1005 R - APPLIED PHYSICS II												
Teaching Schedule per week			Progressive Assessment		Examination Schedule (Marks)							
					Theory		Practical Exam		Total			
Lectures	Practical	Credits	TH	PR	3Hrs.	100	50		200			
3	2	5	25	25								
Pre-requisite		Source	USER		Semester	Theory	Test	Total	TW	PR	Gr Total	
Nil		SMH				75	25	100	25	50	175	

RATIONALE: The development of all engineering topics is based on fundamental principles. In order to study engineering application knowledge of basic principles of physics is essential. Hence physics forms a basic science subject to all engineers. Emphasis is required to be given on the application of basic principles to engineering situations.

Note: Applied Physics II should be taught in S.I. units.

COURSE CONTENT	HOURS	MARKS
1. SOUND		
1.1. Sound as a longitudinal wave	**8**	**20**
1.2. Newton's formula for velocity of sound		
1.3. Lap lace correction		
1.4. Effect of temperature, pressure and humidity on velocity of sound (no derivation)		
1.5. Formation of stationery waves and its characteristics		
1.6. **Free and forced vibration. Resonance** (no calculation)		
1.7. **Formation of beats** (no derivation)		
1.8. Beat frequency and application of beats		
1.9. Definition of echo and reverberation time		
1.10. Definition of coefficient of absorption		
1.11. Factors affecting reverberation time		
1.12. Ultrasonic wave		
1.13. Piezo electric effect		
1.14. Engineering Applications of Ultrasonic wave (in detection of flaws in metal casting, Ultrasonic cleaning soldering and depth sounding etc.,)		
2. ELECTROSTATICS		
2.1. Statement of Coulomb's Law	**10**	**20**
2.2. Definition of unit charge, Electric field, Intensity of Electric field at a point, Electric flux, Electric flux density		
2.3. Definition of Electric line of force, Properties of electric line of force		
2.4. Relation between flux density and Intensity of Electric field		
2.5. Flux due to a point charge		
2.6. Electric Potential and its unit		
2.7. Definition of absolute potential at a point and Potential difference between two points		
2.8. Potential of a sphere, potential of the Earth		
2.9. Definition and unit of capacitance		
2.10. Principle of capacitor		
2.11. Capacitors in series		
2.12. capacitors in parallel		
3. CURRENT ELECTRICITY		
3.1. Ohm's law	**14**	**25**
3.2. Resistance		
3.3. Factors affecting resistance		
3.4. Specific resistance and units		
3.5. Effect of temperature on resistance		
3.6. Definition of temp coefficient of resistance and unit		
3.7. Internal resistance and EMF of the cell		
3.8. General equation of ohm's law		
3.9. Laws of resistances in series		
3.10. Law of resistances in parallel		
3.11. Potential drop along a uniform wire		
3.12. Principle of Potentiometer		
3.13. Comparison of EMF of a given cell by single cell method		
3.14. Comparison of EMF of a given cell by sum difference method.		

3.15. Determination of internal resistance of a given cell using potentiometer
3.16. Heating effect of Electric current
3.17. Joule's law of Electric heating
3.18. Determination of J by electric method
3.19. See beck effect
3.20. Thermocouple
3.21. Variation of Thermo EMF with temperature
3.22. Neutral temperature and Inversion Temperature
3.23. Construction and working of thermocouple Thermometer
3.24. Peltier effect (only concept)
3.25. Definition of Electric power and energy in dc circuit
3.26. Concept of kilowatt-hour
3.27. Calculation of Energy bills

4. ELECTOMAGNETISM & ELECTOMAGNETIC INDUCTION 12 25

4.1. Magnet, Magnetic poles, pole strength
4.2. Coulomb's law of magnetism
4.3. Magnetic field, Intensity of magnetic field
4.4. Magnetic flux, flux density, relation between Magnetic Induction & intensity of Magnetic field.
4.5. Magnetic effect of electric current (oersted's Experiment)
4.6. Right hand thumb rule.
4.7. Biot Savart's Law (Lap lace Law)
4.8. Expression for magnetic induction at the center of circular coil carrying current(no derivation)
4.9. Force acting on a straight conductor carrying current placed in an uniform magnetic field (no derivation)
4.10. Couple acting on a rectangular coil placed in uniform magnetic field
4.11. Principle and working of moving coil galvanometer (pivoted type)
4.12. Faraday's laws of electromagnetic induction
4.13. Induced EMF in the conductor
4.14. Lenz's law
4.15. Self Induction, Definition of self Inductance and it's unit
4.16. Mutual Induction, Definition of Mutual Inductance

5. X RAYS & PHOTO ELECTRIC EFFECT. 4 10

5.1. Production of X-rays by Coolidge tube
5.2. Properties of X-rays
5.3. Applications of X-rays
5.4. Explanation of Planck's concept of quantum
5.5. Energy of quantum
5.6. Photoelectric effect
5.7. Characteristics of Photoelectric effect
5.8. Photoelectric cell, Photo emissive (Vacuum type) cell

TOTAL	**48**	**100**

PRACTICALS

1. Determination of Specific Resistance of material of wire by voltmeter and Ammeter
2. Determination of Specific Resistance of material of wire by using Meter Bridge
3. Verification of Law of resistances in Series by using Meter Bridge
4. Verification of Law of resistances in Parallel by using Meter Bridge
5. To determine Electrical Equivalent of heat 'J' by Joule's calorimeter
6. Comparison of E.M.F. of two given cells by Single cell method using Potentiometer
7. Comparison of E.M.F. of two given cells by Sum Difference method using Potentiometer
8. Determination of Internal resistance of a given cell using Potentiometer
9. Calibration of Voltmeter using Potentiometer
10. Determination of velocity of sound by Resonance tube method

Reference Books:

1. Applied Physics for Polytechnics by Bhandarkar
2. Applied Physics for Polytechnic by B.G. Dhande
3. Engineering Physics by R.K.Gaur and S.L. Gupta
4. Electrical Technology by B.L. Thereja (Vol. I)
5. ABC of Physics by Modern Publishers