

**COURSE STRUCTURE**  
*for*  
**B.TECH. DEGREE**  
*in*  
**INFORMATION TECHNOLOGY**

*(Applicable from the academic session 2024-2025)*



**Dr. B. C. Roy Engineering College**

*An Autonomous Institution*

*Approved by: All India Council for Technical Education (AICTE)*

*Affiliated to: Maulana Abul Kalam Azad University of Technology, West Bengal  
(Formerly Known as -WBUT)*

**Jemua Road, Durgapur, West Bengal, India,713206**

The first-year course structure (Page 3 and Page 4) is unanimously accepted and approved in the first BoS meeting held in the Department of a) Physics, b) Chemistry, c) Mathematics, d) English, e) Electrical Engineering, f) Electronics and Communication Engineering, g) Computer Science and Engineering, h) Mechanical Engineering

The BoS of the Department of Information Technology in its first meeting (held on 30<sup>th</sup> October 2024 in online mode (using Google meet) at 11:00 am (IST) onwards) has unanimously accepted and approved the four-year course structure of the Department of Information Technology.

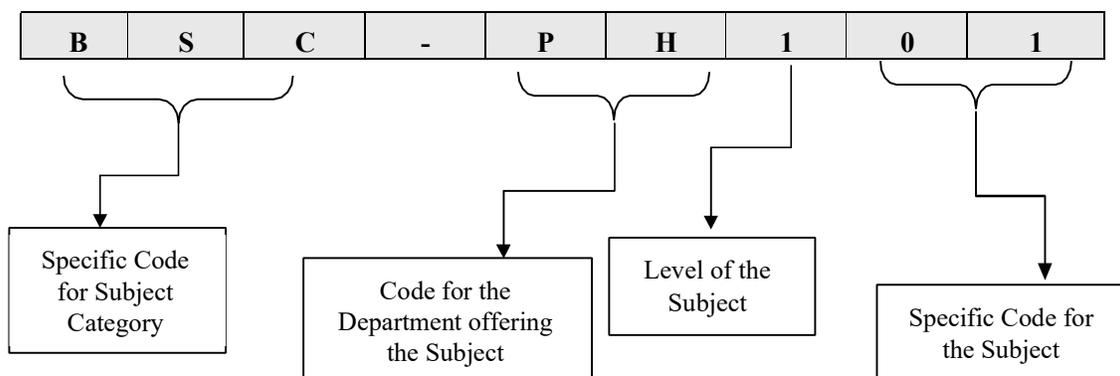


A handwritten signature in black ink, appearing to read "B. Roy".

Signature of the BoS Chairman

H.O.D.  
Department of Information Technology  
Dr. B. C. Roy Engineering College  
DURGAPUR

**Subject Numbering Scheme:**



**Semester Wise Break Up of Credit (New Autonomous Structure)**

| Sem1 | Sem2 | Sem3 | Sem4 | Sem5 | Sem6 | Sem7 | Sem8 | Total |
|------|------|------|------|------|------|------|------|-------|
| 21   | 22   | 22   | 22   | 21   | 22   | 22   | 14   | 166   |

| Sl. No.              | Category  | Breakup of Credits (Actual) As per Proposed Autonomous Structure |
|----------------------|---|--|
| 1.                   | Humanities and Social Sciences including Management courses   | 14   |
| 2.                   | Basic Science Courses   | 20   |
| 3.                   | Engineering Science courses including workshop, drawing, basics of electrical/ mechanical/ computer etc.                      | 33   |
| 4.                   | Professional core course  | 73   |
| 5.                   | Professional Elective specialization/branch courses relevant to chosen  | 6  |
| 6.                   | Multidisciplinary Open Electives Courses  | 6  |
| 7.                   | Project work, seminar and internship in industry or appropriate workplace/ academic and research institutions in India/abroad | 14   |
| 8.                   | Mandatory Non-Credit Courses – Audit Course   | 0<br>(2 Non-credit courses)                                      |
| <b>Total Credits</b> |   | <b>166</b>   |

**B. Tech. in Information Technology  
First Year**

| 1 <sup>st</sup> Year 1 <sup>st</sup> Semester |                     |             |             |  |             |                |          |           |           |           |
|---|---------------------|-------------|-------------|--|-------------|----------------|----------|-----------|-----------|-----------|
| Sl. No.                                       | Category            | Course Type | Course Code | Course Title                                       | Marks       | Hours per Week |          |           |           | Credits   |
|   |                     |             |             |  |             | L              | T        | P         | Total     |           |
| <b>➤ THEORY</b>                               |                     |             |             |  |             |                |          |           |           |           |
| 1   | Ability Enhancement | BS          | M-101       | Mathematics-I                                      | 100         | 3              | 0        | 0         | 3         | 3         |
| 2   | Multi-Disciplinary  | BS          | CH-101      | Chemistry  | 100         | 3              | 0        | 0         | 3         | 3         |
| 3   | Multi-Disciplinary  | ES          | EC-101      | Basic Electronics Engineering                      | 100         | 3              | 0        | 0         | 3         | 3         |
| 4   | Multi-Disciplinary  | ES          | ME-101      | Engineering Mechanics                              | 100         | 3              | 0        | 0         | 3         | 3         |
| 5   | Major               | ES          | CS-101      | Introduction to Computer Hardware and Software     | 100         | 3              | 0        | 0         | 3         | 3         |
| <b>TOTAL THEORY</b>                           |                     |             |             |  | <b>500</b>  | <b>15</b>      | <b>0</b> | <b>0</b>  | <b>15</b> | <b>15</b> |
| <b>➤ PRACTICAL/SESSIONAL</b>                  |                     |             |             |  |             |                |          |           |           |           |
| 6   | Multi-Disciplinary  | BS          | CH-191      | Chemistry Lab                                      | 100         | 0              | 0        | 2         | 2         | 1         |
| 7   | Multi-Disciplinary  | ES          | EC-191      | Basic Electronics Engineering Lab                  | 100         | 0              | 0        | 2         | 2         | 1         |
| 8   | Major               | ES          | CS-191      | Introduction to Computer Hardware and Software Lab | 100         | 0              | 0        | 4         | 4         | 2         |
| 9   | Skill Enhancement   | ES          | ME-191      | Engineering Graphics                               | 100         | 0              | 0        | 4         | 4         | 2         |
| 10  | Ability Enhancement | BS          | ENV-181     | Environmental Science                              | 100         | 1              | 0        | 0         | 1         | 0         |
| <b>TOTAL PRACTICAL/SESSIONAL</b>              |                     |             |             |  | <b>500</b>  | <b>1</b>       | <b>0</b> | <b>12</b> | <b>13</b> | <b>6</b>  |
| <b>TOTAL OF SEMESTER</b>                      |                     |             |             |  | <b>1000</b> | <b>16</b>      | <b>0</b> | <b>12</b> | <b>28</b> | <b>21</b> |

| 1 <sup>st</sup> Year 2 <sup>nd</sup> Semester |                           |             |             |  |             |                |          |           |           |           |
|---|---------------------------|-------------|-------------|--|-------------|----------------|----------|-----------|-----------|-----------|
| Sl. No.                                       | Category                  | Course Type | Course Code | Course Title                                 | Marks       | Hours per Week |          |           |           | Credits   |
|   |                           |             |             |  |             | L              | T        | P         | Total     |           |
| <b>➤ THEORY</b>                               |                           |             |             |  |             |                |          |           |           |           |
| 1   | Ability Enhancement       | BS          | M-202       | Mathematics-II                               | 100         | 3              | 0        | 0         | 3         | 3         |
| 2   | Multi-Disciplinary        | BS          | PH-201      | Physics                                      | 100         | 3              | 0        | 0         | 3         | 3         |
| 3   | Multi-Disciplinary        | ES          | EE-201      | Basic Electrical Engineering                 | 100         | 3              | 0        | 0         | 3         | 3         |
| 4   | Ability Enhancement       | HM          | ENG-201     | English Language and Technical Communication | 100         | 3              | 0        | 0         | 3         | 3         |
| 5   | Major                     | ES          | CS-202      | Programming for Problem Solving              | 100         | 3              | 0        | 0         | 3         | 3         |
| <b>TOTAL THEORY</b>                           |                           |             |             |  | <b>500</b>  | <b>15</b>      | <b>0</b> | <b>0</b>  | <b>15</b> | <b>15</b> |
| <b>➤ PRACTICAL/SESSIONAL</b>                  |                           |             |             |  |             |                |          |           |           |           |
| 6   | Multi-Disciplinary        | BS          | PH-291      | Physics Lab                                  | 100         | 0              | 0        | 2         | 2         | 1         |
| 7   | Multi-Disciplinary        | ES          | EE-291      | Basic Electrical Engineering Lab             | 100         | 0              | 0        | 2         | 2         | 1         |
| 8   | Skill Enhancement         | ES          | ME-291      | Workshop Practices                           | 100         | 0              | 0        | 4         | 4         | 2         |
| 9   | Ability Enhancement       | HM          | ENG-291     | Language Lab                                 | 100         | 0              | 0        | 2         | 2         | 1         |
| 10  | Major                     | ES          | CS-292      | Programming for Problem Solving Lab          | 100         | 0              | 0        | 4         | 4         | 2         |
| <b>TOTAL PRACTICAL/SESSIONAL</b>              |                           |             |             |  | <b>500</b>  | <b>0</b>       | <b>0</b> | <b>14</b> | <b>14</b> | <b>7</b>  |
| 11  | Extra-Curricular Activity |             |             | NSS  | 100         | 0              | 0        | 0         | 0         | 0         |
| <b>TOTAL OF SEMESTER</b>                      |                           |             |             |  | <b>1100</b> | <b>15</b>      | <b>0</b> | <b>14</b> | <b>29</b> | <b>22</b> |

**B. Tech. in Information Technology  
Second Year**

| 2 <sup>nd</sup> Year 3 <sup>rd</sup> Semester |                     |             |             |   |            |                |          |           |           |           |
|---|---------------------|-------------|-------------|---|------------|----------------|----------|-----------|-----------|-----------|
| Sl. No.                                       | Category            | Course Type | Course Code | Course Title                              | Marks      | Hours per Week |          |           |           | Credits   |
|   |                     |             |             |   |            | L              | T        | P         | Total     |           |
| <b>➤ THEORY</b>                               |                     |             |             |   |            |                |          |           |           |           |
| 1   | Ability Enhancement | BS          | IT-301      | Mathematics III                           | 100        | 3              | 1        | 0         | 4         | 3         |
| 2   | Major               | PC          | IT-302      | Data structure and algorithm              | 100        | 3              | 0        | 0         | 3         | 3         |
| 3   | Minor               | ES          | IT-303      | Analog and Digital Electronics            | 100        | 3              | 0        | 0         | 3         | 3         |
| 4   | Major               | PC          | IT-304      | Problem Solving Using Python              | 100        | 3              | 0        | 0         | 3         | 3         |
| 5   | Multi-Disciplinary  | BS          | IT-305      | Biology for Engineers                     | 100        | 3              | 0        | 0         | 3         | 3         |
| <b>TOTAL THEORY</b>                           |                     |             |             |   | <b>500</b> | <b>15</b>      | <b>1</b> | <b>0</b>  | <b>16</b> | <b>15</b> |
| <b>➤ PRACTICAL/SESSIONAL</b>                  |                     |             |             |   |            |                |          |           |           |           |
| 6   | Major               | PC          | IT-392      | Data structure and algorithm Laboratory   | 100        | 0              | 0        | 4         | 4         | 2         |
| 7   | Minor               | EC          | IT-393      | Analog and Digital Electronics Laboratory | 100        | 0              | 0        | 4         | 4         | 2         |
| 8   | Major               | PC          | IT-394      | Problem Solving Using Python Laboratory   | 100        | 0              | 0        | 4         | 4         | 2         |
| 9   | Skill Enhancement   | HM          | IT-395      | Soft skill Laboratory-I                   | 100        | 0              | 0        | 2         | 2         | 1         |
| <b>TOTAL PRACTICAL/SESSIONAL</b>              |                     |             |             |   | <b>400</b> | <b>0</b>       | <b>0</b> | <b>14</b> | <b>14</b> | <b>7</b>  |
| <b>TOTAL OF SEMESTER</b>                      |                     |             |             |   | <b>900</b> | <b>15</b>      | <b>1</b> | <b>14</b> | <b>30</b> | <b>22</b> |

| 2 <sup>nd</sup> Year 4 <sup>th</sup> Semester |                     |             |             |   |            |                |          |           |           |           |
|---|---------------------|-------------|-------------|---|------------|----------------|----------|-----------|-----------|-----------|
| Sl. No.                                       | Category            | Course Type | Course Code | Course Title                                      | Marks      | Hours per Week |          |           |           | Credits   |
|   |                     |             |             |   |            | L              | T        | P         | Total     |           |
| <b>➤ THEORY</b>                               |                     |             |             |   |            |                |          |           |           |           |
| 1   | Ability Enhancement | BS          | IT-401      | Discrete Mathematics                              | 100        | 3              | 0        | 0         | 3         | 3         |
| 2   | Major               | PC          | IT-402      | Computer Organization and Architecture            | 100        | 3              | 0        | 0         | 3         | 3         |
| 3   | Major               | PC          | IT-403      | Design and Analysis of Algorithms                 | 100        | 3              | 0        | 0         | 3         | 3         |
| 4   | Major               | PC          | IT-404      | Formal Language & Automata Theory                 | 100        | 3              | 0        | 0         | 3         | 3         |
| 5   | Major               | PC          | IT-405      | Object Oriented Programming                       | 100        | 3              | 0        | 0         | 3         | 3         |
| <b>TOTAL THEORY</b>                           |                     |             |             |   | <b>500</b> | <b>15</b>      | <b>0</b> | <b>0</b>  | <b>15</b> | <b>15</b> |
| <b>➤ PRACTICAL/SESSIONAL</b>                  |                     |             |             |   |            |                |          |           |           |           |
| 6   | Major               | PC          | IT-492      | Computer Organization and Architecture Laboratory | 100        | 0              | 0        | 4         | 4         | 2         |
| 7   | Major               | PC          | IT-493      | Design and Analysis of Algorithms Laboratory      | 100        | 0              | 0        | 4         | 4         | 2         |
| 8   | Major               | PC          | IT-495      | Object Oriented Programming Laboratory            | 100        | 0              | 0        | 4         | 4         | 2         |
| 9   | Skill Enhancement   | PC          | IT-496      | Technical Aptitude-I                              | 100        | 0              | 0        | 2         | 2         | 1         |
| <b>TOTAL PRACTICAL/SESSIONAL</b>              |                     |             |             |   | <b>400</b> | <b>0</b>       | <b>0</b> | <b>14</b> | <b>14</b> | <b>7</b>  |
| <b>TOTAL OF SEMESTER</b>                      |                     |             |             |   | <b>900</b> | <b>15</b>      | <b>0</b> | <b>14</b> | <b>29</b> | <b>22</b> |

**B. Tech. in Information Technology  
Third Year**

| 3 <sup>rd</sup> Year 5 <sup>th</sup> Semester |                    |             |             |  |             |                |          |           |           |           |
|---|--------------------|-------------|-------------|--|-------------|----------------|----------|-----------|-----------|-----------|
| Sl. No.                                       | Category           | Course Type | Course Code | Course Title   | Marks       | Hours per Week |          |           |           | Credits   |
|   |                    |             |             |  |             | L              | T        | P         | Total     |           |
| <b>➤ THEORY</b>                               |                    |             |             |  |             |                |          |           |           |           |
| 1   | Major              | PC          | IT-501      | Software Engineering and Project Management            | 100         | 3              | 0        | 0         | 3         | 3         |
| 2   | Major              | PC          | IT-502      | Operating System                                       | 100         | 3              | 0        | 0         | 3         | 3         |
| 3   | Major              | PC          | IT-503      | Machine Learning                                       | 100         | 3              | 0        | 0         | 3         | 3         |
| 4   | Major              | PC          | IT-504      | Data Base Management System                            | 100         | 3              | 0        | 0         | 3         | 3         |
| <b>TOTAL THEORY</b>                           |                    |             |             |  | <b>400</b>  | <b>12</b>      | <b>0</b> | <b>0</b>  | <b>12</b> | <b>12</b> |
| <b>➤ PRACTICAL/SESSIONAL</b>                  |                    |             |             |  |             |                |          |           |           |           |
| 5   | Major              | PC          | IT-591      | Software Engineering and Project Management Laboratory | 100         | 0              | 0        | 4         | 4         | 2         |
| 6   | Major              | PC          | IT-592      | Operating System Laboratory                            | 100         | 0              | 0        | 4         | 4         | 2         |
| 7   | Major              | PC          | IT-593      | Machine Learning Laboratory                            | 100         | 0              | 0        | 4         | 4         | 2         |
| 8   | Major              | PC          | IT-594      | Data Base Management System Laboratory                 | 100         | 0              | 0        | 4         | 4         | 2         |
| 9   | Skill Enhancement  | HM          | IT-595      | Soft skill Laboratory-II                               | 100         | 0              | 0        | 2         | 2         | 1         |
| 10  | Value Added Course | HM          | IT-581      | Constitution of India                                  | 100         | 2              | 0        | 0         | 2         | 0         |
| <b>TOTAL PRACTICAL/SESSIONAL</b>              |                    |             |             |  | <b>600</b>  | <b>2</b>       | <b>0</b> | <b>18</b> | <b>20</b> | <b>9</b>  |
| <b>TOTAL OF SEMESTER</b>                      |                    |             |             |  | <b>1000</b> | <b>14</b>      | <b>0</b> | <b>18</b> | <b>32</b> | <b>21</b> |

| 3 <sup>rd</sup> Year 6 <sup>th</sup> Semester |                    |             |                        |   |             |                |          |           |           |           |
|---|--------------------|-------------|------------------------|---|-------------|----------------|----------|-----------|-----------|-----------|
| Sl. No.                                       | Category           | Course Type | Course Code            | Course Title  | Marks       | Hours per Week |          |           |           | Credits   |
|   |                    |             |                        |   |             | L              | T        | P         | Total     |           |
| <b>➤ THEORY</b>                               |                    |             |                        |   |             |                |          |           |           |           |
| 1   | Major              | PC          | IT-601                 | Image Processing  | 100         | 3              | 0        | 0         | 3         | 3         |
| 2   | Major              | PC          | IT-602                 | Computer Networks   | 100         | 3              | 0        | 0         | 3         | 3         |
| 3   | Major              | PC          | IT-603                 | Data Mining and Data Warehousing  | 100         | 3              | 0        | 0         | 3         | 3         |
| 4   | Major              | PE          | IT-604/605/606/607/608 | Professional Elective- I (Distributed System/ Web Technology/ Soft Computing and Optimization/Parallel and Distributed Algorithms/ Pattern Recognition) | 100         | 3              | 0        | 0         | 3         | 3         |
| 5   | Multi-Disciplinary | OE          | IT-609/610             | Open Elective-I (Human Resource Development and Organizational Behaviour /Numerical Methods)  | 100         | 3              | 0        | 0         | 3         | 3         |
| <b>TOTAL THEORY</b>                           |                    |             |                        |   | <b>500</b>  | <b>15</b>      | <b>0</b> | <b>0</b>  | <b>15</b> | <b>15</b> |
| <b>➤ PRACTICAL/SESSIONAL</b>                  |                    |             |                        |   |             |                |          |           |           |           |
| 6   | Major              | PC          | IT-691                 | Image Processing Laboratory   | 100         | 0              | 0        | 4         | 4         | 2         |
| 7   | Major              | PC          | IT-692                 | Computer Networks Laboratory  | 100         | 0              | 0        | 4         | 4         | 2         |
| 8   | Major              | PC          | IT-693                 | Data Mining Laboratory  | 100         | 0              | 0        | 4         | 4         | 2         |
| 9   | Skill Enhancement  | PC          | IT-694                 | Technical aptitude-II   | 100         | 0              | 0        | 2         | 2         | 1         |
| <b>TOTAL PRACTICAL/SESSIONAL</b>              |                    |             |                        |   | <b>400</b>  | <b>0</b>       | <b>0</b> | <b>14</b> | <b>14</b> | <b>7</b>  |
| <b>TOTAL OF SEMESTER</b>                      |                    |             |                        |   | <b>1000</b> | <b>15</b>      | <b>0</b> | <b>14</b> | <b>29</b> | <b>22</b> |

**B. Tech. in Information Technology  
Fourth Year**

| 4 <sup>th</sup> Year 7 <sup>th</sup> Semester |                    |             |                |  |            |                |          |           |           |           |
|---|--------------------|-------------|----------------|--|------------|----------------|----------|-----------|-----------|-----------|
| Sl. No.                                       | Category           | Course Type | Course Code    | Course Title   | Marks      | Hours per Week |          |           |           | Credits   |
|   |                    |             |                |  |            | L              | T        | P         | Total     |           |
| <b>➤ THEORY</b>                               |                    |             |                |  |            |                |          |           |           |           |
| 1   | Major              | PC          | IT-701         | Internet of Things   | 100        | 3              | 0        | 0         | 3         | 3         |
| 2   | Major              | PC          | IT-702         | Human Computer Interaction   | 100        | 3              | 0        | 0         | 3         | 3         |
| 3   | Multi-Disciplinary | OE          | IT-703/704/705 | Open elective-II (Operation Research and Optimization / Soft Skill & Interpersonal Communication/ Essence of Indian Knowledge Tradition) | 100        | 3              | 0        | 0         | 3         | 3         |
| 4   | Value Added Course | HM          | IT-706         | Economics for Engineers  | 100        | 3              | 0        | 0         | 3         | 3         |
| <b>TOTAL THEORY</b>                           |                    |             |                |  | <b>400</b> | <b>12</b>      | <b>0</b> | <b>0</b>  | <b>12</b> | <b>12</b> |
| <b>➤ PRACTICAL/SESSIONAL</b>                  |                    |             |                |  |            |                |          |           |           |           |
| 5   | Skill Enhancement  | PC          | IT-787         | Mini Project   | 100        | 0              | 0        | 12        | 12        | 6         |
| 6   | Major              | PC          | IT-791         | Internet of Things Laboratory  | 100        | 0              | 0        | 4         | 4         | 2         |
| 7   | Major              | PC          | IT-792         | Human Computer Interaction Laboratory  | 100        | 0              | 0        | 4         | 4         | 2         |
| <b>TOTAL PRACTICAL/SESSIONAL</b>              |                    |             |                |  | <b>300</b> | <b>0</b>       | <b>0</b> | <b>20</b> | <b>20</b> | <b>10</b> |
| <b>TOTAL OF SEMESTER</b>                      |                    |             |                |  | <b>700</b> | <b>12</b>      | <b>0</b> | <b>20</b> | <b>32</b> | <b>22</b> |

| 4 <sup>th</sup> Year 8 <sup>th</sup> Semester |                    |             |                        |  |            |                |          |           |           |           |
|---|--------------------|-------------|------------------------|--|------------|----------------|----------|-----------|-----------|-----------|
| Sl. No.                                       | Category           | Course Type | Course Code            | Course Title   | Marks      | Hours per Week |          |           |           | Credits   |
|   |                    |             |                        |  |            | L              | T        | P         | Total     |           |
| <b>➤ THEORY</b>                               |                    |             |                        |  |            |                |          |           |           |           |
| 1   | Value Added Course | HM          | IT-801                 | Sustainable Development & Environmental Science  | 100        | 3              | 0        | 0         | 3         | 3         |
| 2   | Major              | PE          | IT-802/803/804/805/806 | Professional elective-II (Cyber security/ Artificial Intelligence/ Quantum computing/ Cloud Computing/ Advanced Computer Networks) | 100        | 3              | 0        | 0         | 3         | 3         |
| <b>TOTAL THEORY</b>                           |                    |             |                        |  | <b>200</b> | <b>6</b>       | <b>0</b> | <b>0</b>  | <b>6</b>  | <b>6</b>  |
| <b>➤ PRACTICAL/SESSIONAL</b>                  |                    |             |                        |  |            |                |          |           |           |           |
| 5   | Skill Enhancement  | PC          | IT-887                 | Major Project  | 100        | 0              | 0        | 16        | 16        | 8         |
| <b>TOTAL PRACTICAL/SESSIONAL</b>              |                    |             |                        |  | <b>100</b> | <b>0</b>       | <b>0</b> | <b>16</b> | <b>16</b> | <b>8</b>  |
| <b>TOTAL OF SEMESTER</b>                      |                    |             |                        |  | <b>300</b> | <b>6</b>       | <b>0</b> | <b>16</b> | <b>22</b> | <b>14</b> |

**END**