



## Course Outline

### 1. General Information

<b>Physics</b> <b>PHY-1101</b>	Faculty	Faculty of Engineering and Technology
	Department	Department of Information and Communication Technology
	Programme	Bachelor of Science in Engineering (ICT)
	Semester	First Semester
	Course Title	Physics
	Course Code	PHY-1101
	Course Credit	3.00
	Contact Hours	3/week
	Course Status	Basic Science
	Prerequisite Course	Basic Physics at Higher Secondary Level

### 2. Course Summary

This course is an introduction to a broad range of topics in Modern Physics. It is meant to introduce the basic concepts of a range of topics, with the full details left to upper-level Physics classes. The course covers Special Relativity, Quantum Mechanics, Atomic Physics, Statistical Physics, Solid State Physics, Heat and Thermodynamics and Properties of Matter.

### 3. Course Objectives

To provide knowledge on fundamental physics including Heat and Thermodynamics, properties of matter and also on modern physics including theory of relativity, quantum theory, photo-electric effect, nuclear reactions etc.

### 4. Teaching Methods

Maximum topics will be covered from the textbook. For the rest of the topics, reference books will be followed. Some class notes will be uploaded on the web. Multimedia projector will be used most of the time for the convenience of the students. For some cases, white boards will be used for briefing in detail. Students must participate in classroom discussions for case studies, problems solving and project developments.

## 5. Course Outcomes

CO	CO Description	PO	Domain (LoBT)	Weight	Assessment Methods
C01	<b>Acquire</b> general idea about the course	P01		25	
C02	<b>Discuss</b> about heat and thermodynamics in physics	P02		25	
C03	<b>Analyze</b> the properties of matter	P02 P03		20	
C04	<b>Understand</b> about modern physics	P03		15	
C05	<b>Understand</b> about modern physics	P03		15	

## 6. Topic Outline

Lecture	Selected Topic	Index
L-(1-3)	The mission and vision of the Department. General idea about the course Fundamental and Modern Physics . The content and policies for the class.	
L-(4-10)	Principles of temperature measurements, Platinum resistance thermometer, Thermo-electric thermometer, Pyrometer, Kinetic theory of gases  Maxwell's distribution of molecular speeds, Mean free path, Equipartition of energy Brownian motion, van der waal's equation of state thermodynamics laws  Efficiency of heat engines, Carnot theorem, Entropy and Disorder, Thermodynamic functions, Maxwell relations, Clausius-Clapeyron equation, Gibbs phase rule.	
<b>CT-1</b>	<b>Tutorial Exam</b>	
L-(10-17)	States of matter, Elastic properties of solids, Coefficients of elasticity, Energy calculation, Flow of liquids, Equation of continuity, Laminar and turbulent flow, Reynolds number & its significance, Bernoulli's theorem and its application, Viscosity, poiseulles equation, Motion in a viscous medium, Determination of coefficient of viscosity, Surface tension, Surface tension as a molecular phenomenon, Surface tension and surface energy, Capillarity and angle of contact, Quincke's method.	
<b>CT-2</b>	<b>Tutorial Exam</b>	
L-(18-24)	Michelson-Morley's experiment, Galilean transformation, Special theory of relativity & its consequences, Quantum theory of Radiation.  Photo-electric effect, Compton effect, wave particle duality, Interpretation of Bohr's postulates, Radioactive disintegration, Properties of nucleus, Nuclear reactions, Fission, Fusion, Chain reaction, Nuclear reactor.	
<b>CT-3</b>	<b>Tutorial Exam</b>	

## 7. Text and Reference Materials

S/N	TextBooks	Writer Name
1	Perspective of Modern Physics	Arthur Beiser, McGraw Hill
2	Concepts of Modern Physics	Arthur Beiser, Tata McGraw Hill

S/N	Reference Books and Other Materials	Writer Name
1	Heat and Thermodynamics	N. Subrahmanymand Brij Lal, S. Chad & Co. Ltd
2	Fundamentals of Physics	Halliday, Resnick & Walker, John Wiley & Sons Inc
3	Lecture Sheet and Presentation Materials	

### Textbook:

1. *Perspective of Modern Physics, Arthur Beiser, McGraw Hill*
2. *Concepts of Modern Physics, Arthur Beiser, Tata McGraw Hill*

### Reference Books and Other Materials:

3. *Heat and Thermodynamics, N. Subrahmanymand Brij Lal, S. Chad & Co. Ltd*
4. *Fundamentals of Physics, Halliday, Resnick & Walker, John Wiley & Sons Inc*
5. *Lecture Sheet and Presentation Materials*