Beyond Degrees: Re-Imagining Engineering Education for the Future

Engineering education worldwide is undergoing a significant transformation. The convergence of Artificial Intelligence, automation, advanced manufacturing, digital technologies, sustainability, and global connectivity is redefining industries and the competencies expected from engineering graduates. Academic excellence alone is insufficient; industries seek professionals who can innovate, solve complex problems, collaborate across disciplines, adapt to emerging technologies, and contribute meaningfully from day one.

This changing landscape presents both opportunities and responsibilities for higher education institutions. Universities and engineering colleges must extend their mission beyond delivering curricula and awarding degrees. They must create learning ecosystems that nurture creativity, practical competence, professional ethics, leadership, adaptability, and a lifelong passion for learning. The true measure of educational excellence lies not simply in the number of graduates produced but, in their ability, to create value for industry, society, and the nation.

Mr. S V Balasubramaniam,
Chairman,
Bannari Amman Institute of Technology

At Bannari Amman Institute of Technology (BIT), this philosophy has guided our journey over the past three decades. Education should prepare students not only to pass examinations but also to excel in life, contribute to society, and lead technological transformation. This belief has inspired us to create an ecosystem where learning extends beyond classrooms and conventional laboratories.

One distinctive initiative is Gurugulam, a unique engineering life-skills program introduced for every student, regardless of discipline. Every aspiring engineer gains hands-on exposure to welding, electrical wiring, electronics, PLC programming, prototype modelling, computer networking, and engineering systems maintenance. These experiences cultivate respect for engineering practice and strengthen problem-solving abilities.

Complementing this initiative is our extensive network of Product Development Centres, or Special Labs, which function as industry-inspired innovation centres. Here, students work alongside faculty mentors and industry experts on technologies like Artificial Intelligence, Robotics, Electric Vehicles, Drone Technologies, and more. Students engage in design, building, experimenting, and creating solutions for real challenges.

Our Personalised Competency Development Programme (PCDP) assesses each student's individual needs, providing customised learning pathways aligned with specific industry roles. This fosters specialised competencies, making them better equipped for specialised career opportunities.

Strong industry partnerships are crucial. Students benefit from sponsored laboratories, live projects, internships, and expert mentoring. Such engagement bridges the gap between academia and industry, helping graduates understand professional expectations before entering the workforce.

Beyond technical competence, we encourage participation in innovation challenges, competitions, and entrepreneurial initiatives, nurturing creativity, resilience, teamwork, leadership, and decision-making. Sustainability is embedded into campus life, promoting environmental stewardship as a core value of our educational philosophy.

Aligning Academic Excellence with Industry Demands for Tomorrow's Leaders

Dr. Anand Jacob Verghese, *Chancellor, Hindustan Institute of Technology and Science (HITS)*

At HITS, we offer a dynamic and evolving curriculum aligned with industry expectations, ensuring students are thoroughly prepared for professional challenges. Our academic offerings include hands-on learning experiences such as project-based learning and specialised courses in AI, alongside opportunities in design projects, internships, live projects, hackathons, industrial visits, guest lectures, and research initiatives. Additionally, honours and minors programs enable students to deepen their knowledge and explore specific interests.

The Centre for Professional and Career Development (CPCD) at HITS has established a structured roadmap spanning all four years of study. This continuous approach ensures students steadily build essential skills rather than cramming preparation into their final semester. Students progressively enhance their communication, coding proficiency, technical expertise, interview readiness, and professional etiquette. Beyond securing placements, our primary goal is to cultivate highly sought-after graduates ready for successful careers.

First-Year Support System

To assist first-year students during their transition to campus life, HITS has developed a robust support system addressing academic, emotional, and social needs.

Academic Support

We begin with a comprehensive Orientation Program introducing students to the curriculum, academic regulations, Outcome-Based Education (OBE), examination systems, and campus facilities. To bridge knowledge gaps, foundation and bridge courses are offered in Mathematics, Physics, Chemistry, Programming, and English.

Each student is paired with a faculty mentor for academic guidance, progress monitoring, and personalised support. For additional assistance, remedial classes, tutorial sessions, and academic counselling are regularly arranged. Students also receive training on using our Learning Management System (LMS), Enterprise Resource Planning (ERP), digital library, and online learning tools to foster autonomous study skills.

Emotional Support

HITS places significant emphasis on emotional well-being. Our structured Mentor–Mentee System facilitates regular one-on-one interactions for the early identification of personal or academic concerns. Students have access to professional counselling services for managing stress, anxiety, and personal well-being. Workshops focus on mental health awareness, emotional resilience, time management, and essential life skills, fostering an inclusive community where students feel valued and supported.

Social Support

Social integration is vital for a welcoming campus experience. Students are encouraged to join technical clubs, professional societies, cultural groups, sports teams, NSS, NCC, and extracurricular initiatives to build teamwork, leadership, and interpersonal skills. HITS organises cultural, athletic, and community engagement activities that promote inclusivity and meaningful friendships. We also actively involve parents to foster a strong connection between home and campus.

Continuous Monitoring and Engagement

Student success is supported by ongoing monitoring of attendance, academic performance, and overall well-being through mentors and departmental review mechanisms. Timely interventions ensure any personal or academic challenges are addressed promptly, helping first-year students acclimate confidently and build a strong sense of belonging.

Career Guidance and Counselling for Final-Year Students

In their final year, HITS provides an intensive career guidance and counselling program designed to prepare engineering students for diverse post-graduation pathways, including employment, higher education, entrepreneurship, and competitive examinations.

Career Planning and Counselling:
Personalised mentorship from faculty and career counsellors guides students toward opportunities in core engineering, IT, research, higher education, the public sector, and entrepreneurship, aligning personal interests with realistic career outcomes.

Placement Training:
Training encompasses aptitude, logical reasoning, quantitative ability, verbal communication, group discussions, technical interviews, and HR behavioural interviews. Regular mock interviews and assessment tests help build confidence and performance.

Industry Interaction and Skill Development:
We connect students with industry through guest lectures, expert talks, alumni sessions, and company visits. Real-world exposure is further enhanced via internships, live projects, and industry-sponsored certifications in emerging technologies like AI, Data Science, Cloud Computing, and Cyber Security. Training also emphasises soft skills—such as leadership, teamwork, problem-solving, and professional etiquette to maximise employability.