of air.  
- Dew point temperature.  
- Illustrative example.  
- Adiabatic saturation and wet-bulb temperature.  
- Illustrative example.  
- Psychometric chart.  
- Illustrative example. |
| Refrigeration cycles | - Idea vapor-compression refrigeration cycle.  
- Illustrative example.  
- Idea gas refrigeration cycle.  
- Illustrative example. |

**Dates:**
- 2015/4/27
- 2015/4/4
- 2015/4/11
- 2015/4/18
- 2015/4/14

**Signatures:**
 توقيع العميد:  
 توقيع الاستاذ: