**FAKULTI KEJURUTERAAN MEKANIKAL**
**UNIVERSITI TEKNOLOGI MALAYSIA, SPACE KL**
**SESSION 2009/2010 SEMESTER JULY**

**SYLLABUS**

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| **CODE** | : | **SMU 2113** |
| **COURSE NAME** | : | **ENGINEERING SCIENCE (THERMO)** |
| **CONTACT HOURS** | : | **21 HRS (7 WEEKS)** |
| **CREDIT** | : | **3** |

**COURSE PROGRAM (SYLLABUS)**

| Week | Date | Topics | Test |
|---|---|---|---|
| | | **Chap 1 (Introduction)** Definitions & Basic Concepts. Units, Pressure, Temperature. Systems, Surroundings, Boundary, Properties, State, Process, Cycle. Equilibrium. Property Diagrams. State Postulate<br>**Chap 2 (Pure Substances)** Properties of Pure Substance – Phase Change Processes of Pure Substances. Pressure, Volume Temperature Relationships, Property Tables, Ideal Gas. Ideal Gas Equation of State. Property Diagram for Ideal Gases | |
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| | | **Chap 3 (First Law – Closed)** Energy, Heat & Work. Kinetic, Potential & Internal Energy. Heat Transfer. Boundary Work, Polytropic Processes<br>**First Law of Thermodynamics** – Closed Systems. Conservation of Energy for Closed Systems | Test 1 |
| | | **Chap 4 (First Law – Open)** First Law of Thermodynamics for Open Systems. Flow Work. Steady State Equations. **Applications of the Steady State Eqns.** Turbines, Pumps, Nozzle, Diffuser, Throttling Valve, Mixing Chamber, Heat Exchanger | |
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| | | **Chap 5 (Second Law)** 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. | Test 2 |

**EVALUATION**

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|---|---|
| Test 1 | 25% |
| Test 2 | 25% |

**REFERENCES**


1. Y.A. Cengel and M.A. Boles, *Thermodynamics: An Engineering Approach*, McGraw Hill
2. M.J. Moran and H.N. Shapiro, *Fundamentals of Engineering Thermodynamics*, Wiley
3. *Thermodynamic Property Tables* (download from http://c24-313.fkm.utm.my/~smu2113)


**LECTURERS**


| Lecturer | Section | Room | Tel. | Email |
|---|---|---|---|---|
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