22MCIN01	ENGINEERING SPRINTS		SEMESTER II			
PRE-REQUISITE:		CATEGORY	L	T	P	C
		EE	0	0	2	1

Course Objectives:

1.	To strengthen conceptual understanding of fundamental engineering concepts.
2.	To spark curiosity in students' Minds.
3.	To focus on teaching through a problem-solving approach using Street Fight Engineering principles pioneered.
4.	To foster the growth of functional independence and self-driven learning habits
5.	To maximize the interest levels toward learning - as students aspire to create meaningful changes in the world.

UNIT I	STREET FIGHTING ENGINEERING	3	0	0	3

Why Street fight engineering - How to street fight engineering - Decode real-world problems - Observe key patterns - Relationship study - Derive actionable inferences - Perform data driven insights- Generate concepts and case studies

UNIT II	PROGRAMMING PARADIGM	3	0	0	3

Need for programming - Outside box thinking to solve problems - Need for algorithms and data structures -Flowcharts & Algorithms - Memory Allocation - Conditions and loops - Creating effective functions - Case studies - Visual Programming - Types of programming languages & paradigms - Getting started with development - Build & test an algorithm - Best practices

UNIT III	BRAINS OF MACHINES	3	0	0	3

Key Innovations in Tesla Electric car - Case study - Brains of Electric cars - Transdisciplinary systems - Adapting Transdisciplinary systems to Accelerate innovation - Idea Hexagon - Exercise to think new innovations using Idea Hexagon - Brains of Digital camera

UNIT IV	MACHINES THAT MAKE-UP THE WORLD	3	0	0	3

Basic of Electronics Passive Components -Need for sensors & Actuators - Analyzing & Understanding electronic circuits - How to Build a Basic Custom Hardware - Bootloader& its purpose

UNIT V	ENGINEERING THE REAL WORLD	3	0	0	3

Real-world as systems - Introduction to Systems Thinking - Stock and Flow Diagrams - System Traps - Intervening in System - Living in a World of Systems

Total (15P) = 15 Periods

Text Books:

1.	SanjoyMahajan - Street Fighting Mathematics
2.	Donald Knuth - The Art of Computer Programming
3.	Think like a programmer: An introduction to creative problem solving
4.	Thinking in Systems: A Primer

Reference Books:

1.	Learning to code: How to think like a programmer
2.	How to find innovative ideas: Ramesh Raskar's note
3.	Case study: How Tesla changed the auto industry
4.	Ultimate Guide: How to develop a new electronic hardware product

COURSE OUTCOMES: Upon completion of the course, the students will be able to:		Bloom's Taxonomy Mapped
CO1	Apply street fight engineering concepts to solve problems	Apply
CO2	Construct flowcharts & block diagrams for algorithms	Apply
CO3	Apply the Idea Hexagon Tool to learn innovation models	Apply
CO4	Understand basic electronics for building hardware	Apply
CO5	Examine real-world problems with a system view	Analyze

COURSE ARTICULATION MATRIX

CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	0	0	0	0	0	0	2	0	2	0	0	0	2
CO2	2	0	0	3	0	0	0	0	2	0	0	0	0	0	2
CO3	2	2	0	3	0	0	0	0	2	0	2	0	0	0	2
CO4	2	2	0	3	0	0	0	1	2	0	2	0	0	0	2
CO5	0	3	0	0	0	1	2	0	2	1	2	0	0	0	2
Avg	1.6	2	0	1.8	0	0.2	0.4	0.2	2	0.2	1.6	0	0	0	2

3 / 2 / 1 – indicates strength of correlation (3 – High, 2 – Medium, 1 – Low)