

DEPT. OF ECE
presents

NEXUS

JAN-MAR 2021
Vol.6-Edition1

ECE NEWS AND EVENTS



ABOUT ECE DEPT.

Vision

To excel globally in technical education and research in the field of electronics and communication engineering and thus contribute to the welfare of society.

Missions:

M1: To establish a unique learning environment to enable the students to face the ever-emerging challenges in electronics and communication engineering.

M2: To equip the students with a broad intellectual spectrum and prepare them for diverse and competitive career paths.

M3: To provide practical orientated education and foster tie-up with national/International educational institutes, research bodies, and industry to support students and faculty development pursuits.

M4: To provide ethical and value-based education by promoting activities addressing societal needs.

Program Educational Objectives (PEOs)

PEO1: Be able to successfully practice electronics and communication engineering with acquired skills and knowledge.

PEO2: Be receptive to new technologies and attain professional competence through advanced education, research work, and other professional activities.

PEO3: To prepare graduates who will practice their profession with ethics, integrity, and social responsibility in a global context.

PEO4: To develop leadership qualities with demonstrable attributes and to contribute to societal needs.

FROM DIRECTOR'S DESK

It gives me immense satisfaction that next issue of ECE Newsletter is ready for the readers. A college Newsletter mirrors the success story of an institution and act as a great medium to reach out to the outer world. It reflects upon the persistent and committed efforts made by faculty, staff and students for taking the institution one step ahead. Continuing the same tradition, this issue of Nexus reflects upon commendable contribution made by all members of PIET family in their fields of expertise as well as for the overall growth of the college.

I congratulate everyone for their bit of service for the institution and do expect the same in times to come. I also congratulate the editorial team for bringing out present issue of newsletter.

Wish you good luck!



Prof.(Dr.) Shakti Kumar
(Director)

“Success consists of going from failure to failure without loss of enthusiasm.”

—Winston Churchill



FROM HOD's DESK

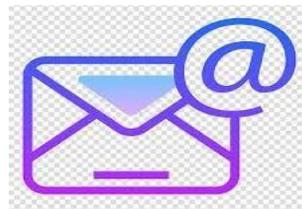
I am very pleased to present you the newsletter of Electronics and Communication Engineering Department. Within these pages you will find much news related to diverse activities from the whole Faculty members and students. You can see the contributions from Faculties and students. I hope everyone will find this newsletter exciting and interesting.

"Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time."
- Thomas A. Edison

Wishing you all the best !!!



Prof. Swati Gupta
(HOD ,ECE)



Please feel free to drop in your suggestions to :

swatigupta.ece@piet.co.in



EDITOR'S NOTE

It is a matter of pride as well as pleasure to present before our readers next issue of Department Newsletter. We feel honored for the faith reposed in us for performing the role of editors of Department Newsletter. We have put whole-hearted endeavors to give a complete and kaleidoscopic view of laudable achievements of ECE department. Through further issues of Nexus, we do hope that we will come up to the expectations of our readers.

"There are far, far better things ahead than any we leave behind." - C.S. Lewis



Associate Prof.(Dr.)
Monika Gambhir , ECE



Assistant Prof.
Sapna Arora , ECE



Please feel free to drop in your suggestions to :

monika.ece@piet.co.in sapna.ece@piet.co.in

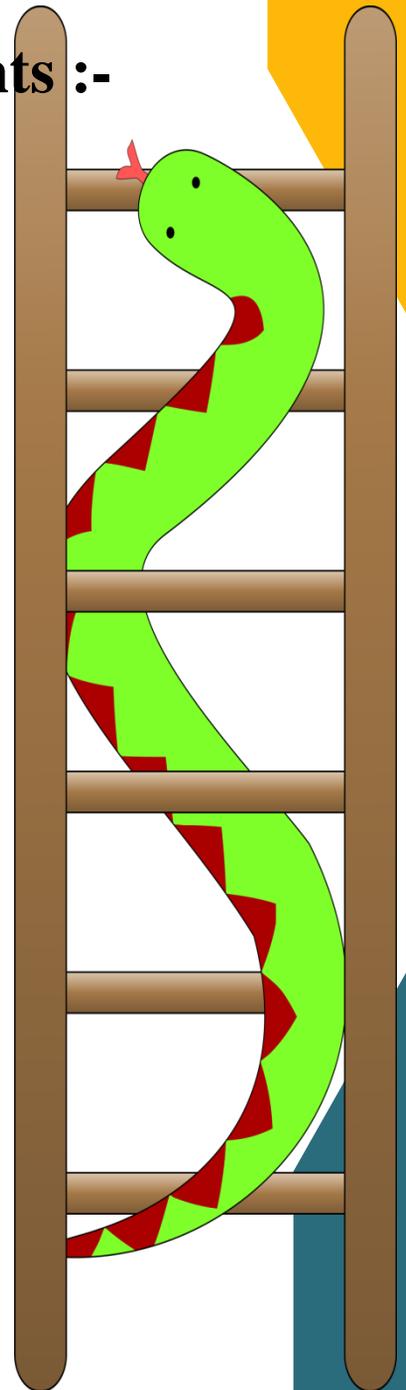
CONTENT

1. Students' Achievements :-

- ❖ Swadeshi Micro-Processor Challenge
- ❖ Voice Controlled Auto Obstacle Avoiding Car
- ❖ Team : The Maroons

2. Webinar

3. Quiz-o-mania



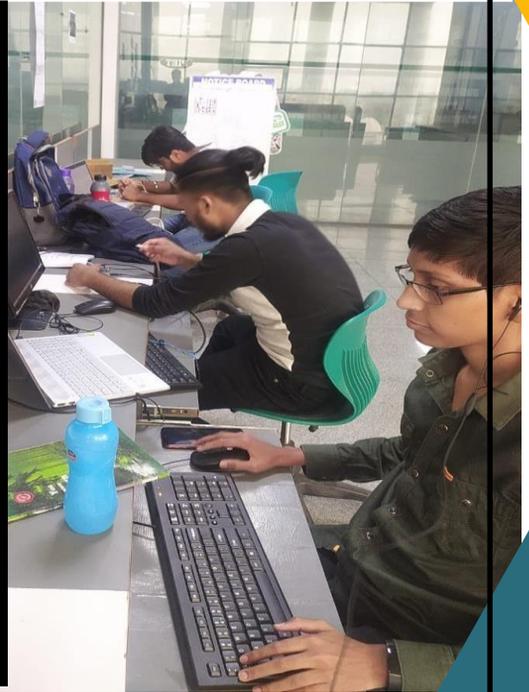
STUDENTS' ACHIEVEMENTS

- Swadeshi Micro Processor Challenge

The team , Abhiyantaa , of ECE Dept, under the mentorship of teacher **Dr. Monika Gambhir** and **Mr. Pankaj Batra** , is one of the Top 100 Semi-Finalist Teams short-listed for Swadeshi Microprocessor Challenge amongst the **6,169** participating Quarter-Finalist teams.

Team is working upon the Smart Wearable Health Monitoring device to be controlled by Vega Processor which is made in India.

Team is lead by Sanyam Jain (ECE 4th year) with other members Rahul Dabur (ECE 4th year), Manvi (ECE 4th year) , Mubarak Husain (ECE 3rd year) and Satyam Gupta (CSE 3rd year) .



• VOICE CONTROLLED AUTO OBSTACLE AVOIDING CAR

(A smart approach to replace non repairable Chinese toy to smart Indian repairable toys)

Under the 'AatmaNirbhar Bharat Abhiyan' initiated by our Hon'ble Prime Minister, Shri. Narendra Modi, Toycathon-2021 is conceived to challenge India's innovative minds to conceptualize novel Toy and Games based on Bharatiya civilization, history, culture, mythology and ethos.

In Toycathon 2021 our team selected in Feb 2021. In this event our team will make a car which would be voice controlled and will avoid obstacles coming in its path to avoid destruction of toy. Something creative and attracting. It can be repaired with a minimal cost and as its voice controlled, it will attract many fun loving children towards this fascinating toy. Usually in the market we get toys which work for some time properly and after that they become waste, irrespective of the money for which it is bought. But our toy will be repairable if any problems come over. More over with some changes in the code and words it would become a new toy. It can also build the creativity, coding and practical knowledge of kids. It would be educational despite along with entertainment.

Students Participated In Toycathon-

Chirag

Kunal

Riya

Mentors-Arun Rana and Sachin Dhawan



Team :- THE MAROONS

Students of 3rd year ECE had participated in the International Eyantra Robotics Competition 2020-2021 and made it to the Semi finals. They had been shortlisted from 2000+ teams and only 54 teams made it to the semifinals.

Teams Members:-

- 1:-Subhranshu Mishra (LEADER)
- 2:-Tushar Amar
- 3:-Sourabh Sharma
- 4:-Abhishek Chouhan

Their Journey includes :

At first, themes were assigned and they got a pretty interesting theme in which they had to use VERILOG HDL and also to work on the latest FPGA.

Later on, TASK0 was assigned ,and they used Quartus Prime II for the VERILOG HDL programming.

After completing the TASK 0 within a week **TASK1** is assigned in which they have to Design:-

- 1)Comparator
- 2)Multiplexer
- 3)Sequence Detector
- 4)Binary to ASCII conversion

They Performed well in this Task and **score 100/100**.

TASK 2 can be considered as the game-changer as this task decide whether they will be shortlisted for the semifinals or just disqualified.

They have to Design:-

- 1)Analog to Digital Controller
- 2)Universal Asynchronous Receiver-Transmitter
- 3)Inter-Integrated Circuit

They **score 62/100** and shortlisted for the **SEMIFINALS**(STAGE 2)

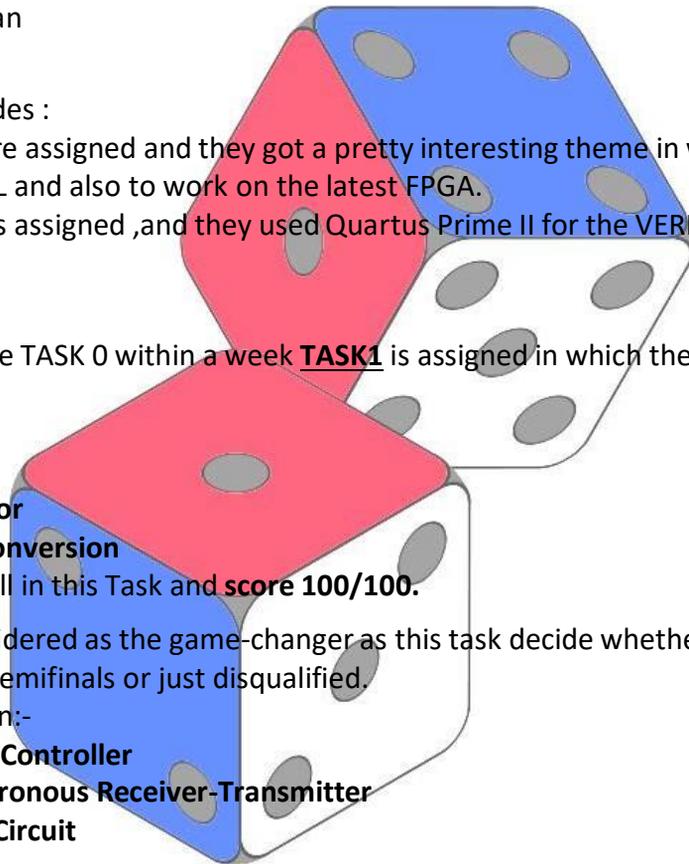
For the SEMIFINALS ,they received a HARDWARE kit from the EYANTRA.

Then TASK 3 has been assigned to them in which they have to print MAP and make a Bridge as per the theme Specifications.

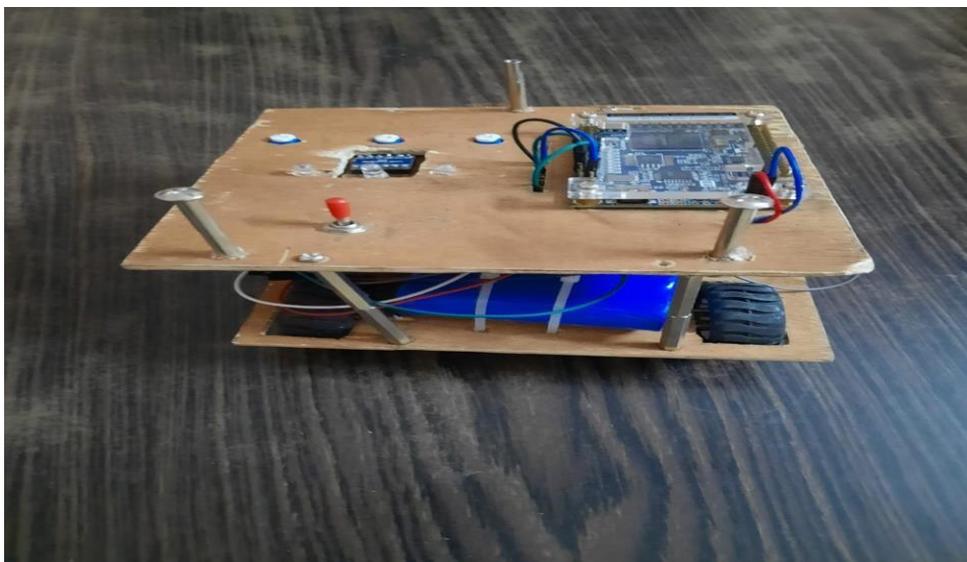
Again we scored 100/100 in TASK3.

Now the competition start's shifting to another level and the level of hardness is increasing.

In TASK4 they have to prepare bot for the Traversal on the map for particular configurations.



TASK 5 AND TASK 6 are the main tasks in which they have to implement the entire configuration provided by the EYANTRA Team and configure/ Program their bot as per the configuration. This has surely helped the students learn a lot and inspires others too.



WEBINAR

On 17 March, 2021, A webinar on Deep Dive of 5G Wireless Technology: regulatory, standardization and deployment perspectives, was conducted.

Mr. Amit Kumar Sharma is experienced in Telecom and ICT domain with leading roles as Solution Architect, Radio network design planning & optimization principal engineer, subject matter expert. He is working as a **Technical Solution Manager, Groundhog Pte. Ltd. Singapore.**

He has patented one idea of 'method for competitor network performance comparison'. It solved problem of extensive drive testing and sample collection for benchmarking. In this webinar, the prime focus is on the 5G cellular network architecture, massive multiple input multiple output technology, and device-to-device communication (D2D). Along with this, some of the emerging technologies that are addressed in this webinar include interference management, spectrum sharing with cognitive radio, ultra-dense networks, multi-radio access technology association, full duplex radios, millimeter wave solutions for 5G cellular networks, and cloud technologies for 5G radio access networks and software defined networks.

Zoom Webinar | You are viewing AMIT KUMAR SHARMA's screen | View Options

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Evolution of telecom industry

- 1G Voice Calls 📞
- 2G Voice Calls, Text (SMS) 📞 📄
- 3G Voice Calls, Text (SMS), Application 📞 📄 📶
- 4G Voice Calls, Text (SMS), Application, Video Streaming 📞 📄 📶 📺
- 5G Voice Calls, Text (SMS), Application, Video Streaming, Low latency 📞 📄 📶 📺 🚗
- 6G Voice Calls, Text (SMS), Application, Video Streaming, Ultra Low latency

Analogue
0G - 1G

Digital
2G (2.5G - 2.75G) - 3G (3.5G - 3.75G - 3.9G/3.95G) - 4G (4G/4.5G - 4.5G/4.9G) - 5G - 6G

Generation	Icon	Technology	Typical download speed	Maximum download speed
1G	G	GPRS	<0.1 Mbit/s	0.1 Mbit/s
	E	EDGE	0.1 Mbit/s	0.3 Mbit/s
2G	3G	3G (Basic)	0.1 Mbit/s	0.3 Mbit/s
	H	HSPA	1.5 Mbit/s	7.2 Mbit/s
3G	H+	HSPA+	4 Mbit/s	21 Mbit/s
	H+	DC-HSPA+	8 Mbit/s	42 Mbit/s
4G	4G	LTE Category 4	15 Mbit/s	150 Mbit/s
	4G+	LTE-Advanced Cat6	30 Mbit/s	300 Mbit/s
4G	4G+	LTE-Advanced Cat9	45 Mbit/s	450 Mbit/s
	4G+	LTE-Advanced Cat12	60 Mbit/s	600 Mbit/s

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Why standardization



3rd Generation Partnership Project



Open RAN Alliance



Telecom Infra Project



GSM Association



European Telecommunications Standards Institute



International Telecommunication Union



Institute of Electrical and Electronics Standards

- To prepare technical write up for telecom operators and network manufacturers to follow
- To provide test guidelines for various technologies
- Control of network parameters for planning and optimization

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Prof. Swati Gupta Prof. Arun Kum...

5G frequency selection

The diagram illustrates the 5G frequency spectrum from 0 GHz to 100 GHz. Key bands include:

- 802.11be EHT (1 GHz – 7.125 GHz)**: Located in the sub-6 GHz range.
- 5G FR1 (450 MHz – 7.125 GHz)**: Sub-6 GHz band.
- 5G FR2 (24.25 GHz – 52.6 GHz)**: Millimeter wave band.
- 802.11ad / 802.11ay (57.24 GHz – 70.20 GHz)**: Millimeter wave band.
- WIGig – 60GHz Wi-Fi**: Located in the 60 GHz range.

An inset diagram shows the 0-10 GHz range, highlighting:

- non-mmWave 5G**: Includes 2G, 3G, 4G, and 5G bands.
- 2.4GHz Wi-Fi, Bluetooth, etc.**: Common sub-6 GHz bands.
- Up to 6GHz 802.11ax**: Sub-6 GHz Wi-Fi band.
- 5GHz Wi-Fi**: Sub-6 GHz Wi-Fi band.

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Prof. Swati Gupta Prof. Arun Kum...

Pathways

The diagram shows a central node for **ECE Telecom Engineering** branching into several career paths:

- Radio Network planning and optimization Engineer
- Device Testing Engineer
- Protocol Design Engineer
- Telecom Software Developer
- 3GPP Spec Research Engineer
- Antenna Design & Research Engineer

Sample Titles:

- Radio Frequency Engineer, Comms
- Principal Engineer Lead – Core Protocol
- Test Engineer
- Network Engineer
- Wireless Design/Standards Engineer - 3GPP RAN
- Network Engineer, Connectivity
- Wireless protocol test engineer
- Engineer – Mobile Network
- Radio Access Network Engineer
- Principal Antenna Design Engineer
- Sr. Telecom App Developer

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Quiz-O-Mania

Online technical quiz was conducted for 3rd and final year students on 25th March 2021 through Microsoft Teams. Quiz consists of 14 questions and time limit was 20 minutes.

