Bits and Bytes

Dept. Of Electronics & Communication Engg.

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PRINICIPAL'S MESSAGE

With technology spreading its wings to all walks of life, there is a need for an ever-widening knowledge base; Chandigarh College of Engineering and Technology (CCET) - Degree Wing has risen to the occasion and resolves to provide talented, skilled, and highly competent technical human resources to industry & society. The students have reiterated their efforts in co-curricular and academics in synchronization with what the industry requires. The faculty members and students have showcased their zeal for knowledge with their research projects and internships.

I wish all the very best to all the students who have proved their mettle in academics and extracurricular activities: We believe that success is inevitable where foresightedness, firm determination, hard work, and discipline exist. In our everyday life and in every sphere of our life the influence of technology is becoming so pervasive, that it gets indispensable to keep up with this fast-changing world. The perfect platform that makes a learning environment ideal is a calm, well-disciplined, and orderly learning environment, purposeful and stimulating teaching. We believe that hard work with discipline and proper guidance is a guarantee of excellence and we work dedicatedly to achieve the same. I congratulate all of the ECE department's faculty, staff, and students on the launch of the e-newsletter, in addition to their ongoing contributions to research and innovation, and I wish the editorial team continued success.

HOD'S MESSAGE

Greetings!!

It gives me immense pleasure to share the first issue of the departmental e-newsletter "Bits and Bytes" with you, highlighting a wide range of activities in Electronics and Communication. It will serve as a forum for ECE faculty and students to share achievements, with various stakeholders, like alumni, academic institutions and industries etc. With more than 90% of faculty having Ph.D. qualifications, the ECE department is active in research areas like Radar Signal Processing, VLSI Design, Fabrication of Antenna, MIMO-OFDM, and many other recent research areas. The department is equipped with various important software for undergraduate and Ph.D. Students: OrCad for PCB Design, HFSS for antenna design, MATLAB, etc. Apart from this our labs are equipped with good hardware equipment including Optical Fibre training kits, Wireless Communication training kits, and Embedded System hardware kits. The department encourages students to execute out of the box ideas and innovations. I congratulate all the faculty, staff, and students of the ECE department for their continuous contribution towards research, innovations and wish the editorial team a continuous success. We look forward to fulfilling the vision of the Department of Electronics and Communication through continuous curriculum updation and up-to-date enhancement of laboratory equipments which will help aspiring engineers in meeting tremendous growth in different areas of Electronics and Communication engineering.

EDITORIAL DESK

Greetings, Readers!

I feel proud on successful release of inaugral issue of e-Newsletter “Bits and Bytes” of the ECE Department, Chandigarh College of Engineering and Technology (Degree Wing), Sector-26, Chandigarh.

Basic objective of our Department is to provide a stimulating environment to aspiring engineers to realize their dreams and goals and to ignite their inquisitive minds to get excellence in the field of electronics and communication.

This e-Newsletter is an attempt to create a spirit of inclusiveness and unity in the budding engineers who are the primary instruments to make India Atma Nirbhar. Under the able guidance of our mentor Dr. Manpreet Singh Gujral, Principal, CCET College-cum- Director, Technical Education, UT Chandigarh, Dr. Davinder Singh Saini, Head of the Department has encouraged the students to actively contribute for this edition. I am also thankful to the faculty members and staff of the Department for providing support. I also congratulate the students for their enthusiastic efforts in this endeavor and its timely release. I appreciate the efforts of student committee that worked day and night to make this e-Newsletter possible. We hope you will appreciate reading this newsletter as much as we cherished delivering it to you.

Although uttermost care has been taken while working on this e-newsletter still if readers have some suggestions for further improvement, kindly convey to our editorial board so that we can work to improve its quality. We value your feedback and support.

Wishing you pleasant nostalgia, and Best wishes.

OUR TEAM

Shobhna Manjhu (CO19552)

Vaibhav Kushwaha (CO19560)

Ruman Sidhu (CO20550)

Pravneet Kaur Bujrall (CO20544)

Arjun (CO21518)

IN THE NEWS

- The Yoga camp for CCET Degree Students from June 1st, 2022 to June 22nd, 2022 to celebrate International Yoga Day was organised by Dr. Anil Kumar Vaghmare, the faculty coordinator.

- A 2-day workshop in the ECE Department (for faculty and students) was organised on "OrCad Design and Simulation Software" through Entuple Technologies Pvt. Ltd. from March 3rd, 2022 to March 4th, 2022, by Dr. Parvinder Kaur. Around 100 students attended this event in batches and reaped the benefits of designing innovative projects.

OUR ACHIEVEMENTS

- In January 2022, Ankur Sharma submitted his Ph.D. thesis titled "Transmit waveform design for Bandwidth Optimization and side lobes reduction in pulse compression radar" under the guidance of Dr. Davinder Singh Saini.

Publications:

- In January and March of 2022, Ankur Sharma and Davinder Singh Saini submitted two research articles in SCI journals.
- In July 2022, Sunita Saini and Davinder Singh Saini submitted a research paper in the SCI journal.
- M Vinod Kumar and Dinesh Sharma have published a research article in the SCIE journal and at an International conference in April/May 2022.

Ongoing Project:

- Dinesh Sharma and Shilpa Jindal are engaged in a DST & RE (Chandigarh Administration) research project named "Design and Development of IoT-based Water Quality Monitoring System for Chandigarh."

2019-2023 Batch (Present 4thYear):

- Nitin (CO19547) and Shubhranshu Pattanaik (CO19555) - 1st prize in Bot pull competition organized by IIC on the occasion of 'National Science Day'. (February-2022)

2020-2024 Batch (Present 3rd Year):

- Rishika (CO20547) and Dev Jugran (CO20517) - 2nd prize in street play in PECFEST. (April-2022)
- Ruman Sidhu (CO20550) -
  - 2nd prize in inter-year basketball CCET. (March-2022)
- Harsh Kashyap (CO20527) - 2nd prize in Technical Quiz organized by IIC on the occasion of 'National Science Day'. (February-2022)
- Dhruv Kamal (LCO20574), Anshu Narang (CO20508), Abhitesh (LCO20573) - 2nd prize in roborace in PECFEST. (April-2022)

2021-2025 Batch (Present 2nd Year):

- Karan Sharma (CO21539) - 3rd prize in poster making competition. (April-2022)
- Manya (CO21547) and Varinda Arora (CO21567)- 2nd prize in Bot pull competition organized by IIC on the occasion of 'National Science Day'. (February-2022)
- Varinda Arora (CO21567), Arshia (CO21520), Harshita Maheshwari (CO21535), Anju Devi (CO21515) - 3rd prize in inter-year basketball CCET. (March-2022)

FUTURE OF SEMICONDUCTOR INDUSTRY IN INDIA

"Semiconductors are backbone of 4th Industrial revolution."

- Dr. K. G Sharma
Prof. ECE

China emerged as major rival for India and is now world leader in semiconductor supply chain. Taiwan is also important location in semiconductor manufacturing. China is continuously threatening Taiwan to be part China. If the semiconductor supply gets disrupted then it will be an economic, geopolitical and strategic threat to India.

Where does India stand?

Till March 2021, India was 100% dependent on semiconductors. India has advantage in chip design and assembly. Few global companies have setup their chip design and assembly centers in India. India has highly skilled workforce and cheap semi-skilled labour, which is crucial in assembly. Foxconn, Samsung and Wistron had setup their assembly plants in India. As per Ministry of Electronics & Information technology (MeitY), twenty thousand engineers are working in the field of chip design in India. But role of India in global supply chain is still negligible.

India needs to take significant steps in Design and Manufacturing segment to become 'Atmanirbhar' in the semiconductor industry.

Previous efforts –

In 2007, Intel was interested to setup its manufacturing plant in India but diverted to Vietnam.

In 2013, India failed to attract investors even after approving subsidies to JAYPEE group and HSMC group.

This happened largely due to infrastructure constraints, especially continuous stable power supply. Also a chip manufacturing unit requires 20 million of ultra-pure water per day and a pollution free environment inside the factory.

How India can emerge as a Semiconductor superpower in Future?

Government needs to dedicate few semiconductor corridors to attract indigenous and global chip makers.

India can support existing expertise and repeat pharma model for chip manufacturing.

India needs to provide skilled manpower under Skill India Mission and improve ease of doing business to attract the companies.

The rapidly changing technology demands a handsome amount to be invested in R&D to compete with other firms. India needs to focus on R&D-intensive activities like EDA, Core IP and Chip design. This can be done by supporting our existing chip design experts and innovation centers. Technology centers can be setup in major engineering colleges where we can find critical and high-skilled workforce. India should first focus on medium and low-end chips which are less costly and involve less risks compared to high end chips. These low and medium-end chips are used everywhere except some high end smart phones and laptops. The foundries required to produce these chips needs less setup investment and can be established with less than $1 billion. We can get required expertise in India and we can become Original Design Manufacturer (ODM) easily in the field of low and medium-end chips. It will help to develop ecosystem of Indian companies in world semiconductor market.

China is world leader in Assembly, testing and Packaging (ATP) and this is labour intensive sector. This segment shares 10% by value of the semiconductor industry. But now the cost of labor in china is increasing and its population is aging. India can become the next destination for ATP utilizing demographic dividend and cheap labour. Vietnam and Malaysia are posing big challenge for India in attracting companies from china.

How India is moving to be leader in this arena of semiconductor manufacturing?

Indian Government is accelerating the movement – "Make in India, Make for India, and Make for the World"

Indian government is planning to setup two Green Fab units and two Display Fab units in India.

Government recently approved $10 billion (almost 76,000 Crore Rupees) for the production linked incentive scheme for semiconductors.

Indian government is ready to provide 50% of the project cost to eligible companies.

The central government is coordinating with the state governments to build infrastructure for fabrication plants.

Indian government is planning to support 80,000 semiconductor engineers in coming 20 years.

Tata group in talks with 3 states to setup $300 million semiconductor assembly unit. Uttar Pradesh government launches new electronics manufacturing policy to invest 40,000 Crores and attracting private players to setup their plant in UP.

At the end as an Electronics engineers, we hope and wish that India will emerge as global leader in semiconductor manufacturing in coming years.

ELECTRONIC INDUSTRY– BACKBONE FOR SELF RELIANT BHARAT

- Dr. Shilpa Jindal
AP ECE.

As our Nation is celebrating Azadi ka Amrit Mahotsav on completion of 75 years to Independence, it's time to realize what future do we see for ourselves in a country poised to take the next leap forward. India's steps towards sustainability and self sufficiency in almost all fields. The development of infrastructure like largest, longest - tunnels, bridges, expressways, buildings, etc and the use of modern technology therein inter alia including information technology, Artificial intelligence based safety, security, facilities, etc is projecting India as a frontrunner in modernization. The government schemes like Make In India, Skill India, AtmaNirbharBharat , etc are endevouring to become self reliant by increasing indigenio manufacturing using technical know how.

Banking sector has implemented technology in a nice fashion. Through an Internet Banking facility one can transact money from his premises in an easy and secure way be it making Fixed Deposits, RTGS, etc. It has resulted into real time transaction as well as rare need to physically visit the banks . Further, Retail Payment means in India have changed from physical mode to digital mode using UPI apps like Bhim, Paytm, Google pay, PhonePay, etc. Even we see petty traders like sabjiwala, rehriwala, prasadwala in our local markets are shifting for digital payment. All this is possible because of the availability of Electronic devices like mobile phones, wireless connectivity (fast Internet plans) at affordable rates.
Hon'ble Prime Minister of India has appealed during a meeting of Niti Aayog on 7th August 2022 that all States must work on three T's i.e. Trade ,Tourism and Technology. It is a call to use the technology in all spheres of life to achieve sustainable development that will make things smarter and life easier. Information and computer technology is a recent development in last four decades. Initially, it was neither accessible nor affordable for common man particularly in developing as well as under-developed countries.This was the period of new innovations in this field to make it more accessable and affordable. Now the innovations have taken several steps ahead of time and therefore, it is a high time to focus on its implementation making it affordable and accessable to the peoples of these technology starved countries. It can play a pivotal role to increase their GDP with sustainable development.

We have several advantages to reap the benefits of this situation. Firstly, Indians have the leading role in developing the technology particularly computer and information technology whether it was developed indigeniously or on foreign land. Secondly, we can better understand the functional requirements, individually and communally, of these societies being have first hand experience of the life style. Thirdly, a big domestic market is available for us before depending on export market. We only need to realize how can the technology be introduced optimally in different spheres of life and then to develop appropriate electronic devices for the use of all stakeholders including end user. Certain examples from recent developments are illucidated below for brainstorming how the use and upgradation of electronics technology can improve the quality of life and add smartness to living through self sufficiency :

• Chandigarh has recently introduced an integrated command control center (ICCC) project under which many HD cameras have been installed on the roads to manage traffic.
• Eight prime institutes of India led by IIT Madras have developed indigenious 5G Test-bed and launched in the programme marking silver jubilee celebrations of the Telecom Regulatory Authority of India (TRAI). It will validate industry products, prototypes, solutions and algorithms in 5G and next generation technologies. Further, IIT Madras is in advance stage to develop an open source processor under the "Shakti" project that will further aid to indigenious making of electronic products and devices without the restrictions and royalties.

Electronic devices have become an inseparable part of human life with the advent of technologies like wired communication (optical fiber) , wireless communication (4G and 5G) , Artificial Intelligence, Machine learning, Big Data and Sensor Technologies, RFID (Radio frequency identification) technologies widely implemented at toll plazas, IoT (Internet of Things) making devices smart and automatic, mobile computing to name a few etc. poses huge demand for electronic equipment in terms of infrastructure. Further, the electronic devices providing cheap and sustainable "one click away" facility of web portals and mobile apps for upgradion of business organizations, is the need of the hour to benefit the customers and other stakeholders. We also have to realize the immense potential for developing electronic devices to use the technology in agriculture sector, non-farm occupations, domestic needs, etc. in rural and remote areas. It will not only give due share of technology to the said community but would also be a commercially viable project in view of voluminous potential demand.
So, there is a great role of the electronics industry in making indigenius devices and attaining India's vision 2047. I must conclude that electronic devices and its industries will play a crucial role in developing India towards Digital India, Sustainable India and Indigenous India.

NETWORK ENGINEERING

Role of Electronics and Communication Engineering in Industry

By- Inderjeet Singh
CO20528

Data science and network engineering are booming fields. It topped LinkedIn's Emerging Jobs Report even a few years ago, with 650 percent job growth in less than a decade and plans to add 11.5 million new jobs in the coming years. Now is the time to break into this flourishing industry.

If you've been wondering how to become a network engineer or "What does a networking engineer do?" then read this helpful guide that covers network engineer salary ranges, education requirements, and career path opportunities. With more open networking engineer positions than available candidates, networking is an occupation that should be considered.

What is the role of a Network Engineer?
Network engineers, also known as network administrators, are employed by the IT department of a company. They are in charge of ensuring that their company's computer systems and network hardware run smoothly. Installing new hardware, running diagnostics, and installing routine software updates are some of their important roles.

Qualifications and skills for network engineers:
An associate degree may be sufficient for an entry-level network engineering position, but most positions require a bachelor's degree in computer science or several years of experience. Engineers must be able to decode complex networks, identify problems, and suggest improvements. They must also be able to collaborate and train other engineers and support staff on how to operate the network.

Certifications and training for network engineers:
A variety of universities and other educational institutions provide network engineer training courses and programmes. Several institutions provide certifications that can help you achieve your career goals.

The following are some of the more popular network engineer certifications:
• CompTIA Network+
• Cisco Certified Technician (CCT) Routing & Switching
• Cisco Certified Network Associate (CCNA)
• Cisco Certified Network Professional (CCNP)
• Cisco Certified Internetwork Expert (CCIE)

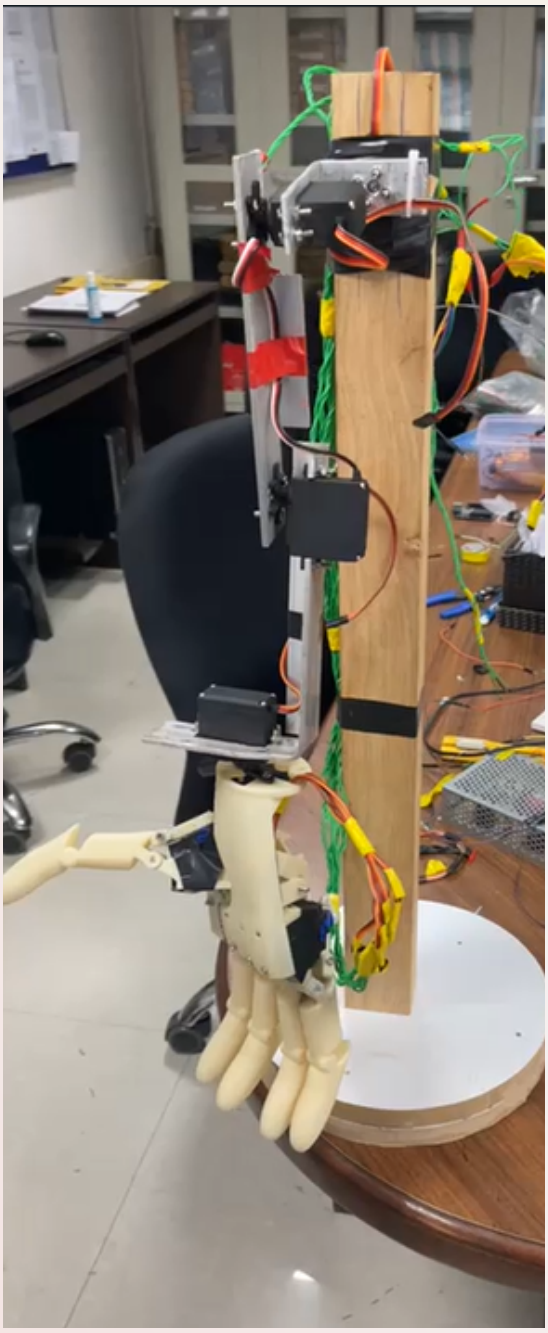
What is the starting salary for a B-tech network engineer in India?
It differs from one company to another. If you work in the IT sector, such as TCS, Wipro, or Infosys, you will be offered a fresher's package worth around 20–25k per month. Microsoft pays 50,000 during the training period, and if you pass the exam after that, you will be hired and earn around 90,000 per month. However, if you work for a smaller, less well-known company, you will not be paid as well. Then you can expect to be paid around 15,000 at most.

Career opportunities for network engineers:
Within the networking field, network engineers can take a variety of paths. Network analysts, for example, are experts in network installation and maintenance and work mainly on both the technical and business sides of a company. A list of jobs that are suitable for someone with network engineering skills, aside from network engineer, is provided below:

i)Network Analyst
ii)Network Specialist
iii)Network Technician
iv)Network Manager

HUMANOID ARM

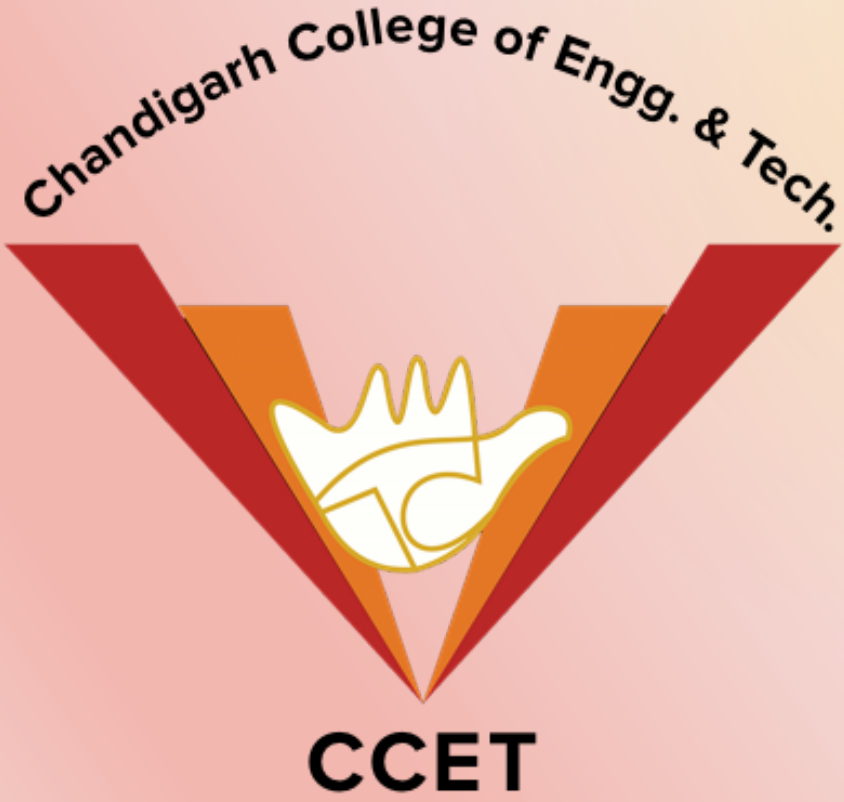
Project Made By - Shubhranshu Pattnaik CO19555, Anish Pathak CO19510, Aashi Gupta CO19501, Suyash Tilak CO19557, Nitin CO19547, Kanishka Singh CO19541, Ishika Malhotra CO19535, Amandeep CO19109 and Paramvir Singh CO19143



In recent years the mushrooming power, functionality, and ubiquity of computers and the Internet have outstripped early forecasts about technology's rate of advancement and usefulness in everyday life. The field of robotics has been an integral part of both the development and the advancement process. The students have built an in-house robotic arm, which has been inspired by an exoskeleton design. The functionality and usability of this robotic arm are enormous. At the heart of this arm is an Arduino. All the processing, from getting input from the user to making the movements in the arm, is performed by the Arduino. To mimic the movements of its user, they have used Flex Sensors (for the fingers and elbow) and an Accelerometer (MPU 6050, for the wrist and the shoulder). This arm is capable of moving about 6 DOF (Degrees Of Freedom). The Robotic arm project isn't just limited here. There is the scope of expanding this project and implementing it on a larger scale and even integrating it into a complete robot. In the coming years, we would be seeing a boom in the automation and robotics industry and our world might be governed by technology.

TECHNICAL CLUB – ROBOKNOX

Roboknox is the robotics and automation society at CCET Chandigarh. It is the ECE department's technical club. We work to spread knowledge on Robotics and it's diverse applications. We do this through contests, workshops, demos, and seminars. 'Together Everyone Achieves More'. It is this exemplary virtue that has bounded the club and helped it to grow to its present potential. We believe in order to make progress and be successful, we need a team effort. In our club, we have united members with diverse interests, talents and goals. This has helped us to grow as a club and achieve more than any individual could on their own. Our focus is to help students develop an interest in the ever-growing field of robotics by exposing them to robotics at all levels, starting with the basics. Our goal is to stimulate an interest in this field by doing so. Knowledge is Power. ROBOKNOX makes sure that its members have the resources that they need to take their next big step in robotics. Some of the events that Roboknox organized are Bot Pull and Line Follower competition on the occasion of National Science Day and Workshop on Introduction to CAD in collaboration with ASME. Our students also performed outstandingly well in PECFEST, they won various robotics competitions like meshmerize, cosmo clench, hydra jet.



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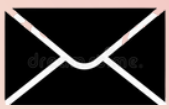

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