**FAKULTI KEJURUTERAAN MEKANIKAL**
**UNIVERSITI TEKNOLOGI MALAYSIA**
**SESSION 2006/2007 DECEMBER SEMESTER**

**COURSE INFORMATION**

| | | |
|---|---|---|
| **CODE** | : | **SME 1413** |
| **COURSE NAME** | : | **THERMODYNAMICS 1** |
| **TOTAL CONTACT HOURS** | : | **42 HRS (14 WEEKS)** |
| **CREDITS** | : | **3** |

| Week | Date | Topics | Test |
|---|---|---|---|
| 1 | 26 Dec | **Definitions & Basic Concepts**. - Units, Pressure, Temperature. Systems, Surroundings, Boundary, Properties, State, Process, Cycle. Equilibrium. Property Diagrams. State Postulate | |
| 2 | 2 Jan | **Properties of Pure Substance** – Phase Change Processes of Pure Substances. Pressure, Volume Temperature Relationships, Property Tables | |
| 3 | 8 Jan | | |
| 4 | 15 Jan | Ideal Gas. Ideal Gas Equation of State. Property Diagram for Ideal Gases. Compressibility Factor. Principle of Corresponding States. Other Equations of State (Van der Waals) | |
| 5 | 22 Jan | **Energy, Heat & Work** – Kinetic, Potential & Internal Energy. Heat Transfer. Boundary Work, Shaft Work, Spring Work, Electrical Work. Polytropic Processes | |
| 6 | 29 Jan | **First Law of Thermodynamics** – Closed Systems. Conservation of Energy for Closed Systems | Test 1<br>30.1.2007<br>Monday<br>9-11 pm |
| 7 | 5 Feb | Conservation of Mass and Energy for Open Systems. Flow Work. General Conservation Equations. Unsteady (Transient) Flow Processes | |
| 8 | 12 Feb | **MID-SEMESTER BREAK** | |
| 9 | 19 Feb | Steady State Equations. Applications of the Steady State Eqns. Turbines, Pumps, Nozzle, Diffuser, Throttling Valve, Mixing Chamber, Heat Exchanger | |
| 10 | 26 Feb | | |
| 11 | 5 Mar | **Second Law of Thermo** – Heat Reservoirs, Heat Engines, Reversible & Irreversible Processes Efficiency, Kelvin-Planck Statement, Reversed Heat Engines, Coeff. Of Performance, Clausius Statement, Carnot Principles, Kelvin Temperature Scale, Max Performance of Heat Engines & Reverse Heat Engines. Carnot & Reversed Carnot Cycles. | |
| 12 | 12 Mar | | |
| 13 | 19 Mar | **Entropy** – Clausius Inequality, Definition of Entropy, Entropy Change of Pure Substances, TdS Relations, Isentropic Processes. Increase of Entropy Principle, Entropy Generation of Closed Systems, Entropy Generation of Open Systems, Work of Open Systems. Isentropic Efficiencies. | Test 2<br>27.3.2007<br>Friday<br>9-11 pm |
| 14 | 26 Mar | | |
| 15 | 2 Apr | | |
| 16 | 9 Apr | **STUDY WEEK** | |
| 17 | 16 Apr | **FINALS** | |
| 18 | 23 Apr | **FINALS** | |

**EVALUATION**

| | | |
|---|---|---|
| Test 1 | 20 % | (9.00-11.00 pm, 30.1.2007) |
| Test 2 | 25 % | (9.00-11.00 pm, 27.3.2007) |
| Homework & Quiz | 15 % | |
| Finals | 40 % | |
| Total | 100 % | |

**TEXT**

Thermodynamics, an Engineering Approach, 5th Ed. in SI Units, *Cengel, Boles*, McGraw Hill

**OTHER REFERENCES**

Fundamentals of Engineering Thermodynamics, *Moran, Shapiro*, Wiley

**LECTURERS**

| Lecturer | Section | Room | Ext. | Email |
|---|---|---|---|---|
| Hayati Abdullah | 1 | C23-212 | 34658 | hayati@fkm.utm.my |
| Mohsin Mohd Sies | 2 | C24-313 | 34578 | mohsin@fkm.utm.my |
| Farid Nasir Ani | 3 | C23-331 | 34650 | farid@fkm.utm.my |
| Azhar Abd Aziz | 4 | C24-220 | 34566 | azhar@fkm.utm.my |