Oriental College of Technology, Bhopal

Department of Electronics & Communication Engineering

ELECTROSPARK

Volume 3 issue 1
(2022-23)

ABOUT THE COLLEGE

Oriental Group of Institutes (Indore - Bhopal- Jabalpur) India established in the year 1995 is a self financed premier education group imparting education in the disciplines of Engineering, Pharmacy, Management and Advanced Computer Studies. The Oriental College of Technology, offers six under graduate Bachelor of Engineering courses and three post graduate, Master of Technology courses. The college is having an excellent library, internet lab, modern labs for each department, central workshop, sports & games facilities etc.

Bhopal, the capital of Madhya Pradesh, is also known as city of lakes. It is well connected to all parts of the country by rail and air. The institute is about 09 km from Bhopal railway station, and 07 km from Habibganj railway station and 18 km from Raja Bhoj Airport.

VISION OF THE COLLEGE

The Institute aspires to become a pioneer in the field of engineering and research by providing quality, skilled and compatible engineers who are proficient in their domain knowledge.

MISSION OF THE COLLEGE

1. To create awareness on cutting edge technologies to make the outgoing engineers acceptable to the employers meeting their on–job requirements.
2. To develop an in-house facility for giving solutions to industrial problems.
3. To inculcate professional ethics, leadership qualities, communication, and entrepreneurial skills satisfying societal needs.

ABOUT THE DEPARTMENT

The Department of Electronics and Communication Engineering was started in OCT in the year 2002 with the intake of 60 students with the objective of imparting quality education in the field of Electronics and Communication and the intake was increased to 120 in the year 2003. The department started MTech. (Digital Communication) in the year 2010 with an intake of 24 students. At present, the department is offering an undergraduate course in Electronics and Communication Engineering and one post graduate course in Communication Systems. The department has well-equipped laboratories with the facility of working in various areas like Integrated circuits, Microprocessor and Microcontrollers with interfaces, Microwave and optical communication, Digital signal processing and VLSI etc. The department has dynamic and committed faculty members who have published and presented papers in various Journals, National and international conferences in the area of speech processing, image processing, wireless communication networks and neural networks. Original MATLAB 15.0 with signal processing tool box, ORCAD PSPICE 10.1 version, XILINX 9.1 version is added to the department to bring multi faceted knowledge among students in the ECE discipline. The department in association with student professional bodies like ISTE, IETE has organized several workshops, conferences and other technical events.

The ultimate aim of the department is to foster the technical skills in the field of Electronics and Communication that will help the students to practically express their findings as products conducive to the society

VISION OF THE DEPARTMENT

To become a pioneer in Electronics & Communication Engineering by providing quality, skilled, socially responsible, and innovative engineers.

MISSION OF THE DEPARTMENT

1. Impart quality education and a supportive environment to enable the students to face the challenges in Electronics and Communication Engineering.
2. Enable students with skills to solve complex technological problems by applying the concepts of mathematics, science, and engineering fundamentals by promoting collaborative and multidisciplinary activities.
3. Establish a noble learning ambiance that enables students to raise their innovation skills.
4. Inculcate teamwork, lifelong learning, and ethical properties to meet the expectations of the industry and society.

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

PEO1: Able to solve technological problems using fundamentals of mathematics and engineering sciences.

PEO2: Able to design and develop interdisciplinary and innovative Electronics & Communication systems using modern tools for the betterment of society and the environment.

PEO3: Receptive to new technologies, attain professional competence through lifelong learning, and interact sensibly with society by applying ethical principles.

PROGRAMME OUTCOMES (PO'S)

Programme outcomes are narrower statements that describe what students are expected to know and be able to do upon the graduation. They are formed in line with the graduate attributes of NBA. These relate to the skills, knowledge, attitudes, values and behaviour outcomes that students acquire through the programme.

Graduates will have ability to:

1 Engineering Knowledge: Understand and apply basic concepts of Mathematics, Physics, Chemistry and Engineering.

2 Problem Analysis: Understand and analyze circuit theory, electromagnetic theory, control theory, communication theory and apply them to electronics and communication engineering applications.

3 Design & Development of Solutions: Analyze and design the electronic components and to apply in analog and digital communication systems.

4 Investigation of Complex Problem: Analyze and design the electronic components and to apply in analog and digital communication systems.

5 Modern Tools Usage: Use contemporary computing tools and techniques in electronics and communication Engineering applications.

6 Engineer and Society: Handle engineering aspects of modern electronics and communication technology, utilization and the impact of engineering solutions to the Societal needs.

7 Environment & Sustainability: Acquire knowledge of contemporary issues to sustain the ever changing environment.

8 Ethics: Apply the ethical principles to their profession and social issues.
9 Individual & Team work: Perform individually and in a group to accomplish a common goal.
10 Communication: Effectively communicate and present technological developments.
11 Lifelong Learning: Gain self-confidence to engage in lifelong learning.
12 Project management & Finance: Plan and manage a project in a cost effective manner.

CHAIRMAN'S MESSAGE

Shri Praveen Thakral

Hon. Chairman

India has the world's largest population. It is not enough to only foster cognitive intelligence among the youth. The youth requires a mutual faculty endowed with multi dimensional intelligence. What are the objectives that the youth should work towards? These cannot be purely materialistic, materialistic Programme alone does not guarantee national security. What is essential is the character or integrity of the country's citizens. A national policy for integrating spiritual values and organization leadership can be achieved through measures by which we can create a modern Mindset among the youth. This will not only motivate them to acquire technical cognitive competence but also develop their emotional, moral, social, spiritual, environmental and innovational intelligence. This will make them more patriotic self-reliant individuals of high character, possessing a social conscience. Such an army of evolved youth will be the asset of the nation.

CEO MESSAGE

Shri RK Sahani

CEO

I am happy to meet all of you through this News Letter and I thank all the staff who strived to give professional education in a new perspective manner and achieve perfection in all the fields. The main reason for our tremendous performance in various activities is the involvement of the faculty members who motivated students whole heartedly to participate in the seminars, industrial visit, inter activity session and other extracurricular activities to inculcate in them sound moral values, strong personality and eagerness to work in the society. Because of these efforts we have been successful in moulding the personality of our students and imbibe in them moral values and the spirit to team work. As a result 328 of our students leaving the institution in the year 2015 got Placed in reputed and renowned firms. I wish this solidarity continues for successive years and we would be proud to release many more news letter like this, highlighting our achievements. I have no doubts in near future OCT will be termed as one of the leading technical institutions in our district.

DIRECTOR'S MESSAGE

Dr Amita Mahor

Director

The Department of ECE has seen a considerable growth since its inception in the year 1995. The well qualified faculty and courses of this department aid to prepare students for careers as professional engineers through an education in fundamental principles as well as in the context of real application and design environment. The department encourages all students to take advantage of the opportunities provided by the institute and participate in all the extracurricular activities that are offered. I wish to emphasis the importance of few things that we always have to remember. Parents and teachers should remember that students should not be forced, but should be guided to achieve their goals in an easy and pleasing ways, so that we can discover the touch of genius in each one of them.

HOD MESSAGE

Dr Nikita Shivhare
HOD EC

THE DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING (ECE) has consistently maintained an exemplary academic record. The greatest asset of the department is its highly motivated and learned faculty. The available diversity of expertise of the faculty with the support of the other staff prepares the students to work in global multicultural environment. The graduates of the Electronics & Communication Stream have been selected by some of the world's leading corporations & as well as by most of the leading Indian counter parts. We hope that we will continue to deliver our best to serve the society and mankind. It is also expected and that our students will continue to pass-on the skills which they have developed during their stay at this department to whole of the world for a better society. We will be happy to receive your suggestions for further improvement and development of our department.

FROM THE EDITOR'S DESK

Dear Students,
We hearty welcome you to the newly launched ECE Department's first issue of the Magazine for the academic year 2019-2020.
The objective of the magazine is to mainly focus on Achievement of the students from the ECE department in the Co-curricular and Extra-Curricular Activities.
I congratulate all my team members for their constant effort in launching this Magazine. We are also thankful to our Management and Principal for their support and encouragement. Finally we are gratified to our reviewers for their frank opinions and constructive suggestions, namely our colleagues and students.

EDITORIAL BOARD

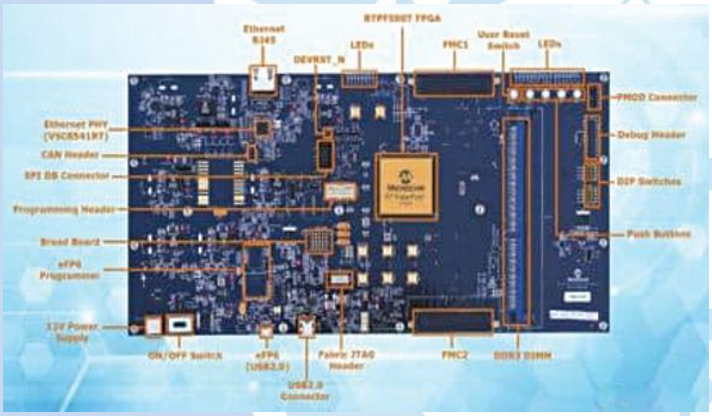
- Dr Nikita Shivhare, HOD EC
- Mr. Pradeep Kumar Patel, EC
- Abhishek Ghaghre (0126EC201001), III Year EC
- Kishan Kumar (0126EC211014), II Year EC
- Rahul Chandrawanshi (0126EC211032), II Year EC

Articles

Development kit for IoT

Synzen Precision Technology has released a new development platform that uses the advanced capabilities of the Nordic nRF9160 module. The development platform features a new LTE solution, which eliminates the requirement of switching networks, thus reducing costs, complexity, and size of the product. The whole module comes in a small form factor, measuring just 50mm×50mm. The development platform offers security features to ensure protection of transmission of sensitive data, making it suitable for a wide variety of IoT applications. This new platform is designed to simplify the creation and deployment of IoT projects while ensuring seamless connectivity and secure data transmission.

Development kit for space applications



The RT Polar Fire development kit is an integrated development platform that combines Microchip's flight-ready RT Polar Fire FPGA with the development kit and interfaces. The development platform is suitable for evaluating design concepts based on actual in-flight electrical and mechanical characteristics. To enable the designers to evaluate high-speed transceivers and test all of their control, DSP, communications, and image-processing algorithms, the kit employs the same package and silicon that final in orbit or deep-space units will have. The FPGA increases mission-critical computing and connectivity throughput compared to SRAM FPGAs while consuming up to 50% less power and offering greater immunity to radiation induced configuration single event upsets. This platform will enable designers to solve difficult spaceflight challenges as reducing satellite signal processing congestion. Moreover, it will enable designers to prototype with the same low-power, high through put radiation-tolerant (RT) FPGA that will be used in spaceflight.

Robust diodes in SMC package

Harshita Rai

0126EC191027

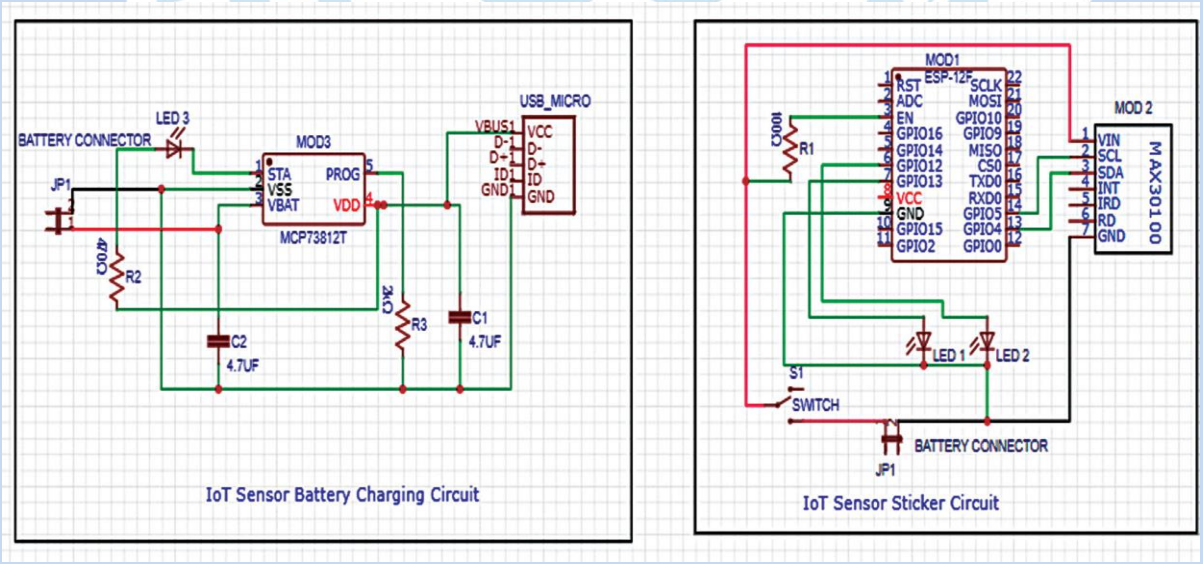
5.0SMDJxxS-HRA from Littelfuse are high-reliability TVS diodes that provide robust overvoltage protection with low early failures and zero degradation over continuous surge events. The diodes offer 60% higher surge handling capability and higher power rating than most other high-reliability TVS diodes. These come in a compact SMC package, offering higher power density, thus allowing more space saving PCB designs. The diodes meet the DO-160 lightning protection regulatory requirement and offer a very low clamping voltage, making them suitable for a wide range of aircraft-related applications, including aircraft power trains and aircraft subsystems. They can also be used in harsh environments in applications such as AC or DC power line protection, low-frequency data lines, and industrial automation.

A Small Portable IoT health sticker

Monitoring health of a person continuously 24 hours a day and every day of the week is not easy for even doctors and researchers, unless the person is under care in a hospital or clinic. For a common person wishing to monitor his or her health in normal day to day life, it becomes even more difficult because most cardiac and other health monitors are not portable. These cannot be left attached to a person's body whole day for continuous monitoring. So, here is how you can design and make a small IoT-enabled monitor that you can stick to your body to capture your health data. It will capture data like heartbeat and body temperature in real time and show it on your phone or any other device that can be connected to Wi-Fi. It can be used anywhere to monitor the health parameters on a continuous basis.

The circuit and working

Fig. 2 shows circuit diagram of the IoT health sticker, which is built around ESP12F (MOD1), MAX 301002 (MOD2), and MCP73812T (MOD3) ICs. The circuit has two parts—the IoT sensor battery charger(left side) and the IoT sensor sticker.After connecting the componentsas per circuit diagram, interconnect the charger and sensor circuits. The charging circuit has battery connector JP1, which is connected to the IoT sensor chip circuit via switch S1. Connect the battery's positive terminal through wire to pin 1 of JP1 and the negative terminal through another wire to the battery connector.



Software

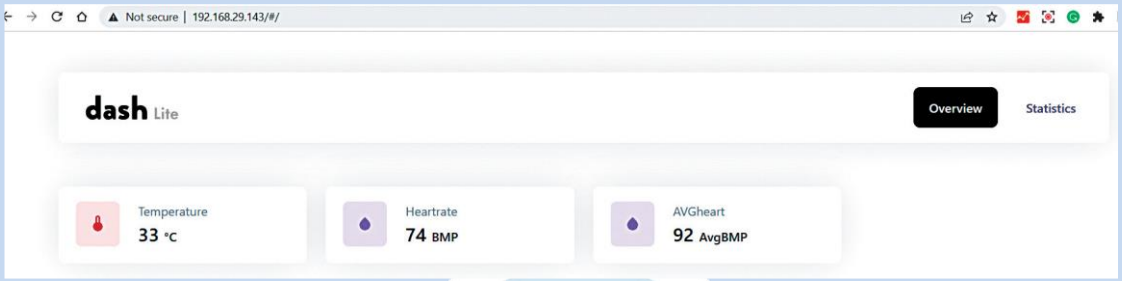
You need to prepare the code for IoT sticker and Arduino IDE. To install the Arduino IDE and ESP8266 board, open the library manager and install ESP-DASH and Sparkfun Max301x libraries. Include the Max3015 library and ESP-DASH in the code. Then set up the SSID and password of your phone Wi-Fi (hot spot) or home Wi-Fi. To be mobile you may use phone Wi-Fi, but if you want to monitor at home only you may use the home Wi-Fi.

sketch_nov07d §

```
#include <Wire.h>

#include "MAX30105.h"

#include "heartRate.h"
#include <Arduino.h>
#if defined(ESP8266)
  /* ESP8266 Dependencies */
  #include <ESP8266WiFi.h>
  #include <ESPAsyncTCP.h>
  #include <ESPAsyncWebServer.h>
#elif defined(ESP32)
  /* ESP32 Dependencies */
  #include <WiFi.h>
  #include <AsyncTCP.h>
  #include <ESPAsyncWebServer.h>
#endif
#include <ESPDash.h>


/* Your WiFi Credentials */
const char* ssid = "Jio-Fiber-4G"; // SSID
const char* password = "1234567890"; // Password

/* Start Webserver */
AsyncWebServer server(80);

/* Attach ESP-DASH to AsyncWebServer */
ESPDash dashboard(&server);
```

```
void loop()
{
    long irValue = particleSensor.getIR();

  if (checkForBeat(irValue) == true)
  {
    //We sensed a beat!
    long delta = millis() - lastBeat;
    lastBeat = millis();

    beatsPerMinute = 60 / (delta / 1000.0);

    if (beatsPerMinute < 255 && beatsPerMinute > 20)
    {
      rates[rateSpot++] = (byte)beatsPerMinute; //Store this reading in the array
      rateSpot %= RATE_SIZE; //Wrap variable

      //Take average of readings
      beatAvg = 0;
      for (byte x = 0 ; x < RATE_SIZE ; x++)
        beatAvg += rates[x];
      beatAvg /= RATE_SIZE;
    }
  }
  float temperature = particleSensor.readTemperature();

  Serial.print("temperatureC=");
  Serial.print(temperature, 4);

  Serial.print("IR=");
  Serial.print(irValue);
  Serial.print(", BPM=");
  Serial.print(beatsPerMinute);
  Serial.print(", Avg BPM=");
  Serial.print(beatAvg);

  Serial.println();
```

If you want to connect your phone to this monitoring device, you can set the Wi-Fi in STA mode. Set the cards' names in the web page UI. You need to to show the heart rate, average heart rate, and body temperature data. So, create the cards for these to show in a web page hosted by ESP-DASH. Now create the setup function and initialise the I2C connection with the Max sensor



module and host the UI webpage. In the loop, check the sensor data and update it in the webpage UI cards. Put the ESP32 in programming mode and connect the ESP chip to FTDI. Select the ESP8266 board in Arduino IDE and select the right port and upload the source code healthtest.ino.

Construction and testing

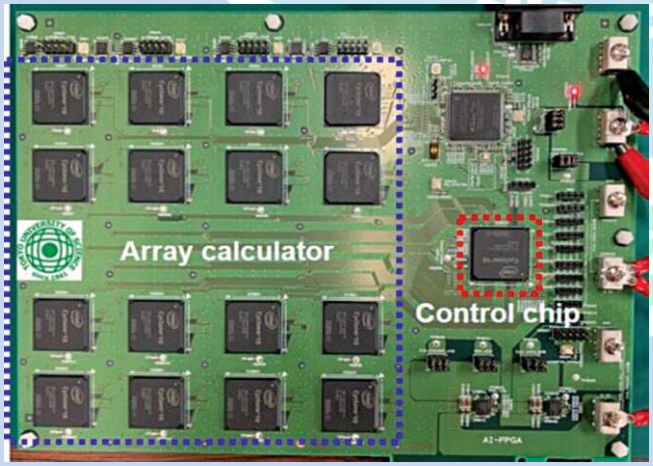
After uploading the source code, solder all the components and connect the battery. Make a small, thin sticker using a sticking tape available at chemists for use on skin to stick it as shown in Fig. 5 and Fig. 6. Charge the device and slide the switch on the device to on position. You may now stick the IoT health monitor on your forearm or upper arm. Wait for the device to get connected and then search for the IP address in the browser. You should be able to see your health data on your phone or any other device you may have connected.

Dr. Nikita Shivhare

HOD-EC

Annealing processors that mimic quantum devices' spin

Researchers at TUS, Japan have created annealing processors that mimic the behavior of spins using quantum devices and have attempted to develop semiconductor devices using large-scale integration (LSI) technology aiming to do the same. This new method of calculation of the system's energy state is divided among multiple fully coupled chips first, forming an 'array calculator.' A second type of chip, called control chip, collects the results from the rest of the chips and computes the total energy, which is used to update the values of the simulated spins. They built a fully connected annealing system with 384 spins and used it to solve several optimisation problems, including a 92-node graph colouring problem and a 384-node maximum cut problem. This FPGA implementation is 584 times faster and 46 times more energy-efficient when solving the maximum cut problem.



Bhupendra Pandagre

(0126EC191018)

INDUSTRIAL VISIT

10-Oct-2022

Department of Electronics and Communication Engineering, Oriental College of Technology, Bhopal conducted an industrial visit to at Centre for Research and Industrial Staff Performance, (CRISP), Bhopal on 10/10/2022 for students of V Semester students.

CRISP is established under Indo-German Cooperation agreement as an autonomous organization of the Dept. of Technical Education and Skill Development, Govt. of M.P. CRISP provides technical training and consultancy services for Industry Personnel, Government Officers, Faculties of academic and teaching institutions, Students and Jobseekers. CRISP is equipped with the state-of-the-art equipment and technology, latest software, qualified, trained and experienced trainers in the relevant fields. CRISP has its head office in Bhopal and training centers at several national and international locations.

The total of 59 students participated in this visit and learn about Microcontroller and embedded systems,VLSI design under supervision of Dr. Mayur Shukla The trip was a very useful, informative & good learning experience for Orientalites. In this visit students were briefed about latest trends in Microprocessor and VLSI Design etc.

Outcomes of the Visit:

1. Students have learnt about the latest technology and the equipment used in Industries in the Field of Microprocessors and Microcontrollers.
2. The various processes involved in making a Programmable Logic Controllers.
3. Students have gained knowledge about VHDL, Verilog Tools for Designing VLSI Circuits.

Workshop on Internet of Things

- **Mr. Sudesh Morey, Managing Director, Drmz System Innovations Private Limited**

As, university curriculum can't adequately cover all areas of importance or relevance, therefore it is important for higher education institutions to supplement the curriculum to make students better prepared to meet industry demands as well as develop their own interests and aptitudes. Our college offers a wide variety of courses for better growth of our students. These courses are conducted to help students stand apart from the rest in the job market by adding further value to their carriers.

The Expert Talk Plays an important role in Strengthening the technical skills of undergraduates. In the race of making good and bright career in short span of time, most of the time students neglect the aim and the need of education. In view of this changing pattern and condition of youth education in India, and to guide students on different topics which are not covered under the defined academic syllabus, the Electronics & Communication Engineering Department of Oriental College of Technology had organized **"Workshop on IoT"** on 08th May, 2023 for the students of final year. This Course syllabus was covered by **Mr Sudesh Morey.**

Our expert has shared their insights, real life scenarios, practical use cases and their solutions on Internet of Things and hands on development using various IoT kits. The lecture was focused on the key concepts related to the Internet of Things. Students were introduced to IoT architecture and applications, Cloud services and future challenges. Functions of Relay and different sensors

were explained. Students received a brief overview of the Introduction to the Internet of Things, The Arduino Platform, Reading from Sensors and Programming fundamentals.
Students were informed about Pin configurations of Node-MCU and Blynk app, in detail. The students installed Blynk app on their mobiles, and made the necessary software setup for running the program on their laptop

At last, **Mr. Pradeep Patel**, Assistant Professor ECE given the vote of thanks to course instructors for addressing the students. At the end he thanked all the faculties and student volunteers for their support in organizing this program successfully.

Outcomes:

1. **Students have learnt about applications of IoT in real life situations.**
2. **An overview of Arduino Applications in AI and ML.**

Alumni Meet

The Alumni Association of Oriental College of Technology, Bhopal organized "ALUMNI MEET 2022"- a programme to facilitate, consolidate and coordinate Alumni Activities at Oriental College of Technology in Auditorium Block on Feb. 2022. The alumni meet is to reconnect with the Alumni and celebrate their success and various achievements. The Alumni started arriving in college by 4.00 p.m. and they were received by the registration team and they have been asked to fill the registration form. The Alumni Meet started with a welcome address by the alumni association chairman Mr. Praveen Thakral. The meeting was graced by the Director Dr Amita Mahor.

During the interaction session the alumni they:

- Discussed about the current trends in languages and certifications in the industry.
- About their personal experiences in the development of open source software.
- About online certifications of various courses.
- Discussed how to start new business.

Alumni also interacted with the students and gave motivational talk regarding preparing for higher studies and placements. Students asked many questions regarding placements and the alumni shared their views. Vote of thanks was given by Mr. Lalit Jain, alumni association secretary and he thanked the various organizers alumni members of the event. He also thanked the management of Oriental College of Technology for the support and guidance which has made Alumni Meet 2022 a grand success.

Placement Talk

Vijay Laxmi Pandey(0126EC181022): Wipro

I want to thank my EC faculty and T&P department for helping me and guiding me during the placement by providing good quality training and also helping me to present my best to a good software development company i.e. TCS. The faculty is helpful They were always available and responded to all the queries.

Important questions for interview:

1. **How to Answer "Tell Me About Yourself"**
   One of the most common questions students face is often 'Tell Me About Yourself' for college interviews. This question allows the college admissions professional to know you better and assess whether you are a right fit for the college. Understanding how to frame your response to this question can guide you in providing a satisfactory answer that reveals a bit more about you than your resume can suggest. In this article, we discuss why college admissions offices ask you about yourself, share some steps for preparing a response for this question and provide some example answers.

2. **Why do Interviewers Ask 'Tell Me About yourself'**
   Interviewers ask 'Tell me about yourself' for college interviews to get an in-depth view of your background and relevant information regarding your qualifications for the respective course or degree. Your response reflects who you are and what are your motivations and interests. This question helps college admissions offices understand your qualities and how you might fit in with the college's community. Typically, this is the first interview question an interviewer asks. Your response can make a favourable impression and set the tone for the rest of your interview.

Objectives of The Campus Placement

- To identify the talented and qualified students in the college.
- To create promising career opportunities for students in reputed corporate companies.
- To select candidates who are suitable for the current job roles without any biased behaviour.
- To provide roles and duties as per the student's knowledge, expertise, and interest.
- To ensure students start a career and move forward in the right direction for better quality living.
- To provide ultimate satisfaction to students by offering the companies of their choice according to their eligibility.
- To provide career guidance through counselling and interactions with industry experts.
- To evaluate and select the right candidate to meet the organization's requirements.
- To identify the professional traits, real-time skills, and values within the students.

Student Achievements

Department Toppers
Academic Year (2022-2023)
4th Year

S. No.	Enrolment No.	Name	CGPA	Photo
1	0126EC203D02	KANISHKA SHRESTH	9.15	
2	0126EC191002	ABHISHEK JAIN	9.06	
3	0126EC191040	PRATIKSHA SAHU	8.88	
4	0126EC191030	JITENDRA LODHA	8.88	
5	0126EC191007	ALOK RAJ	8.76	

3rd Year

S. No.	Enrolment No.	Name	CGPA	Photo
1	0126EC201014	MEGHA SISODIYA	9.11	
2	0126EC201015	MEHAR DARKSHA	9.08	
3	0126EC201009	HARSH BAJPAI	9.04	
4	0126EC213D01	ANJALI KUMARI	8.73	
5	0126EC201018	PRIYANSHI SHIVHARE	8.67	

2nd Year

S. No.	Enrolment No.	Name	CGPA	Photo
1	0126EC211007	ANAS SERAJ	9.43	
2	0126EC211014	KISHAN KUMAR	9.27	
3	0126EC211039	SAURABH PATEL	9.22	
4	0126EC211041	SHALU YADAV	8.97	
5	0126EC211022	NIDHI BORIWAR	8.91	

Chancellor's Awards

S. No.	Name of Student	Enrollment No.	Batch
1	Divyanshu Shekhar	0126EC161034	2016-20
2	Apoorva Vaidh	0126EC141027	2014-18
3	Shraddha Agarwal	0126EC141098	2014-18
4	Nishi Aryan	0126EC121061	2012-16
5	Sulekha Yadav	0126EC111112	2011-15
6	Raksha Patel	0126EC111084	2011-15
7	Kanchi Jain	0126EC111047	2011-15

Distinguised Alumni

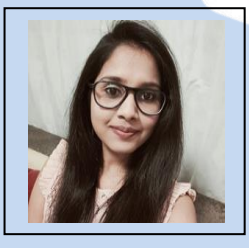
Mr. Jagadish Nagar Azim Premji Foundation,2009

Ms. Ayushi Gupta Capgemini

Ms. Kanchi Jain Barclays, Pune 2016

Mr. Anuved Nayak Zoomcar,

Ms. Ku. Roma Laxmi TCS



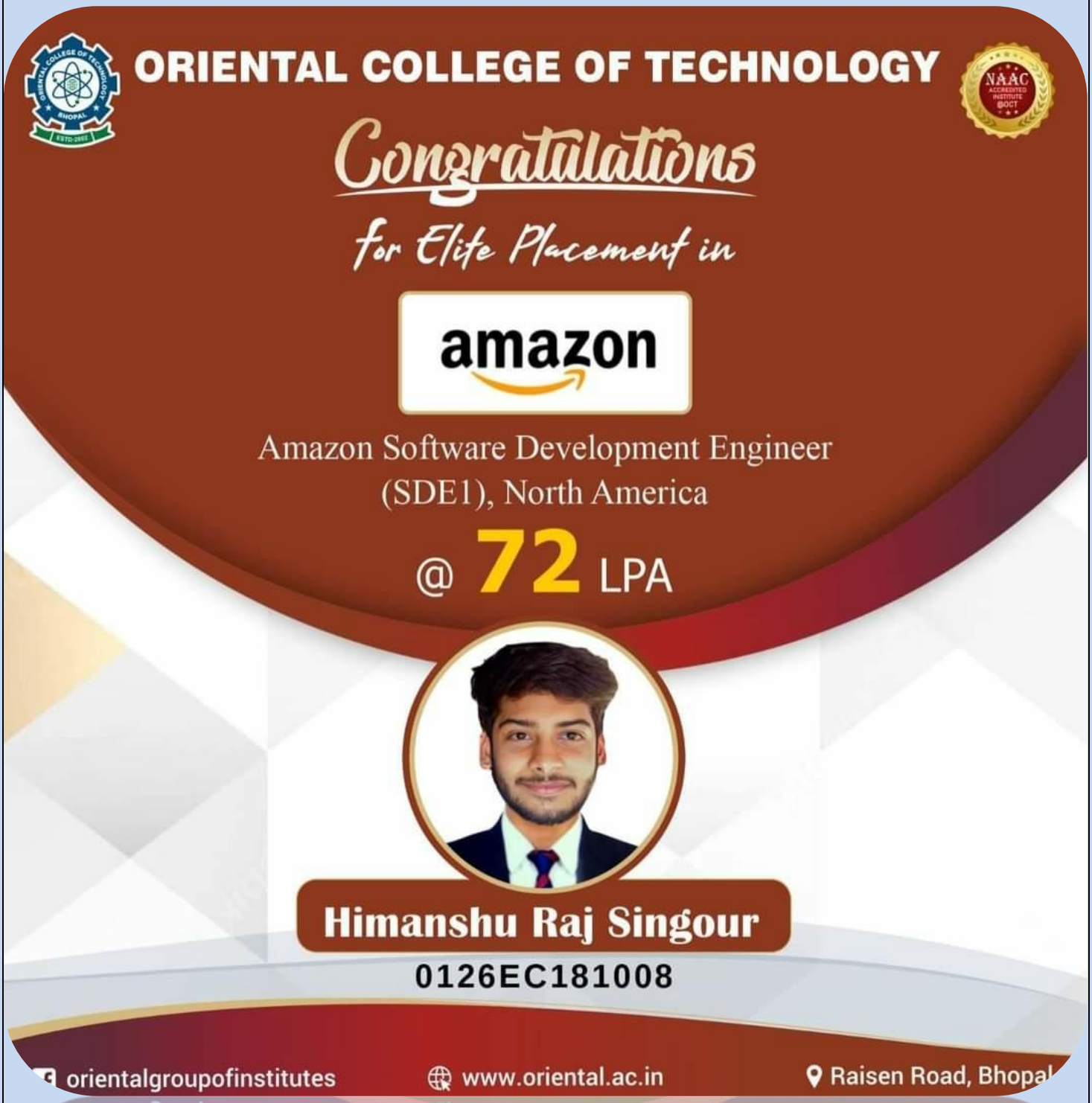
Ms. Nayan Gupta Infosys

Ms. Asra Iqbal Niyo Solutions Inc.

Mr. Ketan Gupta Q2ebanking

Mr. Mohammad Saif Viteos Fund Services 2017

Mr. Aman ku. Verma Mantra Labs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