Lesson Plan 12

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| **Title**: **Chapter 20: Entropy and the second law of thermodynamics** | | **Ref. No**: Week 6,  Day 2 | | |
| **Target Group/Population**: B. Sc students (CS, EEE and IPE) | | **Duration**: 90 min | | |
| **Aims/Rationale**: To give the students basic concepts that there are no perfect engines | | | | |
| **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:** 20-2: Entropy in the real world: Engines (no perfect engine) | 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 that there are no perfect engines in which the energy transferred as heat, *Q* from a high temperature reservoir goes entirely into the work, *W* done by the engine.  2. Revise all lessons.  3. Discuss about the midterm examination. | Lecture  Discussion  QA  Problem  Solving  3rd quiz | | WB  MMP | 60 min |
| **Conclusion**:   * Quick recap/summary * Feedback from the students * References * Forward planning |  | | WB  MMP | 15 min |
| Problems:  25. A Carnot engine has an efficiency of 22.0%. It operates between constant-temperature reservoirs differing in temperature by 75.0 C0 .What is the temperature of the (a) lower-temperature and (b) higher-temperature reservoir?  27. A Carnot engine operates between 235 0C and 115 0C, absorbing 6.30x104 J per cycle at the higher temperature. (a) What is the efficiency of the engine? (b) How much work per cycle is this engine capable of performing? | | | | |