

**Symbiosis Institute of Technology, Pune**  
**Bachelor of Technology (Robotics and Automation)**  
**Programme Structure 2022-26**



|    |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                    |                                              |                                         |
|----|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------|-----------------------------------------|
| 1. | OBJECTIVE               | To generate competent manpower in the emerging areas of Robotics and Automation To inculcate among the students an aptitude for engineering and research in Industry 4.0 for generation of better and smarter solutions to real world problems.                                                                                                                                                                                                                       |                                    |                                              |                                         |
| 2. | DURATION (IN MONTHS)    | 48 (Full Time)                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                    |                                              |                                         |
| 3. | INTAKE                  | 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                    |                                              |                                         |
| 4. | RESERVATION             | I.Within the sanctioned intake                                                                                                                                                                                                                                                                                                                                                                                                                                        | a) SC<br>(In Percentage)           | b) ST<br>(In Percentage)                     | c) Differently abled<br>(In Percentage) |
|    |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 15                                 | 7.5                                          | 3                                       |
|    |                         | II.Over and above the sanctioned intake                                                                                                                                                                                                                                                                                                                                                                                                                               | a) Kashmiri Migrants<br>(In Seats) | b) International Students<br>(In Percentage) |                                         |
|    |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2                                  | 15                                           |                                         |
| 5. | ELIGIBILITY             | Passed Standard XII (10+2) or equivalent examination with Physics and Mathematics as compulsory subjects along with one of the Chemistry/ Biotechnology/ Biology/ Technical Vocational subject/ Computer Science/ Information Technology/ Informatics Practices/ Agriculture/ Engineering Graphics/ Business Studies from any recognised Board with a minimum of 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste/ Scheduled Tribes). |                                    |                                              |                                         |
| 6. | SELECTION PROCEDURE     | Selection would be based on joint merit of entrance exam score and PCM/PMV aggregate percentage                                                                                                                                                                                                                                                                                                                                                                       |                                    |                                              |                                         |
| 7. | MEDIUM OF INSTRUCTION   | English                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                    |                                              |                                         |
| 8. | PROGRAMME PATTERN       | Semester                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                    |                                              |                                         |
| 9. | COURSE & SPECIALIZATION | As per Annexure A                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                    |                                              |                                         |



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| 10. | FEE                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Academic Fee p.a | Institute Deposit | Total  |
|-----|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------|--------|
|     |                                       | <b>Indian Students</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 260000           | 20000             | 280000 |
|     |                                       | <b>International Students (USD equivalent to INR)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 390000           | 20000             | 410000 |
| 11. | ASSESSMENT                            | All internal courses will have 100% component as internal evaluation at the institute level. All external courses will have 40% internal component and 60% component as external [University] examination. The internal and external will be separate heads of passing.                                                                                                                                                                                                                                                                              |                  |                   |        |
| 12. | STANDARD OF PASSING                   | The assessment of the student for each examination is done, based on relative performance. Maximum Grade Point (GP) is 10 corresponding to O (Outstanding). For all courses, a student is required to pass both internal and external examination separately with a minimum Grade Point of 4 corresponding to Grade P. Students securing less than 40% absolute marks in each head of passing will be declared FAIL. The University awards a degree to the student who has achieved a minimum CGPA of 4 out of maximum of 10 CGPA for the programme. |                  |                   |        |
| 13. | AWARD OF DEGREE/ DIPLOMA/ CERTIFICATE | Bachelor of Technology (Robotics and Automation) will be awarded at the end of semester VIII examination by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10.00 CGPA.                                                                                                                                                                                                                                                                                                              |                  |                   |        |

**14. CLASSIFICATION OF CREDITS**

| Semester     | Generic Core | Generic Elective | Specialization Core | Specialization Elective | Open Elective | Audit    | Total      |
|--------------|--------------|------------------|---------------------|-------------------------|---------------|----------|------------|
| 1            | 20           | 0                | 0                   | 0                       | 0             | 1*       | 20         |
| 2            | 19           | 0                | 0                   | 0                       | 0             | 1*       | 19         |
| 3            | 21           | 2                | 0                   | 0                       | 0             | 1*       | 23         |
| 4            | 23           | 1                | 0                   | 0                       | 0             | 0        | 24         |
| 5            | 19           | 3                | 0                   | 0                       | 3             | 0        | 25         |
| 6            | 16           | 4                | 0                   | 0                       | 3             | 0        | 23         |
| 7            | 14           | 8                | 0                   | 0                       | 0             | 0        | 22         |
| 8            | 14           | 0                | 0                   | 0                       | 0             | 0        | 14         |
| <b>Total</b> | <b>146</b>   | <b>18</b>        | <b>0</b>            | <b>0</b>                | <b>6</b>      | <b>0</b> | <b>170</b> |

\* Satisfactory completion of the non letter grade courses 'Integrated Disaster Management', 'Fitness for Life', 'Environmental Science' is mandatory for the award of degree.

This Programme Structure is aligned with the norms laid down by the University and is approved by the Academic Council.  
Hereafter changes (if any) which conform to the policy on "Curriculum Development and Review" would be permissible, subject to revision of the Programme Structure, following the specified processes.

Head - Academics

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**Annexure A**

| Catalog Course Code  | Course Code | Course Title                        | Nature | Specialization/ Area/ Department | Teaching Scheme (Hours Per Week) |   |      | Examination Scheme (Marks) |     |        |     | Total Credits    | Total |
|----------------------|-------------|-------------------------------------|--------|----------------------------------|----------------------------------|---|------|----------------------------|-----|--------|-----|------------------|-------|
|                      |             |                                     |        |                                  |                                  |   |      | Practical                  |     | Theory |     |                  |       |
|                      |             |                                     |        |                                  | L                                | T | La b | CA                         | ESE | CA     | ESE |                  |       |
| Semester : 1         |             |                                     |        |                                  |                                  |   |      |                            |     |        |     |                  |       |
| Generic Core Courses |             |                                     |        |                                  |                                  |   |      |                            |     |        |     |                  |       |
| TE7168               | 0701270101  | Engineering Mathematics -I          | BS     |                                  | 3                                | 1 | 0    | 0                          | 0   | 40     | 60  | 4                | 100   |
| T7391                | 0701270102  | Physics                             | BS     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3                | 75    |
| TE7687               | 0701270103  | Physics Lab                         | BS     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1                | 25    |
| T7383                | 0701270104  | Communication Skills                | HS     |                                  | 2                                | 0 | 0    | 0                          | 0   | 20     | 30  | 2                | 50    |
| T7384                | 0701270105  | Communication skills lab            | HS     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1                | 25    |
| T7658                | 0701270106  | Workshop Practice                   | ES     |                                  | 0                                | 0 | 4    | 50                         | 0   | 0      | 0   | 2                | 50    |
| TE7286               | 0701270107  | Programming and Problem Solving     | ES     |                                  | 2                                | 0 | 0    | 0                          | 0   | 20     | 30  | 2                | 50    |
| TE7287               | 0701270108  | Programming and Problem Solving Lab | ES     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1                | 25    |
| T6873                | 0701270109  | Creative Thinking                   | HS     |                                  | 1                                | 0 | 0    | 0                          | 0   | 25     | 0   | 1                | 25    |
| T7414                | 0701270110  | Engineering Mechanics               | ES     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3                | 75    |
| TE7188               | 0701270111  | Environmental Science *             |        |                                  | 0                                | 0 | 0    | 0                          | 0   | 0      | 0   | Non Letter Grade | 0     |
| Total                |             |                                     |        |                                  | 14                               | 1 | 10   | 80                         | 45  | 165    | 210 | 20               | 500   |
| Semester : 2         |             |                                     |        |                                  |                                  |   |      |                            |     |        |     |                  |       |
| Generic Core Courses |             |                                     |        |                                  |                                  |   |      |                            |     |        |     |                  |       |
| TE7169               | 0701270201  | Engineering Mathematics -II         | BS     |                                  | 3                                | 1 | 0    | 0                          | 0   | 40     | 60  | 4                | 100   |



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|----------------------|-------------|--------------------------------------------------|--------|----------------------------------|----------------------------------|---|------|----------------------------|-----|--------|-----|------------------|-------|
|                      |             |                                                  |        |                                  |                                  |   |      | Practical                  |     | Theory |     |                  |       |
|                      |             |                                                  |        |                                  | L                                | T | La b | CA                         | ESE | CA     | ESE |                  |       |
| TE7694               | 0701270202  | Chemistry                                        | BS     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3                | 75    |
| TE7695               | 0701270203  | Chemistry Lab                                    | BS     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1                | 25    |
| T7540                | 0701270204  | Basic Electrical and Electronics Engineering     | ES     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3                | 75    |
| T7593                | 0701270205  | Basic Electrical and Electronics Engineering Lab | ES     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1                | 25    |
| TE7624               | 0701270206  | Engineering Graphics                             | ES     |                                  | 1                                | 0 | 0    | 0                          | 0   | 25     | 0   | 1                | 25    |
| T7925                | 0701270207  | Engineering Graphics Lab                         | ES     |                                  | 0                                | 0 | 4    | 20                         | 30  | 0      | 0   | 2                | 50    |
| TE7300               | 0701270208  | Tinker Lab                                       | ES     |                                  | 0                                | 0 | 4    | 50                         | 0   | 0      | 0   | 2                | 50    |
| TE7890               | 0701270209  | Software Tools for Robotics                      | ES     |                                  | 0                                | 0 | 2    | 25                         | 0   | 0      | 0   | 1                | 25    |
| T6732                | 0701270210  | Critical Thinking                                | HS     |                                  | 1                                | 0 | 0    | 0                          | 0   | 25     | 0   | 1                | 25    |
| TH4095               | 0701270211  | Fitness for Life *                               |        |                                  | 0                                | 0 | 0    | 0                          | 0   | 0      | 0   | Non Letter Grade | 0     |
| Total                |             |                                                  |        |                                  | 11                               | 1 | 14   | 115                        | 60  | 150    | 150 | 19               | 475   |
| Semester : 3         |             |                                                  |        |                                  |                                  |   |      |                            |     |        |     |                  |       |
| Generic Core Courses |             |                                                  |        |                                  |                                  |   |      |                            |     |        |     |                  |       |
| TE7845               | 0701270301  | Fundamentals of Robotics and Automation          | PC     |                                  | 2                                | 0 | 0    | 0                          | 0   | 20     | 30  | 2                | 50    |
| TE7688               | 0701270302  | Statistics and Numerical Methods in Robotics     | BS     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3                | 75    |
| TE7857               | 0701270303  | Mechanics of Materials                           | ES     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3                | 75    |
| TE7858               | 0701270304  | Mechanics of Materials Lab                       | ES     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1                | 25    |





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|--------------------------------|-------------|-----------------------------------------|--------|----------------------------------|----------------------------------|---|------|----------------------------|-----|--------|-----|------------------|-------|
|                                |             |                                         |        |                                  |                                  |   |      | Practical                  |     | Theory |     |                  |       |
|                                |             |                                         |        |                                  | L                                | T | La b | CA                         | ESE | CA     | ESE |                  |       |
| TE7887                         | 0701270305  | Sensor and Electronics Drives           | PC     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3                | 75    |
| TE7888                         | 0701270306  | Sensor and Electronics Drives Lab       | PC     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1                | 25    |
| TE7851                         | 0701270307  | Introduction to Artificial Intelligence | PC     |                                  | 2                                | 0 | 0    | 0                          | 0   | 20     | 30  | 2                | 50    |
| TE7820                         | 0701270308  | Advanced Python Lab                     | ES     |                                  | 0                                | 0 | 4    | 20                         | 30  | 0      | 0   | 2                | 50    |
| TE7828                         | 0701270309  | Basics of Operating Systems             | PC     |                                  | 3                                | 0 | 0    | 0                          | 0   | 75     | 0   | 3                | 75    |
| TE7829                         | 0701270310  | Basics of Operating Systems Lab         | PC     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1                | 25    |
| T4005                          | 0701270311  | Integrated Disaster Management *        |        |                                  | 0                                | 0 | 0    | 0                          | 0   | 0      | 0   | Non Letter Grade | 0     |
| Total                          |             |                                         |        |                                  | 16                               | 0 | 10   | 50                         | 75  | 205    | 195 | 21               | 525   |
| Generic Elective Courses Group |             |                                         |        |                                  |                                  |   |      |                            |     |        |     |                  |       |
| T6184                          | 0701270312  | Basic German I                          | GE     |                                  | 2                                | 0 | 0    | 0                          | 0   | 50     | 0   | 2                | 50    |
| T6186                          | 0701270313  | Basic French I                          | GE     |                                  | 2                                | 0 | 0    | 0                          | 0   | 50     | 0   | 2                | 50    |
| T6188                          | 0701270314  | Basic Spanish I                         | GE     |                                  | 2                                | 0 | 0    | 0                          | 0   | 50     | 0   | 2                | 50    |
| Total Required Credits         |             |                                         |        |                                  |                                  |   |      | 0                          | 0   | 50     | 0   | 2                | 50    |
| Semester : 4                   |             |                                         |        |                                  |                                  |   |      |                            |     |        |     |                  |       |
| Generic Core Courses           |             |                                         |        |                                  |                                  |   |      |                            |     |        |     |                  |       |
| T8000                          | 0701270401  | Service Learning                        | HS     |                                  | 0                                | 0 | 8    | 100                        | 0   | 0      | 0   | 4                | 100   |
| TE7879                         | 0701270402  | Robotic Control Systems                 | PC     |                                  | 2                                | 0 | 0    | 0                          | 0   | 20     | 30  | 2                | 50    |





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|--------------------------------|-------------|--------------------------------------------------|--------|----------------------------------|----------------------------------|---|------|----------------------------|-----|--------|-----|---------------|-------|
|                                |             |                                                  |        |                                  |                                  |   |      | Practical                  |     | Theory |     |               |       |
|                                |             |                                                  |        |                                  | L                                | T | La b | CA                         | ESE | CA     | ESE |               |       |
| TE7880                         | 0701270403  | Robotic Control Systems Lab                      | PC     |                                  | 0                                | 0 | 4    | 20                         | 30  | 0      | 0   | 2             | 50    |
| TE7852                         | 0701270404  | Kinematics and Dynamics of Robotics              | PC     |                                  | 3                                | 0 | 0    | 0                          | 0   | 75     | 0   | 3             | 75    |
| TE7853                         | 0701270405  | Kinematics and Dynamics of Robotics Lab          | PC     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| TE7824                         | 0701270406  | Application of AI in Robotics and Automation     | PC     |                                  | 2                                | 0 | 0    | 0                          | 0   | 20     | 30  | 2             | 50    |
| TE7825                         | 0701270407  | Application of AI in Robotics and Automation Lab | PC     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| TE7674                         | 0701270408  | Applied Mathematics for Robotics                 | BS     |                                  | 3                                | 0 | 0    | 0                          | 0   | 75     | 0   | 3             | 75    |
| T2646                          | 0701270409  | Entrepreneurship Venture                         | HS     |                                  | 1                                | 0 | 0    | 0                          | 0   | 25     | 0   | 1             | 25    |
| TE7846                         | 0701270410  | Hydraulics and Pneumatics for Robots             | PC     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7847                         | 0701270411  | Hydraulics and Pneumatics for Robots Lab         | PC     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| Total                          |             |                                                  |        |                                  | 14                               | 0 | 18   | 150                        | 75  | 245    | 105 | 23            | 575   |
| Generic Elective Courses Group |             |                                                  |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| T6872                          | 0701270412  | Foundation of Ethics                             | GE     |                                  | 1                                | 0 | 0    | 0                          | 0   | 25     | 0   | 1             | 25    |
| T6760                          | 0701270413  | Introduction to Indian Philosophy                | GE     |                                  | 1                                | 0 | 0    | 0                          | 0   | 25     | 0   | 1             | 25    |
| Total Required Credits         |             |                                                  |        |                                  |                                  |   |      | 0                          | 0   | 25     | 0   | 1             | 25    |
| Semester : 5                   |             |                                                  |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| Generic Core Courses           |             |                                                  |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| T6749                          | 0701270501  | Design Thinking                                  | HS     |                                  | 2                                | 0 | 0    | 0                          | 0   | 50     | 0   | 2             | 50    |
| TE7855                         | 0701270502  | Materials and Measurement                        | ES     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |





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|                                |             |                                                           |        |                                  |                                  |   |      | Practical                  |     | Theory |     |               |       |
|                                |             |                                                           |        |                                  | L                                | T | La b | CA                         | ESE | CA     | ESE |               |       |
| TE7856                         | 0701270503  | Materials and Measurement Lab                             | ES     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| TE7889                         | 0701270504  | Simulator for Robotics Lab                                | PC     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| TE7818                         | 0701270505  | Advanced Manufacturing                                    | PC     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7819                         | 0701270506  | Advanced Manufacturing Lab                                | PC     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| TE7859                         | 0701270507  | Microcontroller and Embedded Systems                      | PC     |                                  | 2                                | 0 | 0    | 0                          | 0   | 20     | 30  | 2             | 50    |
| TE7860                         | 0701270508  | Microcontroller and Embedded Systems Lab                  | PC     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| TE7836                         | 0701270509  | Computer Vision for Robotics                              | PC     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7837                         | 0701270510  | Computer Vision for Robotics Lab                          | PC     |                                  | 0                                | 0 | 4    | 20                         | 30  | 0      | 0   | 2             | 50    |
| Total                          |             |                                                           |        |                                  | 13                               | 0 | 12   | 60                         | 90  | 160    | 165 | 19            | 475   |
| Generic Elective Courses Group |             |                                                           |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| TE7892                         | 0701270511  | Theory of Universal Robots & Cobots                       | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7844                         | 0701270512  | Fundamentals of IOT and Cloud Computing                   | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7867                         | 0701270513  | Optimization for Robotics                                 | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7832                         | 0701270514  | Building Automation                                       | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7841                         | 0701270515  | Digital Signals                                           | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7835                         | 0701270516  | Computational Fluid Dynamics with Artificial Intelligence | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7874                         | 0701270517  | Probabilistic Robotics                                    | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| Total Required Credits         |             |                                                           |        |                                  |                                  |   |      | 0                          | 0   | 30     | 45  | 3             | 75    |



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|                             |             |                                              |        |                                              |                                  |   |      | Practical                  |     | Theory |     |               |       |
|                             |             |                                              |        |                                              | L                                | T | La b | CA                         | ESE | CA     | ESE |               |       |
| Open Elective Courses Group |             |                                              |        |                                              |                                  |   |      |                            |     |        |     |               |       |
| TE7698                      | 0701270518  | Nanotechnology                               | OE     | Applied Science                              | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7676                      | 0701270519  | Executive Corporate Communication For Impact | OE     | Applied Science                              | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7195                      | 0701270520  | GIS Applications                             | OE     | Civil Engineering                            | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7203                      | 0701270521  | Intelligent Transportation Management        | OE     | Civil Engineering                            | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7297                      | 0701270522  | Software Testing Tools                       | OE     | Computer Science and Engineering             | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7756                      | 0701270523  | Open Source Technologies                     | OE     | Computer Science and Engineering             | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| T7584                       | 0701270524  | Printed Circuit Board (PCB) Design           | OE     | Electronics & Tele-communication Engineering | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7334                      | 0701270525  | Introduction to Mechatronics                 | OE     | Electronics & Tele-communication Engineering | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7804                      | 0701270526  | Design Optimization Techniques               | OE     | Mechanical Engineering                       | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7351                      | 0701270527  | 3D Printing and Prototyping                  | OE     | Mechanical Engineering                       | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| Total Required Credits      |             |                                              |        |                                              |                                  |   |      | 0                          | 0   | 30     | 45  | 3             | 75    |
| Semester : 6                |             |                                              |        |                                              |                                  |   |      |                            |     |        |     |               |       |
| Generic Core Courses        |             |                                              |        |                                              |                                  |   |      |                            |     |        |     |               |       |



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| Catalog Course Code                 | Course Code | Course Title                                | Nature | Specialization/ Area/ Department | Teaching Scheme (Hours Per Week) |   |      | Examination Scheme (Marks) |     |        |     | Total Credits | Total |
|-------------------------------------|-------------|---------------------------------------------|--------|----------------------------------|----------------------------------|---|------|----------------------------|-----|--------|-----|---------------|-------|
|                                     |             |                                             |        |                                  |                                  |   |      | Practical                  |     | Theory |     |               |       |
|                                     |             |                                             |        |                                  | L                                | T | La b | CA                         | ESE | CA     | ESE |               |       |
| TE7870                              | 0701270601  | PLC and SCADA                               | PC     |                                  | 2                                | 0 | 0    | 0                          | 0   | 20     | 30  | 2             | 50    |
| TE7871                              | 0701270602  | PLC and SCADA Lab                           | PC     |                                  | 0                                | 0 | 4    | 20                         | 30  | 0      | 0   | 2             | 50    |
| TE7290                              | 0701270603  | Project Based Learning -I                   | PIS    |                                  | 0                                | 0 | 4    | 50                         | 0   | 0      | 0   | 2             | 50    |
| T7802                               | 0701270604  | Capstone Course                             | PC     |                                  | 2                                | 0 | 0    | 0                          | 0   | 50     | 0   | 2             | 50    |
| T6774                               | 0701270605  | Principles of Economics                     | HS     |                                  | 2                                | 0 | 0    | 0                          | 0   | 50     | 0   | 2             | 50    |
| F0002                               | 0701270606  | Flexi-Credit Course                         | PC     |                                  | 2                                | 0 | 0    | 0                          | 0   | 50     | 0   | 2             | 50    |
| TE7885                              | 0701270607  | Robotics Operating System                   | PC     |                                  | 2                                | 0 | 0    | 0                          | 0   | 20     | 30  | 2             | 50    |
| TE7886                              | 0701270608  | Robotics Operating System Lab               | PC     |                                  | 0                                | 0 | 4    | 20                         | 30  | 0      | 0   | 2             | 50    |
| Total                               |             |                                             |        |                                  | 10                               | 0 | 12   | 90                         | 60  | 190    | 60  | 16            | 400   |
| Generic Elective Courses Group - I  |             |                                             |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| TE7862                              | 0701270609  | Mobile Application Development              | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7848                              | 0701270610  | Industrial Internet of Things               | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7868                              | 0701270611  | Path Planning and Reinforcement Learning    | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7816                              | 0701270612  | Additive Manufacturing                      | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7842                              | 0701270613  | Embedded System and Wireless Sensor Network | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| Total Required Credits              |             |                                             |        |                                  |                                  |   |      | 0                          | 0   | 30     | 45  | 3             | 75    |
| Generic Elective Courses Group - II |             |                                             |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| TE7863                              | 0701270614  | Mobile Application Development Lab          | PE     |                                  | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |





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|-----------------------------|-------------|-------------------------------------------------|--------|----------------------------------------------|----------------------------------|---|------|----------------------------|-----|--------|-----|---------------|-------|
|                             |             |                                                 |        |                                              |                                  |   |      | Practical                  |     | Theory |     |               |       |
|                             |             |                                                 |        |                                              | L                                | T | La b | CA                         | ESE | CA     | ESE |               |       |
| TE7849                      | 0701270615  | Industrial Internet of Things Lab               | PE     |                                              | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| TE7869                      | 0701270616  | Path Planning and Reinforcement Learning Lab    | PE     |                                              | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| TE7817                      | 0701270617  | Additive Manufacturing Lab                      | PE     |                                              | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| TE7843                      | 0701270618  | Embedded System and Wireless Sensor Network Lab | PE     |                                              | 0                                | 0 | 2    | 10                         | 15  | 0      | 0   | 1             | 25    |
| Total Required Credits      |             |                                                 |        |                                              |                                  |   |      | 10                         | 15  | 0      | 0   | 1             | 25    |
| Open Elective Courses Group |             |                                                 |        |                                              |                                  |   |      |                            |     |        |     |               |       |
| TE7677                      | 0701270619  | Financial Mathematics                           | OE     | Applied Science                              | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7700                      | 0701270620  | Smart Materials                                 | OE     | Applied Science                              | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7223                      | 0701270621  | Smart Urban Planning                            | OE     | Civil Engineering                            | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7240                      | 0701270622  | Water Resource Planning and Management          | OE     | Civil Engineering                            | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| T7499                       | 0701270623  | Java                                            | OE     | Computer Science and Engineering             | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7750                      | 0701270624  | Web Application Development                     | OE     | Computer Science and Engineering             | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| T7574                       | 0701270625  | MATLAB                                          | OE     | Electronics & Tele-communication Engineering | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |



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|------------------------------------|-------------|--------------------------------------------------------|--------|----------------------------------------------|----------------------------------|---|------|----------------------------|-----|--------|-----|---------------|-------|
|                                    |             |                                                        |        |                                              |                                  |   |      | Practical                  |     | Theory |     |               |       |
|                                    |             |                                                        |        |                                              | L                                | T | La b | CA                         | ESE | CA     | ESE |               |       |
| TE7428                             | 0701270626  | Introduction to Image Processing                       | OE     | Electronics & Tele-communication Engineering | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7810                             | 0701270627  | Industrial Revolution and Introduction of Industry 5.0 | OE     | Mechanical Engineering                       | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| T7650                              | 0701270628  | Six sigma                                              | OE     | Mechanical Engineering                       | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| Total Required Credits             |             |                                                        |        |                                              |                                  |   |      | 0                          | 0   | 30     | 45  | 3             | 75    |
| Semester : 7                       |             |                                                        |        |                                              |                                  |   |      |                            |     |        |     |               |       |
| Generic Core Courses               |             |                                                        |        |                                              |                                  |   |      |                            |     |        |     |               |       |
| T7804                              | 0701270701  | B.Tech Project                                         | PIS    |                                              | 0                                | 0 | 8    | 40                         | 60  | 0      | 0   | 4             | 100   |
| TE7877                             | 0701270702  | Robot System Design and Simulation                     | PC     |                                              | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7878                             | 0701270703  | Robot System Design and Simulation Lab                 | PC     |                                              | 0                                | 0 | 4    | 20                         | 30  | 0      | 0   | 2             | 50    |
| F0003                              | 0701270704  | Flexi-Credit Course                                    | PC     |                                              | 3                                | 0 | 0    | 0                          | 0   | 75     | 0   | 3             | 75    |
| TE7876                             | 0701270705  | Responsible AI for Robotics                            | PC     |                                              | 1                                | 0 | 0    | 0                          | 0   | 25     | 0   | 1             | 25    |
| F0001                              | 0701270706  | Flexi-Credit Course                                    | PC     |                                              | 1                                | 0 | 0    | 0                          | 0   | 25     | 0   | 1             | 25    |
| Total                              |             |                                                        |        |                                              | 8                                | 0 | 12   | 60                         | 90  | 155    | 45  | 14            | 350   |
| Generic Elective Courses Group - I |             |                                                        |        |                                              |                                  |   |      |                            |     |        |     |               |       |
| TE7831                             | 0701270707  | Block Chain Technology For Robotics                    | PE     |                                              | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7875                             | 0701270708  | Reliability Engineering                                | PE     |                                              | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |



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|--------------------------------------|-------------|--------------------------------------------------|--------|----------------------------------|----------------------------------|---|------|----------------------------|-----|--------|-----|---------------|-------|
|                                      |             |                                                  |        |                                  |                                  |   |      | Practical                  |     | Theory |     |               |       |
|                                      |             |                                                  |        |                                  | L                                | T | La b | CA                         | ESE | CA     | ESE |               |       |
| TE7854                               | 0701270709  | Lean Manufacturing                               | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7822                               | 0701270710  | Agile Development for Robotics Application       | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7873                               | 0701270711  | Predictive Maintenance                           | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| Total Required Credits               |             |                                                  |        |                                  |                                  |   |      | 0                          | 0   | 30     | 45  | 3             | 75    |
| Generic Elective Courses Group - II  |             |                                                  |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| TE7618                               | 0701270712  | Cyber Physical System                            | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7891                               | 0701270713  | Sustainable Development                          | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7827                               | 0701270714  | Augmented Reality and Virtual Reality Technology | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7861                               | 0701270715  | Mobile and Micro Robotics                        | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| TE7623                               | 0701270716  | Theory of Innovative Design                      | PE     |                                  | 3                                | 0 | 0    | 0                          | 0   | 30     | 45  | 3             | 75    |
| Total Required Credits               |             |                                                  |        |                                  |                                  |   |      | 0                          | 0   | 30     | 45  | 3             | 75    |
| Generic Elective Courses Group - III |             |                                                  |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| T2585                                | 0701270717  | Organizational Behaviour                         | GE     |                                  | 2                                | 0 | 0    | 0                          | 0   | 50     | 0   | 2             | 50    |
| TE7438                               | 0701270718  | History of Science and Technology                | GE     |                                  | 2                                | 0 | 0    | 0                          | 0   | 50     | 0   | 2             | 50    |
| Total Required Credits               |             |                                                  |        |                                  |                                  |   |      | 0                          | 0   | 50     | 0   | 2             | 50    |
| Semester : 8                         |             |                                                  |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| Generic Core Courses                 |             |                                                  |        |                                  |                                  |   |      |                            |     |        |     |               |       |
| T7912                                | 0701270801  | Internship                                       | PIS    |                                  | 0                                | 0 | 24   | 120                        | 180 | 0      | 0   | 12            | 300   |





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|---------------------|-------------|--------------|--------|----------------------------------|----------------------------------|---|------|----------------------------|-----|--------|-----|---------------|-------|
|                     |             |              |        |                                  |                                  |   |      | Practical                  |     | Theory |     |               |       |
|                     |             |              |        |                                  | L                                | T | La b | CA                         | ESE | CA     | ESE |               |       |
| T7802               | 0701270802  | Seminar      | PIS    |                                  | 0                                | 0 | 4    | 20                         | 30  | 0      | 0   | 2             | 50    |
| Total               |             |              |        |                                  | 0                                | 0 | 28   | 140                        | 210 | 0      | 0   | 14            | 350   |

**Abbreviations (Nature)**

|     |                                 |
|-----|---------------------------------|
| BS  | Basic Sciences                  |
| ES  | Engineering Sciences            |
| HS  | Humanities and Social Sciences  |
| OE  | Open Electives                  |
| PC  | Professional Core               |
| PE  | Professional Elective           |
| PIS | Project, Internship, Seminar    |
| PD  | Professional Development Course |
| MC  | Mandatory Course                |
| L   | Lecture                         |
| T   | Tutorial                        |
| CA  | Continuous Assessment           |
| ESE | End Semester Examination        |



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| Semester     | Internal Credits | External Credits | Total Credits | Total Marks |
|--------------|------------------|------------------|---------------|-------------|
| Semester 1   | 3                | 17               | 20            | 500         |
| Semester 2   | 5                | 14               | 19            | 475         |
| Semester 3   | 5                | 18               | 23            | 575         |
| Semester 4   | 12               | 12               | 24            | 600         |
| Semester 5   | 2                | 23               | 25            | 625         |
| Semester 6   | 8                | 15               | 23            | 575         |
| Semester 7   | 7                | 15               | 22            | 550         |
| Semester 8   | 0                | 14               | 14            | 350         |
| <b>Total</b> | <b>42</b>        | <b>128</b>       | <b>170</b>    | <b>4250</b> |