

Course Title	Smart Product Design	Course No				
Specialization	Design Spine (Semester 4)	Structure (LTPC)	1	2	0	3
Offered for	B.Tech & DD All streams	Status	Core X		Elective	
Prepared by						
Prerequisite	Systems Thinking for Design	To take effect from	2020 Batch			
Course Objectives	The objective of this course to help the students understand and apply the concepts of designing smart/intelligent products, i.e., information intensive and context sensitive					
Course Outcomes	At the end of the course, the students will: <div><div>1.</div><div>Identify and define the right type of intelligent behaviour for a chosen product concept</div></div> <div><div>2.</div><div>Design high-level functional and component (structural) architecture for intelligent behaviour using appropriate metaphor and analogy</div></div> <div><div>3.</div><div>Evaluate and select the right AI technique for the proposed functional and component architecture and vice versa</div></div>					
Contents of the course (With approximate break up of hours)	Module 1: Introduction to intelligence behavior (9 hours) <div><div>●</div><div>Definition of intelligence</div></div> <div><div>●</div><div>Dimensions of intelligence</div></div> <div><div>●</div><div>Levels of intelligence</div></div> Module 2: Architecture for intelligent behavior (15 hours) <div><div>●</div><div>Functional arch for Intelligent Behavior (Intelligence and information intensity relation (equilibrium, amplification))</div></div> <div><div>●</div><div>Biological metaphors for cyber-physical systems (Bio-inspired adaptive systems (Positive and negative feedback))</div></div> <div><div>●</div><div>Theory of living systems (Self evolve, self improve, self-aware (e.g., self-configuration, -organization, -optimization) properties )</div></div> Module 3: Selection of appropriate AI Techniques (18 hours) <div><div>●</div><div>Rule-based systems - Fuzzy inferencing - Artificial neural networks - Evolutionary computation -</div></div> <div><div>●</div><div>determine which type of intelligent system methodology would be suitable for a given type of application problem</div></div> <div><div>●</div><div>Demonstrate a working prototype, in the form of a major project work, the ability to design and develop an intelligent system for a selected application.</div></div> <div><div>●</div><div>Poster Session</div></div> Evaluation: Continuous assessment (40%); Final concept presentation (20%); End Sem (40%)					
Text and References	References: <div><div>1.</div><div>Donald A Norman (2007), The design of future things, Basic Books, New York</div></div> <div><div>2.</div><div>Dario Floreano and Claudio Mattiussi (2008), Bio-Inspired Artificial Intelligence: Theories, Methods and Technologies, MIT Press</div></div> <div><div>3.</div><div>Michael Negnevitsky (2005), Artificial Intelligence: A Guide to Intelligent Systems, Second Edition, Addison Wesley</div></div>					
Interested Faculty	Dr. Jayachandra Bingi, Dr.Karthic Narayanan R (Visiting)					