



COVER STORY

OLYMPIC ENGINEERING



TRONICALS

VOLUME 2 | ISSUE 1

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY

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MESSAGE FROM THE HoD



Dr. K. Sundareswaran
HoD, EEE

With yet another release of this semester's issue of "Tronicals," I am extremely delighted to admit that the editorial team has done a stupendous job of subsuming all the key events which have taken place over the course of the last few months. This newsletter runs the gamut from internship experiences to career choices - everything a student yearns to know. To top it off, it also includes major events witnessed by our department as well as engineering advances in the field of sports which was quite apparent in this year's Olympics. I use this opportunity to commend our faculty and students because of whom our department has witnessed a prodigious growth in the field of research and other educational activities. I convey my hearty regards to all the readers.

-Dr. K. Sundareswaran, HOD, EEE

MESSAGE FROM THE FACULTY ADVISOR



Dr. P. Srinivasa Rao Nayak
Faculty Advisor, EEEA

It is with immense pleasure that I assume the role of faculty advisor to guide and support the EEE association. On behalf of Team Tronicals, I whole-heartedly welcome the first year students to the EEE family of NIT Trichy. The EEE association plays a vital role in enhancing the departmental activities in a holistic manner by conducting various workshops, events, co-curricular activities and a symposium that is well received by college students throughout South India. I take pride in the fact that we have a hardworking, dedicated and skilled team that constitutes the EEE association and can guarantee a successful performance during the upcoming academic year. "Tronicals" is one of the several popular initiatives of the EEE association that is worth mentioning. This magazine features a variety of articles including quality technical articles, student voices and updates about major events that has taken place in our institute to keep our college students well updated. I am sure that Team Tronicals will raise the bar with every issue of this magazine. I sincerely convey my best wishes to all the readers.

-Dr. P. Srinivasa Rao Nayak, Faculty Advisor

EDITORIAL

It is indeed hard to believe that the past three years have gone by in a flash. Even though it has only been three years since we, the batch of 2013-2017, amalgamated from various parts of India, it feels that we have been together for a lifetime. We have just a few more months together in this campus, which is our second home, before we part ways to various corners of the world to begin a whole new venture.

We aren't alone in this venture. Our arsenal includes all the skills that we have developed, all the cosmopolitan memories that we have made and the vast knowledge that we have acquired with the help of our mother department - Department of Electrical and Electronics Engineering, NIT Trichy. Every activity has not only widened our arsenal, but has also bridged the gaps between every one of us making us feel like we are a part of the same family.

Our department has not only taught us

engineering, but has also invoked curiosity, hard work, dedication, meticulousness, volubility and a lot more that will take us far in our endeavour. We have learnt that the bitterness of failure is only temporary and it is the sign of a success that is around the corner. My batch is at that point of our journey where it's time to halt and look back at our achievements. We must pat ourselves on our backs for having come this far and it is all thanks to our department for making us who we are.

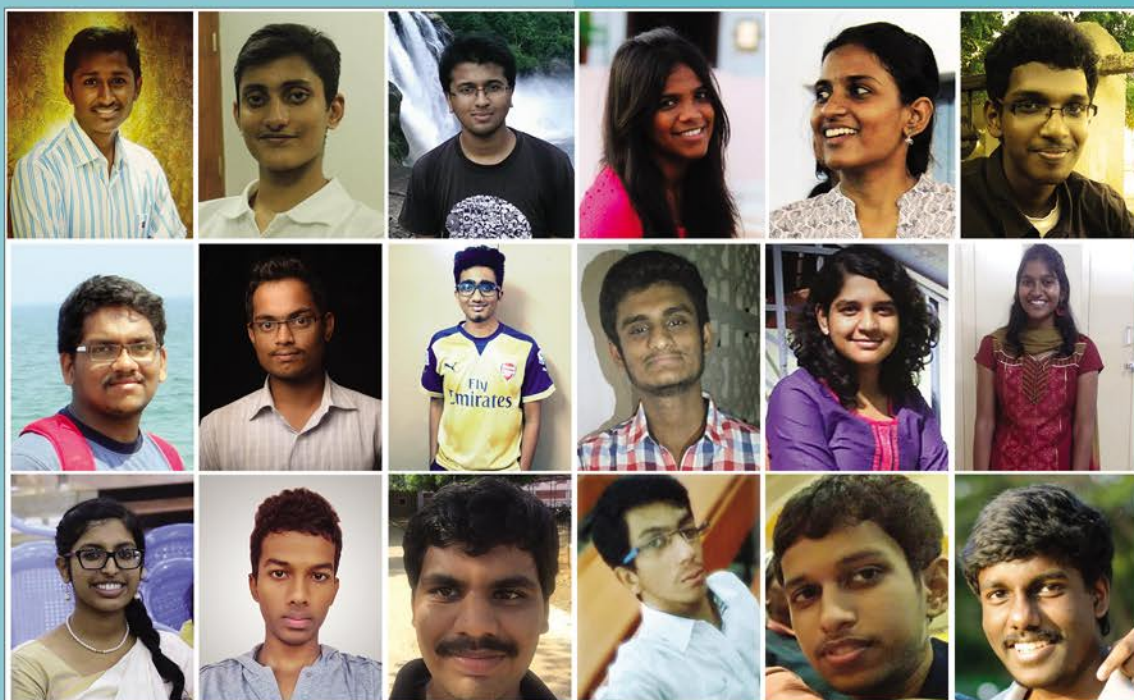
Even though our journey together draws to a close, I'm sure the memories that we have made together would continue to keep us close even though we might be spread out geographically.

Signing off

Batch of 2013-2017

Akshay Anantharaman, Chief Editor, Tronicals

TRONICALS TEAM



VISION AND MISSION OF THE DEPARTMENT

ABOUT:

The Department of Electrical and Electronics Engineering, NIT, Tiruchirappalli was started in the year 1964. It offers one Under-Graduate programme (B.Tech.), two Post-Graduate programmes (M.Tech. in Power Systems and Power Electronics) and also research programmes (M.S. and Ph.D.) in the various fields of Electrical and Electronics Engineering. After the transformation from REC to NIT, the department has grown not only in terms of student and faculty strength, but also in improving the laboratory facilities for the teaching and research purposes. Thus, the department has dedicated and state of the art teaching / research laboratories. The department is recognized for excellence in research (First Department in NIT-T to be accorded QIP status for Ph.D. programme), teaching and service to the profession

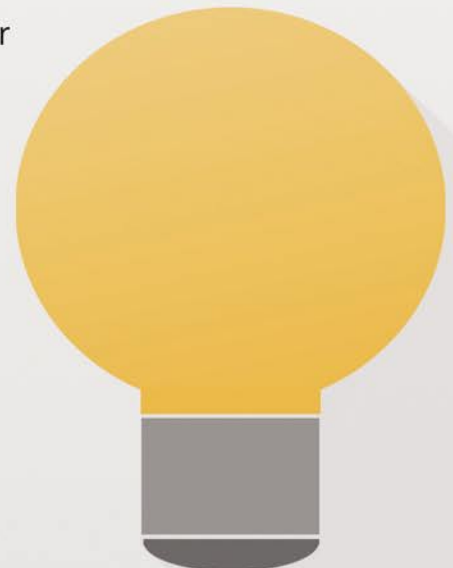
The faculty members have strong sense of responsibility to provide the finest possible education for both graduate and undergraduate students. The academic strength of the faculty is reflected by the alumni, many of whom are in the top echelons of industry and academia both in India and abroad.

VISION:

To be a centre of excellence in Electrical Energy Systems.

MISSION:

- Empowering students and professionals with state-of-art knowledge and Technological skills.
- Enabling Industries to adopt effective solutions in Energy areas through research and consultancy.
- Evolving appropriate sustainable technologies for rural needs.



B.TECH. PROGRAMME

Programme Educational Objectives (PEOs):

The major objectives of the B.Tech. Programme in Electrical and Electronics Engineering

are to prepare students:

1. for graduate study in engineering
2. to work in research and development organizations
3. for employment in electrical power industries
4. to acquire job in electronic circuit design and fabrication industries
5. to work in IT and ITES industries.

Programme Outcomes (POs):

The students who have undergone the B.Tech. Programme in Electrical and Electronics Engineering (EEE):

1. will have an ability to apply knowledge of mathematics and science in EEE systems.
2. will have an ability to provide solutions for EEE problems by designing and conducting experiments, interpreting and analysing data, and reporting the results.
3. will have comprehensive understanding of the entire range of electronic devices, analog and digital circuits with added state-of art knowledge on advanced electronic systems.
4. will have knowledge and exposure on different power electronic circuits and drives for industrial applications.
5. will have in-depth knowledge in transmission and distribution systems, power system analysis and protection systems to pursue a career in the power sector.
6. will have a good knowledge in microprocessors/microcontrollers, data structures, computer programming and simulation software.
7. will be able to develop mathematical modelling, analysis and design of control systems and associated instrumentation for EEE.
8. will be able to systematically carry out projects related to EEE.
9. will have an ability to participate as members in various professional bodies as well as multidisciplinary design teams.
10. will demonstrate the ability to choose and apply appropriate resource management techniques so as to optimally utilize the available resources.
11. will be proficient in English language in both verbal and written forms which will enable them to compete globally.
12. will have confidence to apply engineering solutions with professional, ethical and social responsibilities.
13. will be able to excel in their professional endeavours through self-education.
14. will be able to design and build renewable energy systems for developing clean energy and sustainable technologies.

M.TECH IN POWER SYSTEMS

Programme Educational Objectives (PEOs):

The major objectives of the M.Tech. Programme in Power Systems are to equip the students with adequate knowledge and skills in Power Systems Engineering and to prepare them for the following career options:

1. research programmes in Power Systems Engineering
2. employment in power research and development organisations
3. to work in electric power industries and energy sectors
4. faculty positions in reputed institutions.

Programme Outcomes (POs):

A student who has undergone M.Tech. Programme in Power Systems (PS) will:

1. have an ability to evaluate and analyse problems related to Power Systems and be able to synthesise the domain knowledge and incorporate the principles in the state of art systems for further enrichment
2. be able to critically investigate the prevailing complex PS scenarios and arrive at possible solutions independently, by applying the acquired theoretical and practical knowledge
3. be able to solve PS problems such as load flows, state estimation, fault analysis and stability studies
4. be able to develop broad-based economically viable solutions for unit commitment and scheduling
5. be able to identify optimal solutions for improvising power transfer capability, enhancing power quality and reliability
6. be able to evolve new schemes based on literature survey, and propose solutions through appropriate research methodologies, techniques and tools, and also by designing and conducting experiments
7. be able to interpret power system data and work on well-defined projects with well-defined goals to provide real time solutions pertaining to PS
8. be able to develop, choose, learn and apply appropriate techniques, various resources including hardware and IT tools for modern power engineering, including prediction and modelling with an understanding of the limitations
9. be able to develop dedicated software for analysing and evaluating specific power system problems
10. be able to participate in collaborative-multidisciplinary engineering / research tasks and work as a team member in such tasks related to PS domain, giving due consideration to economic and financial intricacies, and lead the team in specific spheres
11. be able to confidently interact with the industrial experts for providing consultancy
12. be able to pursue challenging professional endeavours based on acquired competence and knowledge
13. be a responsible professional with intellectual integrity, code of conduct and ethics of research, being aware of the research outcomes and serve towards the sustainable development of the society
14. be capable of examining critically the outcomes of research and development independently without any external drive.

M.TECH IN POWER ELECTRONICS

Programme Educational Objectives (PEOs):

The major objectives of the M.Tech. Programme in Power Electronics are to equip the students with adequate knowledge and skills in Power Electronics and to prepare them for the following career options:

1. research programmes in Power Electronics and related areas
2. employment in R & D organisations related to sustainable technologies
3. to work in power electronic circuit design and fabrication industries
4. faculty positions in reputed institutions.

Programme Outcomes (POs):

A student who has undergone M.Tech. Programme in Power Electronics (PE) will:

1. have an ability to evaluate and analyse problems related to Power Electronic Systems and incorporate the principles in the state of art systems for further improvement
2. be able to investigate critical PE problems and to arrive at possible solutions independently, by applying theoretical and practical considerations
3. be able to solve PE problems such as switching control, converter design, analysis and control of solid state drives and stability studies
4. be able to develop appropriate power converters for sustainable energy technologies
5. be able to identify optimal solutions for improvising power conversion and transfer capability, enhancing power quality and reliability through PE based solutions
6. be able to evolve new power electronic topologies and control schemes based on literature survey and propose solutions through appropriate research methodologies, techniques and tools, and also by designing and conducting experiments
7. be able to work on small, well-defined projects with particular goals to provide real time solutions pertaining to power electronics
8. be able to develop, choose, learn and apply appropriate techniques, various resources including sophisticated digital controllers and IT tools for modern power electronic system simulation, including prediction and modelling with existing constraints
9. be able to develop dedicated software for analysing and evaluating specific power electronics and control problems
10. be able to participate in collaborative-multidisciplinary engineering / research tasks and work as a team member in such tasks related to PE domain, giving due consideration to ecological and economical intricacies, and lead the team in specific areas
11. be able to confidently interact with the industrial experts for providing consultancy
12. be able to pursue challenging professional endeavours based on acquired competence and knowledge
13. be a responsible professional with intellectual integrity, code of conduct and ethics of research, being aware of the research outcomes and serve towards the sustainable development of the society
14. be capable of examining critically the outcomes of research and development independently without any external drive.



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MA ASHA RANI, CHILAKAPATI NAGAMANI, GANESAN SARAVANA ILANGO, NATURAL FLUX MINIMISATION TECHNIQUE FOR ENHANCED OPERATION OF DOUBLY-FED INDUCTION GENERATOR, IET ELECTRIC POWER APPLICATIONS 2016

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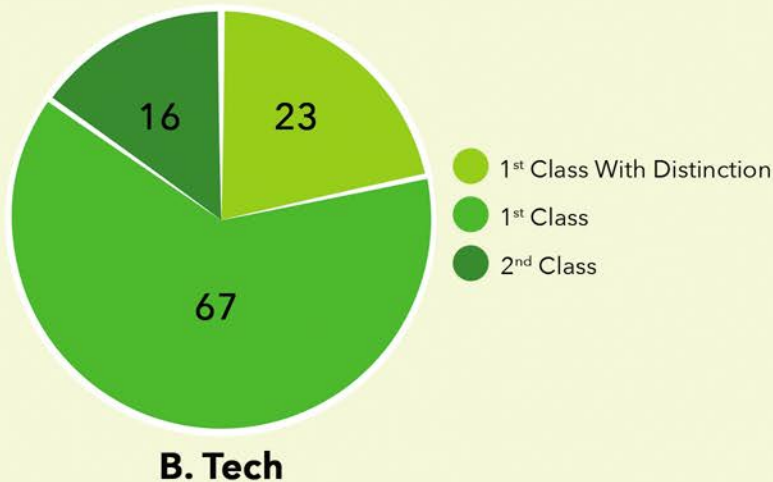
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CONVOCATION '16

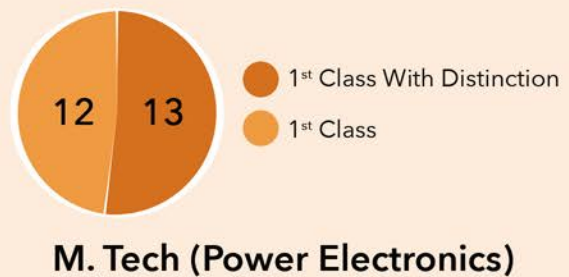
The grand culmination of years of hard work is marked by the Convocation Day, when students are awarded with their degrees and medals. Walking up the stage draped in traditional convocation gowns and collecting their well-deserved degrees one completes the strident endeavor.

The 12th Convocation of NIT Trichy was held on 30th July 2016 and presided over by the esteemed Director of IIT Hyderabad, Prof. Uday B.Desai, who served as Chief Guest of the day.



3 PhD

3 M. S (by Research)



MEDAL WINNERS - 2016

President Medal (Overall Highest CGPA in B.Tech)

Roll Number	Name	CGPA
107112030	GURU PRAANESH R	9.97
107112031	GURU RAGHAV R	9.97

The Institute Medal 2016

Roll Number	Name	CGPA	Programme
107112030	GURU PRAANESH R	9.97	EEE (B. Tech)
107112031	GURU RAGHAV R	9.97	EEE (B. Tech)
207114019	KONDRAPU ANUSHA	9.81	Power Systems (M. Tech)
207214006	VIJAYA NARAYANAN S	9.37	Power Electronics (M. Tech)



OLYMPIC ENGINEERING

THE OLYMPICS, A STAGE WHERE THE BEST THE WORLD HAS TO OFFER COME TOGETHER AND TEST THEIR METTLE AGAINST EACH OTHER. THOUGH IT HAS BEEN GOING ON SINCE 776 BC, THERE HAVE BEEN A FEW CHANGES SINCE THEN....

FOR INSTANCE, TAKE THE 100M SPRINT, PROBABLY THE MOST GLAMOROUS OF THE OLYMPIC EVENTS. BACK IN THE ANCIENT OLYMPICS, SELECTING THE WINNER WAS AS SIMPLE AS SEEING WHO CROSSED THE FINISH LINE FIRST. NOW WE HAVE STOPWATCHES AND PHOTO FINISHES ACCURATE TO THE NANOSECOND.

HERE ARE SOME OF THE NOTEWORTHY INNOVATIONS:

NIKE AEROBLADES

SINCE THE 2000 OLYMPIC GAMES IN SYDNEY, NIKE HAS BEEN OUTFITTING TRACK AND FIELD ATHLETES WITH GEAR DESIGNED TO MAKE THEM MORE AERODYNAMIC. THIS YEAR IN RIO, THE COMPANY'S SOLUTION WAS, OF ALL THINGS, SPIKY TAPE.

NIKE'S SPORTS RESEARCH LAB HAS LONG BEEN DEVELOPING TEXTURIZED GEAR FOR RUNNERS TO HELP THEM REDUCE DRAG, BUT ITS NEWEST INVENTION IS AEROBLADES, WHICH MADE THEIR FIRST OLYMPIC APPEARANCE IN RIO. NIKE'S AEROBLADES ARE "FORMED NODES" THAT LOOK LIKE TINY HOOKS OR SPIKES AND REDUCE WIND RESISTANCE BY INFLUENCING THE MOVEMENT OF AIR AROUND ATHLETES. THE SPORTS BRAND HAS PRODUCED LEG AND ARM SLEEVES COVERED IN AEROBLADES, ALONG WITH ADHESIVE PATCHES.

TO TEST THE DRAG-REDUCING PERFORMANCE AND DETERMINE WHERE PATCHES SHOULD BE PLACED ON THE BODY, NIKE STUCK AEROBLADES TO MANNEQUINS AND PLACED THEM IN A WIND TUNNEL. THEY WERE THEN ABLE TO DEVELOP PLACEMENT INSTRUCTIONS FOR ATHLETES, FROM SPRINTERS TO MARATHON RUNNERS, WITH THE GOAL OF HELPING THEM CROSS THE FINISH LINE FASTER.

HYKSO PUNCH-TRACKING SENSORS

FIGHTERS PLACE LIGHTWEIGHT SENSORS UNDER THE TAPE ON THEIR WRISTS, WHICH SEND DATA TO A MOBILE APP THAT COUNTS PUNCHES AND MEASURES INTENSITY AND VELOCITY. THE APP CAN EVEN DISTINGUISH BETWEEN THE TYPES OF PUNCHES THEY THROW.

THE U.S. AND CANADIAN BOXING TEAMS HAVE BEEN USING HYKSO'S TECHNOLOGY DURING SPARRING AND TRAINING. PREVIOUSLY, BOXING CANADA HEAD COACH DANIEL TREPANIER HAD BEEN USING A MANUAL CLICKER TO COUNT ALL OF THE PUNCHES. NOW, HE CAN ANALYZE STRATEGY, RECOGNIZE PREVIOUSLY UNDETECTABLE PUNCHING PATTERNS AND HELP HIS TEAM ADJUST THEM. (THE MOVIE "REAL STEEL" COMES TO MIND)

"HAVING ACCESS TO THIS ADDED LAYER OF KNOWLEDGE GIVES OUR TEAM A HUGE COMPETITIVE ADVANTAGE HEADING INTO RIO THIS SUMMER," TREPANIER SAID IN A HYKSO TESTIMONIAL BEFORE THE OLYMPICS.

HYKSO'S TRACKING SYSTEMS ARE CURRENTLY AVAILABLE FOR PRE-ORDER BY THE GENERAL PUBLIC.

SOLOS AUGMENTED REALITY GLASSES

FOR TRAINING CYCLISTS WHO WANT TO CHECK THEIR VITAL SIGNS AND BOOST THEIR PERFORMANCE MID-RIDE, SOLOS SMART GLASSES PROVIDE AN AUGMENTED REALITY VIEW OF THE INFO, "HEADS UP AND HANDS FREE." (TALK ABOUT GOOD LOOKING TECH!)

SOLOS, AN OFFICIAL SPONSOR OF THE U.S. CYCLING TEAM, HAS PARTNERED WITH THE ATHLETES TO CREATE A PAIR OF SHADES THAT DISPLAY STATS SUCH AS CADENCE, HEART RATE, SPEED, DISTANCE, DURATION AND MORE, LAYERED OVER THE ROAD AHEAD.

THE GLASSES, DEVELOPED BY WESTBOROUGH, MASS.-BASED KOPIN CORPORATION, ARE DESIGNED TO BE AERODYNAMIC, STYLISH AND COMFORTABLE. THEY ALSO CONTAIN A SPEAKER, WHICH DELIVERS AN AUDIO FEED OF THE CYCLIST'S STATS, AND CONNECT TO A MOBILE INTERFACE.

WHILE THE U.S. CYCLING TEAM TRAINED WITH SOLOS, THEY WEREN'T ABLE TO WEAR THEM DURING THE RACES IN RIO.

OMEGA UNDERWATER LAP COUNTERS

WATCHMAKER COMPANY OMEGA HAS BEEN THE OFFICIAL TIMEKEEPER FOR ALL BUT THREE OF THE OLYMPIC GAMES SINCE 1932, BUT THIS YEAR, IT HAS EXPANDED ITS ROLE BEYOND OFFICIAL DATA-HANDLING.

WHEN SWIMMERS ARE RACING BACK AND FORTH ACROSS THE POOL, THEY OFTEN HAVE TROUBLE KEEPING TRACK OF THE NUMBER OF LAPS THEY'VE COMPLETED. TO ELIMINATE THIS DISTRACTION AND REPLACE THE HUMAN OFFICIALS WHO PREVIOUSLY DISPLAYED NUMBERS AT THE POOL'S EDGE, OMEGA HAS DEVELOPED UNDERWATER LAP COUNTERS.

INSTALLED AT THE BOTTOM OF EACH LANE, THE COUNTERS UPDATE EVERY TIME A SWIMMER TOUCHES A PAD ON THE WALL. THE NUMBERS ARE VISIBLE TO SWIMMERS WITHOUT REQUIRING THEM TO LOOK UP FROM THE POOL. THEY'RE DESIGNED SOLELY FOR IN-THE-MOMENT USE BY COMPETITORS, RATHER THAN OFFICIAL TIMEKEEPING FOR THE RACES, OMEGA CLARIFIES ON ITS WEBSITE.

OMEGA PREMIERED THE LAP COUNTERS AT THE FINA WORLD SWIMMING CHAMPIONSHIPS IN DOHA, QATAR, IN DECEMBER 2014. IN RIO, THE DEVICES WERE USED IN THE 800-METER AND 1500-METER FREESTYLE SWIMMING EVENTS.

FALCOEYE- OPTICAL SCORING SYSTEM

IN THIS MOST TRADITIONAL OF EVENTS, AN ELECTRONIC SCORING SYSTEM HAS REPLACED THE REFEREE'S JUDGEMENT. WHILE THE CLASSIC PAPER TARGETS MAY LOOK THE SAME, IN REALITY THEY ARE NOW ONLY THE VISIBLE FACE OF A HIGH-TECHNOLOGY SENSOR SYSTEM THAT WILL TRANSFORM THE SPECTATOR EXPERIENCE OF THE SPORT. THE BASIC METHOD OF THIS SYSTEM IS THAT IT DOESN'T WORK WITH BUILT-IN SENSORS; IT DEFINES THE ARROW'S POSITION BY OPTICAL SOLUTIONS INSTEAD.

"WHEN THE ARROW HITS THE TARGET, THE SYSTEM SHOWS THE SCORE ON THE BIG SCREEN IMMEDIATELY," SAYS RIO 2016 ARCHERY MANAGER LUIZ EDUARDO ALMEIDA. "IT IS EXTREMELY ACCURATE AND MUCH FASTER."

THE NEW SYSTEM IDENTIFIES THE EXACT POINT OF THE ARROW IN THE TARGET WITHIN AN ACCURACY OF 0.2MM, MUCH MORE PRECISE THAN THE HUMAN EYE IS CAPABLE OF. THE SCORE IS DISPLAYED ON THE SCREEN JUST ONE SECOND AFTER THE ARROW HITS THE TARGET.

THESE ARE BUT A FEW OF THE TECHNOLOGICAL MARVELS THAT HELPED THE GAMES GO SMOOTHLY. THESE ARE MOMENTS THAT CAN MAKE US PROUD TO BE ENGINEERS.

WHO KNOWS, PUT IN THE EFFORT AND TIME, AND WE CAN BE THE PUSH THAT INDIA NEEDS TO EXCEED EXPECTATIONS IN THE COMING 2020 TOKYO OLYMPICS.

RESEARCH INTERNS

S Vidya

Research Intern at **University of New Brunswick, Canada**

Mitacs Globalink Intern, 2016

Application Process:

The application process for Mitacs Globalink is structured and extensive. The essential requirements are: 1. Letter of Recommendation 2. Statement of Purpose 3. Transcripts and 4. Resume. A number of questions are asked about your interests, skills, research projects etc. I would advise all students in their pre final years to apply to the various internships out there. International internships are one of the best ways to not only be exposed to a different work environment, it also helps you become more confident about yourself.



Experience:

My project was titled "Experimental Computer Aided Design Flow". I worked in the Reconfigurable Computing laboratory under the guidance of Dr. Kenneth Kent in the Computer Science Department of University of New Brunswick. My work involved advancement of VTR (Verilog-to-Routing) tool in programming FPGA devices. The work hours were very flexible and the professors were very much helpful and relaxed with the students. Apart from my project work, I had the chance to tour Toronto, Montreal and Quebec City.

Vinitha Selvaraj and Akash Baskaran

Research Interns at **National University of Singapore**

Application Process:

NUS doesn't have an official summer internship program like NTU's SRI (Summer Research Internship). The process is quite straightforward. Go through the website and make a list of professors who are working on projects in your area of interest. Do not send a generic email to all of them. Professors can easily see through random mails. Personalize the emails, state why you're applying to that professor and which projects of theirs you found appealing in your cover letter. It would also help if you read through some of their publications. You do not have to strictly follow the NIT Trichy resume format, prepare a single page resume with only relevant details like your projects, technical skills and past experience (if any.) Better to start emailing by September-October!

Experience:

We were fortunate enough to have been able to work on two projects. Our first project was on developing a Smart Bed Turner to help immobile bed-ridden patients to turn laterally with the aim of preventing bed sores. During the course of the project, we worked on an array of fields such as design of the platform, circuitry, coding to implement an open loop control system and also develop an Android application for easy user interface. The second project we worked on involved

Vision based control of a drone in GPS denied environments. We got hands on experience on working with the DJI Matrice (drone), ViSP (image processing library) and ROS. We were working with the best in the field and this internship gave us a taste of what research life is like. Also, the weekend trips to Universal Studios, Marina Bay Sands, National Museum, Night Safari etc made the experience quite memorable,

A M Bharath

Research Intern at Laboratory of Robotics, Informatics and Microelectronics Montpellier (LIRMM), University of Montpellier, France

My plan after completing my B.TECH is to go for a Masters/Direct Ph.D., and so I decided to do a research intern at a good University. I started searching for labs and universities which specialized in Robotics in different countries like France, Germany, Singapore etc. Then I started mailing different professors requesting for an opportunity (Do not ask for stipend at first. You can apply to DAAD, CHARPAK or other funding agencies.). Luckily I got a reply from a few (heads-up: You won't get replies that easily. But never stop trying.)

My project was in Robotics, to be more specific SWARM robotics or Intelligent matter. I had to design few elementary blocks (both mechanical design and circuit design), which can coordinate among themselves to form different shapes or complete a specific assigned task. The catch was that- no mechanical actuators can be used. All actuators were to be magnets and electromagnets.



If you are applying to European Universities you will have a myriad of tourist experiences (will cost a lot as well, sadly). I had been to Paris, Spain (Barcelona), Toulouse and some nearby places in France. It was great to meet new people and roam around beautiful cities. Regarding food, you will have slight problems if you are vegetarian since in Europe they add pork/beef in almost everything. I learnt to cook rice and took some ready to eat sachets which were very useful.

For second and first years, build up your resume according to your interest, try to ease out the peer pressure and work towards your goal.

Himanshi Yadav

Research Intern at TU Munich, Germany

DAAD-WISE

DAAD-WISE programme gave me a two-way ticket to study robotics, travel and learn about the intricacies of life. I interned at the Hybrid Control Systems department of Technical University, Munich, Germany. The internship work involved designing a framework for implementing a closed loop position control on Khepera-4 Robot to make it navigate between the states on an Urban-Like Environment Platform using live camera feedback. The experiments that I conducted made me realise how almost anything can go wrong and one requires gigantic doses of espresso and patience to get by.



Germany made me feel more Indian than usual. From walking on the right side of the road to drinking milk straight from the carton, Germany did affect me in myriad ways and to variable degrees. I learnt how to cycle for more than ten kilometres, be honest while playing extremely intellectual German board games, sometimes eat pretzel for all three meals and mostly be grateful of my life and achievements.

Harshini Rajachander and Sarang Sharan Research Interns at IIT MADRAS Summer Fellowship Programme - IIT Madras

Appilication Procedure :

During January, the deadline for the Fellowship programme is announced which is sometime in February or March. Check the website <https://sfp.iitm.ac.in/> continuously for information regarding the programme. The application is like any other, where you are required to upload a transcript of your semester-wise performance and fill out your personal information along with your research interests. You are also asked to write an SOP in five lines which I think is the most important part of the application. Once selected, the offer letter will be e-mailed to you by the end of March.



Harshini *Experience:*

For my summer internship, I chose to work in the Department of Aerospace, IITM. My project involved the development of automatic control of small-scale Unmanned Aerial Vehicles in a closed environment. I worked under Dr.Ranjith Mohan as well as few other Doctoral Students who were kind enough to teach me the basics of aircraft modelling and they were always willing to extend their help whenever required.

Appilication Procedure : During January, the deadline for the Fellowship

Sarang *Experience :*

I was selected for the IITM Summer Fellowship Programme – 2016 in the department of Electrical Engineering based on my application. The programme consisted of a series of guest lectures, both by faculty and by research students, and visits to various research labs. In addition, we had to work on an individual project which was allotted to us based on our research interest. I was paid a stipend of Rs. 10,000 for the entire period of two months in two instalments. My guide was Dr. Bharath Bhikkaji and the project that I was working on was - “Trajectory Tracking by a a Holonomic Omni-directional Robot”. I was working in the Control Systems lab where I was surrounded by several convivial research scholars who were all too eager to provide help whenever required. I was also provided with state of the art Lego Education Kits which helped me in my endeavour. Dr. Bhikkaji showed immense involvement in my work which was very motivating. The series of guest lectures were quite riveting as well. All in all, it was an extremely enjoyable experience where I also got to learn a lot.



COMPANY INTERNSHIPS

TVS Motor Company Limited, Hosur

If you want to do a core engineering intern and you have interest in automobile engineering, this might be the right opportunity as you'd get to work in the R&D of one of the top automotive companies in India.

Recruitment Experience: The recruitment process started with an online application-filling, which needed one to have a CGPA of at least 8.0 to proceed further. Then I was needed to upload documents related to my projects, papers published or any academic accomplishments. There was an SOP questionnaire too. After that there was an online test which had really simple questions on circuit theory and communication. Next up was an interview in our campus. I had to be sure of what I did in my projects, and also to remember what I wrote in my SOP as they checked my consistency. Apart from that there wasn't much technical they tested only my passion. The last phase was a 2-day assessment process which happened in Hosur.

The assessment procedures included group activities, discussions, a series of aptitude tests and a single technical test. On the second day, there was an HR interview and all the phases mentioned above were eliminative, so once I was done with it I had a complete package of experience and confidence going forward.

Internship Experience: The project assigned was according to the details gathered during selection process. Mine was mathematical modelling of PMSM, specifically, a model which would help in optimization of Apache 150 CC's magneto. My fellow electrical interns got projects on machine-optimization and automotive electronics. There was a guide and a mentor for my project, who gave me complete freedom for testing and prototyping. There wasn't any pressure on me. Apart from my project, I had many other activities during the program like guest lectures, customer interactions etc.

Hosur as you may know is a small place, which offers you a pleasant weather, minimal cost of living and less traffic when compared to Bangalore. You can plan your weekends and get yourself ready for some south Indian pure veg food provided by the company, you'll definitely like it.

Tips: Practise aptitude questions, and for the technical test learn the basics in all the electrical subjects, which would be more than enough. For the group activities, project yourself as a team-man with a good composure and open yourself up. For the interviews, show them that you are really passionate about what you are doing and what you are capable of.



V Ajay Kumar, Final Year

Alstom Transport, Bangalore

Process:

Alstom opens for 2 profiles- rolling stocks and signalling. The selection process involves Resume shortlisting, GD and interviews. There might also be an online test prior to GD.

Experience:

Alstom transport is a French based MNC working on rail transport and locomotives. I was under train control and information systems team in rolling stocks department. My project was to design and evaluate electrical subsystems for the upcoming Kochi metro. It involved a mix of digital logics and electrical relays. It was initially tough in the beginning but later turned out to be a good learning experience. The intern gave me a good industrial exposure and the applications of various electrical equipments that we learn in engineering. The employees were very friendly, motivating and always ready to help. Alstom transport is located in Bagmane tech park and has a good transportation network. The working hours were quite flexible.

C Meenakshi, Final Year

Reliance Industries Limited, Gujarat

Process:

Written test, 2 sections

1. Aptitude 30 questions/30min
2. Technical 20 questions/30 min (control systems, basic electronics, power system)

Experience:

Our work there was very exciting and much time was spent amongst erudite people who were keen on sharing their wisdom with us. Our project was on a Static Frequency Converter (SFC) for a Process Air Compressor (PAC). SFC is basically a VFD (Variable Frequency Drive) which is used for the starting up and control of a 24MW synchronous machine. SFC also aids in the power flow from the machine to the grid under certain operating scenarios.

RIL being a huge Petrochemical industry with Captive Power generation facilities I was also exposed to state-of-the-art systems like SFC for a PAC, AVR for generators, Fast Bus Transfer, Plug And Switch System, Gas Insulated Switchgear which gave us an understanding of the advancements in today's technology owing to the ever growing industrial demands. After witnessing these present day technology being used right from power generation, transmission, distribution and power system protection, (which basically is the entire course of electrical engineering) under a single roof, helped us bridge the gap between classroom learning to its application in industry. Also, it led to better understanding of engineering concepts and we are now able to appreciate them better. We also understood the role of an electrical engineer in an industry by experiencing it first-hand which helped us in making a career choice.

Besides there were no fixed work timings and our evenings were spent in one of the several well-equipped facilities like gym, badminton courts, TT rooms, swimming pool, snooker room, etc. Weekends translated to us visiting nearby cities like Ahmedabad, Vadodara and Mumbai. Though Gujarat is infamously known to be a vegetarian state, there were a few Muslim joints with the best

chicken we've ever tasted! Personally, those two months were life changing, with many life lessons learnt and many more memories created.

Roshan, Nishit Kumar, Hanuman Suman, Final Year

Siemens, Chennai

For my internship, I was assigned to the sales department of Siemens, Chennai. The work was primarily devoted to the product study of medium-range switchgears in comparison with other switchgears currently in the market. Mentors were assigned to each of us and they proved to be a great help. I was also motivated to come up with new ideas for improving the existing products. Several sessions were conducted by various experts in the industry who gave us a thorough run-down of the working of electrical products and their applications. Hence, I got an in-depth understanding of market scenarios and customer demands of the related products. Overall, it was an extremely good learning experience.

Simran Jain, Final Year

I was assigned to the mobility department where I was working in the CMRL (Chennai Metro Railway Ltd.) project. I was dealing with signaling, telecommunications and platform screen doors for metro railways. I was working along with few other enthusiastic engineers who had a minimum of 5 years' experience. For first two weeks, I was in the admin office where I took up the efforts to learn about the technical details about the project. Then I was shifted to the site office. I got an opportunity to go for the first Metro underground test run and visit the main Operation Control Centre (OCC-Koyambedu). Overall, I had an amazing experience.

Selection Process: Our first round of the application process was aptitude and then we had two round of GD. The candidates must know about the company well. One should show them that one is competent and enthusiastic.

Sujitha, Final Year

Texas Instruments, Bangalore

Preparation:

To crack the Internship tests, it is better to fixate on the profile one is aiming at – analog, digital or software. For Analog profile one must possess thorough knowledge of Circuit Theory and Networks, Transient and Steady State analysis, Filters, Device Theory and basic operations of op-amp. For Digital profile, all combinational & sequential circuits, timing analysis, hazards, FSM design and CMOS gates must be mastered.

TI follows an input-output approach where we were told the targets to be achieved and the rest was left to us. Prerequisites and certain topics to prepare were conveyed to us via mail a few weeks before the start of the internship. I, Pratishtit, was assigned the task of designing a protection scheme block for an IC - which was a great learning and working experience. A midterm review was conducted at the end of one month where certain changes were suggested for all the interns. The whole team was very helpful with respect to any clarifications or help we needed. The rest of our internship was focused at optimizing our designs as much as possible. Our end term evaluation was followed by an HR interview.

Pratishtit Iyer, Ramanathan RM and Srisowmya M, Final Year

Sandisk, Bangalore

Process:

The selection process involves a written test followed by 1 or 2 technical interviews and an HR interview.

Experience:

I interned at SanDisk as a part of Logic Verification team in Memory Technology. My project was in Memory Logic Verification using Constrained Random Test bench. The Learning work and entertainment blended beautifully into my schedule. The area of work was refreshingly different from the electronics we learn in college. To ease me into the field, I was given a series of tasks that led me to a main problem statement. By the time I was working on my main problem, I had learnt a lot and everything made so much sense. The interactions with my colleagues helped me gain a lot of exposure. The best part was, we didn't just get to do our work, but we also got to learn what each and every member of our team did, what difficulties they faced and how to get breakthroughs putting all our minds together. I had a great time working at SanDisk and I am thankful for this opportunity.

S Pavithra, Final Year

Fidelity Investments, Bangalore

Fidelity Investments, a finance company based in Boston, MA that carries out some of its technology operations in Bengaluru, is where we interned. The work profile was software development and one could come across a whole horde of languages like Java, AngularJS, Python, etc. depending on the project assigned. The languages might be new to most interns, but knowing one programming language makes it easy to learn another one. Besides, the mentors and managers assigned were extremely helpful, who despite their hectic schedule were always available to guide us. The work culture was amazing, and gave us an insight into the corporate world and the financial sector.

Projects:

My project was on Web Service Automation – building an automated utility to replace an existing shareware that processes SOAP XML requests using WSDL and Endpoint, that generates responses which are validated.

Kaushik Ram G, Final Year

I worked on adding a custom add-in in Microsoft Excel and created a desktop application for one of their existing web applications.

Manisha Bhagat, Final Year

I worked on sessionization of click stream data using Hive and migrated the task to Spark.

Manpreet Singh, Final Year

Tips for the interview:

Aptitude is mandatory for the test, data structures and algorithms for the interview.

National Instruments R&D, Bangalore

Last summer, I interned as a Software Engineer under the LabVIEW team of National Instruments R&D, Bangalore. The company came for recruitment around the third week of August '15 and the process was pretty straightforward. We had an aptitude-based round followed by an online coding round and a couple of interviews. The internship lasted for about 10 weeks and my team primarily worked on Microsoft stack.

As far as the interview preparation is concerned, I would recommend anyone to learn and implement basic algorithms and data-structures — stacks, queues, linked lists and BSTs — in the language of your choice. Solving questions from SPOJ and CodeChef would help a lot. During the onsite interview you wouldn't be provided with a computer so I would also recommend practicing to write code on paper/white-board so that you get used to it. This holds good for any software engineering interview.

Harshavardhan, Final Year

Qualcomm India (Bangalore development centre)



I did my 2-month summer intern program at Qualcomm BDC. The Bangalore division mainly carries out the development and testing of the various drivers for the Qualcomm powered devices. I was assigned a mentor who explained the plan and timeline for the intern program. I, along with my team members, had to develop a web based application to automate the testing of mobile drivers and to keep a log of the various tests carried out. The testing was to be carried out on a cloud based platform and the results were then to be stored in a database. The people I worked with were very approachable and helpful. They helped me understand the

architecture of the platform and writing test scripts. The team successfully completed the assigned task well before the deadline.

Apart from the main project, Qualcomm conducts a yearly team based competitive event called IdeaQuest. We as interns were supposed to submit ideas from which a few were selected and the teams then had to present a working prototype to a jury consisting of highly experienced Qualcomm employees. I was fortunate enough to be able to participate and reach the finals of IdeaQuest.

Overall the experience was amazing and I thoroughly enjoyed the 2 months I spent there. I would recommend anyone interested in development along with a passion for technology to try for it.

Saurabh Dubey, Final Year

NVIDIA, Bangalore

Work Experience:

Work culture was great as there was no dress code, no strict timings and genial team managers. Our first day involved a formal meet-up with the HR and team managers of Nvidia along with other college interns. As we were assigned to currently running projects, we were asked to learn the basic working and architecture of the chip as well as software like PERFORCE and LINUX which were required for the project in the first one month. Every week we had to give updates to the managers on the progress of the project. In between, there was a launch of PASCAL in India for which we were asked to volunteer which gave us a wonderful experience on VG (Virtual Gaming) modules. Often we were taken to team lunches and HR informal meets. Every Friday, we had training sessions on perforce training, pre and post chip design, perl training and machine learning.

Project details:

Satrujit (GPU ASIC Team)

Designing the efficient pipeline and avoiding bubbles in it to avoid negative slack after synthesis. Coming up with a micro arch RTL design in Verilog synthesis timing check.

Harika (CPU Team)

Developing a common cmain code for all the 8 processors present in tegra by avoiding wastage of memory and generalised io coherence host test for n number of processors.

Recommendation for juniors regarding preparation:

Be thorough with the basics of computer architecture, digital electronics, Verilog and C++ languages (to get in to the company) Linux and perl languages (after getting in to the company)

Satrujit Mohanty, Harika Pasham, Final Year

Hindustan Unilever Limited

Hindustan Unilever Limited is a popular FMCG (fast-moving consumer goods) company that manufactures products that we all use almost every day. The selection process starts with a resume shortlist followed by a technical Personal Interview. One must be thorough with your achievements and have extensive knowledge of your projects. A small tip, be academically sound with Power System Protection and Electrical Motors.

Experience:

The internship started with a two day induction program at Mumbai Head Office (HO). After the induction program, we were given real time projects at different locations. The employees at HUL were very cooperative and friendly. After an eight week project, the internship ended with a summer summit at Mumbai HO followed by Pre-Placement interviews (PPIs). The internship involved loads of fun-filled activities as well as challenging situations leaving us with plethora of memories to carry forward. It was an amazing and wholesome learning experience where new ideas from us were encouraged and sometimes even implemented. If you are interested in both technology and managerial activities, HUL is the place to try for!

B Monika and D V Sai Lakshmi, Final Year

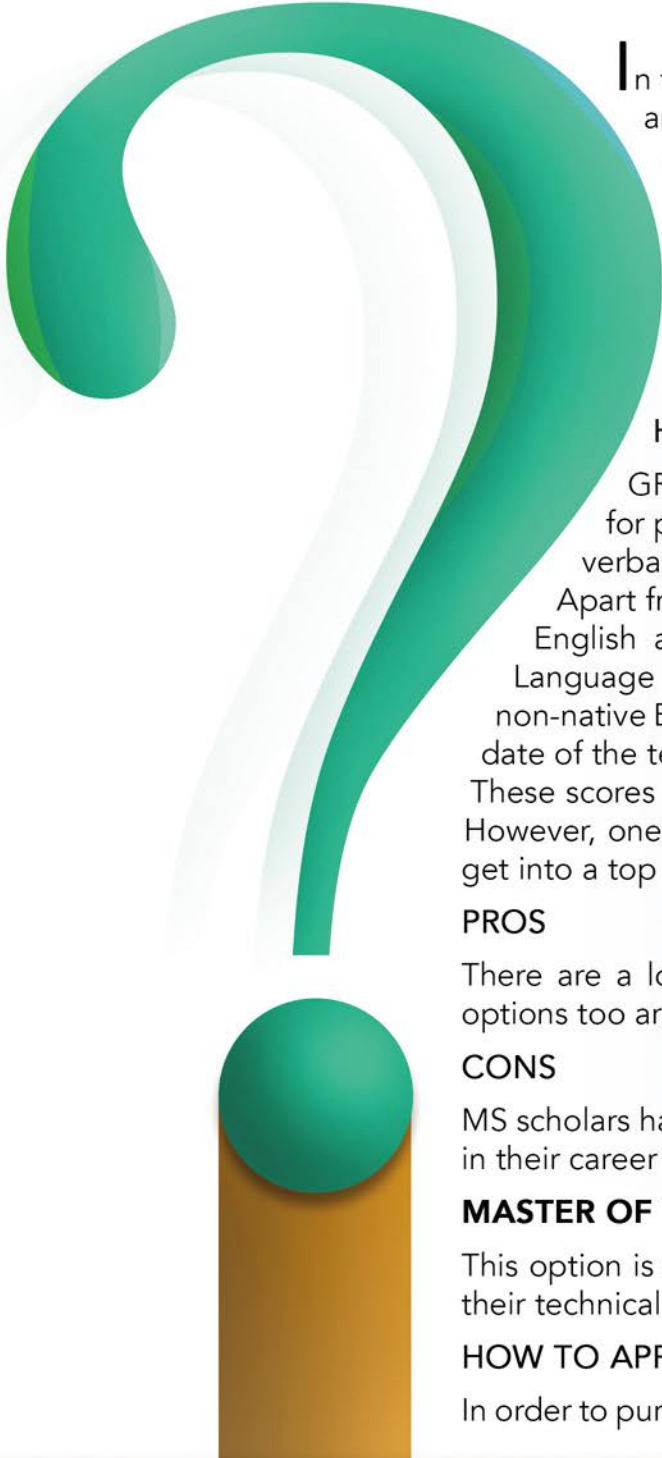
WORKSHOP ON SOLAR TECHNOLOGY



A two day workshop coordinated by Dr. G. Saravana Ilango and Dr. C. Nagamani was held on the 27th and 28th of May. The workshop aimed at imparting quality knowledge and expertise in the field of photovoltaic module interconnection schemes and MPPT algorithms. Dr. Ilango, assisted by his PhD, M. Tech. and B. Tech. scholars had conducted the event. The participants of the workshop included PG students, faculty members of other academic institutions as well as some employees from industries. They were well taken care of by the hospitality team, which primarily consisted of M. Tech. scholars.

The workshop took off with Dr. Ilango explaining about the basics of PV modules. He went on to elaborate on the modeling equations and the parameter calculation algorithm. Various PV module interconnection schemes including Series-Parallel (SP) and Totally Cross Tied (TCT) topology were also explained. The Su Do Ku scheme of interconnection, an unprecedented innovation that he, along with one of his PhD scholars came up with were shared to the participants. The participants also had a hands-on experience on simulating the various concepts covered in the theory session. The simulations were carried out in the computer lab in the EEE department. The participants were well assisted at every stage by volunteers.

The second day saw the participants learn about the various MPPT algorithms including Perturbation and Observation (P&O) algorithm and Particle Swarm Optimization (PSO) algorithm. Instructed by Dr. Ilango, the two algorithms were discussed in detail and the various performance parameters like time taken to settle at the new maximum power point, maximum power oscillations while reaching the Maximum Power point etc were compared. The participants were given a demonstration on the above mentioned algorithms by Mr. Chakrapani, Mr. Guru Raghav Raaman and Mr. Guru Praanesh Raman, followed by a hands-on hardware session on the implementation of the concepts taught in the theory session on hardware kits provided by Texas Instruments. The participants were also given a comprehensive tour of the Solar PV panels present on the roof of the department.



In today's fast paced world, there is no dearth of choices in any field, including education. There are a lot of options regarding what can be done after B.Tech. Here, we bring forth some of them.

MASTER OF SCIENCE (MS)

Master of Science, or MS, as it is more popularly known, is for advanced studies in a particular technical subject.

HOW TO APPLY

GRE (Graduate Record Examination) has to be attempted for pursuing MS in the U.S.A. The test contains questions on verbal reasoning, quantitative aptitude and analytical writing. Apart from GRE, applicants should also attempt TOEFL (Test of English as a Foreign Language) / IELTS (International English Language Testing System) which are English proficiency tests for non-native English speakers. The scores are valid for 5 years from the date of the test.

These scores can also be used to apply for PhD directly after B.Tech. However, one must have a very high CGPA and excellent projects to get into a top college.

PROS

There are a lot of job opportunities after completing MS. Research options too are abundant.

CONS

MS scholars have lesser chances of landing up a managerial post early in their career compared to MBA graduates.

MASTER OF TECHNOLOGY (M.Tech)

This option is extremely viable for people who want to improve upon their technical skills, and thus, pursue a career in the same field.

HOW TO APPLY

In order to pursue M.Tech in IITs, NITs or IISC, one has to attempt GATE

CAREER OPTIONS

AFTER B. TECH

CAREER OPTIONS *AFTER B. TECH*

(Graduate Aptitude Test in Engineering). Some IITs shortlist students based on their GATE score and then conduct their own written test and interview. Although GATE scores are given more preference, a person with decent career marks has an edge over those who don't. The test consists of Subject related Questions (70%), Engineering Mathematics (15%) and Aptitude (15%). Most people start preparing from their second or third year.

PROS

After M.Tech, one can get into a good core company. The salary is mostly higher than what is provided to B.Tech graduates. There are opportunities to pursue research and also take up teaching as a profession.

CONS

There are a few companies which consider only B.Tech and pay accordingly. MBA graduates have a greater chance of climbing the rungs of the ladder in the corporate world as they have more managerial knowledge.

MASTER OF BUSINESS ADMINISTRATION:

MBA is the best option for students who want to hone up their management skills, which are needed to prepare for generalist roles in various non-technical industries. The core courses in an MBA program cover various areas of business such as accounting, finance, marketing, human resources, and operations in a manner most relevant to management analysis and strategy.

HOW TO APPLY

Many prestigious B-Schools in India (including IIMs) shortlist students based on their CAT (Common Aptitude Test) scores. This is followed by a GD or an essay writing round, after which interviews are conducted. The aptitude test contains questions on Quantitative Ability (QA), Verbal Ability (VA) and Reading Comprehension (RC), Data Interpretation (DI) and Logical Reasoning (LR). Other Institutes conduct their own entrance tests. As a lot of people attempt this test, it is advisable to start preparing as early as possible to land up in one of the top colleges.

For pursuing MBA abroad, GMAT (GRADUATE MANAGEMENT ADMISSION TEST) is the exam that has to be attempted. Nowadays, a few colleges have started accepting GRE (Graduate Record Examination) scores too. GMAT tests analytical, writing, quantitative, verbal, and reading skills in written English. Along with this, exams like TOEFL (Test of English as a Foreign Language) / IELTS (International English Language Testing System), which test proficiency in English, have to be attempted. TOEFL scores are accepted in U.S.A and those of IELTS are accepted by most European Universities.

PROS

It is easier to continue studying as one is still in student mode. A large percentage of students find it difficult to prepare for these examinations simultaneously with their job. The salary too is very high.

CONS

Some HR courses are difficult to understand without prior work experience. It is impossible to be financially independent if MBA is done immediately after B.Tech

CAREER OPTIONS *AFTER B. TECH*

PLACEMENTS

This option is perfect for those who have had enough of studying and also for those people who would like to have exposure to the corporate world before deciding on whether to study further in the same field or not.

HOW TO PREPARE

The most basic requirement is to pass the CPC (Campus Placement Committee) examinations. They are conducted in the 6th semester. Those who do not pass in the first attempt can appear for re-CPC exams. It is also advisable to maintain a CGPA > 8 for being eligible for electronics companies. Most electrical, management and software companies require CGPA > 7. A few software companies have no CGPA criteria. A thorough knowledge of the subject is also required for landing a job.

PROS

Learning the importance of hard-earned money and how to spend wisely. Moreover, there are chances to practically apply the concepts taught in college.

CONS

Working long hours and sometimes even on weekends to complete the assigned work is the major let-down.

CIVIL SERVICES

The civil services examination is conducted by the UPSC (Union Public Service Commission) for recruiting people for the IAS (Indian Administrative Service), IPS (Indian Police Service), IFS (Indian Foreign Services) and IRS (Indian Revenue Service).

HOW TO PREPARE

It is one of the most difficult examinations with a success rate of 0.1 - 0.3%. The examination consists of three levels: a preliminary exam, a main exam and a personal interview. The preliminary exam consists of two objective type papers having questions on general studies and aptitude. Main consists of 9 papers of essay type questions. As only 4 attempts are allowed, it is advisable to start preparing as early as possible.



PROS

Job security is the major advantage. In India, any civil servant is looked at with respect. The satisfaction of serving the society is also a major plus point.

CONS

The salary of an honest civil servant is low. Most civil servants are made to shift departments every year.

INDIAN ENGINEERING SERVICES

IES constitutes of engineers working under the Indian government in sectors like railways, roadways, telecommunication etc. Civil, Mechanical, Electrical and Electronics & Communication engineers can attempt the Engineering Services Examination conducted by UPSC (Union Public Service Commission).

CAREER OPTIONS *AFTER B. TECH*

HOW TO PREPARE

The exam consists of 5 papers. The first one is an objective examination having questions on general studies and English. The second and third papers too are objective ones and have questions related to the field of engineering. The fourth and fifth papers have essay type questions related to engineering. The five papers are followed by an interview round. The success rate of this test is extremely low and so it is advisable to start preparing as soon as possible.

PROS

As the jobs are technical, there is no public or political interference, unlike the civil services. The salary is stable and the job is respectable.

CONS

Social recognition is very less. As the promotions are carried out batch-wise, there is no way to differentiate between a high and a low performer.

BANK PROBATIONARY OFFICER EXAMINATION (BANK P.O EXAMINATION)

This exam is the only way of landing a job in renowned banks. A probationary officer is called so because he/she is kept on probation for a certain initial period, which also serves as the training period.

HOW TO PREPARE

The procedure consists of a preliminary examination followed by mains examination and an interview. The preliminary round consists of questions on quantitative aptitude, reasoning and English aptitude. Apart from these, mains consists questions on General Knowledge and Computer Knowledge. Around a year is required to prepare for this exam.

PROS

The salary is lucrative and there are a lot of other benefits. There is an additional benefit of job security.

CONS

There is no room for error. A small mistake may cause a lot of problems for the bank.

STARTUP

This is a very good option for those who do not want to work for others and do not mind taking risks. In recent days, a large number of engineering graduates are opting for this path.

HOW TO START-UP

The three vital requirements of a start-up are 'a useful idea', 'a set of good people' and 'wise investment of money'. Above all, one should learn to never give up as hardships are very common in this path. However, once success is achieved, all hardships are forgotten.

PROS

If the start-up is successful, gigantic financial returns are guaranteed. There is also the satisfaction of having achieved something without much help.

CAREER OPTIONS *AFTER B. TECH*

ARMY/NAVY

The army and navy are branches of the Indian Armed Forces and they too recruit candidates who have finished their B.Tech.

HOW TO APPLY

There are many ways in which one can apply for the armed forces. Prior to that, one must ensure that he/she meets all physical requirements. The 4 ways for applying for the army are CDS (Combined Defence Service) examination, TGC (Technical Graduate Course) which is meant exclusively for male engineering graduates, SSC (Short Service Commission) and UES (University Entry Scheme). SSC is a boon for those who want to serve temporarily. Indian Army has a pact which allows one to serve as a commissioned officer for 5 years, and once the tenure is over, a permanent commission is offered. UES is for B.Tech graduates and has provisional entries for final and pre-final years. For joining the Navy, CDS and SSC are the major examinations. The questions in these examinations are on English, general knowledge and mathematics.

PROS

There is job security and also many additional benefits. Besides, the biggest plus point is that one gets to serve the nation.

CONS

The rules are very strict and postings are mostly in places with extreme weather conditions. The biggest negative is staying miles away from family and friends, for long periods.



ACADEMIC REFORMS

An Interview with Dr. P. Raja,
Associate Dean Academic

What was the inspiration behind the introduction of the new reforms, which allows for pursuing a Major in EEE and a Minor in any other field?

I would say that there are two main reasons. First, there are people wishing to get admission into some program but due to their marks they would have fallen in some other branch which they didn't want. Also, they might have something inside them that wants them to pursue different fields. Second, the situation in most of the industries and even for higher studies is moving towards an inter-disciplinary sort of thing. An electrical student must know something about communication or computer science. Perhaps, something about mechanics as well. To give an example, if a student has some basic knowledge in power plant engineering in the mechanical side of things, say about boilers, etc, the student will be more comfortable working in such an inter-disciplinary field. The same applies for a mechanical student, if he gets to learn some basics about power systems he can find some comfort if he goes to this industry. These are the two main reasons behind introducing this reform.

How many minor subjects can be taken up each semester?

Right now any student can take a maximum of ten electives in the total program. Out of the ten electives, the student must take at least three program electives (core electives). Out of the rest seven, if the student takes at least five electives from a particular branch, she will get a minor from that branch. If the student wants a minor from any department, the student must choose from that department's core electives or the program electives. However, she can also scatter the seven electives across various departments but in that case, she wouldn't be eligible to get a minor.

Will the students be required to attend lab courses?

As far as the new reform is concerned, we classified something as the essential laboratory requirement. This means that to complete a B. Tech. in Electrical and Electronics Engineering, there are laboratory courses called as the essential laboratory courses, which must be completed. Till now in minor courses, we haven't included any laboratory courses.

From an administrative point of view, how challenging it would be to distribute the classes?

If there is a crowd towards a particular minor, the department offering the minor may not have enough man power to handle the classes. So the department will come up with a proposal to manage the crowd or they'll specify the maximum strength they can handle. They should come up with some criteria for this issue. We are yet to look into this issue. Just now the students have started registering on a paper about the minors; we are just collecting the forms and very soon we will get to know the statistics about the crowd. The offline registration is just for us to get a rough statistical idea. The online registration will start soon. As per the original design of the curriculum, the minor can start from the 3rd semester itself, however for the present batch (current second years) who will have this reform, they can opt for minor courses only from their 4th semester as this is a novel idea.



ACADEMIC REFORMS

How can the time slots be allotted for the classes?

If I am the faculty offering a minor course and the students from various departments have registered for my course, in that case I will first call for a meeting. I will make the representative of each branch to come up with a proposal for managing time. There will be some common time when they will all be free. Otherwise, I should go with time slots after normal working hours or in the early morning. If the number is very minimal, say only five students have registered for a minor in a specific department, then the faculty will offer the course in some laboratory or other work space. At present we have some global electives slots incorporated in the time tables; we can follow a similar approach. Right now there is no provision for a student to register for more than one minor in a semester; thus deciding a slot for this wouldn't be difficult.

Is this a permanent reform or is it subjected to change after evaluation of its implementation?

We can improvise the system from the feedback given by the students who face this reform. We will proceed with this system in the future as it is well proposed and it has been implemented positively in many universities.

Will minor courses have prerequisites?

If at all a minor needs prerequisites, it should be from general institute requirement courses that would be studied by every student. Such courses are coded by the term IR that stands for institute requirement courses. There are courses that are termed as PC (program courses), PE (program electives), OE (open electives) and HO(honors). If a student takes a third or fourth course in a minor, then we might make the first two courses as the prerequisites.

How does this help in accreditation?

The accreditation board primarily look at the course outcomes. Since a flexible evaluation system is being introduced, a professor can set different varieties of assessment to match or evaluate the course outcome. In a fixed pattern of cycle tests and assignments, the professor may not be able to completely meet the evaluation part of the course outcome. So the professor may even include laboratory sessions as a part of the evaluation of a course. Thus the evaluation can be done more efficiently and can meet all the course outcomes. In this way, it'll prove to be beneficial for accreditation.

How would the learning process be different from the existing system?

All the faculty involved are preparing an evaluation pattern and setting out plans for conducting classes, tests, etc. Everything is being defined in the course plan. Once the course plan is ready to perfection, the students will get a clear idea about the frequency of tests, assignments and other evaluations. The new flexible system is designed not to disturb the regular classes. This will also make the learning a continuous process.



success of **CURRENTS '16**

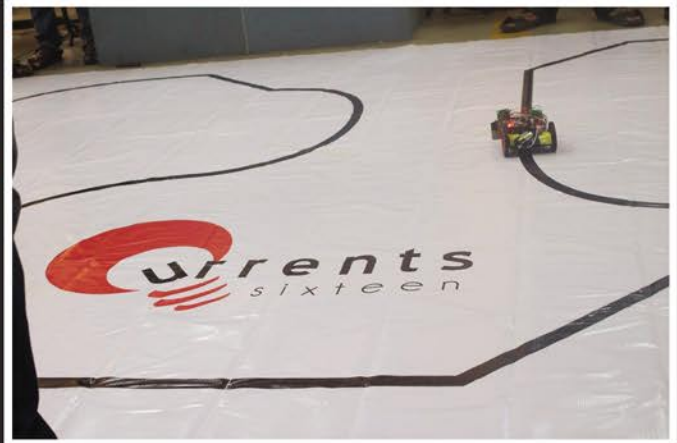
The Electrical and Electronics Engineering department of NIT Trichy conducted the 26th edition of its annual technical symposium, Currents, in 2016. The symposium took place from 18th to 21st of February, within the department premises. It had a plethora of events and workshops that attracted participants from various parts of the country. Students interested in electrical and electronics found the right platform to exercise their technical acumen and get along with like-minded people.

The sponsorship for the symposium reached a new milestone as Currents Sixteen was title-sponsored by Western Digital, a giant in hard-disk drive making. The Technology Partner was another big name in the world of Electrical & Electronics, Texas Instruments. In addition to these two, there were various other big names in the long list of sponsors and media partners that ensured the success of Currents Sixteen well beforehand, which would later be followed up by the successful outreaches, events and workshops.

The build-up to Currents Sixteen included a couple of outreaches and the preliminary round of IoT Challenge. The outreaches

conducted in Bengaluru and Vijaywada set the stage for the symposium and made it more looked forward to. Currents Sixteen associated with Texas Instruments to conduct the outreach in Bengaluru a workshop on Internet of Things-Home Automation, held in BMS College of Engineering. On the other hand, the outreach held in Vijaywada was again a workshop, this time on Development of Handwriting Recognition Device. The venue for that was V R Siddhartha Engineering College. Texas Instruments associated again with Currents to hold IoT Challenge, the flagship event of the 26th edition of the technical symposium. The preliminary round was held in January after which the shortlisted teams were to present their work to the jury during Currents. The success of the aforementioned presymposium activities increased the anticipation of the symposium beyond measure.

Currents Sixteen kicked off with the Inauguration Ceremony on Day 0, when Tronicals Volume 1 Issue 2 was unveiled. What followed that were the events and workshops on Day 1, 2 and 3. Nearly



success of CURRENTS '16

symposium and participate in the events and workshops. There were 8 events in total excluding IoT Challenge, namely, Colloquium, Circuitrix, Dhruva, Currents Tech Quiz, Line Follower, Code Currents, Electronic Arts and Capture Currents. These events stimulated the knowledge of the participants with respect to the topics concerned. The 8 workshops conducted were LiFi Technology, FPGA, Image Processing, Autonomous Robots, Rapid Prototyping & Design, PCB Design, Solar Tech & Design of Power Converter and Handwriting Recognition in Touchpad. For a period of 3 days, the events and workshops captivated the students and ensured that the PR & Hospitality Team was kept busy.

Overall, Currents was a remarkable success yet again, and the legacy that had been lasting for 26 years was ensured to be continuing for years to come. The due credits go to all the working teams, led by the trinity of Sudarshan V, the Chairman, Deepak Srivastav, the Treasurer, and Jaiganesh S, the Overall Coordinator, who not only worked to the success of the symposium, but

also passed on the responsibilities for the next edition to safe hands. The benchmark is for Currents 2017 to work and improve upon is high, but the participation and involvement in the organization of Currents 2016 has showed the only way for Currents is forward.





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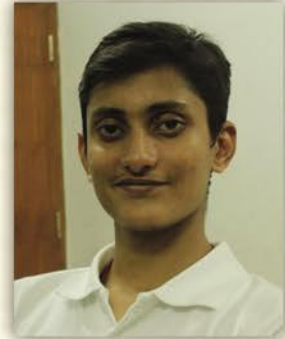
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