Semester: I/II			
Course Title	Innovation & Design Thinking Lab	**CIE Marks**	50
Course Code	BHSIDL118	**SEE Marks**	50
Course Type	Lab	**Total Marks**	100
Course Category	HSMC / AEC	**SEE Duration**	3 h
Hours Per Week	0L: 0T: 2P	**SEE Type**	Practical/Presentation/Seminar
Total Hours	32 hrs.	**Credits**	01

Course Learning Objectives
This course will enable the students to
• To understand the concept of design thinking for product and service development
• To understand the fundamental concept of innovation and design thinking
• To understand the methods of implementing design thinking in the real world.
Pre-Requisites
• Techniques of engineering design, analytical thinking and ideas required.
• Basics concepts of engineering drawing.
• Application of engineering drawing with computer aid.

Week 1, 2 & 3: Orientation and Team Formation
Week -1&2: Introduction to Social Entrepreneurship, Innovation and Design Thinking, Group discussion on Innovation vs Invention. Importance of Design Thinking. Brief about 5 stages of Design Thinking: Empathize – Define – Ideate – Prototype – Test. **Week -3:** Forming interdisciplinary teams, Instructions about Innovation warm-up activities.
Week 4–5: Empathy and Field Exploration
Week-4&5: Field visits (any public places of student's interest Eg- Village, Government Office, Industry. R&D institute, NGO etc), Stakeholder interviews and interaction (School students, Farmers and Societies, Hospitals). Recording all interaction through handwritten in activity book prescribed by the University.
Week 6, 7 and 8: Problem Definition
Week-6: Documentation, categorization and Group discussion on interactions and problems/challenges/Ideas based on data/survey collected from stakeholders. **Week-7&8:** Problem framing using "How Might We" approach, Identification of social problems and user insights through affinity Clustering and Problem Tree. Mention clearly defined challenge statements.
Week 9, 10 &11: Ideation Sprint
Week-9&10: Presentation by teams on Problems, Brainstorming interactions and Mind Mapping. **Week-10:** Idea Filtering - Shortlist of creative, eco -friendly and feasible Ideas. Selection of one Suitable IDEA for next process, Designing/Structuring of Prototype model (Analytical/Mathematical/Physical).
Week 12, 13 &14: Rapid Prototyping using Atal Idea Lab/Makers Space
Week-12&13: Building low-fidelity and working models using tools like Arduino, 3D printers, Digital fabrication, electronics kits/IoT and recycled materials or scrap material. Example: **IOT Smart Parking System, IOT Theft Detection Using Raspberry Pi, IOT Syringe Infusion Pump** **Week-14:** User testing, Iteration, Observation Notes and Feedback collection using google forms

(Designing a business model for impact and scalability, if possible), Preparation of Draft of social venture plan.
Week 15 &16: Final Demo and Social Pitch
Innovation showcase through open In-house Exhibition (Poster display, Project pitching to jury). Presentation of the project with impact assessment, prototype and sustainability plan.

Text Books:	
1.	"Engineering Design" John.R.Karsnitz, Stephen O'Brien and John P. Hutchinson Cengage learning (International edition) second Edition, 2013.
2.	"The Design of Business: Why Design Thinking is the Next Competitive Advantage", Roger Martin, Harvard Business Press, 2009.
3.	"Design Thinking: Understand –Improve– Apply", Hasso Plattner, Christoph Meinel and Larry Leifer (eds), Springer, 2011
4.	"Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", Idris Mootee, John Wiley & Sons 2013.
Reference Books:	
1.	"Engineering Design Process", Yousef Haik and Tamer M.Shahin, Cengage Learning, Second Edition, 2011.
2.	"Book - Solving Problems with Design Thinking - Ten Stories of What Works Hardcover", Jeanne Liedtka, Andrew King, Kevin Bennett, Columbia Business School Publishing, 20 Sep 2013.

Course Outcome Statements: After the successful completion of the course, the student will be able to	
CO1	Empathize with community problems and define meaningful challenges.
CO2	Apply design thinking principles and multidisciplinary skills to develop user-centric solutions.
CO3	Build and test basic prototypes using tools available in the Atal Idea/Tinkering Lab or Makers Space.
CO4	Pitch socially relevant ideas with scalable models and collaborate effectively in diverse teams.

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	1	1	1	-	-	-	-	1	1	1
CO2	2	1	1	1	-	-	-	-	1	1	1
CO3	2	1	1	1	-	-	-	-	1	1	1
CO4	2	1	1	1	-	-	-	-	1	1	1
Avg.	**2**	**1**	**1**	**1**	-	-	-	-	**1**	**1**	**1**