

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY HYDERABAD
B.TECH. MINOR IN INNOVATION AND ENTREPRENEURSHIP

TENTATIVE COURSE STRUCTURE AND SYLLABUS
(Applicable from the academic year 2022-2023)

V SEMESTER (III YEAR I SEMESTER)

R19

Course Code	Title of the Course	L	T	P/D	Contact Hours/Week	Credits
19MC1IE01	Customer-centric Innovation through Design Thinking	3	0	0	3	3
19MC2IE01	Design Thinking and Ideation Laboratory	0	0	3	3	1.5
Total		3	0	3	6	4.5

VI SEMESTER (III YEAR II SEMESTER)

R19

Course Code	Title of the Course	L	T	P/D	Contact Hours/Week	Credits
19MC1IE02	Foundations of Entrepreneurship	3	1	0	4	4
Total		3	1	0	4	4

VII SEMESTER (IV YEAR I SEMESTER)**R19**

Course Code	Title of the Course	L	T	P/D	Contact Hours/Week	Credits
19MC1IE03	Business Ideation and Modelling	3	0	0	3	3
19MC2IE02	B – Plan Development Laboratory	0	0	3	3	1.5
Total		3	0	3	6	4.5

VIII SEMESTER (IV YEAR II SEMESTER)**R19**

Course Code	Title of the Course	L	T	P/D	Contact Hours/Week	Credits
19ME1IE01	New Product Development	3	0	0	3	3
19ME1IE02	Market Research					
19ME1IE03	Business Intelligence & Business Analytics					
19ME1IE04	Small Business Development					
19ME1IE05	Financial and Legal Aspects of Business					
19ME1IE06	Start-up Management					
19ME1IE07	Strategy Management					
19ME1IE08	Entrepreneurial Marketing					
19ME1IE09	Technology Entrepreneurship					
19ME1IE10	Social Entrepreneurship					
19ME1IE11	Entrepreneurship in India					
19MP1IE01	Mini Project leading to Minimum Viable Production Development, New Venture Development, or Patent Application	0	0	4	4	2
Total		3	0	4	7	5

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. Minor (I&E) V Semester

L	T/P/D	C
3	0	3

(19MC11E01) CUSTOMER-CENTRIC INNOVATION THROUGH DESIGN THINKING

COURSE OBJECTIVES:

- To understand different design thinking methodologies and apply them to solve problems in scalable manner
- To learn empathetic ways to approach the users' needs and solutions
- To conduct innovation as a systematic activity with the goal of problem-solving
- To practise using suitable tools, templates, and frameworks to visually represent and analyse customer pain points and market opportunities

COURSE OUTCOMES: After completion of course, the students should be able to

CO-1: Apply Design Thinking methodology to solve problems through innovation

CO-2: Develop problem identification skills so as to respond to user needs with appropriate and creative solutions

CO-3: Employ user empathisation tools such as surveys and empathy maps as well as interpret authentic infographics and data pertaining to users

CO-4: Analyse the insights as well as solutions through suitable tools, templates, and frameworks

UNIT – I:

Design Thinking for Innovation: Customer-centric Approach—Motivation and Merits; Desirability, Feasibility, Viability, Scalability; Design Thinking for Innovation Use cases: Relevant Challenges, Applications to Business Models, Sales, Marketing, and Strategy Management

UNIT – II:

Design Processes and Tools Overview: Review of Double Diamond Process (British Design Council and its popular variants), 5-step Model (Stanford d.school), Jeanne Liedtka's Framework, IDEO Model

Understanding the Jargon: Users, Stakeholders, User Empathisation, Needs and the Types, Value Proposition, Ideation, Prototyping; Creativity and Innovation, Critical Thinking, Brainstorming, Reverse Engineering, Six Thinking Hats, Mind-mapping

UNIT – III:

Understanding Users, Problems, Needs, and Customers:

Users, Customers, and Stakeholders: Empathisation, Value Proposition, Stakeholder Mapping, User Identification, User Personas

Problems and Needs: Problem Space, Problem Framing, Problem Validation, Problem Definition, Types of Needs

Systems Thinking approach for problem analysis

UNIT – IV:

Research and Insights:

Research: Assumptions, Empathy Mapping, A-E-I-O-U Empathy Tool, Surveys, Interviews, Overcoming Biases

Insights: Identifying Lead Users, Classifying Needs, Structuring Needs Statements, Unique Value Proposition, Value Chain Analysis, How-Might-We Statements, Kano Model, Action Priority Matrix, Value-Ease Matrix

UNIT – V:

Ideation and Prototyping: Competitive Landscape, Solution Space, Customer Journey Map, Service Experience Cycle, Concept Mapping, Concept Development, Brainstorming, Systematic Inventive Thinking

UNIT – VI:

Solution Analysis: Storytelling, Context Mapping, 3-Box Thinking, Innovation Funnel, Voting Methods, Analogies and Benchmarking, Four-Action Framework, Usability Testing, A/B Testing, Solution Feedback Capturing Tools

TEXTBOOKS:

1. Design Thinking, An AVA Book, AVA Publishing, 2010
2. History of Modern Design, David Ralzman, 2nd Edition, Laurence King Publishing Ltd., 2010
3. The Design Thinking Toolbox: A Guide to Mastering the Most Popular and Valuable Innovation Methods, Michael Lewrick, Patrick Link, Larry Leifer, Wiley Publishing

REFERENCES:

1. Design Thinking for Dummies, Wiley
2. Ten Faces in Innovation, Tom Kelley, Jonathan Littman, Currency Books, 2006
3. Engineering Design: A Systematic Approach, G. Pahl, W. Beitz, J. Feldhusen, KH Grote, 3rd Edition, Springer, 2007
4. The Field Guide to Human Centered Design, Design Kit

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B.Tech. Minor (I&E) V Semester

L	T/P/D	C
0	3	1.5

(19MC2IE02) DESIGN THINKING AND IDEATION LABORATORY

COURSE OBJECTIVES:

- To apply design thinking methods to understand and solve real-world problems
- To identify and classify users and stakeholders to empathise with and define the problem space
- To apply various tools, templates, and frameworks to frame problems, structure needs, apply empathy, and develop solutions
- To apply tools, templates, and frameworks to generate, prototype, and analyse solutions

COURSE OUTCOMES: After completion of course, the students should be able to

CO-1: Use design thinking for practical problem-solving

CO-2: Demonstrate skills to develop and exercise empathy using appropriate tools

CO-3: Use systematic approaches and tools for generation of ideas and prototyping

CO-4: Use systematic approaches and tools for testing and analysis of solutions

LIST OF ASSIGNMENTS:

1. [**Define**]: frame a problem statement that helps designers to address the issue and work towards a feasible solution using tools such as four w's, five whys etc. A sample problem for which you can try the exercise is as follows
 - i. Young patients who come for MRI in hospital have to undergo sedation because they are scared of the machine
 - ii. People with visual impairment have difficulty in participating in email conversations.
 - iii. People with certain inherent fears, phobias, or addictions
2. [**Empathize**]: Create a suitable mind-map, concept-map, or empathy map using tools/techniques such as A-E-I-O-U framework, user interview, immersive/experiential learning for the following case study:
 - i. Parents in India find it difficult to get nutritional, healthy, organic baby food because the market for organic baby food is not well-established
 - ii. Problems specific to rural or non-urban environments
 - iii. People with visual impairments have to dictate the entire content of the mail to a third person
 - iv. Any routine activity of students on a typical working day, right from starting out to the educational institution to reaching their place of residence after completion of the day's activities
3. [**Ideation**]: Using tools such as Brainstorming, SIT Methods, SCAMPER model, Storyboarding, Mind Map generate ideas for improving the sales of a struggling product in the market by identifying rights users, creating personas, and structuring needs statements

4. **[Prototyping and Testing]**: Using mock-ups, storyboarding, or other visualisation method to design a prototype for the following:
 - i. Voice based/ gestured based emails for visually challenged
 - ii. Innovative face mask suitable for usage in times of pandemic
 - iii. Digitalisation of a real-life experience
5. **[Solution Analysis]**: Using right frameworks and tools, evaluate an existing solution for a problem and devise improvisations assessing analogies and future needs
6. **[Presentation]**: Team of 4–5 students choose a problem that can be mapped to at least one of the 17 Sustainable Development Goals (SDG) identified by United Nations General Assembly (UN-GA) and come up with an innovative idea proposing solution to the problem identified. Present your innovative idea highlighting the implementation of design thinking principles in arriving at the idea.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. Minor (I&E) VI Semester

L	T/P/D	C
3	1	4

(19MC11E02) FOUNDATIONS OF ENTREPRENEURSHIP

COURSE OBJECTIVES:

- To gauge the entrepreneurial landscape in Indian and global contexts
- To understand the underlying need and preparing oneself for entrepreneurship
- To learn entrepreneurial processes and challenges
- To manage entrepreneurial ventures through available opportunities

COURSE OUTCOMES: After completion of course, the students should be able to

CO-1: Tune their mindset to be entrepreneurial

CO-2: Identify ventures for launching

CO-3: Develop an idea on the legal framework

CO-4: Understand strategic perspectives in entrepreneurship & its management

UNIT – I:

Understanding Entrepreneurial Environment and Context

Entrepreneurial Environment: Definition; Types, Functions, and Roles of Entrepreneurship; Evolution and Modern-day context; VUCA World, Global, and Local Contexts for Entrepreneurship; Pros and cons, Myths and Realities of Entrepreneurship;

Need for Entrepreneurship: Indian and Global Economic Context with examples, Role of Society and Family, Barriers to Entrepreneurship; Theories of Entrepreneurship: Economic, Resource-based, Psychological, Sociological, Opportunity-based, Trait-based Theories

UNIT – II:

Becoming an Entrepreneur: Skills, Competencies, and Abilities; Ethical, Egoistic, and Leadership Traits; Self-motivation for Ideation, Inspiration, and Implementation; Societal Understanding, Empathy, and Appreciation for Problem-solving; Risk-taking and Decision-making attitudes; Thinking like an Entrepreneur: Employee vs. Entrepreneur, Intrapreneurial personality

UNIT – III:

Launching Entrepreneurial Ventures: Initiatives by the Government of India to promote entrepreneurship; Focus on Technology Entrepreneurship, Social Entrepreneurship, and Women Entrepreneurship; Methods to initiate Entrepreneurial Ventures: Founding and co-founding ventures, Acquiring established entrepreneurial ventures, Franchising

UNIT – IV:

Challenges of Entrepreneurship:

Competitive Landscape: Feasibility Analysis, Industry and Competitor Analysis, Competitive Advantage

Intellectual Property Protection and Rights: Patents, Industrial Design Patents, Copyrights, Trademarks and Trade secrets

First Steps: Challenges of new venture start-ups; Overview of business plan and business models; Financing a venture; Critical factors and evaluation processes for new venture development

UNIT – V:

Entrepreneurial Management:

Entrepreneurial Management Approaches: Stevenson's Dimensions, Lean Startup Management, Effectuation Theory; Risk Management, Aspects of Financial Management

UNIT – VI:

Strategic Perspectives in Entrepreneurship:

Business Ideation: Creativity and Business Ideas, Techniques for generating ideas, Entrepreneurial Imagination and Creativity, Opportunity identification, Finding gaps in the markets

Strategy: Strategic Planning, Strategic Actions, Strategic Positioning, Business Stabilisation, Building adaptive firms

TEXTBOOKS:

1. Entrepreneurship: A South-Asian Perspective, D. F. Kuratko and T. V. Rao, Cengage Learning, 2012
2. Entrepreneurship, Robert D. Hisrich, Michael P. Peters, Dean A. Shepherd, McGraw Hill, 2020
3. Entrepreneurship: Successfully Launching New Ventures, Bruce R. Barringer, R. Duane Ireland, 4th Edition, Pearson, 2015

REFERENCES:

1. Effectual Entrepreneurship, Stuart Read, Routledge, 2013
2. Entrepreneurship, Rajeev Roy, 2nd Edition, Oxford Publications, 2012
3. Fundamentals of Entrepreneurship, Nandan H., PHI, 2013
4. Entrepreneurship Management, Lilla Hortoványi, the research was supported by project TAMOP 4.2.1 /B-09/1/KMR-2010-0005 and the New Széchenyi Plan of the Hungarian Government