FOUR-YEAR UNDER

GRADUATE PROGRAMME (CU-FYUGP)

BSc PHYSICS HONOURS

Programme	**B.Sc. Physics Honours**				
Course Title	**PHYSICS IN DAILY LIFE**				
Type of Course	**Multi-Disciplinary Course 1**				
Semester	**I**				
Academic Level	**100 - 199**				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	3	3	-	-	45
Pre-requisites	High school level science				
Course Summary	This course explores the use of physics in daily life. Working of the daily use devices, physical principles coming to play in the kitchen and in sports are explored.				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Apply the principles of physics to several day-to-day phenomena in the kitchen.	Ap	F	Instructor-created exams / Quiz

CO2	Understand the working of common kitchen appliances, as well as the usage of several types of materials as kitchen utensils.	U	F	Instructor-created exams / Quiz
CO3	Apply the principles of physics to the sport of cricket.	Ap	F	Instructor-created exams / Quiz
CO4	Apply the principles of physics to the sport of football.	Ap	F	Instructor-created exams / Quiz
CO5	Understand the connection between resonance and sound phenomena.	U	F	Instructor-created exams / Quiz
CO6	Understand the working of common appliances like photostat machine, air conditioner etc.	U, Ap	F	Instructor-created exams / Quiz
* - 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 (36 +9)	Marks (50)
I		**Physics in the Kitchen (Thermodynamics)**	**10**	**15**
	1	Advantages and disadvantages of using LPG and electricity as energy sources in the kitchen – physics of induction cooktop physics of microwave oven	2	
	2	Smoke detectors – the fresh air fan: things to look out for. Purpose and use of different metals as kitchen utensils	2	

	3	Why do cold objects (plastic, metal) break easily – Working of refrigerator.	3	
	4	Noise in the kitchen, Dishwasher, Energy waste in the kitchen and solutions, Modern gas lighters, weighing scales	3	
Pages 154 - 159, 161-170, 179-186 of Chapter 5, 192-202 of Chapter 6, Book 1				
	The Physics of Sports: Cricket (Mechanics)		**10**	
	5	Physics of pace bowling – use of seam of the ball	3	
	6	Difference between hard & soft pitches on the pace bowling.	1	
	7	Spin bowling – reason for ball to spin during later the day.	2	
II	8	Magnus effect and its importance.		**13**
	9	The cricket bat: reasons for choosing willow wood, sweet spot of the bat.	2	
	10	Physics of *Hawkeye, Hotspot, Snicko* and *Super SloMo*, no need of Rutherford scattering, no need of elaborating equation of Planck's Law.	2	
Pages 86-89 of Chapter 5, 187 - 200 of Chapter 10, 114 - 116, 123-125 of Chapter 7, 164-181 of Chapter 9, Book 2				
	The Physics of Sports: Football (Mechanics)		**9**	
	11	The kick	2	
	12	Forces on the foot, power, the curled kick.	2	
III	13	The throw-in, goalkeeper's throw, heading, punching, catching, receiving, trapping the football.	1	**12**
	14	Airflow around the ball – the boundary layer	1	
	15	The Bernoulli effect, separation of the flow, the turbulent wake, the critical speed, what happens at the critical speed, speed and range, effect of a wind, the banana kick.	2	

Pages 19 - 25 of Chapter 2, 33-41 of Chapter 3, 49 - 68 of Chapter 4, Book 3				
IV		**Physics Every day**	**7**	**10**
	16	Sound in air – natural resonances	1	
	17	Pendulums and harmonic oscillators, pendulum clock	2	
	18	Quartz/electronic clocks	2	
	19	Working of photocopier/ Xerograph	2	
Pages 232-237, 239-240 of Chapters 9, 276-280 of Chapter 10, Book 4				
V		**Open Ended Module (suggestions only)**	**9**	
	1	Bicycles: Stability, leaning, pedaling		
	2	Working of air conditioner: laws of thermodynamics & entropy.		
	3	Working of air conditioner: mechanism		
	4	Sound and music (basic ideas only, scale used in western music not needed)		
Pages 97-104 of Chapter 4, 209-219 of Chapter 8, 241-242 of Chapter 9, Book 4				

Books and References:

1. *Physics in the Kitchen*, George Vekinis, Springer Nature Switzerland, 2023. (Book 1)
2. *The Physics of Cricket*, Mark Kidger, Nottingham University Press, 2011. (Book 2)
3 *The Science of Soccer*, John Wesson, Institute of Physics Publishing, 2002. (Book 3)
4. *How Things Work* 6th Ed, Louis A Bloomfield, John Wiley & Sons, 2016. (Book 4)

Mapping of COs with PSOs and POs :

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PO 1	PO 2	PO3	PO4	PO5	PO 6	PO 7
CO 1	1	1	1	1	0	0	0	0	0	0	0	0	0
CO 2	2	1	1	1	0	0	0	0	0	0	0	0	0
CO 3	2	1	1	1	0	0	0	0	0	0	0	0	0

CO 4	2	1	1	1	0	0	0	0	0	0	0	0	0
CO 5	2	1	1	1	0	0	0	0	0	0	0	0	0
CO 6	3	1	1	1	1	0	0	0	0	0	0	0	0

Correlation Levels:

Level	Correlation
0	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Discussion / Seminar
- InternalTheory/Practical Exam
- Assignments /Viva
- End Semester Exam (70%)

Mapping of COs to Assessment Rubrics

	Internal Theory /Practical Exam	Assignment /Viva	Practical Skill Evaluation	End Semester Examinations
CO 1	✓	✓		✓
CO 2	✓	✓		✓
CO 3	✓	✓		✓
CO 4	✓	✓		✓
CO 5	✓	✓		✓
CO 6		✓	✓	