How to select a branch in B.Tech for a successful career

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While IT-related branches were the most obvious choice until last year, with the disruption of entry-level jobs by AI, coupled with a slowdown in hiring by IT companies, along with stagnancy of salaries for fresh graduates, some students are wary of them. | Photo: iStock/ Getty Images

Currently, the admission season for the B.Tech program for 2025-26 is in full swing. The results of IIT JEE Advanced and entrance tests of most states, as well as those by most of the reputed private engineering colleges, have been released. The second round of seat allotment by the Joint Seat Allocation Authority (JoSAA) 2025 for the IITs, NITs, and IIITs was announced, with four more rounds to go. Counseling for the seats in the rest of the institutions is also in progress.

While IT-related branches were the most obvious choice until last year, with the disruption of entry-level jobs by AI, coupled with a slowdown in hiring by IT companies, along with stagnancy of salaries for fresh graduates, some students are wary of them. The job market will be uncertain by the time they graduate in 2029. In a recent panel discussion on “Engineering Education for a New Era” at IIT, Madras, students and parents were advised to get rid of the herd mentality of choosing Computer Science courses over core engineering streams.

In this context, the biggest dilemma in the minds of the students is: which branch to select? For meritorious students that have a choice of multiple institutions, the question is, what is more important - the institution or the branch.

This article presents a perspective on the branches offered by leading institutions along with the job opportunities for fresh engineering graduates in the next five years in various sectors in India, so as to enable the students to make informed decisions.

Availability of seats for 2025-26 academic year

JoSAA 2025 is managing the seat allocation for a total of 62,853 B.Tech seats, which includes about 18,000 in 23 IITs, about 34,000 in 31 NITs and 26 IIITs and balance in 47 Central Government-funded institutions. About 20-25% of the total seats are in IT related branches like Computer Science Engineering (CSE), IT, Data Sciences , and AI/ML , whereas the balance seats are distributed among the core Engineering branches like Mechanical, Civil, Electrical, Mining, Electronics and Communications, and more. Private colleges are offering about 14.74 Lakh seats in 2025-26, a 10% increase over 2024-25. About 35-40% of seats in IT related branches, with most of the additional seats approved by AICTE being for CSE-related branches.

Wide variety of branches offered

In the last few years, due to the burgeoning demand, most of the institutions have been offering a range of branches or specialisations in CSE-related areas like Artificial Intelligence (AI) and Machine Learning (ML), Data Science, Internet of Things (IOT), Cloud Computing, Cyber Security, Block Chain Technology, and more.

A few institutions are offering branches in cutting-edge technologies like Nanotechnology, Computational Engineering, and Quantum Computing. Besides, new branches are being offered in inter-disciplinary areas like Aeronautical, Bio-medical, Bio-technology, Computational Mechanics, Electrical Vehicles, Semiconductor Design and Technology, Robotics and Automation, Smart Manufacturing, Materials Science and Engineering, Mechatronics, Food Technology, etc.

With the sustainability theme taking centre stage in recent times, branches like Sustainability Engineering and renewable energy have also been introduced. Recent wars across the world witnessed the critical role of technology, leading to the introduction of Defence Technology as an inter-disciplinary branch by a few institutions.

Dual degrees, major and minor branches

A number of institutions, including IITs and NITs, have been offering integrated five-year dual degree programs like integrated B.Tech and M.Tech or MS. In some cases, the PG degree is in non-technical disciplines like Finance and Management.

Recognising the need for providing flexibility in careers, several institutions, including some of the IITs and BITS Pilani, are offering specialisation in a primary engineering discipline, called a major branch, along with a secondary specialisation in another field, called a minor branch. The minor could be another branch of engineering or a non-technical discipline like Management, Economics, Finance, and more. Currently, BITS Pilani offers as many as 23 minor branches, which include innovative non-technical domains like English Studies, Supply Chain Analytics, Entrepreneurship, Film and Media, Water and Sanitation, Finance, Management, Philosophy, Computational Economics and Philosophy, Economics and Politics (PEP), and Public Policy.

Job opportunities for fresh graduates in the next five years

It is in this context that an analysis of the future potential job opportunities for fresh graduates in various sectors in the next five years is made to present a futuristic perspective rather than being guided only by the immediate past or current demand by the industry.

Recruitment of fresh B. Tech graduates by large IT companies in India for traditional roles have been on the decline in the last two years due to the slowdown of the IT sector driven by geo-economic factors. Though marginal improvement is expected in 2025-26, the net increase in recruitment in the years to come may not be large, considering the adverse impact of AI on entry-level IT jobs, particularly for the programming roles.

As per a Bain and Company report (March 2025), by 2027, India's AI sector is projected to offer over 2.3 million job openings, versus availability of only an estimated 1.2 million, leaving a shortfall of over one million skilled individuals. The new age disciplines are fuelling demand for new roles like Prompt Engineers, AI/ML Architects, AI/ML Engineers, AI Ethics consultants, Data Engineers, Cloud Architects, Cloud Security Experts, Penetration Testers, IoT Engineers, Blockchain specialists, Robotics Engineers, Data Visualisers, etc. Besides technical skills, employers are looking for people with skills to apply the technologies across sectors in various functions.

Demand for core engineering skills

A lot of engineering design work is being done in India by Engineering Design Outsourcing Centres (EDOC) for Multi-National Companies (MNCs) in sectors like automotive and aerospace. In the recent past, some MNCs have been setting up their design centres, as Global Capability Centres (GCCs), in India. Both EDOCs and GCCs recruit fresh engineering graduates from core engineering branches, with skills in areas like Computer Aided Design and Engineering, Product Lifecycle Management (PLM), and Embedded Systems.

Government initiatives to promote strategic sectors

The Government of India has identified electronics and semiconductors as strategic sectors and plans to triple the electronics sector output in the next five years, to $ 500 billion by 2030. Investments of over ₹1.30 lakh crore for semiconductor manufacturing by Tata Electronics, CG Power, and Kaynes Technology were approved under the Semicon India Programme, which will create career opportunities in core engineering disciplines like Electronics, SpaceTech, DefenceTech, Semiconductors, and Mechanical Engineering.

Sustainability and green technologies

The global imperative to address climate change is driving a significant shift towards Sustainability and Green Technologies, fuelling demand for electrical and mechanical engineers in sectors like smart grids, electric vehicles, and renewable energy.

Banking, Financial Services, and Insurance

The Banking, Financial Services, and Insurance (BFSI) sector, being one of the early adopters of the latest technologies, is offering opportunities to engineers in areas like FinTech, Data Analytics, Cyber Security, financial engineering, and trading in financial markets.

Gig Sector opportunities for freelancers

As most of the organisations shift to just-in-time recruitment, opportunities for freelancers with deep skills will be on the rise. Besides offering flexibility with regard to time of work, they offer higher salaries than regular employees.

Skills in demand by Industry 5.0

Post COVID-19, as the industry transitions from 4th to 5th industrial revolution (Industry 4.0 to Industry 5.0), the focus is on a collaborative partnership between humans and machines, leveraging human creativity and ingenuity alongside the efficiency and precision of advanced technologies like AI and robotics. In order to succeed in this era, besides skills on development and application of technologies, students need to acquire human skills that AI cannot fully replicate, like problem-solving, creativity, critical thinking and communication.

Salaries for fresh graduates

While general entry-level salaries for fresh graduates may continue to remain moderate, specialist roles with deep skills in emerging technologies like Generative AI will command higher salaries, highlighting the premium for skills over mere qualifications. Also, interdisciplinary skills, integrating AI with core engineering or with non-technical areas like management and finance will fetch higher salaries. Continuous upskilling and gaining specialised experience will be crucial for fresh graduates aiming to maximise their earning potential in the coming years.

Institution or branch: what is more important?

There are three major aspects one has to consider while taking the decision on branch – interest/passion of the student, future job opportunities and possibility of getting the branch of choice allocated in the institution.

Choosing the branch, aligned with the aptitude and passion of the student is crucial for the long-term professional success and job satisfaction. At the same time, reputation of prestigious institutions like IITs has its value from placement perspective, as they have better quality faculty, infrastructure, stronger industry connections, and more powerful alumni network.

However, in view of the industry demand, CSE-related branches, even from tier-two institutions, have been in demand. In such a situation, the best practical decision may be to prioritise the branch of interest which has a strong future potential for jobs and then seek the best possible institution offering that branch.

It may also be a good idea to consider the option of minor branch, as a specialisation, along with the major one, as it provides inter-disciplinary skills, thereby offering flexibility in career. It is understood that a number of students at the IITs and BITS Pilani are preferring finance as the minor option due to attractive career opportunities in the BFSI sector, both in India and abroad.

Way forward

As technologies like AI become more and more integral part of industry and business, the next five years will present a number of exciting job opportunities for engineering graduates from all branches, though their profiles will be far different from now. Indian universities and engineering colleges are offering a wide menu of branches to choose from.

While it is important to pursue the branch of one's passion, as the industry is fast moving towards a skills-first hiring model, acquisition and demonstration of hands-on skills will be more important than the branch and institution of study. At times, a student may not be able to succeed in securing the branch or institution of his/her choice. By continuous upskilling and lifelong learning by self, it is possible to achieve professional success, irrespective of the branch and the institution of study.

(Dr. O R S Rao is the Chancellor of the ICFAI University, Sikkim. Views are personal)

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