

# REPORT

## PRAGATI ENGINEERING COLLEGE

(Approved by AICTE, Permanently Affiliated to JNTUK, KAKINADA & Accredited by NBA)

1-378, A.D.B. Road, Surampalem, Near Peddapuram-533437



## “Robotic Arms”

**Date:** 6-3-2025 To 8-3-2025.

**Day:** Thursday To Saturday

Turing Club organised by the Dept. of CSE – AI&ML of Pragati Engineering College in association with Career Guidance Cell is organizing a seminar on "**Robotic Arms**" as part of Industry 4.0.

**REGISTRATION MADE BY STUDENTS :**

| Sl.No | Roll.No    | Student Name                               |
|-------|------------|--|
| 1     | 23A31A4201 | BALUSU NAGA JAHNAVI                        |
| 2     | 23A31A4202 | CHADALAWADA LAKSHMI SUBRAHMANYA MOUNIKA    |
| 3     | 23A31A4203 | DARSI SAHITHYA                             |
| 4     | 23A31A4204 | DEVARAPALLI HEMA SURYA SAHITYA             |
| 5     | 23A31A4205 | GUTTULA AMRUTHA NOOKAMBIKA                 |
| 6     | 23A31A4206 | ILLA LAKSHMI SIRI SIVA SAI CHANDANA        |
| 7     | 23A31A4207 | KAMIDI LALITHA KUMARI                      |
| 8     | 23A31A4208 | KEDASI ROSHINI                             |
| 9     | 23A31A4209 | KOLA SRI VANAJA GEETHA                     |
| 10    | 23A31A4210 | KOPPANA MONIKA SREE BALA                   |
| 11    | 23A31A4211 | KOPPISETTI SRIJA                           |
| 12    | 23A31A4212 | KORIBILLI BHAVYA SRI                       |
| 13    | 23A31A4213 | KOTHAPALLI SAI ROHINI                      |
| 14    | 23A31A4214 | KOTTAPALLI PUJA                            |
| 15    | 23A31A4215 | MADDUKURI SRILAYA                          |
| 16    | 23A31A4216 | MANDAPATI HARSHITHA                        |
| 17    | 23A31A4217 | MUMMIDI LAKSHMI SAI PAVANA ABHILASYA       |
| 18    | 23A31A4218 | PAPPU CHANDRA SRAVANTHI                    |
| 19    | 23A31A4219 | PARAMSETTI TEJASRI                         |
| 20    | 23A31A4220 | PEDIREDLA PURUHOOTHIKA SRI LAKSHMI         |
| 21    | 23A31A4221 | PENUGONDA MADHURI TEJA                     |
| 22    | 23A31A4222 | PERUMALLA JYOSHNA RANI                     |
| 23    | 23A31A4223 | PINJALA TEJA SRI                           |
| 24    | 23A31A4224 | TEEDA DIVYA CHANDANA                       |
| 25    | 23A31A4225 | TEKI PRASANNA KUMARI                       |
| 26    | 23A31A4226 | VADDI SAHITYA                              |
| 27    | 23A31A4227 | VANAPARTHI NAVYA SRI V VB KEERTHI VARDHINI |
| 28    | 23A31A4228 | VANUM POOJA SRI                            |
| 29    | 23A31A4229 | VEDULLA DIVYA                              |
| 30    | 23A31A4230 | VUNDI KAVYA                                |
| 31    | 23A31A4231 | YELIDINDI RAMA TULASI                      |
| 32    | 23A31A4232 | AGUTUMUDI HEMANTH                          |
| 33    | 23A31A4233 | BARRE NAGENDRA BABU                        |
| 34    | 23A31A4234 | BOMMANA MOHANA SURYA AJAY                  |
| 35    | 23A31A4235 | BUDIDHA SATHWIK ABHIRAM                    |
| 36    | 23A31A4236 | CHINNI BALAJI                              |
| 37    | 23A31A4237 | DASAM NEHRU                                |
| 38    | 23A31A4238 | DASARI GOUTAM                              |
| 39    | 23A31A4239 | DASARI JONATHAN                            |
| 40    | 23A31A4240 | DODDI VENKATA VIJAYA PRADEEP RAJ           |
| 41    | 23A31A4241 | ETHAKOTA PHANI VEERA VENKATA ADITHYA       |
| 42    | 23A31A4242 | JAGGUMAHANATHI NITHIN SAI                  |
| 43    | 23A31A4243 | KANCHUPATLA KARTHIKEYA                     |

|    |            |   |
|----|------------|---|
| 44 | 23A31A4244 | KANDAPU CHARAN TEJA                         |
| 45 | 23A31A4245 | KATHA SAI VENU AKSHAY                       |
| 46 | 23A31A4246 | MADDALA NIKHIL                              |
| 47 | 23A31A4247 | MADHAVARAPU SAI SUPRATHEEK                  |
| 48 | 23A31A4248 | MALIPEDDI TARUN                             |
| 49 | 23A31A4249 | MARNI SHYAM SUNDAR                          |
| 50 | 23A31A4250 | MENDI SADU                                  |
| 51 | 23A31A4251 | NAKKA AARON SUSHMITH                        |
| 52 | 23A31A4252 | NELLI VENKAT SAI PRAVEEN                    |
| 53 | 23A31A4253 | OLETI VAMSI                                 |
| 54 | 23A31A4254 | PABBU SUDHEER                               |
| 55 | 23A31A4255 | PADMANADHUNI VEERA VENKATA SAI AKASH        |
| 56 | 23A31A4256 | PANTHADI SWAROOP KUMAR                      |
| 57 | 23A31A4257 | PATTAPU PETER PAUL                          |
| 58 | 23A31A4258 | RAKETLA PREMASAI                            |
| 59 | 23A31A4259 | SALAGRAMA SURYA PAVAN                       |
| 60 | 23A31A4260 | SANNIGANTI AMIT PAUL                        |
| 61 | 23A31A4261 | SRIGHAKOLLAPU R N V H S SRI KRISHNA         |
| 62 | 23A31A4262 | TATAPUDI NISHOK CHANDRA                     |
| 63 | 23A31A4263 | TURANGI GUNAVARDHAN DEVI PRASAD             |
| 64 | 23A31A4264 | YARRA MANIKANTA                             |
| 65 | 23A31A4265 | ADDENKI SATYA SANTOSHI MAHALAKSHMI          |
| 66 | 23A31A4266 | ALLAMPALLI SHARON ROSE                      |
| 67 | 23A31A4267 | AMJURI CHAITANYA SREYA                      |
| 68 | 23A31A4268 | B ANURITHIKA                                |
| 69 | 23A31A4269 | BELAGAM ANKITA PRIYADARSHINI                |
| 70 | 23A31A4270 | CHAKKA VASAVI                               |
| 71 | 23A31A4271 | CHIKKALA KUSUMA CHANDU                      |
| 72 | 23A31A4272 | CHINTALA RAMANESWARI                        |
| 73 | 23A31A4273 | GANDHAM KAVYANJALI                          |
| 74 | 23A31A4274 | GEDDADA LAVANYA                             |
| 75 | 23A31A4275 | JAGADAM CHARISHMA                           |
| 76 | 23A31A4276 | KAKARLAPUDI ANIKSHA                         |
| 77 | 23A31A4277 | KALAGA CHANDINI NAGA LEELA                  |
| 78 | 23A31A4278 | KONA DEVI                                   |
| 79 | 23A31A4279 | KOTHA SUGANYA                               |
| 80 | 23A31A4280 | KUDUPUDI MEGHANA                            |
| 81 | 23A31A4281 | MANDE JAYATHI SRI ANUSHKA                   |
| 82 | 23A31A4282 | MANEPALLI GAYATHRI BHAVANA DEVI             |
| 83 | 23A31A4283 | MEENAVALLI LAKSHMI APOORVA                  |
| 84 | 23A31A4284 | MOHAMMED ASMA                               |
| 85 | 23A31A4285 | NUNNA NAGA SRILAKSHMI                       |
| 86 | 23A31A4286 | PADALA SIRI CHANDANA                        |
| 87 | 23A31A4287 | PAMPANA JYOTHIKA SRI RAMANI                 |
| 88 | 23A31A4288 | PATCHAMATLA VEERA VENKATA LAKSHMI N SUPRIYA |

## Attendance list :



PRAGATI ENGINEERING COLLEGE  
(Autonomous)  
B.Tech  
Computer Science and Engineering  
(Artificial Intelligence & Machine Learning)

EVENT NAME: Robotic Arms.

DATE: 11-03-2025

SPEAKER NAMES: P.V. Deepthi, K. Deepika, K.V. Akhila.

The list of students attended for this event.

| S.No | Roll No.   | Name of the Student | Year | Signature       |
|------|------------|---------------------|------|-----------------|
| 1    | 23A31A42A5 | G. Mukesh           | II   | G. Mukesh       |
| 2    | 23A31A42C2 | O. Pradeep Kumar    | II   | O. Pradeep      |
| 3    | 23A31A42A0 | B. Rajesh           | II   | B. Rajesh       |
| 4    | 23A31A42B2 | K. Harishankar      | II   | K. Harishankar  |
| 5    | 23A31A42B7 | M. Bhanepraveen     | II   | M. Bhanepraveen |
| 6    | 23A31A42D0 | V. Siddantha        | II   | V. Siddantha    |
| 7    | 24A35A4209 | B. Durgaprasad      | II   | B. Durgaprasad  |
| 8    | 23A31A4232 | A. Hemant           | II   | A. Hemant       |
| 9    | 23A31A4243 | K. Karthikeya       | II   | K. Karthikeya   |
| 10   | 23A31A4244 | K. Charan Teja      | II   | K. Charan Teja  |
| 11   | 23A31A4255 | P. V. S. Akash      | II   | P. Akash        |
| 12   | 23A31A4263 | T. Gunavathani      | II   | T. Gunavathani  |
| 13   | 23A31A4248 | M. Tarun            | II   | M. Tarun        |
| 14   | 23A31A4254 | P. Sachin           | II   | P. Sachin       |

A. S. Swarni / G. Swarnika  
Student coordinator

A. P. Raj  
Faculty Coordinator

HoD-CSE(AI&ML)





PRAGATI ENGINEERING COLLEGE  
(Autonomous)  
B.Tech  
Computer Science and Engineering  
(Artificial Intelligence & Machine Learning)

The list of students attended for this event.

| S.No | Roll No.     | Name of the Student          | Year | Signature        |
|------|--------------|------------------------------|------|------------------|
| 15   | 23A31A4235   | B. Sathwik Abhi Ram          | II   | B. Abhi Ram      |
| 16   | 23A31A4245   | K.S.V. AKSHAY                | II   | K.S.V. AKSHAY    |
| 17   | 24A35A4203   | A. Theerth Choudary          | II   | A. Theerth       |
| 18   | 23 A31A 4234 | B. Mohan Sathya Raj          | II   | B. Raj           |
| 19   | 23A31A42I3   | N. Jaya Ashik                | II   | N. Ashik         |
| 20   | 23A31A4264   | B. Chandrasekharaswamy       | II   | B.C.S. Swamy     |
| 21   | 23A31A42I2   | N.V. Poorna chandea<br>varma | II   | N. RATU          |
| 22   | 23A31A42G9   | G. D. E. Ashok               | II   | G. D. E. Ashok   |
| 23   | 24A35A4206   | T. Sivaganga                 | II   | T. Swa           |
| 24   | 22A31A4236   | Ch. Balaji                   | II   | Ch. Balaji       |
| 25   | 23A31A4258   | O. Vamsi                     | II   | O. Vamsi         |
| 26   | 22A31A42B3   | K. Prudhvi                   | II   | K.P.V.N. Krishna |
| 27   | 24A35A4211   | K. Satyanarayana             | II   | K. Satyanarayana |
| 28   | 23A31A4214   | Kottapalli Priya             | II   | Priya            |
| 29   | 23A31A4222   | P. Jyoshna Rani              | II   | P. Jyoshna       |

G. Swalupa / A. Swari  
Student coordinator

A. Raj  
Faculty Coordinator

HoD-CSE(AI&ML)



PRAGATI ENGINEERING COLLEGE  
(Autonomous)  
B.Tech  
Computer Science and Engineering  
(Artificial Intelligence & Machine Learning)

EVENT NAME: Robotic Arms

DATE: 11-03-2025

SPEAKER NAMES: P.V. Deepthi, K. Deepika, K.V. Akhila.

The list of students attended for this event.

| S.No | Roll No.   | Name of the Student    | Year | Signature         |
|------|------------|------------------------|------|-------------------|
| 1    | 23A31A4205 | B. Mathru Sri          | II   | B. Mathru Sri     |
| 2    | 23A31A4206 | Ch. Varsha             | II   | Ch. Varsha        |
| 3    | 23A31A4201 | A. Soumya              | II   | A. Soumya         |
| 4    | 23A31A4212 | K. Bhavya Sri          | II   | K. Bhavya Sri     |
| 5    | 23A31A4208 | K. Roshini             | II   | K. Roshini        |
| 6    | 23A31A42J7 | H. Kusuma Sri          | II   | H. Kusuma Sri     |
| 7    | 23A31A4213 | K. Sai Rohini          | II   | K. Sai Rohini     |
| 8    | 23A31A42J6 | S. Swaroop Rai         | II   | S. Swaroop Rai    |
| 9    | 23A31A4202 | Ch. L. S. Maulika      | II   | Ch. L. S. Maulika |
| 10   | 23A31A4220 | P. Purushothika        | II   | P. Purushothika   |
| 11   | 23A31A42E2 | K. Anjani Surya Prabha | II   | K. A. S. Prabha   |
| 12   | 23A31A42D7 | Ch. Y. Ramya Sri       | II   | Ch. Y. Ramya Sri  |
| 13   | 23A31A42DB | B. Lakshmi Sravani     | II   | B. L. Sravani     |
| 14   | 23A31A42F6 | T. Renuka<br>Lakshmi   | II   | T. Renuka         |

A. Eswari / G. Swalupa  
Student coordinator

A. Souja  
Faculty Coordinator

HoD-CSE(AI&ML)





PRAGATI ENGINEERING COLLEGE  
(Autonomous)  
B.Tech  
Computer Science and Engineering  
(Artificial Intelligence & Machine Learning)

EVENT NAME: Robotic Arms

DATE: 11-03-2025

SPEAKER NAMES: P.V. Deepthi, K. Deepika, K.V. Akhila.

The list of students attended for this event.

| S.No | Roll No.   | Name of the Student | Year | Signature        |
|------|------------|---------------------|------|------------------|
| 1    | 24A35A4204 | K. Gowtham Karthik  | II   | Gk               |
| 2    | 24A35A4205 | P. Jagadeesh        | II   | P. Jagadeesh     |
| 3    | 23A31A4217 | K. Rajesh           | II   | K. Rajesh        |
| 4    | 23A31A4212 | G. Purga Malleswar  | II   | G. Mall          |
| 5    | 23A31A4213 | V. Satish preetham  | II   | V.S. preetham    |
| 6    | 23A31A4215 | K. Mohan Sai        | II   | K. Mohan Sai     |
| 7    | 23A31A4214 | P. Sairam           | II   | P. Sairam        |
| 8    | 23A31A42B5 | K. Satya Sai        | II   | K. Satya Sai     |
| 9    | 23A31A42A1 | Ch. V. Sairam       | II   | Ch. V. Sairam    |
| 10   | 24A35A4210 | K. Manikantesai Ram | II   | K.M. Sai Ram     |
| 11   | 23A31A42G3 | A.V. Tarun          | II   | A.V. Tarun       |
| 12   | 23A31A42J5 | Y. Lalith Aditya    | II   | Y. Lalith Aditya |
| 13   | 23A31A42G5 | Ch. Pranay Reddy    | II   | Ch. Pranay Reddy |
| 14   | 23A31A42G8 | D. Aditya           | II   | D. Aditya        |

Aeswari/G. Swarupa  
Student coordinator

A. Suj  
Faculty Coordinator

HoD-CSE(AI&ML)



**PRAGATI ENGINEERING COLLEGE**  
**(Autonomous)**  
**B.Tech**  
**Computer Science and Engineering**  
**(Artificial Intelligence & Machine Learning)**

The list of students attended for this event.

| S.No | Roll No.   | Name of the Student | Year | Signature        |
|------|------------|---------------------|------|------------------|
| 15   | 23A31A4236 | Ch. Balaji          | II   | Ch. Balaji       |
| 16   | 23A31A4253 | O. Vamsi            | II   | O. Vamsi         |
| 17   | 23A31A42B3 | K. Prudhvi          | II   | K.P.V. Krishna   |
| 18   | 24A35A4211 | K. Satyanarayana    | II   | K. Satyanarayana |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |
|      |            |                     |      |                  |

G. Swathi/A. Eswari  
Student coordinator

Faculty Coordinator

HoD-CSE(AI&ML)





PRAGATI ENGINEERING COLLEGE  
(Autonomous)  
B.Tech  
Computer Science and Engineering  
(Artificial Intelligence & Machine Learning)

EVENT NAME: Robotic Arms

DATE: 11-03-2025

SPEAKER NAMES: p.v. Deepthi, k. Deepika, k.v. Akhila.

The list of students attended for this event.

| S.No | Roll No.   | Name of the Student     | Year | Signature        |
|------|------------|-------------------------|------|------------------|
| 1    | 23A31A4268 | B. Anurithika           | II   | B. Anurithika    |
| 2    | 23A31A4272 | ch. Ramaneswari         | II   | ch. Ramaneswari  |
| 3    | 23A31A4269 | B. Ankita Priyadarshini | II   | B. Ankita        |
| 4    | 23A31A4270 | ch. Dasari              | II   | Ch. Dasari       |
| 5    | 23A31A4282 | M. Bhavana              | II   | M. Bhavana       |
| 6    | 23A31A4283 | M.L. Apoorva            | II   | M.L. Apoorva     |
| 7    | 23A31A4284 | MD. Asma                | II   | Asma             |
| 8    | 23A31A4285 | N.N. Sri Lakshmi        | II   | Sri Lakshmi      |
| 9    | 23A31A4281 | M. J. S. Anushka        | II   | M. J. S. Anushka |
| 10   | 23A31A4226 | V. Sahitya              | II   | V. Sahitya       |
| 11   | 23A31A4221 | P. Madhureja            | II   | P. Madhureja     |
| 12   | 23A31A4231 | Y. Rama Tulasi          | II   | Y. Rama Tulasi   |
| 13   | 23A31A4201 | B. Naga Jahnvi          | II   | B.N. Jahnvi      |
| 14   | 23A31A4216 | M. Harshitha            | II   | Harshitha        |

A. Eswari / G. Swathy  
Student coordinator

A. Srinivas  
Faculty Coordinator

HoD-CSE(AI&ML)



PRAGATI ENGINEERING COLLEGE  
(Autonomous)  
B.Tech  
Computer Science and Engineering  
(Artificial Intelligence & Machine Learning)

The list of students attended for this event.

| S.No | Roll No.   | Name of the Student | Year | Signature          |
|------|------------|---------------------|------|--------------------|
| 1    | 23A31A42D4 | B. Hari Deepika     | II   | B. Hari Deepika    |
| 2    | 23A31A42E3 | K. Navya Jyothi     | II   | K. Navya           |
| 3    | 23A31A42G7 | A. Chaitanya Sriya  | II   | A. Chaitanya Sriya |
| 4    | 23A31A4280 | K. Meghana          | II   | K. Meghana         |
| 5    | 23A31A4278 | K. Devi             | II   | K. Devi            |
| 6    | 23A31A42F7 | T. Chandrakranti    | II   | T. Chy             |
| 7    | 23A31A42F4 | B. Kusuma           | II   | B. Kusuma          |
| 8    | 23A31A42D9 | D. Sriya            | II   | D. Sriya           |
| 9    | 23A31A42F1 | P. Likhitha         | II   | P. Likhitha        |
| 10   | 23A31A4265 | A. Santoshi         | II   | A. Santoshi        |
| 11   | 24A35A4207 | D. Srikaradurga     | II   | D. Durga           |
| 12   | 23A31A4279 | K. Suganya          | II   | K. Suganya         |
| 13   | 23A31A4277 | K. Chandini         | II   | K. Chandini        |
| 14   | 23A31A4214 | Kottapalli Preraj   | II   | Preraj             |
| 15   | 23A31A4222 | P. Jyoshna Dani     | II   | P. Jyoshna Dani    |

G. Swalupa / Aeswari  
Student coordinator

A. S. Saji  
Faculty Coordinator

HoD-CSE(AI&ML)

## **FEED BACK ANALYSIS**

**How satisfied were you with the session content:**

Total number of Students : **84**

**TECHNICAL PRESENTATION OF THE SPEAKER (1(Lowest)-5(Highest)):**

Number Of Students Rating **5** : **45**

Number Of Students Rating **4** : **28**

Number Of Students Rating **3** : **7**

Number Of Students Rating **2.5**: **4**

**CONTENT OF THE TOPIC COVERED (1(Lowest)-5(Highest)):**

Number Of Students Rating **5** : **52**

Number Of Students Rating **4** : **29**

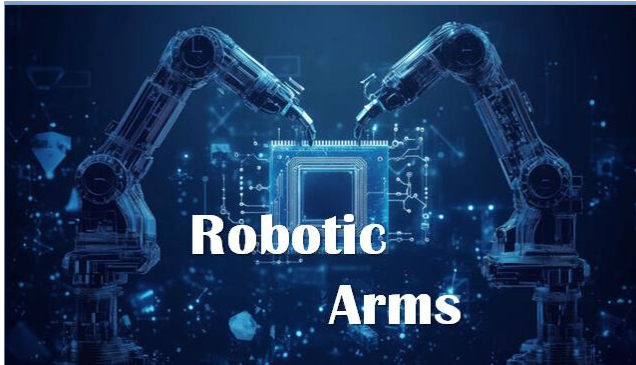
Number Of Students Rating **3** : **3**

Overall rating: **Very Good**

Overall Feedback :**GOOD**



## Content Delivered in the Event:



### Introduction:

Imagine a machine capable of precise movements, tireless operation, and the ability to handle tasks ranging from delicate surgery to heavy manufacturing. This is the world of robotic arms, and they are rapidly transforming industries and our lives.

Working Principle A robotic arm follows programmed instructions or AI-based control systems to perform tasks. The control system interprets inputs from sensors and sends signals to actuators, which move the joints accordingly. Advanced robotic arms use machine learning and computer vision for adaptive movement.

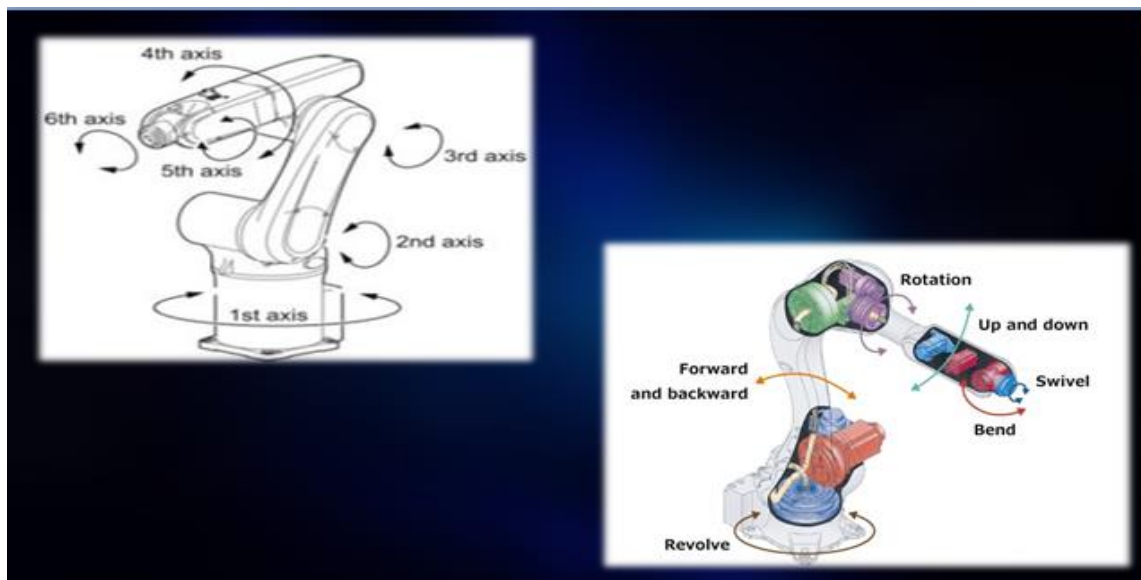
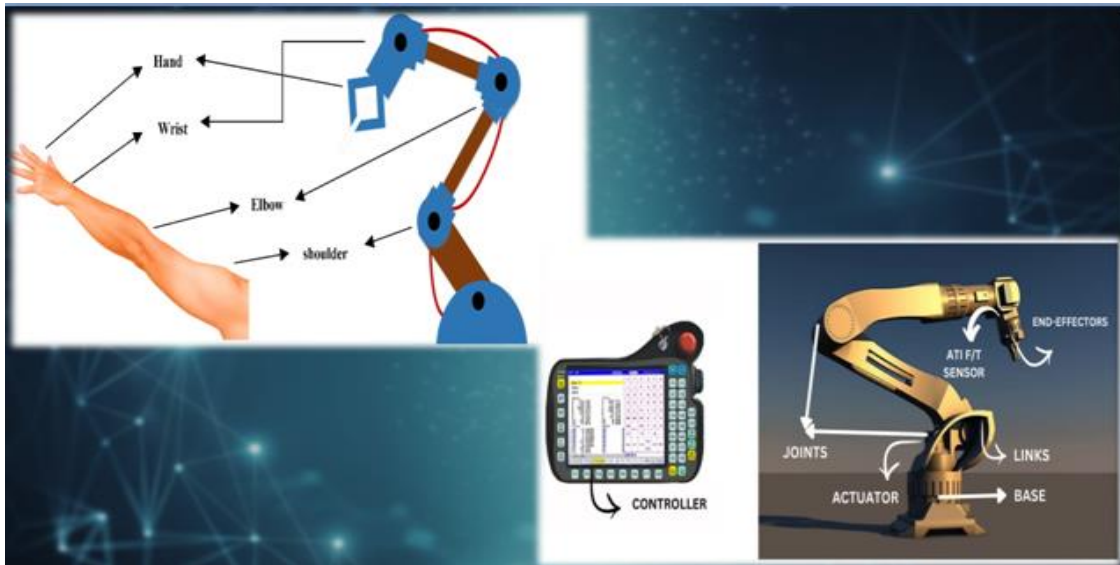
### Working Principle:

- A robotic arm follows programmed instructions or AI-based control systems to perform tasks.
- The control system interprets inputs from sensors and sends signals to actuators, which move the joints accordingly. Advanced robotic arms use machine learning and computer vision for adaptive movement.



# Components of Robotic Arm:

- **Base:** The foundation of the robotic arm, which holds it stable. Can be fixed or mobile (e.g., on a moving platform).
- **Joints:** Allow movement and flexibility. Types: Rotational, prismatic (linear movement), spherical.
- **Links:** The rigid segments that connect joints.
- **Actuators:** Motors that drive the arm's motion. Types: Electric (servo, stepper motors), Hydraulic, Pneumatic.
- **End-Effector (Gripper/Tool):** The "hand" of the robotic arm, which performs tasks. Can be a gripper, suction cup, welding torch, or robotic hand.
- **Sensors:** Provide feedback on position, force, and obstacles. Examples: Proximity sensors, force sensors, vision cameras.
- **Controller & Software:** The brain of the robotic arm, controlling movement. Uses programming languages like Python, C++, and ROS (Robot Operating System).





## Key Characteristics:

- ❑ **Programmability:** Robotic arms are controlled by computer programs, allowing for automated and also repeatable tasks.
- ❑ **Degrees of Freedom:** The number of independent movements a robotic arm can make. More degrees of freedom generally mean greater flexibility.
- ❑ **Precision:** Robotic arms can perform tasks with a high degree of accuracy and repeatability.
- ❑ **Payload Capacity:** The amount of weight a robotic arm can lift or manipulate.
- ❑ **End Effector:** The tool attached to the end of the arm, customized for specific tasks (e.g., grippers, welders, spray guns).

## Overview of Applications:

- ❖ From manufacturing and healthcare to exploration and research, robotic arms are finding applications in a vast range of fields.
- ❖ Robotic arms, with their versatile applications, are transforming industries by automating tasks like material handling, welding, assembly, and more, increasing efficiency and reducing human labor.
- ❖ Robotic arms are helping in warehouses to seamlessly load and unload heavy items from conveyor belts, transport fragile products without causing damage, and stack pallets with impeccable accuracy.

## Examples of robotic arms assembling products:

Welding: Show robotic welding in automotive or other industries.

Painting: Show robotic arms painting cars or other objects.








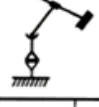


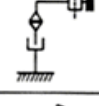


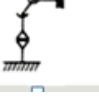

Material Handling: Show robotic arms moving materials in a warehouse.

Packaging: Show robotic arms packaging products. Discuss the benefits of using robotic arms in manufacturing (e.g., increased efficiency, precision, safety).



# Types of robotic arms:

- Spherical robotic arm
- SCARA robotic arm
- Articulated robotic arm
- Cartesian robotic arm
- Cylindrical robotic arm
- Collaborative robotic arm
- Parallel robotic arm

| Principle  | Kinematic Structure   | Workspace   | Function   |
|--|---|---|--|
|  <p>Cartesian Robot</p>     |    |    | <p>Rectangular arms are sometimes called '<b>Cartesian</b>' because the arm's axes can be described by using the X, Y, and Z coordinate system. It is claimed that the cartesian design will produce the most accurate movements.</p>                                |
|  <p>Cylindrical Robot</p>   |    |    | <p>A <b>cylindrical</b> arm also has three degrees of freedom, but it moves linearly only along the Y and Z axes. Its third degree of freedom is the rotation at its base around the two axes. The work envelope is in the shape of a cylinder.</p>                  |
|  <p>Spherical Robot</p>     |   |   | <p>The <b>spherical</b> arm, also known as polar coordinate robot arm, has one sliding motion and two rotational, around the vertical post and around a shoulder joint. The spherical arm's work envelope is a partial sphere which has various length radii.</p>    |
|  <p>SCARA Robot</p>       |  |  | <p>The <b>SCARA</b> (Selection Compliance Assembly Robot Arm) is also known as a horizontal articulated arm robot. Some SCARA robots rotate about all three axes, and some have sliding motion along one axis in combination with rotation about another.</p>        |
|  <p>Articulated Robot</p> |  |  | <p>The last and most used design is the <b>jointed</b>-arm., also known as an articulated robot arm. All joints in the arm can rotate, creating six degrees of freedom. The other three are pitch, yaw, and roll. Pitch is when you move your wrist up and down.</p> |

## Spherical robot / Polar robot:

Used for handling machine tools, spot welding, die casting, fettling machines, gas welding and arc welding. It is a robot whose axes form a polar coordinate system.



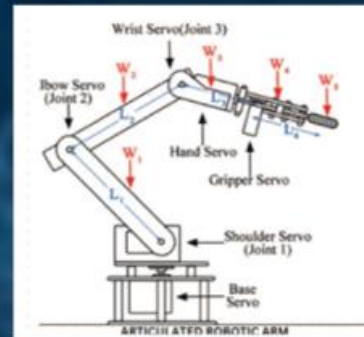
## SCARA Robot(Selective Compliance Assembly Robot Arm):

- SCARA robots have a distinctive design with two parallel arms connected by joints, allowing movement in a single plane (typically the horizontal plane).
- They also have a vertical axis for up-and-down motion.
- This configuration gives them 'selective compliance' - they are compliant (flexible) in the X-Y plane but rigid in the Z-axis.



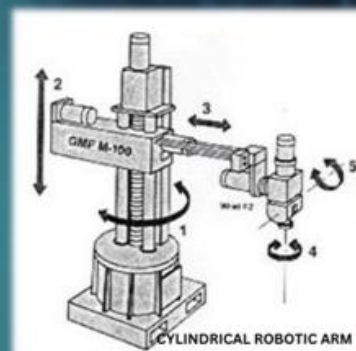
## Articulated Robots:

- Description: The most common type, resembling a human arm with multiple joints (typically 4-6 degrees of freedom).
- Advantages: Highly flexible and versatile, capable of complex movements and reaching into tight spaces.
- Applications: Welding, painting, assembly, material handling.



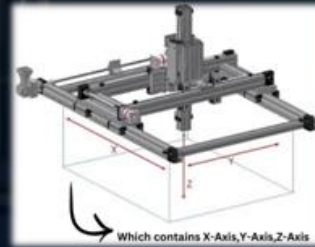
## Cylindrical Robots:

- Description: Have one rotary axis and two linear axes, creating a cylindrical workspace.
- Advantages: Relatively simple design, suitable for specific tasks.
- Applications: Pick and place, material handling, welding.



## Cartesian Robots (Gantry Robots):

- **Description:** Move along three linear axes (X, Y, Z). Often large and used for heavy lifting.
- **Advantages:** Simple to program, high accuracy, large workspace.
- **Applications:** Material handling, packaging, palletizing, CNC machining.



## Collaborative Robots (Cobots):

- **Description:** Designed to work collaboratively with humans in a shared workspace. Focus on safety and ease of use.
- **Advantages:** Safe for human interaction, easy to program, adaptable to various tasks.
- **Applications:** Assembly, material handling, inspection, research.

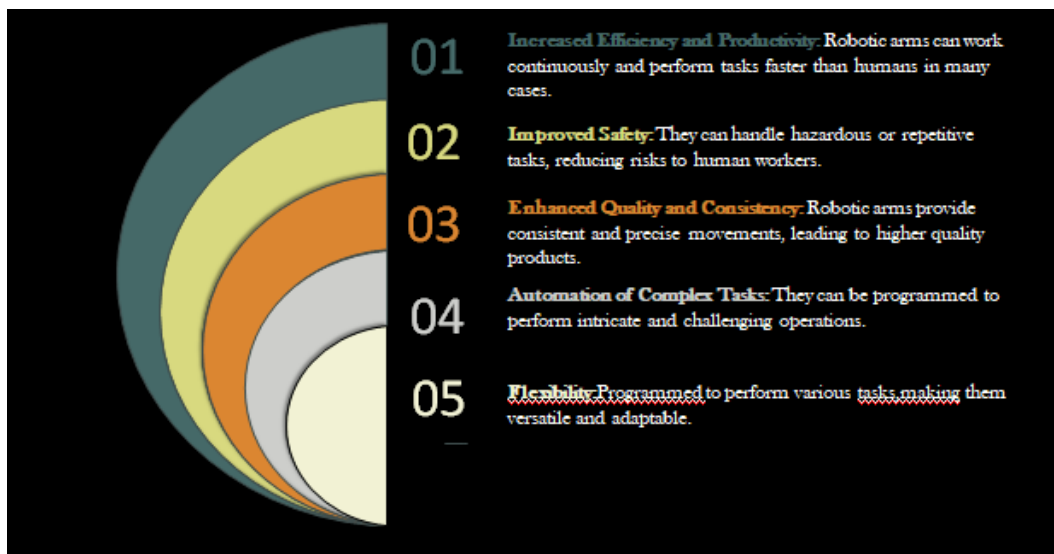


## Parallel Robots (Delta Robots):

- **Description:** Use multiple linked parallel arms to support a single end effector.
- **Advantages:** High speed and acceleration, precise movements.
- **Applications:** High-speed pick and place, packaging, sorting.







## Enhanced Dexterity and Precision:

- **Soft Robotics:** The development of soft robotic arms made from flexible materials will enable them to handle delicate objects and perform intricate tasks with greater precision. This will open up new possibilities in areas like surgery, food handling, and manufacturing of sensitive electronics.
- **Advanced Sensors:** Integration of sophisticated sensors, including tactile and vision sensors, will provide robotic arms with a better understanding of their environment, allowing for more precise movements and improved adaptability.

## Increased Autonomy and Intelligence:

- **AI and Machine Learning:** Integrating AI and machine learning algorithms will enable robotic arms to learn from their experiences, adapt to changing conditions, and make decisions autonomously. This will improve their efficiency and allow them to perform more complex tasks with minimal human intervention.
- **Edge Computing:** Utilizing edge computing will allow robotic arms to process data in real-time, enabling faster response times and improved decision-making, especially in time-sensitive applications like surgery or manufacturing.

## Expanding Applications:

- **Service Robots:** Robotic arms will be increasingly integrated into service robots for tasks such as cleaning, cooking, elder care, and customer service. This will improve efficiency and quality of service in various industries.
- **Healthcare:** Robotic arms will play a greater role in surgery, rehabilitation, diagnostics, and drug dispensing, leading to improved patient outcomes and more efficient healthcare systems.
- **Space Exploration:** Robotic arms will be crucial in space exploration for tasks like assembling habitats, collecting samples, and performing repairs, enabling safer and more efficient space missions.
- **Construction:** Robotic arms will be used in construction for tasks such as bricklaying, welding, and material handling, improving safety and productivity on construction sites.

## Human-Robot Collaboration:

- **Cobots:** Collaborative robots (cobots) designed to work alongside humans will become more prevalent in various industries. This will enable humans and robots to combine their strengths, leading to increased productivity and improved working conditions.
- **Intuitive Interfaces:** The development of intuitive interfaces, such as voice control or gesture recognition, will make it easier for humans to interact with and control robotic arms, fostering better collaboration.

## Conclusion:

- In conclusion, robotic arms have emerged as a transformative technology with a profound impact across diverse sectors.
- From revolutionizing industrial manufacturing through automation and precision to enabling groundbreaking advancements in medical procedures and space exploration, their versatility and adaptability are undeniable.
- While challenges remain in areas like cost, complexity, and the need for sophisticated AI, the trajectory of robotic arm development points toward a future where they become even more integrated into our lives.
- Continued innovation in areas like soft robotics, enhanced sensing, and human-robot collaboration promises to unlock even greater potential, paving the way for more efficient, safer, and more productive workplaces, as well as opening up new possibilities in fields we can only begin to imagine.
- As robotic arms become more intelligent, dexterous, and accessible, they will undoubtedly play a crucial role in shaping the future of technology and human endeavor.





# Pragati Engineering College (AUTONOMOUS)

Department of

CSE(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)

organizes



# ROBOTIC ARMS

*- The Art of Automated Dexterity*

## Event Speakers:-



K. Veera Akhila  
22A31A42D7



K. Deepika  
22A31A42D9



P. Vidhya Deepthi  
22A31A42E6

**Date:- 11-03-2025**

**Venue:-Conference Hall**

**Time:-1:30PM - 3:30PM**

Head of the Department

**Dr. A. Radha Krishna**

## Student coordinators:

A.Eswari-22A31A42C7

G.Swarupa-22A31A42D3

## Faculty coordinators

Mrs.L. Yamuna

Mrs.A.Srujana Jyothi



## Event Photos:







GPS Map Camera  
**Kakinada, Andhra Pradesh, India**  
Peddapuram, Kakinada, Andhra Pradesh 533437, India  
Lat 17.082954, Long 82.053939  
03/11/2025 02:55 PM GMT+05:30  
Note : Captured by GPS Map Camera



GPS Map Camera  
**Kakinada, Andhra Pradesh, India**  
Peddapuram, Kakinada, Andhra Pradesh 533437, India  
Lat 17.083036, Long 82.053956  
03/11/2025 01:56 PM GMT+05:30  
Note : Captured by GPS Map Camera



# PRAGATI ENGINEERING COLLEGE

(Autonomous)

DEPARTMENT OF CSE ( Artificial Intelligence & Machine Learning)

**PEC / Admin / Circular / 2025 / Turing CLUB**

**Date: 8-03-2025.**

All the staff, Pragati Turing club coordinators, First year Students are informed that a seminar on **“Robotic Arms”** is being organized by Turing club & IAENG in association with career Guidance cell. The details are given below.

**Date:** 11- 3-2025

**Time:** 1:30 PM to 3:30 PM

**Venue:** Conference Hall

**Faculty Co-ordinator:** Mrs.L.Yamuna, Mrs. A Srujana Jyothi

**Student Co-ordinator:** A. Eswari (III -year CSE (AI&ML)-22A31A42C7)

G.Swarupa (III-year CSE (AI&ML)-22A31A42D3)

**Speaker:** K.Veera Akhila (III -year CSE (AI&ML)-22A31A42D7)

K.Deepika (III -year CSE (AI&ML)-22A31A42D9)

P.V.Deepthi (III -year CSE (AI&ML)-22A31A42E6)

**Faculty coordinator**

**HoD-CSE(AI&ML)**

Copy to:

- 1) Chairman /All Directors / Vice President for kind information.
- 2) Vice Principal/Dean T&P for information.
- 3) All HoDs are requested to circulate among your staff members.
- 4) Convener-Career Guidance cell
- 5) Office File.