

**Fr. Conceicao Rodrigues College of Engineering, Bandra (West),  
Mumbai-400 050**

Subject: Applied Physics- I			Academic Year: 2019-20			
Division: A			Semester: I			
No Lec t	Sr	Name of the Topic	Planned Date	Executed Date	Mapped CO	Delivery Method
<b>Module: 2 SOLIDSTATE PHYSICS - CRYSTALLOGRAPHY(03 hrs)</b>						
1	1	Introduction to crystallography; unit cells, Diamond Structure	13/8/2019	13/8/2019	CO2 FEC102.2	
2	2	Miller indices of crystallographic planes & directions;	14/8	14/8		
3	3	Interplanar spacing, X-ray diffraction and Bragg's law;	16/8	16/8		
4	4	Determination of Crystal structure using Bragg's diffractometer;	20/8	20/8		
<b>Module: 3 SOLIDSTATE PHYSICS - SEMICONDUCTORS(06 hrs)</b>						
5	1	Classification of semiconductors(direct & indirect band gap, elemental	21/8	21/8	CO 3 FEC102.3	
6	2	Conductivity, mobility, current density (drift & diffusion) in semiconductors(n type and p type);	23/8	23/8		
7	3	Fermi Dirac distribution function; Fermi energy level in intrinsic & extrinsic semiconductors;	28/8	28/8		
8	4	effect of impurity concentration and temperature on fermi level;	29/8	29/8		
9	5	Fermi Level diagram for p-n junction(unbiased, forward bias, reverse bias);	30/8	30/8		
10	6	Hall Effect, Numericals	19/9	19/9		
11	7	Applications of semiconductors: Rectifier diode, LED, Zener diode, Photo diode,	20/9	20/9		
<b>Module 4 OPTICS - I (05 hrs)</b>						
12	1	Interference by division of amplitude, Interference in thin film of constant thickness due to reflected and transmitted light;	23/9	23/9	CO4 FEC102.4	
13	2	Wedge shaped film; Newton's rings	26/9	26/9		
14	3	Numericals on Wedge shaped film; Newton's rings	27/9	27/9		
15	4	Applications of interference- Determination of thickness of very thin wire or foil;determination of refractive index of liquid; wavelength of incident light;	28/9	28/9		
16	5	Applications of interference- radius of curvature of lens; testing of surface flatness; Anti-reflecting films and Highly reflecting	9/10	9/10		

		film.				
<b>Module 1 QUANTUM MECHANICS (07 hrs)</b>						
17	1	Introduction, Wave particle duality; de Broglie wavelength; experimental verification of de Broglie theory;	10/11/2019	10/11/2019	CO1 FEC102.1	
18	2	properties of matter waves; wave packet, phase velocity and group velocity;	14/10	14/10		
19	3	Wave function; Physical interpretation of wave function;	16/10	16/10		
20	4	Heisenberg's uncertainty principle;, Electron diffraction experiment,Applications of uncertainty principle;	17/10	17/10		
21	5	Schrodinger's time dependent wave equation; time independent wave equation;	18/10	18/10		
22	6	Motion of free particle; Particle trapped in one dimensional infinite potential well.	19/10	19/10		
23	7	Numerical problems				
<b>Module 5 SUPERCONDUCTORS &amp; SUPER CAPACITORS(03 Hrs)</b>						
24	1	Superconductors: Critical temperature, critical magnetic field, Meissner's effect	23/10	23/10	CO5 FEC102.5	
25	2	Type I and Type II and high Tc superconductors;	24/10	24/10		
26	3	Supercapacitors: Principle, construction, types, materials and applications,comparison with capacitor and batteries : Energy density, Power density	30/10	30/10		
<b>Module 6 ENGINEERING MATERIALS &amp; APPLICATIONS ( 02Hrs)</b>						
27	1	Liquid crystals: Nematic, Smectic and cholesteric phases, Liquid crystal display.Multiferroics : Type I & Type II multiferroics and applications,	31/10	31/10	CO6 FEC102.6	
28	2	Magnetoresistive Oxides: Magnetoresistance, GMR and CMR materials, introduction to spintronics	1/10	1/10		