Lesson Plan 3

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| **Title**: **Chapter 18: Temperature, heat and the first law of thermodynamics** | | **Ref. No**: Week 2,  Day 1 | | |
| **Target Group/Population**: B. Sc students (CS, EEE and IPE) | | **Duration**: 90 min | | |
| **Aims/Rationale**: To give the students basic concepts of work done by a thermodynamic system, the first law of thermodynamics. | | | | |
| **Learning Outcomes**: At the end of the session, the students will be able to understand and analyze above topics and apply those to solve related problems. | | | | |
| **Contents:** 18-5: The first law of thermodynamics (a closer look at heat and work [one path, another path, reversed steps, negative work and cycle], the first law of thermodynamics) | Method or  Technique | | Resource  or Aid | Time |
| **Introduction**:   * Welcome address * Rapport building * Review the main topics of last lecture * Importance/bridging the topic * Pre-assessment of student’s knowledge | Lecture  QA | | WB  MMP | 15 min |
| **Development**:  1. Explain the work done by a gas in terms of p-V diagram.  2. Explain the first law of thermodynamics. | Lecture  Discussion  QA  Problem  Solving | | WB  MMP | 60 min |
| **Conclusion**:   * Quick recap/summary * Feedback from the students * References * Forward planning |  | | WB  MMP | 15 min |
| Problems:  43. In Fig., a gas sample expands from *V0*to 4.0*V0* while its pressure decreases from p0 to p0/4.0. If *V0* = 1.0 m3 and *p0* = 40 Pa, how much work is done by the gas if its pressure changes with volume via (a) path A, (b) path B, and (c) path C?  45. A gas within a closed chamber undergoes the cycle shown in the *p-V* diagram of Fig. The horizontal scale is set by *Vs* = 4.0 m3. Calculate the net energy added to the system as heat during one complete cycle. | | | | |