ESWAR COLLEGE OF ENGINEERING: NARASARAOPET

Approved by AICTE, New Delhi., Affiliated to JNTUK, Kakinada
Kesanupalli Village, Narasaraopet – 522 601,
Palnadu Dist. A.P.

Phone No. 9121214708 | Email ID: principal@eswarcollegeofengg.org, eswarcollegeofengg@gmail.com
web:eswarcollegeofengg.org

Department of Electronics and Communication Engineering

Dt: 26-11-2018

To
The Principal
Eswar College of Engineering
Narasaraopet

Through HOD-ECE

From
B Siva Nageswara Rao
Assistant Professor
Faculty Coordinator

Sub: Requesting for permission to conduct a value-added course on **Sensors and Actuators** from **10-12-2018 to 14-12-2018.**

Dear Sir,

The Department of ECE is planning to organize a 1 week value-added course on **Sensors and Actuators** from **10-12-2018 to 14-12-2018.**

Total Number of Students registered: 15 No's (IV B.Tech I Sem ECE).

Resource Person: **D Rekha**, Assistant Professor, Department of ECE, ESWAR college of Engineering, Narasaraopet.

Certificate Criteria: 60% of marks in Evaluation, 80% of attendance

In connection with the programme, we request your approval to organize the same and to make the programme a grand success.

Thanks and regards,

Name:,B Siva Nageswara Rao

Signature

.....

HOD- Comments please consider — K. Sam — HOD

Department of ECE
Eswar College of Engineering
Kesanupalli (V), Narasaraopet - 522 601.

Principal Comments: Recommended

Approved/ Rejected

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+91 99636 34414
Email: eswarcollegeofengg@gmail.com
Website: www.eswarcollegeofengg.org

Date: 03-12-2018

CIRCULAR

All B.Tech IV/I ECE students are hereby notified that a value added course titled "Sensors and Actuators" will be conducted from 10-12-2018 to 14-12-2018It is mandatory for all students to enroll their names with course co-ordination B Siva Nageswara rao, Assistant Professor, Department of ECE.

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3. Library
4. Exam Cell
5. HOD's

Civil -
ECE -
CSE -
S&H -

Class Rooms:

211 212 213 115
236 237 114
234 235 216

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Objectives:

- Equip participants with comprehensive knowledge and understanding of various sensors and actuators, including their principles, types, and applications in engineering and technology.
- Develop practical skills in sensor and actuator interfacing, signal conditioning, and integration within complex engineering systems to enhance functionality and performance.
- Foster critical thinking and problem-solving abilities by exploring real-world applications, emerging technologies, and innovative solutions in the field of sensor and actuator technology

Outcomes

Participants will gain a comprehensive understanding of various sensor and actuator types, principles of operation, and their applications in engineering systems.
Participants will develop practical skills in interfacing sensors and actuators, including signal conditioning, control systems integration, and closed-loop system design.
Participants will explore emerging technologies and future trends in sensor and actuator technology, fostering innovation and research opportunities in the field.
Participants will collaborate on hands-on projects to design and implement sensor and actuator-based systems, enhancing their problem-solving and teamwork abilities.

Course Content

- **Introduction to Sensors and Actuators**
- **Sensor Technologies**
- **Actuator Technologies**
- **Sensor and Actuator Interfacing**
- **Applications and Future Trends**

Resource Person

D Rekha, Assistant Professor, Department of ECE, ESWAR college of Engineering, Narasaraopet

Eligibility:
This course is intended for IV B.Tech I Sem ECE

Registration fee
Registration Fee: **No Registration fee**

Participant (Includes refreshment, training and certificate)

Scheduled date

10-12-2018 to 14-12-2018

Last date For Receipt of Application

08-12-2018

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ESWAR COLLEGE OF ENGINEERING
NARASARAOPET-522 601, Guntur (Dt.)

ONE WEEK ADD-ON COURSE
SENSORS AND ACTUATORS
Organized by
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING,
ESWAR COLLEGE OF ENGINEERING
Kesanupalli (V), Narasaraopet
on

10-12-2018 to 14-12-2018

Registration Form

Name_____

Department:_____

Designation:_____

Organisation:_____

Address:_____

Contact No.:

E-mail:

About college

Eswar College of Engineering was established during the academic year 2008 -09 and sponsored by Shaik Dada Saheb Charitable Trust. with a vision of Imparting futuristic technical education and instill high patterns of discipline in order to set global standards and making the students technologically superior and ethically strong. The young and dynamic promoters haveselected this rural area with lot of foresight. The Institution is spread over 22 acres of lush green landscape and located at 5th km stone on the Narasaraopet–Chilakaluripet Road. The Institutionoffers the UG Courses B.Tech-CIVIL, EEE, ECE, CSE, AME, ME, PG Courses M.Tech-PE&ED,DECS,CSE,CAD/CAM & MBA. The tourist places near by are Kotappakonda, Amaravathi, Surylanka Beach. **Eswar College of Engineering is having MOU with International Institute of Information Technology IIIT- Hyderabad and introduced CIT Programme forstudents Digital Class facility is also provided in association with Manipal K12, Bangalore.** the very first college in Andhra Pradesh

About department

The Department of Electronics & Communication Engineering came into existence in 2001 immediately when the institute was founded. It started with an intake of 60 students which was subsequently raised to 120 over a period of time. It offers 4 year B.Tech degree program in Electronics & Communication Engineering, 2 Year M.Tech degree in Digital Electronics and Communication system with an intake of 18.

Vision: To excel in the emerging fields of electronics and communication engineering by conducting cutting-edge research, advocating for ethical principles, and addressing societal needs

Mission:

·To provide strong fundamentals and technical skills through effective teaching learning Methodologies, disseminate knowledge by organizing seminars, field visits and workshops.

·To provide an ambiance for research through collaborations with industry and academia.

·To develop responsible citizens and professional leaders with high ethical and moral values, who contribute in

CHIEF PATRONS

SRI.SHAIK.MEERAVALI

Chairman

SRI.SHAIK.KAREEM MOHIDDIN

Secretary & Correspondent

SRI.SHAIK MASTHAN SHARIF

Managing Director

PATRON

DR.G. NAGA MALLESWARA RAO

Principal

Convener

Dr SK Mirza Shafi shahasavar,

HOD-ECE Department,

The Co-Ordinator,

ONE WEEK ADD-ON COURSE

SENSORS AND ACTUATORS

ESWAR COLLEGE OF ENGINEERING,

KESANUPALLI (V),

NARASARAOPET (M),

GUNTUR-DT

Ph.No: 8985793922, 9581741666

E-mail: www.eswarcollegeofengg.org

www.eswarcollegeofengg.blogspot.com

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Declaration:

The above is formation is true to the best of my knowledge. I agree to abide by the rules and regulations governing the course. If selected I shall attend the course for the entire the duration. I also under take the responsibilities to inform the coordinator in case I am unable to attend the course

Place:

Date:

Signature of the applicant

Sponsorship certificate:

Mr/ Mrs./

Dr.....

.....

Is an employee of our institute/ organization and is here by sponsored and will be permitted to attend the course, if selected

Place

Date

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Department of Electronics and Communication Engineering

Course Name: Sensors and Actuators

Proposed Syllabus

Day 1: Introduction to Sensors and Actuators

Basics of Sensors, Definition and types of sensors, Principles of sensing and transduction, Basics of Actuators

Definition and types of actuators, Principles of actuation and control

Day 2: Sensor Technologies

Optical Sensors, Photodiodes, phototransistors, and optical fibers, Applications in sensing and imaging, Temperature and Humidity Sensors, Thermocouples, RTDs, and capacitive sensors, Principles and applications in environmental monitoring

Day 3: Actuator Technologies

Electromechanical Actuators, DC motors, stepper motors, and solenoids, Principles and applications in robotics and automation, Piezoelectric and MEMS Actuators, Principles of operation and applications, Integration in microsystems and biomedical devices

Day 4: Sensor and Actuator Interfacing

Signal Conditioning for Sensors, Amplification, filtering, and digitization, Importance in sensor accuracy and reliability, Control Systems for Actuators, Feedback control, PWM techniques, Integration with sensors for closed-loop systems

Day 5: Applications and Future Trends

IoT and Smart Sensors Integration of sensors in IoT platforms, Real-world applications and case studies, Emerging Technologies and Future Trends, Wearable sensors, AI-driven actuators, Research opportunities and challenges in sensor and actuator technology

CO Statements

CO's	CO Statements
CO1	Participants will gain a comprehensive understanding of various sensor and actuator types, principles of operation, and their applications in engineering systems.
CO2	Participants will develop practical skills in interfacing sensors and actuators, including signal conditioning, control systems integration, and closed-loop system design.
CO3	Participants will explore emerging technologies and future trends in sensor and actuator technology, fostering innovation and research opportunities in the field.
CO4	Participants will collaborate on hands-on projects to design and implement sensor and actuator-based systems, enhancing their problem-solving and teamwork abilities.

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Feedback form

Course Name: Sensors and Actuators

Please place tick marks at the respective column

S.No	Particulars	Excellent	Very good	Good	Average	Poor
1	How well did you achieve this learning goal in this course?	✓				
2	Does the course contain meet the expectation?		✓			
3	Is The lecture sequence was well planned	✓				
4	Does the Lecture content illustrate with adequate examples	✓				
5	Do you Level of the course up to the standards?		✓			
6	Does the Course meets the level of new knowledge	✓				
7	Is th lecture clear and easy to understand?	✓				
8	Did your expect Teaching aids are effectively used?		✓			
9	Does the resource person interacted well and cleared the doubts.		✓			
10	Overall organization of the course	✓				

Comments

1. principles of Actuation and control
2. Temparature and Humidity sensors

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Feedback form

Course Name: Sensors and Actuators

Please place tick marks at the respective column

S.No	Particulars	Excellent	Very good	Good	Average	Poor
1	How well did you achieve this learning goal in this course?	✓				
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4	Does the Lecture content illustrate with adequate examples		✓			
5	Do you Level of the course up to the standards?	✓				
6	Does the Course meets the level of new knowledge		✓			
7	Is th lecture clear and easy to understand?	✓				
8	Did your expect Teaching aids are effectively used?	✓				
9	Does the resource person interacted well and cleared the doubts.		✓			
10	Overall organization of the course	✓				

Comments

1. Conditioning for sensors
2. Control systems for Actuators

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Feedback form

Course Name: Sensors and Actuators

Please place tick marks at the respective column

S.No	Particulars	Excellent	Very good	Good	Average	Poor
1	How well did you achieve this learning goal in this course?	✓				
2	Does the course contain meet the expectation?	✓				
3	Is The lecture sequence was well planned		✓			
4	Does the Lecture content illustrate with adequate examples		✓			
5	Do you Level of the course up to the standards?	✓				
6	Does the Course meets the level of new knowledge	✓				
7	Is th lecture clear and easy to understand?	✓				
8	Did your expect Teaching aids are effectively used?		✓			
9	Does the resource person interacted well and cleared the doubts.	✓				
10	Overall organization of the course	✓				

Comments

1. wearable sensors

2. IOT techniques

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Department of Electronics and Communication Engineering

Feedback Analysis

Course Name: SENSORS AND ACTUATORS

Number of students attended/ given feedback 15

S.No	Particulars	Excellent	Very good	Good	Average	Poor	Levels
1	How well did you achieve this learning goal in this course?	10	4	1			0.9
2	The course contain meet the expectation	14	1				0.98333
3	The lecture sequence was well planned	13	2				0.96667
4	Lecture content illustrated with adequate examples	12	2	1			0.93333
5	Level of the course up to the mark?	11	3	1			0.91667
6	Course highlights the level of new knowledge	15					1
7	The lecture was clear and easy to understand?	12	2	1			0.93333
8	Teaching aids are effectively used?	11	2	2			0.9
9	The resource person interacted well and cleared the doubts.	14	1				0.98333
10	Overall organization of the course	14	1				0.98333
							0.95

Over all feedback value : 3.8

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Department of Electronics and Communication Engineering

Course Name: Sensors and Actuators

Evaluation of the Value-Added Courses

Answer all the Questions Each Question Carry 1 Mark

Total Marks: 20M **Min Marks: 12 Marks**

Name of the Student **H.T.No:** **Marks obtained:**

1. What is the primary function of a sensor? [ ]

A) Control a system **B) Convert physical quantities into electrical signals**

C) Generate mechanical motion D) Store data

2. Which sensor type is commonly used for detecting light intensity? [ ]

A) Thermocouple **B) Photodiode** C) Accelerometer D) Hall effect sensor

3. What is the primary function of an actuator? [ ]

A) Measure physical quantities **B) Convert electrical signals into mechanical motion**

C) Store energy D) Amplify signals

4. Which actuator type is commonly used in robotics for precise angular control? [ ]

A) Solenoid B) DC motor **C) Stepper motor** D) Relay

5. What is the principle behind capacitive sensors? [ ]

A) Inductance B) Resistance **C) Capacitance change** D) Hall effect

6. Which of the following is NOT a type of temperature sensor? [ ]

A) Thermocouple B) RTD **C) Hall effect sensor** D) Thermistor

7. What does MEMS stand for? [ ]

A) Micro Electronic Mechanical System B) Mechanical Electronic Micro Sensor

C) Micro Electro Mechanical System D) Mechanical Electrical Micro System

8. Which actuator uses piezoelectric materials for operation? [ ]

A) DC motor B) Solenoid **C) Piezoelectric actuator** D) Stepper motor

9. What is the primary purpose of signal conditioning in sensor systems? [ ]

A) Data storage **B) Signal amplification and filtering**

C) Energy conversion D) Mechanical motion

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10. Which sensor is commonly used for detecting magnetic fields? [ ]

A) Thermocouple B) Photodiode **C) Hall effect sensor** D) Ultrasonic sensor

11. What is the primary application of an accelerometer? [ ]

A) Temperature measurement B) Pressure measurement

C) Motion detection D) Light intensity measurement

12. Which actuator type is commonly used in pneumatic systems? [ ]

A) Hydraulic cylinder B) Stepper motor C) Solenoid D) DC motor

13. What is the primary function of a strain gauge sensor? [ ]

A) Measure light intensity B) Measure pressure

C) Measure deformation D) Measure temperature

14. Which sensor type is suitable for measuring humidity? [ ]

A) Thermocouple B) Photodiode **C) Capacitive sensor** D) Hall effect sensor

15. Which actuator type is used for switching purposes in electrical circuits? [ ]

A) DC motor **B) Relay** C) Stepper motor D) Piezoelectric actuator

16. What does RTD stand for? [ ]

A) Resistor Temperature Detector B) Resistance Thermodynamic Detector

C) Resistance Temperature Detector D) Real-Time Detector

17. Which sensor type is commonly used for detecting distance in robotics? [ ]

A) Ultrasonic sensor B) Hall effect sensor C) Thermocouple D) Photodiode

18. What is the primary function of a pressure sensor? [ ]

A) Measure temperature B) Measure light intensity

C) Measure pressure D) Measure distance

19. Which actuator type is commonly used for linear motion control? [ ]

A) Stepper motor B) DC motor C) Solenoid **D) Hydraulic actuator**

20. What is the primary function of a Hall effect sensor? [ ]

A) Measure temperature **B) Measure magnetic fields**

C) Measure light intensity D) Measure pressure

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Department of Electronics and Communication Engineering

Course Name: Sensors and Actuators

Evaluation of the Value-Added Courses

Key

Q.No	Answer	Q.No	Answer
1	B	11	C
2	B	12	A
3	B	13	C
4	C	14	C
5	C	15	B
6	C	16	C
7	C	17	A
8	C	18	C
9	B	19	D
10	C	20	B

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Department of Electronics and Communication Engineering

Course Name: Sensors and Actuators

Evaluation of the Value-Added Courses

Answer all the Questions Each Question Carry 1 Mark

Total Marks: 20M **Min Marks: 12 Marks** 12

Name of the Student Bharat Kumar.M **H.T.No:** 15JE1A0402 **Marks obtained:**

1. What is the primary function of a sensor? [B]

A) Control a system B) Convert physical quantities into electrical signals

C) Generate mechanical motion D) Store data

2. Which sensor type is commonly used for detecting light intensity? [B]

A) Thermocouple B) Photodiode C) Accelerometer D) Hall effect sensor

3. What is the primary function of an actuator? [B]

A) Measure physical quantities B) Convert electrical signals into mechanical motion

C) Store energy D) Amplify signals

4. Which actuator type is commonly used in robotics for precise angular control? [C]

A) Solenoid B) DC motor C) Stepper motor D) Relay

5. What is the principle behind capacitive sensors? [C]

A) Inductance B) Resistance C) Capacitance change D) Hall effect

6. Which of the following is NOT a type of temperature sensor? [C]

A) Thermocouple B) RTD C) Hall effect sensor D) Thermistor

7. What does MEMS stand for? [A]

A) Micro Electronic Mechanical System B) Mechanical Electronic Micro Sensor

C) Micro Electro Mechanical System D) Mechanical Electrical Micro System

8. Which actuator uses piezoelectric materials for operation? [C]

A) DC motor B) Solenoid C) Piezoelectric actuator D) Stepper motor

9. What is the primary purpose of signal conditioning in sensor systems? [B]

A) Data storage B) Signal amplification and filtering

C) Energy conversion D) Mechanical motion

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10. Which sensor is commonly used for detecting magnetic fields? [C]

A) Thermocouple B) Photodiode C) Hall effect sensor D) Ultrasonic sensor

11. What is the primary application of an accelerometer? [C]

A) Temperature measurement B) Pressure measurement

C) Motion detection D) Light intensity measurement

12. Which actuator type is commonly used in pneumatic systems? [A]

A) Hydraulic cylinder B) Stepper motor C) Solenoid D) DC motor

13. What is the primary function of a strain gauge sensor? [D]

A) Measure light intensity B) Measure pressure

C) Measure deformation D) Measure temperature

14. Which sensor type is suitable for measuring humidity? [C]

A) Thermocouple B) Photodiode C) Capacitive sensor D) Hall effect sensor

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C) Resistance Temperature Detector D) Real-Time Detector

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web:eswarcollegeofengg.org

Department of Electronics and Communication Engineering

Course Name: Sensors and Actuators

Evaluation of the Value-Added Courses

Answer all the Questions Each Question Carry 1 Mark

Total Marks: 20M **Min Marks: 12 Marks**

Name of the Student P. Ayyappa **H.T.No:** 15JE1A0401 **Marks obtained:** 12

1. What is the primary function of a sensor? [C]

A) Control a system B) Convert physical quantities into electrical signals

C) Generate mechanical motion D) Store data

2. Which sensor type is commonly used for detecting light intensity? [C]

A) Thermocouple B) Photodiode C) Accelerometer D) Hall effect sensor

3. What is the primary function of an actuator? [A]

A) Measure physical quantities B) Convert electrical signals into mechanical motion

C) Store energy D) Amplify signals

4. Which actuator type is commonly used in robotics for precise angular control? [D]

A) Solenoid B) DC motor C) Stepper motor D) Relay

5. What is the principle behind capacitive sensors? [C]

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6. Which of the following is NOT a type of temperature sensor? [B]

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7. What does MEMS stand for? [C]

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C) Micro Electro Mechanical System D) Mechanical Electrical Micro System

8. Which actuator uses piezoelectric materials for operation? [A]

A) DC motor B) Solenoid C) Piezoelectric actuator D) Stepper motor

9. What is the primary purpose of signal conditioning in sensor systems? [C]

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C) Energy conversion D) Mechanical motion

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C) Measure deformation D) Measure temperature

14. Which sensor type is suitable for measuring humidity? [B]

A) Thermocouple B) Photodiode C) Capacitive sensor D) Hall effect sensor

15. Which actuator type is used for switching purposes in electrical circuits? [C]

A) DC motor B) Relay C) Stepper motor D) Piezoelectric actuator

16. What does RTD stand for? [A]

A) Resistor Temperature Detector B) Resistance Thermodynamic Detector

C) Resistance Temperature Detector D) Real-Time Detector

17. Which sensor type is commonly used for detecting distance in robotics? [B]

A) Ultrasonic sensor B) Hall effect sensor C) Thermocouple D) Photodiode

18. What is the primary function of a pressure sensor? [C]

A) Measure temperature B) Measure light intensity

C) Measure pressure D) Measure distance

19. Which actuator type is commonly used for linear motion control? [D]

A) Stepper motor B) DC motor C) Solenoid D) Hydraulic actuator

20. What is the primary function of a Hall effect sensor? [B]

A) Measure temperature B) Measure magnetic fields

C) Measure light intensity D) Measure pressure

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Department of Electronics and Communication Engineering

1 Week Add-On Course on "Sensors and Actuators"

Dates: 10-12-2018 to 14-12-2018.

Marks Sheet

S.No.	HT.NO	Student Name	Marks
1	15JE1A0401	PANADI AYYAPPA	12
2	15JE1A0402	MALEPATI GURU BHARAT KUMAR	11
3	15JE1A0403	SHAIK JOHNY	12
4	15JE1A0404	KANCHARLA KOTESWAR RAO	13
5	15JE1A0405	SHAIK YALAVARTHIPATI MUNEER AHAMED	12
6	15JE1A0406	SHAIK NAGOOR BASHA	14
7	15JE1A0407	JOGIPARTHI NARASIMHARAO	13
8	15JE1A0409	KOTA RATNA KUMARI	14
9	15JE1A0410	NARISETTY SOWRI BABU	13
10	15JE1A0411	CHAVALI SRILALITHA	12
11	15JE1A0412	KOYA SRINADH	13
12	15JE1A0413	VASA SUDHA RANI	14
13	16JE5A0401	DERANGULA SAI PRIYA	13
14	16JE5A0402	POLAKAM RAVINDRA	14
15	14JE1A0434	KOTHAPALLI SIVA SANKAR	13

Course Coordinator

HOD-ECE

Department of ECE
Eswar College of Engineering
Kesanupalli (V), Narasaraopet - 522 643.

Principal

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Department of Electronics and Communication Engineering

Summary of the Program

Course Name: Sensors and Actuators

The Department of Electronics and Communication Engineering at Eswar College of Engineering, Narasaraopet, proposes to conduct a one-week value-added course on " **Sensors and Actuators**" from **10-12-2018 to 14-12-2018.**. The course aims to enhance the skills and knowledge of 15 students from IV B.Tech I Sem ECE.

Evaluation Criteria for Certification:

- Marks: Students were required to secure a minimum of 60% marks in the evaluation.
- Attendance: A minimum of 80% attendance was mandatory for certification.

Objectives of the Course:

- Equip participants with comprehensive knowledge and understanding of various sensors and actuators, including their principles, types, and applications in engineering and technology.
- Develop practical skills in sensor and actuator interfacing, signal conditioning, and integration within complex engineering systems to enhance functionality and performance.
- Foster critical thinking and problem-solving abilities by exploring real-world applications, emerging technologies, and innovative solutions in the field of sensor and actuator technology.

Course Delivery Method:

- The course consisted of lectures, and practical sessions, conducted by **Mrs D Rekha**, an experienced faculty member from the Department of ECE.
- Interactive sessions encouraged active participation and engagement from the students to ensure effective learning and understanding of the concepts.

Benefits for Students:

Enhanced Skillset: Students will acquire practical skills and knowledge in sensor and actuator technologies, making them more proficient and competitive in the evolving field of engineering and technology.

Career Advancement: With specialized expertise in sensors and actuators, students can explore diverse career opportunities in industries such as robotics, automation, biomedical engineering, and IoT, thereby expanding their career prospects and earning potential.

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Hands-on Experience: The course offers hands-on training and project-based learning opportunities, allowing students to apply theoretical concepts to real-world problems, thereby enhancing their problem-solving, analytical, and teamwork skills.

Innovative Thinking: By exploring emerging technologies and trends in sensor and actuator technology, students will be inspired to think creatively, innovate, and contribute to advancements in the field, fostering a culture of innovation and research-driven learning..

In conclusion, the "Sensors and Actuators" course equips students with essential knowledge and practical skills in the field of engineering and technology. Through hands-on training and project-based learning, students enhance their problem-solving abilities and gain valuable insights into real-world applications. This course fosters innovation and prepares students for diverse career opportunities in industries such as robotics, automation, and IoT.

Faculty Coordinator HOD-ECE Principal

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