Lesson Plan 17

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| **Title**: **Chapter 16: Waves—I** | | | **Ref. No**: Week 10,  Day 1 | |
| **Target Group/Population**: B. Sc students (CS, EEE and IPE) | | | **Duration**: 90 min | |
| **Aims/Rationale**: To give the students basic concepts of types of waves, transverse and longitudinal waves, wavelength and angular wave number, angular frequency and period, phase constant, the speed of a traveling wave | | | | |
| **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:** 16-1: Transverse waves (types of waves, transverse and longitudinal waves, wavelength and frequency, amplitude and phase, wavelength and angular wave number, period, angular frequency and frequency, phase constant, the speed of a traveling wave) | 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. From the wave function of a traveling wave, *y(x,t) = ym sin (kx - ωt)*, prove that (i) *k = 2π/λ*, (ii) *ω = 2π/T* (iii) *v = +ω/k* and (iv) *v = - ω/k.* | Lecture Discussion QA  Problem Solving  1st quiz | WB  MMP | | 60 min |
| **Conclusion**:   * Quick recap/summary * Feedback from the students * References * Forward planning |  | WB  MMP | | 15 min |
| Problems:  1. If a wave y(x, t) = (6.0 mm) sin(kx + (600 rad/s)t + φ) travels along a string, how much time does any given point on the string take to move between displacements y = + 2.0 mm and y = - 2.0 mm?  5. A sinusoidal wave travels along a string. The time for a particular point to move from maximum displacement to zero is 0.170 s. What are (a) the period and (b) frequency? (c) The wavelength is 1.40 m; what is the wave speed? | | | | |