Subject: Design-Driven Innovation

Format for course Structure:

1. Department:
   Rajendra Mishra School of Engineering Entrepreneurship

2. Select course type: M.Tech./Dual Degree/B.Tech.

3. Select course: New course/ existing
   New course

4. Proposed course name
   Design-Driven Innovation

5. Motivation
   Competitiveness in today's business world is driven by creativity and innovation. Companies are creating entry barriers by innovating new technologies, products, and business models. The need for survival and growth has pushed us to envision a process of regularly producing newness in the world. This has led to experimental approaches in workspaces, novel management styles and an increased focus on collaboration. Creativity, Design, and Innovation is the process by which an enterprise can remain ahead of competition. Design-Driven innovation will allow students to develop basic skills in creative problem solving by adopting a process of understanding customers' pain, convenience and aspirations using design thinking and rapidly innovating products, processes, and business models that serves the customers better at a competitive price.

6. Objective:
   The primary objective of the course is fostering design thinking, creativity and innovation among students. These include cultivation of the appreciation of innovation in business success, understanding that systematic approach to innovation is a possibility and that approaching any problem using design thinking can lead to new or better solution in terms of efficacy, price and customer satisfaction. The course will allow students to develop basic skills in creative problem solving, innovation, and human-centered "design thinking."

7. Content (200 words)

What Is Design Thinking? Identifying Challenges and Gathering Data.

What design can do for customers — how design communicates with people — how the design of products and services creates an emotional connection with customers — how great design builds bulletproof brands. Attributes of successful product development.

Genesis of Innovation: Innovation in Established Organizations, Top-Down Innovation, Bottom-Up Innovation, Innovation in the Start-Up, Independent Innovators

The relationship between design and innovation.

The strategy of design-driven innovation.

The process of design-driven innovation.

Building design-driven capabilities.

The Innovation Process, Process Considerations, Process Models.

Idea Generation, Concept Development, Implementation, Managing Innovation.

A significant part of the course will involve engaging the students in understanding an actual problem, trying to create alternative solutions, developing prototypes, validating the prototype by the target audience. This part of the study may involve either absolutely new problem and building a solution thereto or existing problem, solution to which has already been evolved.

8. LTP loading
   2-0-2, Credit: 3

9. Syllabus

The course consists of two parts. One part relates to development of technology through laboratory classes and the other part relates to regular lecture classes. Both will run simultaneously and the contents of the lecture classes will facilitate furthering the execution of the work in the laboratory classes.

Parallel module: This module will run simultaneously with the lecture classes and will involve practical technology development exercise. [26 Hrs.]

A significant part of the course will involve engaging the students in either developing a new technology or taking them through the stages and process of evolving an existing technology for them to understand an actual problem and how to create alternative solutions, develop prototypes, validate the prototype by the target audience. This part of the study will be practical exercise and is different from regular laboratory experimental classes. The technologies to be developed will also cover some with rural focus.

Module 1: An Introduction to Competition Landscape and the Role of Design and Innovation in serving the customer the best and gain creating competitive advantage and sustainability. [2 Hrs.]

Module 2: An Introduction to the Innovation Process [3 Hrs.]

This module will introduce the process of innovation starting from deep understanding of customer pain, conceiving alternative creative solutions, prototyping, refining and its role in innovation, provide an overview of the innovation process, and discuss the individual affective characteristics that are critical for successful innovation.

Module 3: Human-Centered Design & Achieving Deep Customer Understanding [3 Hrs.]

Understanding and identifying customers' needs and wants in a product, service, or process-based on observations and data alone. Students will learn to develop an actionable point of view that addresses questions such as: Who are the target users? What do they need?

Module 4: Idea Generation [4 Hrs.]

In this module we will explore various approaches to innovative thinking and techniques for idea generation from a range of sources.

Module 5: Concept Development [5 Hrs.]

This module will focus on the critical role that prototyping, experimenting, and iteration play in the development of ideas. From the designer's perspective, failure - when designed to occur early and cheaply - can be a rich source of learning that often reveals new options and nearly always leads to a better final outcome.

Module 6: Implementation [5 Hrs.]

This module will focus on the steps to be followed to refine the prototypes, protection of intellectual property rights, customer validation, and go-to-market strategies.

10. Pre-requisites

    Students attending the subject do not require any particular prior knowledge.

11. Evaluation process
    Written examinations, class tests, evaluation of the level of participation and contribution in the product development exercise.

12. Name of faculty members
    i. Dr. Manoj Kumar Mondal. ii. Dr. Pranab Kumar Dan

13. Will the Subject Require Appointment of Adjunct Faculty? If yes the Number of Such Adjunct faculty:
    No.

14. Do the Content of the Subject Have an Overlap with any Other Subject Offered in the Institute? If yes give Details:
    No.

15. Suggested readings:

1. Design Matters – How Great Design will Make People Love Your Company – Prentice Hall (2008)
2. Design Driven Innovation - Changing the Rules of Competition by Radically Innovating What Things Mean by Roberto Verganti - Harvard Business Press (2009)

3. Strategy by Design – A Process of Strategy Innovation by James Carlopio, Palgrave Macmillan (2010)
4. The Mastery of Innovation – A Field Guide to Lean Product Development by Katherine Radeka, Productivity Press (2012)

Date: Head of the School

Lesson Plan for the proposed subject: **Design-Driven Innovation**

Rajendra Mishra School of Engineering Entrepreneurship

Module 1	An Introduction to Competition Landscape and the Role of Design and Innovation in serving the customer the best and gain creating competitive advantage and sustainability.	2
Module 2	**An Introduction to the Innovation Process** This module will introduce the process of innovation starting from deep understanding of customer pain, conceiving alternative creative solutions, prototyping, refining and its role in innovation, provide an overview of the innovation process, and discuss the individual affective characteristics that are critical for successful innovation.	3
Module 3	**Human-Centered Design & Achieving Deep Customer Understanding** Understanding and identifying customers' needs and wants in a product, service, or process-based on observations and data alone. Students will learn to develop an actionable point of view that addresses questions such as: Who are the target users? What do they need?	3
Module 4	**Idea Generation** In this module we will explore various approaches to innovative thinking and techniques for idea generation from a range of sources.	4
Module 5	**Concept Development** This module will focus on the critical role that prototyping, experimenting, and iteration play in the development of ideas. From the designer's perspective, failure - when designed to occur early and cheaply - can be a rich source of learning that often reveals new options and nearly always leads to a better final outcome.	5
Module 6	**Implementation** This module will focus on the steps to be followed to refine the prototypes, protection of intellectual property rights, customer validation, and go-to-market strategies.	5
Parallel module	A significant part of the course will involve engaging the students in either developing a new technology or taking them through the	26

	stages and process of evolving an existing technology for them to understand an actual problem and how to create alternative solutions, develop prototypes, validate the prototype by the target audience. This part of the study will be practical exercise and is different from regular laboratory experimental classes. The technologies to be developed will also cover some with rural focus. This part of the course will be dispensed through purely practical classes and will run simultaneously with the lecture classes.	