# Annexure – I

## CREDIT FRAMEWORK STRUCTURE

| Semester | | I | II | III | IV | V | VI | VII | VIII | Total Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| Basic Science Course | BSC/ESC | 7 | 7 | | | | | | | 14 |
| Engineering Science Course | | 6 | 6 | | | | | | | 12 |
| Program Core Course (PCC) | Program Courses | 2 | 2 | 13 | 10 | 7 | 4 | 6 | | 44 |
| Program Elective Course (PEC) | | | | | | 4 | 6 | 6 | 4 | 20 |
| Multidisciplinary Minor (MDM) | Multidisciplinary Courses | | | 2 | 3 | 3 | 3 | 3 | | 14 |
| Open Elective (OE) Other than a particular program | | | | | | 2 | 3 | 3 | | 08 |
| Vocational and Skill Enhancement Course (VSEC) | Skill Courses | 2 | | 1 | 1 | 2 | 2 | | | 08 |
| Ability Enhancement Course (AEC -01, AEC-02) | Humanities Social Science and Management (HSSM) | 1 | 1 | | | 2 | | | | 04 |
| Entrepreneurship/Economics/Management Courses | | | | 2 | 2 | | | | | 04 |
| Indian Knowledge System (IKS) | | | 2 | | | | | | | 02 |
| Value Education Course (VEC) | | | | 2 | 2 | | | | | 04 |
| Research Methodology | Experiential Learning Courses | | | | | | | | 4 | 04 |
| Comm. Engg. Project (CEP)/ Field Project (FP) | | | | | 2 | | | | | 02 |
| Project | | | | | | | 2 | 2 | | 04 |
| Internship/OJT | | | | | | | | | 12 | 12 |
| Co-curricular Courses (CC) | Liberal Learning Courses | 2 | 2 | | | | | | | 04 |
| **Total Credits (Major)** | | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **160** |

| | | | | |
|---|---|---|---|---|
| | | July 2026 | NEP 4.0 | Applicable for 2026-27 Admitted |
| Chairman - BoS | Dean – Academics | Date of Release | Version | |

# ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

## B. Tech. Scheme of Examination & Syllabus 2026-27

## ROBOTICS AND ARTIFICIAL INTELLIGENCE

### FIRST SEMESTER

| Sr. No. | Course Category | Course Code | Course Title | Hours per Week | | | Credits | Maximum Marks | | | | Min Passing marks | Duration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Mid-Sem Examination | Continual Assessment | End Sem Examination | Total | | No. of Hrs. for ESE |
| 1 | BSC | 26RA101T | Applied Physics | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 2 | BSC | 26RA101P | Applied Physics Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 3 | BSC | 26RA102T | Linear Algebra and Calculus | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 4 | BSC | 26RA102P | Linear Algebra and Calculus Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 5 | ESC | 26RA103T | Engineering Mechanics | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 6 | ESC | 26RA103P | Engineering Mechanics Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 7 | ESC | 26RA104T | Logic Building with C and Python | 2 | - | | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 8 | ESC | 26RA104P | Logic Building with C and Python Lab | - | - | 2 | 1 | | 25 | 25 | 50 | 25 | - |
| 9 | PCC | 26RA105T | Fundamentals of Robotics | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 10 | AEC | 26RA106P | Business Communication Skills I Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 11 | SEC | 26RA207T | Design Thinking# | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 12 | CC | 26RA108P | Co-curricular Courses - I | - | - | 4 | 2 | - | 50 | - | 50 | 25 | - |
| Total | | | | 13 | | 14 | 20 | 70 | 245 | 335 | 650 | - | - |

**#: To be conducted through online MOOC (NPTEL)**

| | | | | |
|---|---|---|---|---|
| | | July 2026 | NEP 4.0 | Applicable for 2026-27 |
| Chairman - BoS | Dean – Academics | Date of Release | Version | |

# ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

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## B. Tech. Scheme of Examination & Syllabus 2026-27

## ROBOTICS AND ARTIFICIAL INTELLIGENCE

### SECOND SEMESTER

| Sr No | Course Category | Course Code | Course Title | Hours per Week | | | Credits | Maximum Marks | | | | Min Passing marks | Duration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Mid-Sem Examination | Continual Assessment | End Sem Examination | Total | | No. of Hrs. for ESE |
| 1 | BSC | 26RA201T | Applied Chemistry | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 2 | BSC | 26RA201P | Applied Chemistry Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 3 | BSC | 26RA202T | Statistics and Transforms | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 4 | BSC | 26RA202P | Statistics and Transforms Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 5 | ESC | 26RA203T | Engineering Graphics | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 6 | ESC | 26RA203P | Engineering Graphics Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 7 | ESC | 26RA204T | Basics of Electrical and Electronics Engineering | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 8 | ESC | 26RA204P | Basics of Electrical and Electronics Engineering lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 9 | PCC | 26RA205T | Fundamentals of AI | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 10 | AEC | 26RA206P | Business Communication Skills – II Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 11 | IKS | 26RA107T | Indian Knowledge Systems# | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 12 | CC | 26RA208P | Co-curricular Courses – II | - | - | 4 | 2 | - | 50 | - | 50 | 25 | - |
| Total | | | | 13 | | 14 | 20 | 70 | 245 | 335 | 650 | | |

**#: To be conducted through online MOOC (NPTEL)**

| | | | | |
|---|---|---|---|---|
| | | July 2026 | NEP 4.0 | Applicable for 2026-27 |
| Chairman - BoS | Dean – Academics | Date of Release | Version | |

# ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

## B. Tech. Scheme of Examination & Syllabus 2026-27

## ROBOTICS AND ARTIFICIAL INTELLIGENCE

### THIRD SEMESTER

| Sr No | Course Category | Course Code | Course Title | Hours per Week | | | Credits | Maximum Marks | | | | Min Passing marks | Duration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Mid-Sem Examination | Continual Assessment | End Sem Examination | Total | | No. of Hrs for ESE |
| 1. | PCC | 26RA301T | Analog and Digital Electronics | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 2. | PCC | 26RA301P | Analog and Digital Electronics Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 1 | PCC | 26RA302T | Actuators for Robotics | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 3. | PCC | 26RA303T | Robot Mechanisms | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 4. | PCC | 26RA303P | Robot Mechanisms Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 5. | PCC | 26RA304P | Robot Programming Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 6. | PCC | 26RA305T | Robot Safety and Maintenance | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 7. | VEC | 26RA401T | Environmental Science | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 8. | HSSM | 26RA402T | Fundamentals of Economics and Management | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 9. | SEC | 26RA341P | Career Development - I | - | - | 2 | 1 | - | 50 | - | 50 | 25 | - |
| 10. | MDM | 26RA331M | MDM-I (Refer MDM basket) | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| | | | Total | 16 | | 8 | 20 | 90 | 215 | 345 | 650 | | |

**Note: MDM – I course will be conducted through MOOC (NPTEL). The course will be notified one month prior to commencement of semester.**

| MDM-I | |
|---|---|
| 26RA331M | |

| | | | | |
|---|---|---|---|---|
| | | July 2026 | NEP 4.0 | Applicable for 2027-28 |
| Chairman - BoS | Dean – Academics | Date of Release | Version | |

# ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

## B. Tech. Scheme of Examination & Syllabus 2026-27

## ROBOTICS AND ARTIFICIAL INTELLIGENCE

### FOURTH SEMESTER

| Sr No | Course Category | Course Code | Course Title | Hours per Week | | | Credits | Maximum Marks | | | | Min Passing marks | Duration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Mid-Sem Examination | Continual Assessment | End Sem Examination | Total | | No. of Hrs for ESE |
| 1 | PCC | 26RA401T | Machine Learning | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 2 | PCC | 26RA401P | Machine Learning Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 3 | PCC | 26RA402T | Sensors and Microcontrollers for Robotics | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 4 | PCC | 26RA402P | Sensors and Microcontrollers Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 5 | PCC | 26RA403T | Robot Kinematics | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 6 | PCC | 26RA403P | Robot Kinematics Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 7 | VEC | 26ES301T | Constitution of India | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 8 | HSSM | 26ES302T | Fundamentals of Entrepreneurship | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 9 | SEC | 26RA441P | Career Development - II | - | - | 2 | 1 | - | 50 | - | 50 | 25 | - |
| 10 | CEP | 26RA404P | Mini Project* | - | - | 4 | 2 | - | 50 | - | 50 | 25 | - |
| 11 | MDM | 26RA431M | MDM-II (Refer MDM basket) | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| | | | Total | 14 | | 12 | 20 | 80 | 255 | 315 | 650 | | |

*** Field Project or Community engagement project in the major discipline**

**Note: MDM - II course will be conducted through MOOC (NPTEL). The course will be notified one month prior to commencement of semester.**

| MDM-II | |
|---|---|
| 26RA431M | |

| | | | | |
|---|---|---|---|---|
| | | July 2026 | NEP 4.0 | Applicable for 2027-28 |
| Chairman - BoS | Dean – Academics | Date of Release | Version | |

# ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

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## B. Tech. Scheme of Examination & Syllabus 2026-27

## ROBOTICS AND ARTIFICIAL INTELLIGENCE

### FIFTH SEMESTER

| Sr No | Course Category | Course Code | Course Title | Hours per Week | | | Credits | Maximum Marks | | | | Min Passing marks | Duration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Mid-Sem Examination | Continual Assessment | End Sem Examination | Total | | No of Hours for ESE |
| 1 | PCC | 26RA501T | Robot Dynamics | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 2 | PCC | 26RA501P | Robot Dynamics Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 3 | PCC | 26RA502T | Control Systems | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 4 | PEC | 26RA503T | Program Elective course - I | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 5 | PEC | 26RA503P | Program Elective course – I Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 6 | VSC | 26RA504P | Technical Skill Development - I | - | - | 4 | 2 | - | 50 | - | 50 | 25 | - |
| 7 | AEC | 26RA541P | English for Engineers | - | - | 4 | 2 | - | 50 | - | 50 | 25 | - |
| 8 | MDM | 26RA531M | MDM – III (Refer MDM basket) | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 9 | OE | 26RA561O | Open Elective – I (Refer OE basket) | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| | | | Total | 14 | | 12 | 20 | 90 | 240 | 320 | 650 | | |

**Note: MDM - III course will be conducted through MOOC (NPTEL). The course will be notified one month prior to commencement of semester.**

| Program Elective course - I | |
|---|---|
| 26RA503T(i) | Mobile and Micro Robotics |
| 26RA503T(ii) | Data Analytics |
| 26RA503T(iii) | Intelligent Manufacturing |

| MDM-III | |
|---|---|
| 26RA531M | |

| Program Elective course – I Lab | |
|---|---|
| 26RA503P(i) | Mobile and Micro Robotics Lab |
| 26RA503P(ii) | Data Analytics Lab |
| 26RA503P(iii) | Intelligent Manufacturing Lab |

| Open Elective – I | |
|---|---|
| 26RA561M | Basics of Robotics |

| | | | | |
|---|---|---|---|---|
| | | July 2026 | NEP 4.0 | Applicable for 2028-29 |
| Chairman - BoS | Dean – Academics | Date of Release | Version | |

# ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

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## B. Tech. Scheme of Examination & Syllabus 2026-27

## ROBOTICS AND ARTIFICIAL INTELLIGENCE

### SIXTH SEMESTER

| Sr No | Course Category | Course Code | Course Title | Hours per Week | | | Credits | Maximum Marks | | | | Min Passing marks | Duration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Mid-Sem Examination | Continual Assessment | End Sem Examination | Total | | No of Hours for ESE |
| 1 | PCC | **26RA601T** | Vision for Robotics | **2** | **-** | **-** | **2** | **10** | **10** | **30** | **50** | **23** | **1.5** |
| 2 | PCC | **26RA602T** | Deep Learning | **2** | **-** | **-** | **2** | **10** | **10** | **30** | **50** | **23** | **1.5** |
| 3 | PEC | **26RA603T** | Program Elective course - II | **3** | **-** | **-** | **3** | **20** | **20** | **60** | **100** | **45** | **3** |
| 4 | PEC | **26RA604T** | Program Elective course - III | **3** | **-** | **-** | **3** | **20** | **20** | **60** | **100** | **45** | **3** |
| 5 | VSC | **26RA605P** | Technical Skill Development - II | **-** | **-** | **4** | **2** | **-** | **50** | **-** | **50** | **25** | **-** |
| 6 | PROJ | **26RA606P** | Project - I | **-** | **-** | **4** | **2** | **-** | **50** | **50** | **100** | **50** | **-** |
| 7 | MDM | **26RA631M** | MDM – IV (Refer MDM basket) | **3** | **-** | **-** | **3** | **20** | **20** | **60** | **100** | **45** | **3** |
| 8 | OE | **26RA661O** | Open Elective – II (Refer OE basket) | **3** | **-** | **-** | **3** | **20** | **20** | **60** | **100** | **45** | **3** |
| | | | **Total** | **16** | | **8** | **20** | **100** | **200** | **350** | **650** | | |

**Note: Any one PCC/PEC course will be conducted through MOOC (NPTEL). The course will be notified one month prior to commencement of semester.**

| MDM-IV | |
|---|---|
| 26RA631M | |

| Program Elective course - II | |
|---|---|
| 26RA603T(i) | Autonomous Robotics and Telecherics |
| 26RA603T(ii) | Control of Robotic Systems |
| 26RA603T (iii) | Industrial Electronics and Power Convertors |

| Program Elective course – III | |
|---|---|
| 26RA604T(i) | Robot System Design and SLAM |
| 26RA604(ii) | Hydraulic & Pneumatic Drives for Robots |
| 26RA604T(iii) | Micro Electro Mechanical Systems |

| Open Elective – II | |
|---|---|
| 26RA661M | Robot Drives and Actuators |

| | | | | |
|---|---|---|---|---|
| | | **July 2026** | **NEP 4.0** | **Applicable for 2028-29** |
| **Chairman - BoS** | **Dean – Academics** | **Date of Release** | **Version** | |

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## B. Tech. Scheme of Examination & Syllabus 2026-27

## ROBOTICS AND ARTIFICIAL INTELLIGENCE

### SEVENTH SEMESTER

| Sr No | Course Category | Course Code | Course Title | Hours per Week | | | Credits | Maximum Marks | | | | Min Passing marks | Duration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Mid-Sem Examination | Continual Assessment | End Sem Examination | Total | | No of Hours for ESE |
| 1 | PCC | 26RA701T | Aerial Robotics | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 2 | PCC | 26RA701P | Aerial Robotics Lab | - | - | 2 | 1 | | 25 | 25 | 50 | 25 | - |
| 3 | PCC | 26RA702T | Natural Language Processing | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 4 | PCC | 26RA702P | Natural Language Processing Lab | - | - | 2 | 1 | - | 25 | 25 | 50 | - | - |
| 5 | PEC | 26RA703T | Program Elective course - IV | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 6 | PEC | 26RA704T | Program Elective course - V | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 7 | MDM | 26RA731M | MDM – V (Refer MDM basket) | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 8 | OE | 26RA761O | Open Elective – III (Refer OE basket) | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 9 | PROJ | 26RA705P | Project - II | - | - | 4 | 2 | - | 50 | 50 | 100 | 50 | - |
| | | | **Total** | **16** | | **8** | **20** | **80** | **205** | **365** | **650** | | |

**Note: MDM - V course will be conducted through MOOC (NPTEL). The course will be notified one month prior to commencement of semester.**

| MDM-V | |
|---|---|
| 26RA731M | |

| Program Elective course - IV | |
|---|---|
| 26RA703T(i) | Biomedical Robotics |
| 26RA703T(ii) | Augmented Reality and Virtual Reality |
| 26RA703T(iii) | Advanced Mechatronics |

| Program Elective course – V | |
|---|---|
| 26RA704T(iii) | Swarm Robotics |
| 26RA704T(iv) | Service Robotics |
| 26RA704T(v) | Human Robot Interaction |

| Open Elective – II | |
|---|---|
| 26RA761M | Robot Safety and Maintenance |

| | | | | |
|---|---|---|---|---|
| | | July 2026 | NEP 4.0 | Applicable for 2029-30 |
| Chairman - BoS | Dean – Academics | Date of Release | Version | |

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## B. Tech. Scheme of Examination & Syllabus 2026-27

## ROBOTICS AND ARTIFICIAL INTELLIGENCE

### EIGHTH SEMESTER

**Option A**

| Sr No | Course Category | Course Code | Course Title | Hours per Week | | | Credits | Maximum Marks | | | | Min Passing Marks | No of Hours for ESE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Mid-Sem Examination | Continual Assessment | End Sem Examination | Total | | |
| 1 | RM | 26RA801T | Research Methodology# | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 2 | RM | 26RA801P | Research Methodology Lab# | - | - | 4 | 2 | - | 25 | 25 | 50 | 25 | - |
| 3 | PEC | 26RA802T | Program Elective - VI # | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 4 | PEC | 26RA803P | Program Elective - VI Lab # | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 5 | OJT | 26RA804P(i) | Industry/Research Internship* | - | - | 24 | 12 | - | 200 | 200 | 400 | 200 | - |
| | | | **Total** | **5** | **0** | **30** | **20** | **30** | **280** | **340** | **650** | | |

**Option B**

| Sr No | Course Category | Course Code | Course Title | Hours per Week | | | Credits | Maximum Marks | | | | Min Passing Marks | No of Hours for ESE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Continual Assessment | Mid-Sem Examination | End Sem Examination | Total | | |
| 1 | RM | 26RA801T | Research Methodology# | 2 | - | - | 2 | 10 | 10 | 30 | 50 | 23 | 1.5 |
| 2 | RM | 26RA801P | Research Methodology Lab# | - | - | 4 | 2 | - | 25 | 25 | 50 | 25 | - |
| 3 | PEC | 26RA802T | Program Elective Course - VI # | 3 | - | - | 3 | 20 | 20 | 60 | 100 | 45 | 3 |
| 4 | PEC | 26RA803P | Program Elective Course - VI Lab # | - | - | 2 | 1 | - | 25 | 25 | 50 | 25 | - |
| 5 | ELC | 26RA804P(ii) | Institutional Internship$ and Project - III | - | - | 24 | 12 | - | 200 | 200 | 400 | 200 | - |
| | | | **Total** | **5** | **0** | **30** | **20** | **30** | **280** | **340** | **650** | | |

**Option B is available to students only after recommendation of the concerned Head of the department. The project and internship should contribute towards career development plan of the students.**

**# Courses to be mapped with NPTEL/SWAYAM/MOOC offered course in that semester.**

*** One Semester Internship offered by Institute Level Cells such as TPDC/ IEDC / E-Yantra/ Team Ashwa Riders along with project in the Major Discipline assigned by department to be carried out.**

| Program Elective course - VI | |
|---|---|
| 26RA802T(i) | Microcontroller Architecture and Programming |
| 26RA802T(ii) | Signals and Systems |
| 26RA802T (iii) | Advances in Robotics and Artificial Intelligence |

| Program Elective course – VI Lab | |
|---|---|
| 26RA803T(i) | Microcontroller Architecture and Programming Lab |
| 26RA803T(ii) | Signals and Systems Lab |
| 26RA803T (iii) | Advances in Robotics and Artificial Intelligence Lab |

| | | | | |
|---|---|---|---|---|
| | | July 2026 | NEP 4.0 | Applicable for 2029-30 |
| Chairman - BoS | Dean – Academics | Date of Release | Version | |

## Basket for Multi-Disciplinary Minor Courses (MDM)

### A. Robotics & Artificial Intelligence Engineering

| Semester | Course Category | Course Code | Name of Course | Subject Expert Name | Weeks | Credits |
|---|---|---|---|---|---|---|
| III | MDM-I | 26RA331M | Introduction to Robotics | Prof. Asokan T, Prof. Balaraman Ravindran, Prof. Krishna Vasudevan IIT Madras | 12 | 2 |
| | | | Robotics and Control: Theory and Practice | Prof. Sukavaram, Prof. Flexi Orlando, IIT Roorkee | 8 | |
| | | | Robotics: Basics and Selected Advanced Concepts | Prof. Ashitava Ghosal IISc Bangalore | 12 | |
| IV | MDM-II | 26RA431M | Sensors and Actuators | Prof. Hardik Jeetendra Pandya | 12 | 3 |
| | | | Microsensors, Implantable Devices and Rodent Surgeries for Biomedical Applications | Prof. Hardik Jeetendra Pandya, Prof. Shabari Girishan K V IISc Bangalore, | | |
| | | | A Brief introduction of Micro - Sensors | By Prof. Santanu Talukder IISER Bhopal | | |
| V | MDM-III | 26RA531M | An Introduction to Artificial Intelligence | Prof. Mausam, IIT Delhi | 12 | 3 |
| | | | Artificial Intelligence: Knowledge Representation And Reasoning | Prof. Deepak Khemani IIT Madras | | |
| VI | MDM-IV | 26RA631M | Wheeled Mobile robots | Prof. Asokan T, Prof. Santhakumar IIT Madras, IIT Palakkad | 12 | 3 |
| | | | Control Engineering for Robotics | Prof. Chayan Bhaval, IIT Guwahati | | |
| VII | MDM-V | 26RA731M | Intelligent Control of Robotic Systems | Prof. Flexi Orlando, IIT Roorkee | 12 | 3 |
| | | | Advanced Robotic Applications | Prof Ashish Dutta IIT Kanpur | | |
| **Total Credit** | | | | | | **14** |

## Basket for Program Elective Courses (PEC)

### B. Robotics & Artificial Intelligence Engineering

| Semester | Course Category | Course Code | Name of Course | Credits |
|---|---|---|---|---|
| **V** | **PEC** | **26RA503T(i)** | **Mobile and Micro Robotics** | **3** |
| V | PEC | 26RA503T(ii) | Data Analytics | 3 |
| V | PEC | 26RA503T(iii) | Intelligent Manufacturing | 3 |
| V | PEC | 26RA503P(i) | Mobile and Micro Robotics Lab | 1 |
| V | PEC | 26RA503P(ii) | Data Analytics Lab | 1 |
| V | PEC | 26RA503P(iii) | Intelligent Manufacturing Lab | 1 |
| VI | PEC | 26RA603T(i) | Autonomous Robotics and Telecherics | 3 |
| **VI** | **PEC** | **26RA603T(ii)** | **Control of Robotic Systems** | **3** |
| VI | PEC | 26RA603T (iii) | Industrial Electronics and Power Convertors | 3 |
| **VI** | **PEC** | **26RA604T(i)** | **Robot System Design and SLAM (Simultaneous Localization and Area Mapping)** | **3** |
| VI | PEC | 26RA604(ii) | Hydraulic & Pneumatic Drives for Robots | 3 |
| VI | PEC | 26RA604T(iii) | Micro Electro Mechanical Systems | 3 |
| VII | PEC | 26RA703T(i) | Biomedical Robotics | 3 |
| **VII** | **PEC** | **26RA703T(ii)** | **Augmented Reality and Virtual Reality** | **3** |
| VII | PEC | 26RA703T(iii) | Advanced Mechatronics | 3 |
| VII | PEC | 26RA704T(i) | Human Robot Interaction | 3 |
| VII | PEC | 26RA704T(ii) | Autonomous Mobile Robots | 3 |
| VII | PEC | 26RA704T(iii) | Swarm Robotics | 3 |
| **VII** | **PEC** | **26RA704T(iv)** | **Service Robotics** | **3** |
| **VII** | **PCE** | **26RA704T(v)** | **Human Robot Interaction** | **3** |
| VIII | PEC | 26RA802T(i) | Microcontroller Architecture and Programming | 3 |
| VIII | PEC | 26RA802T(ii) | Signals and Systems | 3 |
| VIII | PEC | 26RA802T (iii) | Advances in Robotics and Artificial Intelligence | 3 |
| VIII | PEC | 26RA803T(i) | Microcontroller Architecture and Programming Lab | 1 |
| VIII | PEC | 26RA803T(ii) | Signals and Systems Lab | 1 |
| VIII | PEC | 26RA803T (iii) | Advances in Robotics and Artificial Intelligence Lab | 1 |

## Basket for Open Elective Courses (OE)

### C. Robotics & Artificial Intelligence Engineering

| Semester | Course Category | Course Code | Name of Course | Credits |
|---|---|---|---|---|
| V | OE-I | 26RA561M | Basics of Robotics | 2 |
| VI | OE-II | 26RA661M | Robot Drives and Actuators | 3 |
| VII | OE-III | 26RA761M | Robot Safety and Maintenance | 3 |

## EXIT OPTIONS

**Award of UG Certificate in Major with 40 credits and an additional 8 credits (After First Year)**

| EXIT COURSES | | | |
|---|---|---|---|
| **S.N.** | **Course name** | **Mode of conduction** | **Credits** |
| **1.** | Vocational Course Robot Programming 8 Weeks / Industry Internship for 8-week duration | Online/ Offline | 8 |

**Award of UG Diploma in Major with 80 credits and an additional 8 credits (After Second Year)**

| EXIT COURSES | | | |
|---|---|---|---|
| **S.N.** | **Course name** | **Mode of conduction** | **Credits** |
| **1.** | Vocational Course on Deep Learning for 8 Weeks / Industry Internship for 8-week duration | Online/ Offline | 8 |

**Award of UG Degree in Major with 120 credits and an additional 8 credits (After Third Year)**

| EXIT COURSES | | | |
|---|---|---|---|
| **S.N.** | **Course name** | **Mode of conduction** | **Credits** |
| **1.** | Vocational Course on Natural Language Progressing or Internet of things for 8 Weeks / Industry Internship for 8-week duration | Online/ Offline | 8 |