Sri Venkateswara College of Engineering

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

VIDYUT

OFFICIAL NEWSLETTER

VOLUME 1 | ISSUE 12 | DECEMBER 2023

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NEWSLETTER EDITORIAL TEAM

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Dr. Sudhakar K Bharatan, Professor

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Mr. W. Sherwin Bino, II year

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RI VENKATESWARA COLLEGE OF ENGINEERING DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Vision of the Institution

To be a leader in Higher Technical Education and Research by providing the state-of-the-art facilities to transform the learners into global contributors and achievers.

Mission of the Institution

To develop SVCE as a "CENTRE OF EXCELLENCE" offering Engineering Education to men and women at undergraduate and postgraduate degree levels, bringing out their total personality, emphasizing ethical values and preparing them to meet the growing challenges of the industry and diverse societal needs of our nation.

Vision of the Department

The vision of Electrical and Electronics Engineering Department is to provide a high standard of education in Electrical and Electronics Engineering so as to meet the industry standards through domain.

Mission of the Department

M1: To create state of the art facilities such that the students excel in Electrical and Electronics Engineering education.

M2: To equip students with a well-defined curriculum to meet the requirements of Industries and society.

M3: To promote a culture of research, innovation and entrepreneurship in the thrust and allied areas of Electrical and Electronics Engineering.

M4: To inculcate soft skills and foster ethical values and shape the total personality of the students.

Program Educational Objectives (PEOs) UG-EEE

PEOI: Graduates of EEE transformed to engineering contributors in the fields of Electrical, Electronics and Computer Engineering.

PEO2: Succeed in becoming entrepreneurs through human centered design thinking and innovation.

PEO3: Become eligible to pursue higher studies in their chosen areas of engineering or management

PEO4: Effective, conscious and ethical team player in the field of green energy management and sustainability

Program Outcomes (POs) for UG-EEE

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Modern tool usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and team work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and lead.
12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs) for UG-EEE

PSO1: The ability to build, implement, test and maintain analog and/or digital systems and implement Electronic control of Drives for Industrial automation and Electric Vehicle.

PSO2: The ability to analyze Power system network encompassing stability, control and protection and interconnection of renewable energy sources with micro smart grid

Program Outcomes (POs) for PG-PED

PO1: An ability to independently carry out research/investigation and development work to solve practical problems.

PO2: An ability to write and present a substantial technical report/ document.

PO3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

Program Specific Outcomes (PSOs) for PG-PED

PSO1: The ability to design and analyze Power Electronic converters and control of Electric drives for Industrial applications.

PSO2: The ability to apply Power Electronic Circuits in Transmission

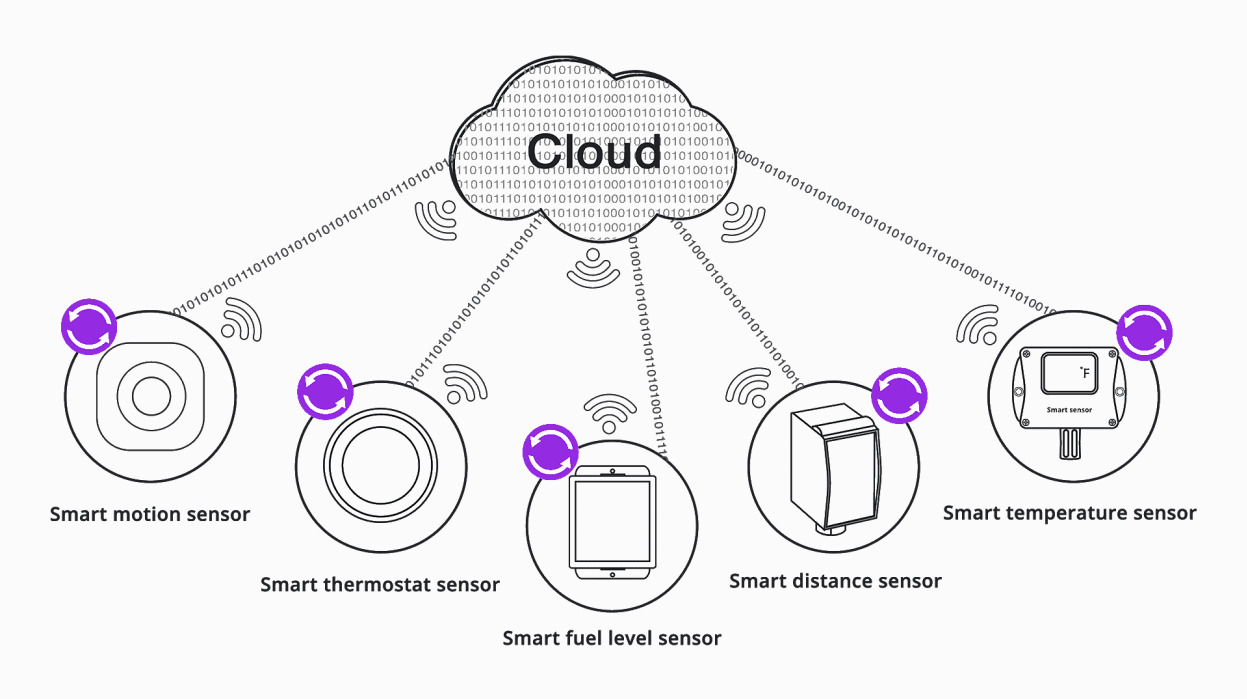
ARTICLE

Smart Sensors & it's applications

- Dr. R J Venkatesh, Assistant Professor

Smart sensors are also called intelligent sensors, and they have integrated electronics which enable them to perform certain functions like logic functions, two-way communication, etc. Also, they are capable of making decisions. These sensors are also able to measure environmental data with

in industries. These sensors have three important parts. They are sensing element, Signal processing and microprocessor.



Difference between Smart Sensors and Conventional Sensors

- These sensors differ from the conventional sensors in a way that they are faster than the conventional type.
- These sensors are also more accurate than the conventional sensors.
- These sensors are smaller in size as compared to conventional sensor.
- They consume low power.

Functions of Smart Sensors

These sensors have the following functions:

- They are used for performing information processing.
- These sensors can perform compensation.
- They perform integration with other systems
- These sensors perform validation.
- These sensors perform data fusion.

Reasons for use of smart sensors

These sensors are used because:

- These have the ability of self-calibration.
- The accuracy level is very high
- They have a relatively good communication.
- They can do multi-sensing.
- Cost-effective.
- Quick response.
- Low power consumption.
- They have a remote diagnosis.

Features of Smart Sensors

These sensors have the following features:

- Analog to digital conversion
- Microcontroller with advanced features, mostly PIC
- Sensor identification
- Data logging as well as real time clock
- Communication via serial bus

Smart sensors are used based on the following criteria:

- They are selected accord to the self-calibration capability.
- The accuracy of the sensor must be taken into consideration.

Functions of Smart Sensors

These sensors have the following functions:

- They are used for performing information processing.
- These sensors can perform compensation.
- They perform integration with other systems
- These sensors perform validation.
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Smart sensors are used based on the following criteria:

- They are selected accord to the self-calibration capability.
- The accuracy of the sensor must be taken into consideration.
- The self-diagnosis ability should also be considered.
- Information processing capability must also be considered.
- The area to be covered also impacts the selection.
- Fault tolerance should be considered.

- These sensors must be selected according to the ability to operate in harsh environment.
- Reliability in operation should be taken into consideration.
- They must have a good service life.

Basic components of a smart sensor

Base Sensor: conventional sensor that detects the physical quantity.

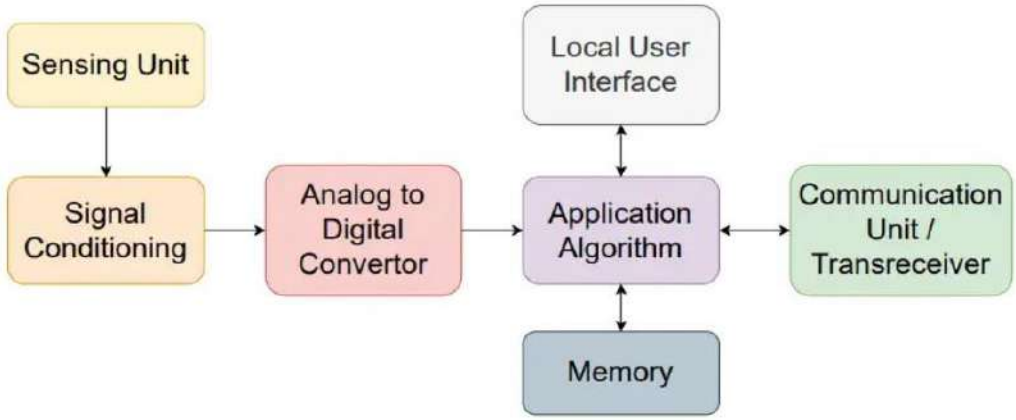
Power Supply: Power supply is used to feed power to the computing resource. Power supply may also supply power to the sensor base.

Microprocessor: Microprocessor is a computing element, which enables a sensor to make some data calculations which measure quantity. Microprocessor can also take actions based on these analyses.

Memory: The memory dedicated for storing measured values, and calculated data and storing the incorporated software logic which controls how the sensor will handle these data.

Communication Module: Communication module is used to transmit and receive data between the sensor and external devices over a similar network or the internet.

Working of Smart Sensors



A conventional sensor is used for providing the sensing capability. Conventional sensors are designed to measure the physical quantity and produce an analog signal. This signal must also be processed before it can be used. Here, microprocessor plays a major role. This integrated microprocessor which is installed inside the sensor filters out the unwanted noise signal and convert the base signal into a usable form. The integrated microprocessor contains software functions that would make calculations which measure values and may act at specific values. The memory card is also integrated within the sensor. It stores data which is measured and the operating parameters of the sensor. Also the communication module integrated within the sensor and will allow connecting to external devices by a private network or internet.

Use of Smart Sensor

These sensors are used for the same purpose as a normal sensor that measures a physical quantity. But it also has added data handling and communication capabilities which makes these sensors suitable for many industrial applications. These sensors are the most important elements in **IoTs** because of its communication abilities through the internet.

Types of Smart sensors

Smart sensors which are used in industries are mainly of five types. There are some special purpose sensor also available in market. The five types of smart sensors are:

- Level sensors
- Temperature sensors
- Pressure sensors
- Infrared sensors
- Proximity sensors

They are preferred over the conventional sensors because they have data handling capabilities. But there are still some applications where it is suitable to use a conventional sensor. If the

application needs complete control over the sensor input, then it might be advisable to use a conventional sensor rather than the smart sensor.

Advantages of smart sensor

Smart sensors offer the following advantages:

- **These sensors improve process's performance**
    - These sensors generate data by connecting different devices and systems, hence enabling different machines that talk to one another. By this, it helps in:
    - Monitoring equipment and system performance
    - Comparing and analyzing data sets.
- **These sensors reduce maintenance by predicting failures of equipment**
    - They help in reducing unnecessary maintenance, cost of part replacements and potential for production downtime. Data collected by these sensors is used in detecting failure patterns, which eliminates the need for service equipment. These sensors can use the data for sending alerts to operators, notifying them for potential failure. Hence, they can take action before causing production downtime.
- **These sensors can automatically log data for historical records and regulatory compliance**
    - In some processes and productions, manufacturers require giving some data records which prove their production parameters have set limits of their customers. When smart sensors are used, they can help automatically in this issue. The reason is that these sensors automatically log data like temperature, humidity, energy consumption, hours of operation, maintenance need and production line outputs.
- **These sensors provide notification of problems which can process quality**
    - Smart sensors may identify system problems which could affect production output or the product quality and will provide real-time notification of them. This helps in avoiding production downtime.
- **Smart sensors can self-test, self-calibration and self-diagnosis**

    - These sensors can do a self-test during power-up so as to determine if a component has failed or not. Smart sensors also send a notification message to the process controller for taking proper actions. Smart sensors have the ability to self-calibrate if needed.
- **Smart sensors have the capacity to do multi-sensing**
    - A smart sensor is able to measure multiple physical quantities at the same time. Say for an example, a fusion liquid sensor is able to measure temperature, flow, pressure and density of a medium simultaneously.
- **Smart sensors have high precision.**
    - The smart sensors can filter out signal noise and compensate for random errors. Hence, they increase the accuracy of the sensor.

Disadvantages of smart sensor

The smart sensors have the following disadvantages.

- These sensors have both actuators and sensors. Hence, they are more complex as compared to conventional sensors.
- Because the complexity is higher in wired smart sensors, so the cost are also higher.
- Sensor calibration must be managed by an external processor.
- There are pre-defined embedded functions that need to be given during the design of the smart sensors.

STUDENTS PARTICIPATIONS

Our Hon'ble Prime Minister Shri Narendra Modi launched a major initiative called "Viksit Bharat@2047' on 11th December 2023,10:00 a. m to 11:00 a.m. The live telecast of the event was watched by over hundred students from all departments at Biotech seminar hall, SVCE.

Speech content:

Prime minister addressed students and educational institutions regarding the importance of technology in uplifting a nation. He encouraged all the students to pursue higher education and excel in their respective fields and wanted all students to strive towards research.

EVENTS ORGANIZED BY ALUMNI ASSOCIATION-SVCE

Alumni Reunion - (1994 - 98) batch

The 1998 batch alumni reunion is scheduled on 15-12-2023. It has been organized to build relationships and collect updated contact information for their alumni directory and future outreach efforts. Reunion attendees are more likely to donate, and many schools use the time to help inspire donations, endowments, and other forms of giving. The program was organized such way that from welcome address, introduction, refreshments, guided tour to the college campus, latest facilities, and developments and interaction with current students. After lunch, casual networking and discussion with each other were arranged.

Events Conducted by Inter interdisciplinary Center for iNRC

Three students from Sairam College Engineering Carried out 15 days Internship program in Interdisciplinary Nano Research Centre (iNRC), SVCE, from 27.11.2023 to 15.12.2023 under the guidance of Dr. Sudhakar K Bharatan.

Events Organized by Entrepreneurship and Incubation Cell (EPIC) –SVCE

Guest lecture on Entrepreneurship

SVCE EPIC of Sri Venkateswara College of Engineering organized an Expert Talk on “Entrepreneur Success Story". The chief guest was Mr. Palaniappan Narayanan, Co-Founder & CEO, Mocero Health Solutions and an alumnus of EE department, SVCE. The event was conducted on 22.12.2023 at Multipurpose Hall. All the first-year students of EE department benefitted from the guest lecture.

SVCE EPIC of Sri Venkateswara College of Engineering organized an exhibition called Inno-Exhibit for encouraging and promoting student’s innovative ideas/ Prototype to the next Technology Readiness Level (TRL) on 26.12.2023 from 9.30 AM -3.00 PM at Function Hall & Video Hall. Three students from I Year EE, namely Hemalekha, Deepthi and Sona Meyyapan, participated and presented their ideas and prototype at the event.

PARENT TEACHERS MEETING (JUNIOR) 23.12.2023

Parents' day meet for first year students for the ODD semester of academic year (2023-2024) was held on, 23.12.2023 Saturday. Dr.Sudhakar K B, AHoD/EEE addressed the gathering and discussed elaborately about the autonomous stream and importance of regular class attendance, Laboratory class attendance, CAT exams, Special classes and Career planning through verticals in curriculum.

The moments captured during the meet

Address by Dr. Sudhakar K Bharatan , AHOD to the parents
in DC Machines Laboratory& Software Laboratory.

Interaction of parents with Faculty advisors

PALS RESIDENTIAL WORKSHOP AT IIT MADRAS

The PALS team of IIT-Madras along with SVCE and various partner institutes across South India, organized a highly informative and engaging "Three-day Residential Student's Workshop" from 27th to 29th Dec, 2023. The event aimed to provide information to students and faculty about the essential skills and traits required to succeed in their careers and make a positive impact in the industry and also to provide necessary exposure.

Participants From SVCE

1. BHARADWAJ S, AP/EE
2. PUNEETH, III YR, ADS
3. SHUBHAM SINHA, III YR, ADS
4. LOGARANJAN, III YR, MECH,
5. KATHIRAVAN, III YR, IT

Key Outcomes of the Workshop

1. The event brought together the students and faculties of various institutes and various departments and encouraged them to work on a common problem.
2. The participants developed their innovating thinking capability and also became a better team player
3. The workshop helped all the participants to acquire enormous exposure and to expand their professional network.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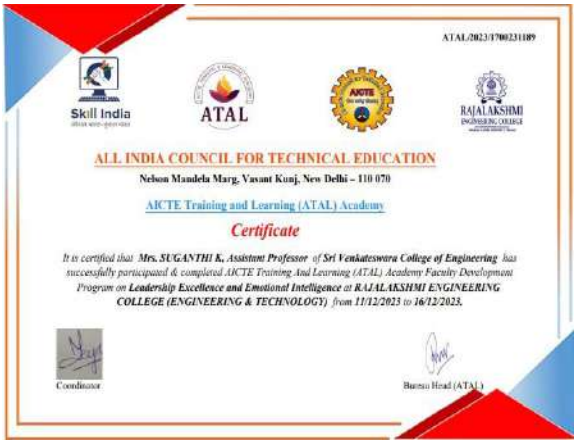
Faculty Achievements/Participation in International conference /FDP

Dr.S.Arulmozhi and Ms.K.Sugnathi, Assistant Professors, successfully participated and completed AICTE Training and Learning Academy Faculty Development Program on" Leadership Excellence and Emotional Intelligence" at Rajalakshmi Engineering College(Engineering & Technology) from 11.12.2023 to 16.12.2023.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ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Nelson Mandela Marg, Vasant Kunj, New Delhi – 110 070

AICTE Training and Learning (ATAL) Academy

Certificate

It is certified that Mrs. SUGANTHI K, Assistant Professor of Sri Venkateswara College of Engineering has successfully participated & completed AICTE Training And Learning (ATAL) Academy Faculty Development Program on Leadership Excellence and Emotional Intelligence at RAJALAKSHMI ENGINEERING COLLEGE (ENGINEERING & TECHNOLOGY) from 11/12/2023 to 16/12/2023.

Coordinator

Bureau Head (ATAL)


ATAL/2023/1702112616

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Nelson Mandela Marg, Vasant Kunj, New Delhi – 110 070

AICTE Training and Learning (ATAL) Academy

Certificate

It is certified that Dr. Arulmozhi Subramanian, Assistant Professor of Sri Venkateswara College of Engineering has successfully participated & completed AICTE Training And Learning (ATAL) Academy Faculty Development Program on Leadership Excellence and Emotional Intelligence at RAJALAKSHMI ENGINEERING COLLEGE (ENGINEERING & TECHNOLOGY) from 11/12/2023 to 16/12/2023.

Coordinator

Bureau Head (ATAL)

Dr. R.J Venkatesh, Assistant Professor successfully participated and completed AICTE Training and Learning Academy Faculty Development Program on' Implementation of Power Electronic Converters & Control Topologies in Electric Vehicle Applications: Challenges and Opportunities "at Sri Krishna College of Engineering from 11.12.2023 to 16.12.2023.


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AICTE Training and Learning (ATAL) Academy

Certificate

It is certified that Dr. R J Venkatesh, Assistant Professor of Sri Venkateswara College of Engineering, Sriperumbudur has successfully participated & completed AICTE Training And Learning (ATAL) Academy Faculty Development Program on IMPLEMENTATION OF POWER ELECTRONIC CONVERTER & CONTROL TOPOLOGIES IN ELECTRIC VEHICLE APPLICATIONS: CHALLENGES AND OPPORTUNITIES at SRI KRISHNA COLLEGE OF TECHNOLOGY from 11/12/2023 to 16/12/2023.

Coordinator

Dr. R.Karthikeyan, Professor successfully participated and completed AICTE Training and Learning Academy Faculty Development Program on ‘Application of Artificial Intelligence on Biomedical Engineering”, at Easwari Engineering College from 18.12.2023 to 23.12.2023


ATAL/2023/1702534564

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AICTE Training and Learning (ATAL) Academy

Certificate

It is certified that Mr. R KARTHIKEYAN, Associate Professor of Sri Venkateswara College of Engg has successfully participated & completed AICTE Training And Learning (ATAL) Academy Faculty Development Program on APPLICATION OF ARTIFICIAL INTELLIGENCE IN BIOMEDICAL ENGINEERING at EASWARI ENGINEERING COLLEGE from 18/12/2023 to 23/12/2023.

Coordinator

Bureau Head (ATAL)

Dr. C.Kamal, Assistant Professor successfully participated and completed AICTE Training and Learning Academy Faculty Development Program on “Alternate Fuels- Hydrogen Energy and Environment” at Anna University, from 11.12.2023 to 16.12.2023.


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ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Nelson Mandela Marg, Vasant Kunj, New Delhi – 110 070

AICTE Training and Learning (ATAL) Academy

Certificate

It is certified that Dr. C.KAMAL, Assistant Professor of Sri Venkateswara College of Engineering has successfully participated & completed AICTE Training And Learning (ATAL) Academy Faculty Development Program on Alternate Fuels - Hydrogen Energy and Environment at ANNA UNIVERSITY from 11/12/2023 to 16/12/2023.

Coordinator

Bureau Head (ATAL)

Dr. R Kannadasan Raju, Assistant professor, presented his paper titled “Development of Gas insulated substation in smart city: Very fast raising over-voltages and its impact on surge arresters” at the 9th IEEE International Conference on sustainable technology and engineering 2023 at Shangri-la Fijian resort, Fiji, held from December 4th - 6th, 2023.

Dr. R Kannadasan Raju, Assistant professor, acted as Executive member and session chair at the 9th IEEE International Conference on sustainable technology and engineering 2023 at Shangri-la Fijian resort, Fiji, held from December 4th - 6th, 2023.

SVCE supported 50% cost towards Registration and International Travel.

Placement Detail

Five students from final year, EEE, got placed in JSE Engineering Pvt Ltd, during the campus placement drive held in the month of December.

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