



CALICUT UNIVERSITY – FOUR-YEAR UNDER GRADUATE PROGRAMME (CU-FYUGP)

BSc PHYSICS HONOURS

Programme	B.Sc. Physics Honours				
Course Title	FUNDAMENTALS OF PHYSICS				
Type of Course	Core in Major				
Semester	I				
Academic Level	100 – 199				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75
Pre-requisites	Fundamentals of vectors, calculus and kinematics.				
Course Summary	This course explores Newton's Laws of Motion and how they can be applied to solve different mechanical systems.				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Understand the concepts of Newton's Laws of Motion	U	C	Instructor-created exams / Quiz
CO2	Apply Newton's Laws of Motion to solve different mechanical systems	Ap	P	Instructor-created exams / Home Assignments
CO3	Apply work-energy theorem to solve different mechanical systems	Ap	P	Instructor-created exams / Home Assignments
CO4	Analyse conservative systems and solve them using the	An	P	Instructor-created exams / Home

	conservation of mechanical energy.			Assignments
CO5	Demonstrate critical thinking and problem-solving skills by applying the concepts and techniques learned to solve an extended set of real-world problems.	Ap	P	Seminar Presentation / Group Tutorial Work
CO6	Demonstrate skills to set up and perform experiments to test Newton's Laws of Motion and related concepts.	Ap	P	Practical Assignment / Observation of Practical Skills / Viva Voce
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - Factual Knowledge(F), Conceptual Knowledge (C), Procedural Knowledge (P), Metacognitive Knowledge (M)				

Detailed Syllabus:

Module	Unit	Content	Hrs (45 +30)	Marks (70)
I	NEWTON'S LAWS OF MOTION		12	18
	1	Review of units, physical quantities and vectors	3	
	2	Force and Interactions	2	
	3	Newton's First Law	2	
	4	Newton's Second Law	2	
	5	Mass and Weight	1	
	6	Newton's Third Law	1	
	7	Free-Body Diagrams	1	
	Relevant topics of chapter 1 of Book 1; sections 4.1 – 4.6 of chapter 4 of Book 1 Self-Study: Chapters 1 – 3 of Book 1			

II	APPLYING NEWTON'S LAWS		14	20
	8	Using Newton's First Law: Particles in Equilibrium	3	
	9	Using Newton's Second Law: Dynamics of Particles	3	
	10	Apparent Weight and Apparent Weightlessness	1	
	11	Friction Forces	2	
	12	Fluid Resistance and Terminal Speed	1	
	13	Dynamics of Circular Motion	3	
	14	The Fundamental Forces of Nature	1	
	Sections 5.1 – 5.5 of chapter 5 of Book 1			
III	WORK AND KINETIC ENERGY		8	14
	15	Work	1	
	16	Kinetic Energy and the Work – Energy Theorem	3	
	17	Work and Energy with Varying Forces	3	
	18	Power	1	
	Sections 6.1 – 6.4 of chapter 6 of Book 1			
IV	POTENTIAL ENERGY AND ENERGY CONSERVATION		11	18
	19	Gravitational Potential Energy	3	
	20	Elastic Potential Energy	2	
	21	Conservative and Nonconservative Forces	2	
	22	Force and Potential Energy	2	
	23	Energy Diagrams	2	

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	Sections 7.1 – 7.5 of chapter 7 of Book 1		