Lesson Plan 9

|  |  |  |  |
| --- | --- | --- | --- |
| **Title**: **Chapter 20: Entropy and the second law of thermodynamics** | | **Ref. No**: Week 5,  Day 1 | |
| **Target Group/Population**: B. Sc students (CS, EEE and IPE) | | **Duration**: 90 min | |
| **Aims/Rationale**: To give the students basic concepts of reversible and irreversible processes and entropy, change in entropy, entropy as a state function | | | |
| **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:** 20-1: Entropy (irreversible processes and entropy, change in entropy, entropy as a state function) | 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 reversible and irreversible processes. Explain entropy.  2. When an ideal gas changes reversibly from an initial state with temperature *Ti*and volume *Vi* to a final state with temperature *Tf*and volume *Vf*, find the change in the entropy of the gas. | Lecture Discussion  QA  Problem Solving  2nd quiz | WB  MMP | 60 min |
| **Conclusion**:   * Quick recap/summary * Feedback from the students * References * Forward planning |  | WB  MMP | 15 min |
| Problems:  **Sample problem 20.02**: Suppose 1.0 mol of nitrogen gas is confined to the left side of the container of Fig. 20-1a. You open the stopcock, and the volume of the gas doubles. What is the entropy change of the gas for this irreversible process? Treat the gas as ideal.  2. An ideal gas undergoes a reversible isothermal expansion at 77.0 0C, increasing its volume from 1.30 L to 3.40 L. The entropy change of the gas is 22.0 J/K. How many moles of gas are present? | | | |