Our IITs have a lot to catch up

V. Sethuraman

The IIT system is the brainchild of the 22-member National Research Council. The council was formed in 1959 to advise the government on the establishment of technological institutions for the country. In 1959, the council recommended the establishment of such institutions and the establishment of the Indian Institute of Technology (IIT) in Delhi. The IITs were established in 1959 in the form of a joint venture between the government and the University of Delhi. The first IIT was established in 1959 in Delhi, and the second IIT was established in 1962 in Bombay. The IITs have been instrumental in the development of industry in India and have played a key role in the country's economic growth.

None of the IITs is anywhere near world standards today. Not a single IIT has made its mark in the Top 200 Quacquarelli Symonds (QS) World University Rankings in 2011.

Dr. Umanath Nayak

The last few months have been a period of turmoil in the family. My son has reached the phase where he has to take the most important decisions of his life. No, I am not talking about selecting a life partner, or even deciding upon the right job or career. The question is: Should he or should he not enrol in one of those guaranteed-for-success institutes like IIT, IEI coaching like all his friends have done?

He was not going to follow in my footsteps and become a doctor, engineering was the only other obvious choice. In his teenager lingo, doctors have such a "sad life," meaning "too much hard work." I did not argue with him; he did have a point! I am a prime example! I have completed some years of experience in the sales and marketing department of a large company. I have learned that what matters is not just the degree but the way you present it.

I started my research on the subject — the primary source being the coldly 'academic' colleagues in the hospital. One diagnosed speech used to recount how the entire family got into "war mode" in preparation for his elder son's grand entry to the hallowed portals of the IIT. He was then busy preparing for his school and college examinations. The second son, curious about what he would get into if he entered the IIT and had the opportunity of being among those chosen few. The family went into mourning for a full month. The boy subsequently got into another equally reputed engineering institute and is now the most successful student in his class.

Dr. Umanath Nayak is a consultant and a head of Nock Oncologist, Apollo Health Centre, Apollo Hills, Hyderabad. Email: drumatinationyak@gmail.com

Hindu ND 15/07/2012

Coaching classes — boon or bane?

My colleague now swears against this type of coaching and is dead against his younger son repeating the same mistake. On the other hand, two of his colleagues from the same department swear by this method of regimented training. "This is the only way out," they say knowledgeably. The son of one of them obtained the rank in the South, following the same modus operandi, sacrificing two years in the prime of his life for the sake of a guaranteed future. My colleague finds it unacceptable and has no reservations about recommending this system of education to others.

But something bothered me. If students are going to spend two years focusing only on the methodology of cracking the IIT-JEE, what about knowledge and intellectual growth? They are supposed to imbibe these crucial years of their development and not just getting into an IIT indeed guarantee a grand future for all and sundry? Do students from other colleges not excel in engineering?
WHO’S THE NEXT BOSON?

**EUREKA!** The Bose on Higgs boson has put the spotlight back on Indian scientists. Here are others who’re at the brink of breakthroughs or have made key contributions to their fields.

**Chunni Palit Kasturi**

Hindustan Times ND 15/07/2012

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**INDIANS WHO SET THE BAR IN WORLD SCIENCE**

**Government’s support is pleasantly surprising**

Rajendra Prasad, IAS

**My work:** Ensuring help for our scientific community

**‘We just need to change our research culture’**

Alok Jha

**How much the world spends on R&D, and why India is doing so in science research**

**In our field, there are simply no excuses**

Adhikary Sen, IIS, Shaligram

**My work:** Engaging closer for an understanding of nature’s laws

**‘India can lead the world in scientific research’**

Sukanta Pal, IIS, Ranchi

**My work:** Contributing to Indian development
Engineers are not the end product

Ravi Kumar Tadepalli

Over the years the Indian Institutes of Technology have proved their excellence in engineering education. Two main reasons were the selection of students and the fantastic faculty. The JEE produced the best students and the faculty moulded into the best in the world. The goal of the students was excellence in technology and being the best in this field.

But that was some time ago. Times have changed. A student came up to me and asked which branch of engineering he should take to complete the IIT easily and get into an Indian Institute of Management. Students ask for internships in banks and help from the alumni for this endeavour. A III B. Tech student asks for opportunities in music at an entrepreneur meet in an IIT. IIT toppers take high-paying jobs in non-engineering companies.

All these may seem stray cases. But isn't it surprising that the top placement firms in the IITs are consulting, IT, banking and insurance? They seem to be taking away the chunk of the toppers. The number of B.Tech students opting for higher studies in engineering and research also seems to have declined.

The IITs were formed to improve technology and produce world-class engineers and scientists. But they have now been reduced to a brand image without the zing of engineering. The goal of students seems to be cracking the JEE, not engineering. All these students are confident of completing the course with at least 5 point CGPA. Not really interested in engineering.

What is the reason? The quality of the students? The curriculum? The teachers or the lack of them? The parents? The coaching classes? The market opportunities for engineers? The JEE itself?

The coaching classes seem to have mastered a way of cracking the JEE. The student is bright and taught the methodology of cracking the JEE. Maybe, the JEE must not be so structured as we have it now. Maybe, it should be more randomised in the type of questions. Maybe, the questions should be related to more practical aspects of engineering. But if you want to be a top-notch engineer, it takes much more than that and years of painstaking learning in industry. Is it possible that the student is not aware of this aspect of engineering? Can the JEE bring this aspect to the fore?

Sometimes, parents force their children into the IITs because of their brand image. I wonder how many of them insist that their children stick to engineering as a career option?

Engineering seems to be one of the few fields where there is no compulsory internships like in medicine, law and CA. This is one of the reasons why students may not be fully aware of the beauty and possibilities of engineering.

Engineering is also a field which is like a joker in a pack of cards. The graduates fit into any career! Naturally, the student will graduate into a more lucrative/easier career. Would a barrier to this help in getting committed students?

I imagine the plight of the professors! They have to deal with more number of uninterested students. They teach engineering knowing fully well that very few of their students are going to use what they are taught. What can be more demoralising to the teacher in a professional course? With the number of institutes multiplying, can there be enough teachers of that high calibre? We seem to be diluting the importance of a temple of excellence.

Once upon a time, we were grappling with brain drain when most of the IITians went abroad. Now we have a great environment and demand for good engineers but we don't have them! True, it is a field where you need to build a reputation over time and the remuneration does not come as fast. It requires great deal of passion to become a good engineer.

Does all this mean that the IITs have lost their relevance? To a certain extent, yes. They are not serving their basic purpose. If the IITs cannot produce great engineers, the purpose is defeated. We are unable to get the students interested in engineering. Yet, we are increasing the number of the IITs. We are probably producing good thinkers at the IITs, which is why other fields are picking up the students. So should we rename it the Indian Institute of Thinkers?

(The writer is an IITian Email: rkbala@hotmail.com)
Govt nod for Mars mission soon

Srinivasa Laxman | TNN

Mysore: ISRO chairman K Radhakrishnan on Saturday said the government’s nod to the country’s Mars mission is expected soon.

“India’s much-awaited mission to Mars is in the final stage of approval,” said Radhakrishnan. The mission will be launched from Sriharikota in Andhra either in November 2013, 2016 or 2018.

“Many studies have been done relating to this mis-

Mars on August 6 could prompt the Indian government to clear the programme. “We’re waiting to go to Mars,” said a scientist.

Initially, nine scientific experiments were designed for this flight. This could be reduced considering the weight factor. The rocket will be an advanced version of the highly-proven four-stage Polar Satellite Launch Vehicle, designated as PSLV-XL, used for India’s mission to moon, Chandrayaan-1.

Radhakrishnan said India’s first dedicated astronomy satellite, Astrosat, will be launched in 2013. “All the instruments are going through their final evaluation and it will be a national laboratory available to scientists both in India and abroad,” he said. The mission was delayed for various reasons. About the Geo Synchronous Satellite Launch Vehicle Mark 2, he said the flight stage of the cryogenic engine should be ready in November 2012.

HT, Kolkata

HOW INDIA IS DOING IN SCIENCE RESEARCH

• India’s research volume has grown from 2006 by 14.3%, less than China’s growth of 22.8%

• But India’s research quality is marginally better — on an average, a paper is cited 2.7 times by other researchers, compared to 2.2 for Chinese research.

• India is among world leaders in 159 areas of research — chemistry topping the list. China is among leaders in 885 research areas.

• IISc Bangalore, IITs, BARC and CSIR laboratories are India’s research leaders.

SOURCE: ELSEVIER PUBLICATIONS
In new IIT entrance test, cut-offs to vary widely across boards

Vanita Shrivasvata
vanita.shrivastava@hindustantimes.com

NEW DELHI: In a quirky scenario, a student of the West Bengal class 12 board will need just 58% to be eligible to take the IIT-Joint Entrance Exam (JEE) next year while an aspirant from the Tamil Nadu board will have to score nearly 78% to make the cut.

Preliminary data of seven boards across the country shows that the percentage required to be in the top 20 percentile — a necessary condition to be eligible for IIT-JEE next year — will vary for different boards.

The new pattern for IIT will have two exams — mains and advanced.

The final rank will depend on the performance in the advanced exam, provided a student is in the top 20 percentile of her board.

So far, the eligibility criterion for IITs was that a student should score a minimum of 60%.

The new pattern changes all that. So, if you’re a student who wants to make it to the top 20 percentile bracket this year, you’d have to score 77.8% in the CBSE board, 78.1% in the Tamil Nadu board, 67.5% in Karnataka, 66% in Uttar Pradesh, 64% in Madhya Pradesh and just 58% in the West Bengal board exam.

These figures would apply only for general category students.

For students seeking to take the test under various quotas, it would be less.

Separate data will be compiled for these categories soon.

The Council of Boards of School Education (COBSE), which compiled the data this year, said all state boards have been asked to put up their percentage figures in the public domain soon.

"Once the student knows the percentage, he (or she) can prepare for professional entry into IITs accordingly. There will be just minor variations in this figure every year," sources in COBSE said.

"Next year, the numbers would fluctuate around this data. So, an IIT aspirant can know how much he or she should aim for in the boards," said Gautam Baruah, IIT-Guwahati director.

Sources said the ICSE, CBSE, Andhra Pradesh and Tamil Nadu boards are most likely be in the highest percentage bracket. Boards such as those of West Bengal, Jharkhand and Bihar will be at the lower end.

### ELIGIBILITY PERCENTAGE FOR IIT IN DIFFERENT BOARDS

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Illustration: ABHIMANYU SINHA
आईआईटी की जड़ें खोदने की नीति

दाख़िले के लिए बालाधिवेश के अंकों को लेकर जो दक्ष दिन रही, यह हास्यादर है। प्रतिमा चालिया का प्रेमलीला "पार्टीटाइटा" नहीं हो सकता।

जहां चाहिए है जहां है छूट, सच्चा है। इसका काम मजेदार नहीं है। ऐसा देखना चाहिए है। इसका काम मजेदार नहीं है। इसका काम मजेदार नहीं है। इसका काम मजेदार नहीं है।

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IITians mentor the underprivileged

By Neha Pushkarna In New Delhi

PRIYANKA Palshetkar wants to become an automobile engineer. Roshan Hande dreams to be a mathematician. Jaypal Shinde wants to change the world. They may not have enough means and money yet, but all of them aspire to get a good education. Helping them and other teenagers realise their dreams are students of different IITs in the country.

For last two years, IIT students from Delhi, Mumbai, Chennai, Kanpur, and Roorkee have been reaching out to bright minds with limited resources in their areas as well as in Dehradun and Pondicherry to put them on the path to success. They select the most deserving aspirants through a series of tests and place them in coaching centres to prepare for the IIT entrance test for free. And if ever they stumble, IIT students get by their side doubling up as their mentors.

What started as a personal endeavour of two IIT-Bombay graduates in 2010 has now turned into a movement across IITs to fulfil a social responsibility. Krishna Rammurthy and Akshay Saxena began Avanti to lead more underprivileged students on the road to IITs so that their talent didn’t go waste. Krishna in fact left his job of two years

Started by 2 IIT-Bombay students

at an international consulting firm to run Avanti full-time. There are now eight people, including seven IIT graduates, working for Avanti day in and day out.

"During our days at IIT-Bombay, we realised not many underprivileged students made it to IITs. We thought of providing required resources to such students and opened six chapters in different IITs. The first batch started preparing in 2011 and is due to take the IIT entrance next year," Krishna, who graduated in chemistry from IIT-Bombay in 2006, said. Manisha Kulreja, who takes care of the Delhi chapter, also left her job in Malaysia to run Avanti, added: “This is what made me happy.”

Avanti volunteers reach out to government schools in different cities to invite deserving students to take a talent search exam held in three parts. Those with a total family income of less than ₹20,000 per month are eligible for the fellowship. “Nearly 5,000 aspirants sat for the exam in six cities for the selection of the first batch. About 120 of them were finally selected. There were children of taxi drivers, vegetable sellers and others who did not earn enough to afford a coaching for IIT entrance,” Krishna said.

Avanti ties up with coaching centres which agree to give 100% scholarship to the fellows. “It’s an incentive for the coaching institutes. They would any day like to coach a student with high potential to get into an IIT,” Krishna said.

Those with family income ₹20k eligible

Krishna and Akshay started the operations of Avanti from the prize money of 25,000 Euros they won at a competition in Stanford in 2005. An ‘angel investor’ in Mumbai later augmented their funds. Every year, they also select volunteers from different IITs for mentoring the fellows. For them, the experience has been an eye-opener.
Sunita begins her second space odyssey

BAIKONUR (KAZAKHSTAN): Indian-American record-setting astronaut Sunita Williams, along with her two colleagues, took off for her second space odyssey on a Russian Soyuz rocket, which blasted off successfully from a cosmodrome in Kazakhstan on Sunday.

Forty-six-year-old NASA astronaut Ms. Williams, Russian Soyuz Commander Yuri Malenchenko and Japan Aerospace Exploration Agency flight engineer Akihiko Hoshide started their two-day voyage at 08:10 a.m. IST for a four-month mission on the International Space Station (ISS).

Russia's Federal Space Agency Roscosmos announced that the spacecraft departed successfully from the carrier rocket and reached intermediate orbit.

"The spacecraft separated from the third stage of the carrier rocket in a normal regime and at the designated time," the agency said.

The Soyuz TMA spacecraft is due to dock with the ISS's Zvezda service module at 10:32 a.m. IST on Tuesday.

Born in Holyoke, Massachusetts, Ms. Williams, who earlier lived and worked aboard the ISS for six months in 2006-07, will further extend the record for the longest stay in space for a woman astronaut.

Ahead of the launch, she told reporters that the last mission laid the ground for a long-standing friendship and collaboration in the space programme.

She said she would be excited to watch the London 2012 Summer Olympics from the station and put a much more global perspective on the mega sporting event beginning July 27.

Ms. Williams and her team of astronauts plan an orbital sporting event to mark the Olympics.

Ms. Williams, a flight engineer on the station's Expedition 33 crew, will take over as commander of Expedition 33 on reaching the space station.

The trio will join the current ISS occupants - Russian cosmonauts Gennady Padalka and Sergei Revin and NASA astronaut Joe Acaba, who have been in orbit since May 17.

The six crew members will work together for about two months. Mr. Acaba, Mr. Padalka and Mr. Revin are scheduled to return to Earth on September 17.

Before they depart, Mr. Padalka will hand over command of the station and Expedition 33 to Ms. Williams. She, Mr. Malenchenko and Mr. Hoshide will return home in mid-November, NASA said.

The new crew members are expected to conduct over 30 scientific missions during their stay aboard the ISS.

Ms. Williams, whose father hailed from Gujarat, was selected as an astronaut by NASA in 1998. She was assigned to the ISS as a member of Expedition 14 and then joined Expedition 15.

Sunita's record
She holds the unique record for the longest spaceflight - 195 days - for women space travellers.

She received a master's degree from the Florida Institute of Technology in 1995. Her flight suit was named Julie in her honor.

Both Ms. Williams and Mr. Akihiko have experience on board the space station but had never before travelled on the Soyuz.

Earlier they travelled aboard a U.S. space shuttle.

"Getting my haircut. Next one will be on ISS," Mr. Akihiko tweeted on the eve of the launch.

For Ms. Williams, one of the most experienced Russian cosmonauts, it is his fifth long-duration spaceflight.

Mr. Malenchenko, who is piloting the Soyuz spacecraft, was a member of three long expeditions to the Mir orbital station, the International Space Station and one shuttle flight. Russian Soyuz-family spacecraft remain the only means of transportation for crew members to and from the orbital station until at least 2015. — PTI

ANOTHER BEGINNING: Indian-American astronaut Sunita Williams, Japanese astronaut Akihiko Hoshide and Russian cosmonaut Yuri Malenchenko, crew members of the mission to the International Space Station, wave prior to the launch of the Soyuz-FG rocket (right) at the Baikonur Cosmodrome in Kazakhstan on Sunday. — PHOTOS: AP
Asian space powers gear for more moon missions

Gopal Raj

MYSORE: The three major Asian space powers — China, Japan and India — are entering the next phase of their lunar exploration.

The three nations have already successfully dispatched lunar probes that photographed and studied Earth's natural satellite from space. Now, all three want to send an orbiter that will circle the Moon as well as a lander that will gently settle on its surface and release a rover that will roam about.

South Korea, which is creating its own launch capability, too seems to have similar ambitions.

Media reports have quoted Chinese space officials as saying that the Chang'e-3 could leave for the Moon in 2013.

Addressing a press conference here on Saturday during an international gathering of scientists involved in space-related research, K. Radhakrishnan, Chairman of the Indian Space Research Organisation, said India's Chandrayaan-2 mission could be on its way in 2014.

Although M. Annadurai, project director of Chandrayaan-2, was scheduled to give a talk about the mission at a session of the scientific assembly of the Committee on Space Research (COSPAR) on Sunday, the presentation was cancelled.

There was, however, a talk about Japan's Selene-2 landing mission to Moon by Tatsuaki Okada of the Japan Aerospace Exploration Agency's Institute of Space and Astronautical Science.

The mission involved sending a 700 kg-orbiter along with a lander weighing about 1,000 kg. It would also carry a 100 kg rover, said Dr. Okada. The lander and rover were being designed for a mission lasting two weeks. The orbiter could operate for about a year.

- Japan plans to send Selene-2 landing mission to Moon
- South Korea plans an orbiter-lander mission to Moon around 2023

Some 70 landing sites were proposed by various research groups, he noted. These had been whittled down to 11, all of which were in the Moon's mid-latitudes (from 60 degrees south to 60 degrees north) on the nearside that faces Earth.

(In contrast, India's Chandrayaan-2 mission planners would like to land near the lunar poles where water ice could have accumulated.)

South Korea proposed an analytical instrument that could be carried on Japan's Selene-2 rover, said Kyeong Ja Kim of the Korea Institute of Geosciences and Mineral Resources. The country also had aspirations of launching an orbiter-lander mission to the Moon around 2023.

China plans to bring lunar soil and rock samples back to Earth for analysis. Some reports suggest that Chang'e-5 could be launched around 2017. Japan too is considering a follow-on sample-return mission, according to Dr. Okada. The Selene-3 launch could take place in the early 2020s, he told reporters.

China has begun examining the possibilities of sending its astronauts to the Moon.

But no firm plans have yet been made and the goal of its human spaceflight programme remains the establishment of a large space station about a decade from now. If Japan sent astronauts to the Moon, it would be in close cooperation with the U.S., as was done in the case of the International Space Station, said Dr. Okada.
COMPUTER, ELECTRICAL ENGG TOP CHOICE AT IIT-B

Bhavya Dore
bhavya.dore@hindustantimes.com

MUMBAI: Getting into the Indian Institute of Technology (IIT) for the most popular branches got tougher this year, with more toppers choosing the four-year BTech degrees in computer science and electrical engineering at IIT-Bombay.

The list for the computer science branch at IIT-B ended with all India rank 75, while the list for electrical engineering ended with all India rank 91. Last year, the computer science course closed at rank 93, while electrical engineering closed with rank 106. A higher closing rank for a stream means that more top rankers have opted for it.

Candidates are allotted seats based on their preferences as well as their position on the merit list. Allotments ended with the fourth round of allotments on Wednesday.

"I picked computers because there are more research opportunities abroad. Over the years, computer science at IIT-B has become the standard choice among toppers," said Devdeep Ray, 18, who had an all India rank of 133 and will begin the new term at IIT-B next week.

Graduates from the computer science and electrical engineering branches usually get the best job offers at the end of their programmes, with annual salary packages often crossing Rs60 lakh per annum. "For both these courses, students seem to be going by rank and market forces," said an IIT professor.

The closing rank for mechanical engineering has fluctuated over four years but closed again within the top 500, with the closing rank for engineering physics showing steady improvement over the same period and closing within the top 1,000.

In contrast, popularity of branches such as aerospace engineering, chemical engineering and metallurgical engineering at IIT-B has dipped in the past few years. "Choice of course is related to how students perceive certain areas," said IIT-Kanpur professor Dheeraj Sanghi. He conducted a comparative analysis for all 15 IITs and multiple subjects over an eight-year period from 2008 to 2010 tracing both short term and long term trends in incoming student preferences.

This year's data also re-emphasised that IIT-B has entrenched its position as the most favoured IIT, with the highest closing ranks across all the major four-year programme branches.
Role of libraries in academics

Aaditi Isaac/TNN

Stressing on the role that libraries and library-sources can play in fostering academic and research excellence in the Indian universities, a seminar was organised by the Information & Library Network Centre (INFLIBNET), an Inter-University Centre (IUC) under the University Grants Commission, India. “Traditionally, libraries and library sources have been important but have been invisible globally. The role of libraries in a technology-driven world has changed. Technology has brought about a revolution in terms of sharing resources and we must make use of it for the benefit of students and faculty,” says Jagdish Arora, director, Information and Library Network Centre, an autonomous inter-university centre of UGC.

Technology has brought about a revolution in terms of sharing resources and we must make use of it

In India, universities, which have funds, update their libraries through e-books, online journals, etc. What about universities which do not have funds? “The UGC infonet digital library consortium provides access to 7,500 journals in about 200 universities, which are funded by UGC. The universities that run all kinds of programmes, get access to all journals. We follow a model that allows us to get access to quality material that can be given out to the member-colleges. We have opened another gate for universities, not part of the forum. They can get their own subscriptions at the rate the other 200 universities pay and access quality material for five years. We are giving them access to the market, which they cannot afford,” says Arora.

Talking about the challenges that are faced by Indian universities, Arora says that infrastructure is the biggest hurdle. “We can give universities cables but how they use it, is up to them. Connectivity is something we have to work on harder.”

Paula Kaufman, dean of libraries and university librarian, University of Illinois Urbana-Champaign says that there is a need to look at a sustainable model for the growth of a library that will be beneficial to users.

“The value of a library is different from one institution to the other. It is a challenge to get funds to upgrade the library and the resources within but unless we do that, we cannot measure the impact the library resources are creating for the users.”

“The model that we follow, measures things such as growth of e-books, cost per-use, etc. This allows us to keep track of what resources are being used and what resources are needed and what aren’t. Use of resources in our university is not just restricted to students coming to the library physically and reading. With technology, students access material from outside the campus through the internet. This is a positive development because it has changed the way we offer library services,” she says.
The Ramanujan Foundation for Initiatives in Mathematics Education (RFIME) recently organised a conference in the Capital for mathematics teachers, titled Enabling Mathematics Learning through Technology. The conference was inaugurated by Vineet Joshi, chairman, Central Board of Secondary Education (CBSE). The inaugural function was facilitated by Shyama Chona, chairperson RFIME. Jonaki B Ghosh, the conference convener, introduced the theme of the conference by emphasising the role of technology in making mathematics learning meaningful. Eminent mathematicians such as R Ramanujam, Institute of Mathematical Sciences Chennai; Shailesh Shirali, Community Math Centre, Rishi Valley School and Inder K Rana, IIT Powai, Mumbai, were the plenary speakers of the conference and delivered talks on various aspects related to mathematics education and the use of technology in teaching mathematics. While Ramanujam talked about ‘Mapping the School Mathematics Curriculum’ that focused on the logical and pedagogical structure of the curriculum, Shailesh Shirali talked about the role of technology in facilitating experimentation and discovery in the mathematics classroom. Rana spoke about making mathematics learning more relevant through real-world problems.

The conference also deliberated on various issues related to integration of technology in mathematics instruction and provided participants with hands-on experience in using some technology tools for teaching mathematics. 120 teachers from schools across Delhi and NCR participated in the conference.