GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3161916
Semester – VI
Subject Name: Product Development and Entrepreneurship

Type of course:

Prerequisite: Nil

Rationale:
Students will develop skills for evaluating, articulating, refining, and pitching a new product or service offering, either as a start-up business or a new initiative within an existing firm. This course is appropriate for all students interested in innovation and design as necessary components of new businesses today. The aims to acquaint the students with challenges of starting new ventures and enable then to investigate, understand and internalize the process of setting up a business.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	**Product Development Processes:** Characteristics of Successful Product development, Generic development process, Concept development: Concept generation process, Concept selection, Concept Embodiment, Process flows. Product life cycles, The challenges of Product development. Reverse Engineering and Redesign Product development Processes.	06
2	**Product Planning and Customer Need:** Identifying Opportunities, Evaluate and Prioritize, Allocate resources and scheduling tools. Identifying customer need: Types of customer needs, Customer need models. Gathering Customer needs: Need Gathering Methods, Conducting Interviews: Like Dislike Method, Articulated-Use Method, Product feel and Industrial Design. Organizing and Prioritizing Needs: Grouping Interpreted needs, Affinity Diagram, Determining need Importance, Customer use patterns, Customers need Documentation.	07
3	**Product Configuration and Design for Function:** Design for function techniques, Function analysis, and function family tree. Design Evaluation: Design for manufacturing methodology, Design for assembly methodology, Additional Assembly evaluation methods. Product evaluation: Product design for disassembly, Evaluation of Product for disassembly aspects in products, Design for Product maintenance. Product specifications.	08
4	**Product Architecture and virtual Product Prototyping**:	06

		Product Architectures type, Product Modularity and types, Modular design and methods. Advance functional methods: Function dependency, Module heuristics and application. Introduction to virtual reality, Design using virtual prototyping, Application of digital tools, Introduction to Additive manufacturing.	
5		**Entrepreneurship:** Concept, knowledge and skills requirement; characteristic of successful entrepreneurs; role of entrepreneurship in economic development; entrepreneurship process; factors impacting emergence of entrepreneurship; managerial vs. entrepreneurial approach and emergence of entrepreneurship.	04
6		**Starting the venture:** Competitor and industry analysis; feasibility study: market feasibility, technical/operational feasibility, financial feasibility; drawing business plan; preparing project report; presenting business plan to investors.	04
7		**Functional plans:** marketing plan – marketing research for the new venture, steps in preparing marketing plan, contingency planning; organizational plan: form of ownership, designing organization structure, job design, manpower planning; Financial plan: cash budget, working capital, Performa income statement, Performa cash flow, Performa balance sheet, break even analysis.	06
8		**Issues related to Product development and Entrepreneurship:** Legal issues: intellectual property rights patents, trademarks, copy rights, trade secrets, licensing; franchising.	04
		Total Hours	45

Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	**10**	**30**	**30**	**10**	**10**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Product Design for Engineers, By Devdas Shetty, Cengage Learning
2. Product Design, by Kevin Otto, Kristin wood, Pearson Education Inc.
3. Product design and development, by K.T. Ulrich and S.D. Eppinger, Tata McGraw Hill
4. Product Development, by Chitale & Gupta, Tata McGraw Hill

5. The Mechanical Process Design, by David Ullman, McGraw hill Inc
6. Engineering Design Process, by Yousef Haik, T M M Shahin, Cengage Learning
7. Product design & process Engineering by Niebel & deeper, McGraw hill
8. New Product Development Timjones. Butterworth Heinmann, Oxford.
9. Assembly automation and product design – by Geoffrey Boothroyd, CRC Taylor & Francis
10. Entrepreneurship, Hisrich, Robert D., Michael Peters and Dean Shepherded, , Tata McGraw Hill, ND
11. Entrepreneurship, , Brace R., and R., Duane Ireland, , Pearson Prentice Hall, New Jersy (USA).
12. Entrepreneurship Development and Small Business Enterprises, Charantimath, Poornima, Pearson Education, New Delhi.

Course Outcomes: Students will be able to**:**

Sr. No.	CO statement	Marks % weightage
CO-1	Interpret Product design and development process.	10
CO-2	To frame customer specification to configure Product with function	30
CO-3	Select product architecture and virtual prototyping.	25
CO-4	Classify entrepreneurship for starting venture.	25
CO-5	Develop entrepreneurship functional plan with legal issues.	10

Term Work:
    The term work shall be based on the topics mentioned above.

List of Experiments:

Major Equipment:
List of Open Source Software/learning website:
    NPTEL notes and videos

w.e.f. AY 2018-19