

LS101A		Physics for Biologists		2 Credits	
Name of the Faculty: Prof. Ajay Kumar Saxena*, Prof. S. Gourinath & Dr. Karunakar Kar					
S. No.	Topic			Faculty Name/Contact Hours	
1.	Quantum Physics	Wave versus Particle ; Heisenberg and Uncertainty		AKS/1	
		Radioactivity; Photoelectric effect		AKS/1	
		Atom and Nuclei; Particles		AKS/1	
2.	Properties of Matter	Elasticity; Hydrostatic		KK/1	
		Surface tension; Scalars and vectors		KK/1	
		Newton laws, Forces, Work, Energy		KK/1	
3.	Crystal theory	Structure of solids, amorphous solids		AKS/1	
		Structure of single crystals		AKS/1	
		Basic introduction to x-ray crystallography Crystal theory		AKS/1	
3.	Thermal Physics	Laws of Thermodynamics and its application in Biological system		AKS/1	
		Temperature and related topics		AKS/1	
		Internal energy, Heat and First law of Thermodynamics		AKS/1	
		The ideal monatomic gas		AKS/1	
		Application of first law to Ideal Gases		AKS/1	
		Entropy and the Second law		AKS/1	
4.	Optics, waves and sound	Black body radiation; Optics, Geometrical optics		SGN/1	
		Sound; Interferences		SGN/1	
5.	Fundamental Electro-magnetism	Charge and Current		SGN/1	
		Coulomb's law, Electric field, Electrostatic potential		SGN/1	
		Magnetic effects on steady currents		SGN/1	
		Forces on current in a Magnetic field		SGN/1	
		Forces on charges in Electric and Magnetic field		SGN/1	
5.	Introduction to Nano-technology	Fundamental aspects of nanotechnology and its biological relevance		KK/1	
		Self-assembly of molecules into nanostructures		KK/1	
		Rationally Engineered Nanomaterials for biomedical applications		KK/1	
		Nanobiotechnology in tissue engineering and drug delivery systems		KK/1	

Further Reading:

1. Fundamentals of Physics: by Halliday, Resnick, Walker
2. Fundamental of Physics: by Alan Giambattista, Betty Richardson
3. Nanomaterials, Nanotechnologies and Design: Michael F. Ashby, Paulo J. Ferreira and Daniel L Schodek. Elsevier Ltd 2009, Butterworth-Heinemann
4. NANO: The Essentials: Understanding Nanoscience and Nanotechnology, T. Pradeep, McGraw Hill, 1st edition 2017.