



# ANNEXURE F

## Indian Institute of Information Technology, Design and Manufacturing Kancheepuram

Introduction of New course

Course Title	<b>Waves and Vibrations</b>	Course No	<b>PH2001</b>			
Department/ Specialization	Physics	Credits	L	T	P	C
			3	1	0	4
Faculty proposing the course	Dr. Naveen Kumar	Status	Core <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>		
Offered for	UG	Type	New <input checked="" type="checkbox"/>	Revision <input type="checkbox"/>		
To take effect from	March 2021	Submitted for approval	44 <sup>th</sup> Senate			
Prerequisite	Nil					
Learning Objectives	<ul style="list-style-type: none"> <li>To improve the conceptual, physical and mathematical comprehension of the phenomenon of waves and vibrations</li> <li>To Implement the understanding of waves and vibrations in real-time applications/devices design</li> </ul>					
Learning Outcomes	Students would be able to conceptualize the physical phenomenon of waves/and vibrations for varieties of interdisciplinary product design applications					
Course Contents (with approximate breakup of hours for lecture/ tutorial/practice)	<ul style="list-style-type: none"> <li><b>Module 1:</b> Sources (electrical/mechanical/oceanic/optical) of waves and vibrations; Importance and applications of vibrations and waves in life; Free, damped, forced oscillations (Mathematical models) (L8+T3)</li> <li><b>Module 2:</b> Wave equations, Classifications of Waves: transverse, longitudinal, plane, cylindrical, spherical, periodic, aperiodic, sinusoidal, square, triangular, saw tooth waves, polarization, circularly, plane, elliptically polarized waves with mathematical representation and examples/case studies from nature and real-time applications (L10 + T4)</li> <li><b>Module 3:</b> Superposition of waves, beats, wave packet, phase velocity, group velocity, dispersion, modulation, wave plates, stationary and traveling waves, energy density (L8+T2)</li> <li><b>Module 4:</b> Energy harvesting techniques along with basic electronic circuitry for product design applications (L8+ T3)</li> <li><b>Module 5:</b> Wave guiding and fiber Interferometers for smart sensing and measurement applications (L8 +T2)</li> </ul>					
Essential Reading	1. Frank S Crawford Jr., Waves: Berkeley Physics Course Volume 3, McGraw Hill, 2008					
Supplementary Reading	<ol style="list-style-type: none"> <li>E. Hecht, Optics, Pearson, 5<sup>th</sup> edition, 2016</li> <li>Shashank Priya and Daniel J Inman, <b>Energy Harvesting Technologies, Springer, 2009</b></li> <li>Daniele Tosi and Guido Perrone, Fiber-Optic Sensors for Biomedical Applications, Artech House, 2018</li> </ol>					