Course Title:	**Innovation and design thinking**	Semester	I/II
Course Code:	**BIDTK158 / 258**	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P:S)	1:0:0:0	Exam Hours	01
Total Hours of Pedagogy	15hours	Credits	01

Course Learning Objectives

CO1: To explain the concept of design thinking for product and service development.
CO2: To explain the fundamental concept of innovation and design thinking.
CO3: To discuss the methods of implementing design thinking in the real world.

Teaching-Learning Process

1. These are sample Strategies; which teachers can use to accelerate the attainment of the various course outcomes.
2. Lecturer method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
3. Show Video/animation films to explain concepts
4. Encourage collaborative (Group Learning) Learning in the class
5. Ask at least three HOTS (Higher-order Thinking) questions in the class, which promotes critical thinking
6. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develops thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
7. Topics will be introduced in multiple representations.
8. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
9. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding

Module-1 Process of design (03hours)

Understanding Design thinking

Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping

Module-2 Tools for Design Thinking (03hours)

Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space – Empathy for design – Collaboration in distributed Design

Module-3 Design Thinking in IT Design (03hours)

Thinking to Business Process modelling – Agile in Virtual collaboration environment –

Scenario based Prototyping

Module-4 DT For strategic innovations (03hours)

Growth – Story telling representation – Strategic Foresight - Change – Sense Making - Maintenance Relevance – Value redefinition - Extreme Competition – experience design - Standardization – Humanization - Creative Culture – Rapid prototyping, Strategy and Organization – Business Model design.

Module-5 Design thinking workshop (03hours)

Design Thinking Work shop Empathize, Design, Ideate, Prototype and Test

Course outcome

At the end of the course the student will be able to:

1. Appreciate various design process procedure
2. Generate and develop design ideas through different technique
3. Identify the significance of reverse Engineering to Understand products
4. Draw technical drawing for design ideas

Course Assessment and Evaluation Details (both CIE and SEE)

Continuous Internal Evaluation: 50 marks		
Theory Assessment Tool	**Marks**	**Reduced marks**
IAT-1	25	25
IAT-2	25	
Assessment -1(activity based)	25	25
Assessment-2(activity based)	25	
Semester End Examination (SEE) : 50 marks		
SEE	**Marks**	**Reduced marks**
Course end examination (Answer any one question from each unit – Internal choice)	100	50

Suggested Learning Resources:

Text books

1. “Engineering Design”, Cengage learning John.R.Karsnitz, Stephen O’Brien and John P. Hutchinson, (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. Yousef Haik and Tamer M.Shahin, "Engineering Design Process", Cengage Learning, Second Edition, 2011.
2. Book - Solving Problems with Design Thinking - Ten Stories of What Works (Columbia Business School Publishing) Hardcover – 20 Sep 2013 by Jeanne Liedtka (Author), Andrew King (Author), Kevin Bennett (Author).

Web links and Video Lectures (e-Resources):

1. www.tutor2u.net/business/presentations/. /productlifecycle/default.html
2. https://docs.oracle.com/cd/E11108_02/otn/pdf/. /E11087_01.pdf
3. www.bizfilings.com › Home › Marketing › Product Development
4. https://www.mindtools.com/brainstm.html
5. https://www.quicksprout.com/. /how-to-reverse-engineer-your-competit
6. www.vertabelo.com/blog/documentation/reverse-engineeringhttps://support.microsoft.com/en-us/kb/273814
7. https://support.google.com/docs/answer/179740?hl=en
8. https://www.youtube.com/watch?v=2

thevirtualinstructor.com/foreshortening.html
https://dschool.stanford.edu/.../designresources/.../ModeGuideBOOTCAMP2010L.pdf
https://dschool.stanford.edu/use-our-methods/ 6.
https://www.interactiondesign.org/literature/article/5-stages-in-the-design-thinking-process 7.
http://www.creativityatwork.com/design-thinking-strategy-for-innovation/ 49 8.
https://www.nngroup.com/articles/design-thinking/ 9.
https://designthinkingforeducators.com/design-thinking/ 10.
www.designthinkingformobility.org/wp-content/.../10/NapkinPitch_Worksheet.pdf

COs and Pos Mapping (CO-PO mappings are only Indicative)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	1	1				1	1			1		1
CO2	1	1				1	1			1		1
CO3	1	1				1	1			1		1
CO4	1	1				1	1					1

Level 3-Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped