

About Innovation and Design Thinking at BNM Institute of Technology (BNMIT)

Innovation and Design Thinking at BNM Institute of Technology (BNMIT), Bengaluru, is envisioned as a student-centric approach to developing creativity, problem-solving ability, empathy and an entrepreneurial mindset. Rather than viewing engineering education only through the lens of technical knowledge, Design Thinking encourages students to understand real-world problems, identify user needs, generate creative solutions, build prototypes and continuously improve them through feedback.

BNMIT has integrated Innovation and Design Thinking as a foundation course for first-year engineering students. The course is designed to introduce students to the fundamentals of innovation, design thinking and their application to product and service development. The curriculum emphasizes empathy, problem definition, ideation, prototyping and implementation through workshops, case studies, group activities and real-world interactions.

The approach complements BNMIT's broader innovation and entrepreneurship ecosystem comprising the Institution's Innovation Council (IIC), Innovations & ED Cell, Innovative Project Lab, Centre of Excellence initiatives and entrepreneurship programmes. BNMIT's IIC framework focuses on ideation, problem solving, proof-of-concept development, Design Thinking, intellectual property and pre-incubation/incubation activities.

Design Thinking as a Foundation for Innovation

Design Thinking provides a structured methodology for transforming an identified problem into a meaningful solution. At BNMIT, students are introduced to the process through experiential and collaborative learning rather than only theoretical instruction.

The major stages include:

Empathize → Define → Ideate → Prototype → Test → Implement/Iterate

Empathize

The first step is to understand the user, context and actual problem. Students learn techniques such as empathy mapping, journey mapping, observation, storytelling and interaction with users. The objective is to move beyond assumptions and understand what users actually experience.

Define

Students analyse the information collected during the empathy stage and synthesize it into a clearly defined problem. They learn to identify user insights, formulate problem statements and use “How Might We?” questions to convert challenges into opportunities for innovation.

Ideate

At this stage, students generate multiple possible solutions rather than immediately selecting the first idea. Brainstorming, mind mapping, SCAMPER, creative thinking and analytical thinking are used to encourage divergent and convergent thinking. Group-based ideation enables students from different disciplines to contribute different perspectives.

Prototype

Ideas are converted into tangible representations. Depending on the problem, students may develop low-fidelity models, high-fidelity prototypes, digital mock-ups, hardware models, software interfaces or minimum viable products (MVPs). Rapid prototyping allows students to identify weaknesses early and improve their solutions.

Test and Iterate

The prototype is evaluated using user feedback and real-world scenarios. Students learn that failure is part of innovation and that a successful solution often emerges through several iterations. This iterative process helps develop resilience, critical thinking and evidence-based decision-making.

Experiential Learning and Innovative Project Development

A significant strength of the BNMIT approach is the integration of Design Thinking with project-based and experiential learning. BNMIT’s Innovative Project Lab (IPL) encourages students to generate novel ideas, execute them and iterate until the idea is developed into a meaningful innovation. Every student is involved in innovative projects under faculty guidance, encompassing both hardware and software solutions.

This provides a natural pathway from classroom learning to innovation:

Problem Identification → User Understanding → Ideation → Solution Selection → Prototype → Testing → Iteration → Demonstration → Innovation/Entrepreneurship

Students can therefore apply Design Thinking to areas such as healthcare, agriculture, sustainability, smart systems, assistive technologies, artificial intelligence, IoT, robotics and other emerging technologies.

Linking Design Thinking with Innovation and Entrepreneurship

Design Thinking at BNMIT is not an isolated academic activity. It forms an important foundation for the institution’s wider innovation and entrepreneurship ecosystem.

The BNMIT Innovation and Startup Policy identifies Design Thinking as an important mechanism for generating empathetic ideas and recommends exposing students to entrepreneurship, business thinking, innovation challenges, competitions and entrepreneurial role models.

The progression can be represented as:

Design Thinking → Innovative Idea → Proof of Concept → Prototype → Validation → IPR → Business Model → Incubation → Startup/Technology Transfer

The IIC and ED Cell provide opportunities for promising ideas to move beyond the classroom through ideation competitions, workshops, mentoring, intellectual property awareness, entrepreneurship programmes and pre-incubation activities.

BNMIT has also conducted certificate programmes covering the entrepreneurial journey, problem/user identification and validation, solution development, Design Thinking, prototyping, testing, business modelling and pitching.

Building a Culture of Creativity and Innovation

The ultimate objective of Design Thinking at BNMIT is to create a culture in which students naturally approach problems with curiosity and creativity. The methodology encourages students to ask:

- Who is experiencing the problem?
- What is the real need?
- Why does the problem exist?
- Can the problem be reframed?
- What alternatives are possible?
- Can the solution be rapidly prototyped?
- What does the user think about the solution?
- How can the solution be improved?
- Can the solution create social or economic value?

This approach transforms students from passive recipients of knowledge into problem finders, solution creators and potential innovators.

The interdisciplinary nature of Design Thinking is particularly valuable in engineering education. A healthcare challenge, for example, may require inputs from electronics, computer science, artificial intelligence, mechanical engineering, management and healthcare professionals. Such collaboration develops communication, teamwork and systems thinking alongside technical competence.

Innovation and Design Thinking at BNMIT represents a shift from “learning to solve given problems” to “learning to identify and solve meaningful problem”. By integrating empathy, creativity, analytical thinking, prototyping, experimentation and iteration, students develop the capabilities required for innovation in a rapidly changing technological environment.

The integration of the Design Thinking course with BNMIT’s Innovative Project Lab, IIC, ED Cell and entrepreneurship ecosystem creates a strong pathway from student idea to innovation and potential startup. With continued emphasis on interdisciplinary collaboration, real-world challenges and experiential learning, Design Thinking can become a powerful catalyst for developing technically competent, creative, socially responsible and entrepreneurial engineers at BNMIT.