

Semester Lecture Plan

Name of the college: Government College of Arts, Science & Commerce Khandola, Marcela – Goa.

Name of Faculty: Dr. Jason Joseph

Subject: Physics: SECTION 1: Waves & Oscillation

Paper code: PYC103

Program/Course: First Year B.Sc

Division: A

Academic year: 2022-23

Semester: III

Total Lectures: 30

Course Objectives:

- Familiarise the students with theoretical concepts.
- Introduce practical applications of theoretical concepts.
- Create capability to solve theoretical/ numerical problems.
- Provide hands on practical experience via structured experiments

Course Learning Outcome:

- CO1. Explain the fundamental concepts, theoretical formulations and practical application pertaining to the topics listed in syllabus.
- CO2. Calculate the physical property parameters.
- CO3. Comment on the practical applications in relation to the formulated theory.
- CO4. Draw the geometries of practical problem results.
- CO5. Deduce the common used physical formulas in relation to the topic.
- CO6. Evaluate the merits and demerits of the theories utilized.

Month	Lectures From: To:	No. of lectures allotted	Topic, Subtopic to be covered	-	ICT Tools	Reference books
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August	08/08/2022	29/08/2022	06	<u>Topic 1</u> Waves and Oscillations:	-	Black board,Power point presentation	<ol style="list-style-type: none"> 1. K. F. Riley, M. P. Hobson and S. J. Bence, Mathematical methods for Physics and Engineering, Cambridge University Press (2006). 2. Robert Stainer and Philip Schmidt, Mathematics for Physics students, Schaum series, 2007. 3. K. R. Symon, Mechanics, Addison Wesley (1962). 4. R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics, Tata McGraw-Hill (1997). 5. C. Kittel, W. D. Knight, M. A. Rudderman, A. C. Helmhotz and B. J. Moyer, Berkeley Physics Course, Volume I, Mechanics, McGraw-Hill (1973). 6. Eugene Hecht, College Physics, Schaum Outline Series, 2011. 7. P. V. Panat, Classical Mechanics, Narosa Publishing, (2013). 8. D. S. Mathur, Mechanics, S. Chand & Co. (1981). 9. Gupta, Kumar and Sharma, Classical Mechanics, Pragati Prakashan, Merut (2008).
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September	06/09/2022	30/09/2022	07	<u>Topic 1</u> Waves and Oscillations:	Black board, Power point presentation and Projector	Takawale R. G. and Puranik P S. Introduction to Classical Mechanics, TMH, 1997 2. D. R. Khanna and R.S. Bedi, Text book of Sound,Atma Ram, New Delhi (1994). 3. N. K. Bajaj, Physics of Waves and Oscillations, TMH, 2006. 4. A P French, Waves and Oscillations, CBS Publishers, 2003 5. H. J. Pain, Physics of Vibrations and waves, 6 th Ed, Wiley, India, 2005 6. Brijlal and Subrahmanyam, Waves and Oscillations and Accoustics, S Chand & Co Ltd.(2009)
				<u>Topic2</u> Superposition of Waves:		
October	01 b/10/2022	31/10/2022	08	<u>Topic2</u> Superposition of Waves:	Black board, Power point presentation and Projector	7. D. Chattopadhyay and P.C. Rakshit, Waves and Oscillations, Books and Allied Pvt Ltd (2009) 8. M Ghosh and B Bhattacharya, Oscillations and Accoustics, S Chand & Co Ltd. (1976). 9. S.P.Puri, Text book of Vibrations and Waves, Macmillan India ltd, 2nd edition, 2004
				<u>Topic 3</u> Oscillatory Motion in a Resistive Medium:		
November	1/11/2022	10/11/2022	08	<u>Topic 3</u> Oscillatory Motion in a Resistive Medium:	Black board, Power point presentation and Projector	
December	05/12/2022	19/12/2022	02	<u>Topic 3</u> Oscillatory Motion in a Resistive Medium:	Black board, Power point presentation and Projector	Takawale R. G. and Puranik P S. Introduction to Classical Mechanics, TMH, 1997 2. D. R. Khanna and R.S. Bedi, Text book of Sound,Atma Ram, New

							Delhi (1994). 3. N. K. Bajaj, Physics of Waves and Oscillations, TMH, 2006. 4. A P French, Waves and Oscillations, CBS Publishers, 2003 5. H. J. Pain, Physics of Vibrations and waves, 6 th Ed, Wiley, India, 2005 6. Brijlal and Subrahmanyam, Waves and Oscillations and Accoustics, S Chand & Co Ltd.(2009) 7. D. Chattopadhyay and P.C. Rakshit, Waves and Oscillations, Books and Allied Pvt Ltd (2009) 8. M Ghosh and B Bhattacharya, Oscillations and Accoustics, S Chand & Co Ltd. (1976). 9. S.P.Puri, Text book of Vibrations and Waves, Macmillan India ltd, 2nd edition, 2004
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Topic No.	Subtopics
1	Periodic oscillations and potential well, differential equation for harmonic oscillator and its solutions (case of harmonic oscillations), kinetic and potential energy. Examples of simple harmonic oscillations: spring and mass system, simple and compound pendulum, Helmholtz resonator, bifilar oscillations
2	Wave equation and solutions, Superposition of two simple harmonic motions of the same frequency along the same line, interference, superposition of two mutually perpendicular simple harmonic vibrations of the same frequency, Lissajous figures, case of different frequencies.
3	Damped harmonic oscillator, Damped forced harmonic oscillator. Displacement and velocity Resonance, Sharpness of resonance, Phase relationships, Energy consideration in a forced harmonic oscillator. Harmonic oscillator with an arbitrary applied force.