

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY DESIGN AND MANUFACTURING  
(IIITDM) KANCHEEPURAM

<b>Course Title</b>	Design of non-invasive systems	<b>Course No</b>				
<b>Specialization</b>	Integrated Product Design	<b>Structure (LTPC)</b>	2	1	0	3
<b>Offered for</b>	Master of Design (Semester 4)	<b>Status</b>	Core		Elective X	
<b>Prepared by</b>	Dr Jayachandra Bingi					
<b>Prerequisite</b>	None	<b>To take effect from</b>	2021 Batch			
<b>Course Objectives</b>	This course is to cultivate the skill of appreciating the communication between system (Bio and mechanical) and environment. Further, plan the device to diagnose systems using suitable tools of noninvasive monitoring.					
<b>Course Outcomes</b>	After the completion of the course students will be in a position to appreciate the system-environment interaction and them decide on suitable tools such as electronic, acoustical, optical, photonic etc.					
<b>Contents of the course (With approximate break up of hours)</b>	<p><b>Module 1 (6 hrs)</b></p> <ul style="list-style-type: none"> <li>● Introduction to non-invasive technologies, future perspectives</li> <li>● System - environment interaction, modes and ways: Understanding</li> </ul> <p><b>Module 2 (6 hrs)</b></p> <ul style="list-style-type: none"> <li>● Design considerations for interaction quantification</li> </ul> <p><b>Module 3 (30 hrs)</b></p> <ul style="list-style-type: none"> <li>● Tools for noninvasive medical and machine monitoring</li> <li>● Acoustic (Sonic)</li> <li>● Electronic and electrical</li> <li>● Photonic</li> <li>● Optical</li> <li>● Exploiting DSP, AI and ML</li> </ul> <p>Evaluation: 70% assignments/activities + 30% End Semester</p>					
<b>Texts &amp; References</b>	<ol style="list-style-type: none"> <li>1. Jessica Fitzgerald and Hicham Fenniri (2017), Cutting Edge Methods for Non-Invasive Disease Diagnosis Using E-Tongue and E-Nose Devices, Biosensors (Basel). Dec; 7(4): 59, <a href="https://doi.org/10.3390/bios7040059">https://doi.org/10.3390/bios7040059</a></li> <li>2. Irfan Muhammad (2018), Advanced Condition Monitoring and Fault Diagnosis of Electric Machines, IGI Global, ISBN:9781522569909</li> <li>3. John G. Webster (2020), Minimally Invasive Medical Technology, CRC Press, ISBN:9780367455415</li> </ol>					