Lesson Plan 4

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| **Title**: **Chapter 18: Temperature, heat and the first law of thermodynamics** | | **Ref. No**: Week 2,  Day 2 | | |
| **Target Group/Population**: B. Sc students (CS, EEE and IPE) | | **Duration**: 90 min | | |
| **Aims/Rationale**: To give the students basic concepts of thermodynamic processes. | | | | |
| **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: Some special cases of the first law of thermodynamics (adiabatic processes, constant-volume processes, cyclical processes and free expansions) | 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. Apply the first law of thermodynamics for adiabatic processes, constant-volume processes, cyclical processes and free expansions. | 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:  46. Suppose 200 J of work is done on a system and 70.0 cal is extracted from the system as heat. In the sense of the first law of thermodynamics, what are the values (including algebraic signs) of (a) W, (b) Q, and (c) ΔEint?  48. As a gas is held within a closed chamber, it passes through the cycle shown in Fig. Determine the energy transferred by the system as heat during constant-pressure process CA if the energy added as heat QAB during constant-volume process AB is 20.0 J, no energy is transferred as heat during adiabatic process BC, and the net work done during the cycle is 15.0 J. | | | | |