

**ACADEMIC CURRICULA**  
**UNDERGRADUATE/ INTEGRATED**  
**POST GRADUATE DEGREE**  
**PROGRAMMES**

**(With exit option of Diploma)**

**(Choice Based Flexible Credit System)**

**Regulations 2021**

**Volume – 1**

**(Updated on July 2025)**



**SRM**

INSTITUTE OF SCIENCE & TECHNOLOGY  
(Deemed to be University u/s 3 of UGC Act, 1956)

**SRM INSTITUTE OF SCIENCE AND TECHNOLOGY**

**(Deemed to be University u/s 3 of UGC Act, 1956)**

**Kattankulathur, Chengalpattu District 603203,**

**Tamil Nadu, India**

**29. B.Tech. in Computer Science and Engineering with Specialization in Software Engineering**

**29. (a) Mission of the Department**

|                  |                                                                                                                                                                                                        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mission Stmt – 1 | To impart knowledge in cutting edge Computer Science and Engineering technologies in par with industrial standards.                                                                                    |
| Mission Stmt – 2 | To collaborate with renowned academic institutions to uplift innovative research and development in Computer Science and Engineering and its allied fields to serve the needs of society               |
| Mission Stmt – 3 | To demonstrate strong communication skills and possess the ability to design computing systems individually as well as part of a multidisciplinary teams.                                              |
| Mission Stmt – 4 | To instill societal, safety, cultural, environmental, and ethical responsibilities in all professional activities                                                                                      |
| Mission Stmt – 5 | To thrive students with profound technical knowledge, problem solving, and leadership skills essential to generate novel software technologies to empower individuals, organizations, and the society. |

**29. (b) Program Educational Objectives (PEO)**

|         |                                                                                                                                                                                                                                                                           |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PEO – 1 | Graduates will be able to perform in technical/managerial roles ranging from design, development, problem solving to production support in software industries and R&D sectors.                                                                                           |
| PEO – 2 | Graduates will be able to successfully pursue higher education in reputed institutions.                                                                                                                                                                                   |
| PEO – 3 | Graduates will have the ability to adapt, contribute and innovate new technologies and systems in the key domains of Computer Science and Engineering.                                                                                                                    |
| PEO – 4 | Graduates will be ethically and socially responsible solution providers and entrepreneurs in Computer Science and other engineering disciplines.                                                                                                                          |
| PEO – 5 | Graduates will be equipped with knowledge in the field of software engineering including scientific principles, analysis techniques, design methodologies, build and maintain secured software system to meet the demands and challenges of the growing software industry |

**29. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping**

|         | Mission Stmt. - 1 | Mission Stmt. - 2 | Mission Stmt. - 3 | Mission Stmt. - 4 | Mission Stmt. - 5 |
|---------|-------------------|-------------------|-------------------|-------------------|-------------------|
| PEO - 1 | 3                 | -                 | -                 | -                 | 1                 |
| PEO - 2 | -                 | -                 | 2                 | -                 | -                 |
| PEO - 3 | -                 | 3                 | 3                 | -                 | -                 |
| PEO - 4 | -                 | -                 | -                 | 2                 | 3                 |
| PEO - 5 | -                 | -                 | -                 | 3                 | 3                 |

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

**29. (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PO)**

|         | Program Outcomes (PO) |                  |                                 |                                            |                   |                          |                              |        |                        |               |                        |                    | Program Specific Outcomes (PSO) |       |       |
|---------|-----------------------|------------------|---------------------------------|--------------------------------------------|-------------------|--------------------------|------------------------------|--------|------------------------|---------------|------------------------|--------------------|---------------------------------|-------|-------|
|         | 1                     | 2                | 3                               | 4                                          | 5                 | 6                        | 7                            | 8      | 9                      | 10            | 11                     | 12                 | PSO-1                           | PSO-2 | PSO-3 |
|         | Engineering Knowledge | Problem Analysis | Design/development of solutions | Conduct investigations of complex problems | Modern Tool Usage | The engineer and society | Environment & Sustainability | Ethics | Individual & Team Work | Communication | Project Mgt. & Finance | Life Long Learning |                                 |       |       |
| PEO - 1 | 3                     | -                | -                               | 1                                          | -                 | 2                        | -                            | 3      | 2                      | 3             | -                      | -                  | -                               | -     | 2     |
| PEO - 2 | -                     | 2                | 2                               | -                                          | 3                 | -                        | 3                            | 2      | -                      | -             | -                      | -                  | 2                               | -     | -     |
| PEO - 3 | -                     | 3                | 3                               | 2                                          | -                 | -                        | -                            | -      | -                      | 2             | -                      | 3                  | -                               | 2     | -     |
| PEO - 4 | -                     | 2                | 3                               | -                                          | -                 | 3                        | 2                            | -      | 2                      | -             | 2                      | 2                  | -                               | 2     | -     |
| PEO - 5 | -                     | -                | 3                               | -                                          | -                 | 3                        | -                            | -      | 3                      | 3             | 3                      | 3                  | -                               | -     | 3     |

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

**PSO – Program Specific Outcomes (PSO)**

|         |                                                                                                                                                           |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| PSO - 1 | To understand, analyze, design, and develop computing solutions by applying fundamental concepts of computer science and engineering.                     |
| PSO - 2 | To apply computing principles, skills and practices to develop solutions using logical and reasoning skills, for real life problems.                      |
| PSO - 3 | To design and develop solutions by following standard software engineering principles and implement by using suitable programming languages and platforms |

**29. (e) Program Structure: B.Tech. in Computer Science and Engineering with Specialization in Software Engineering**

| Humanities & Social Sciences<br>including Management Courses (H) |                           |                 |   |   |   |  |
|------------------------------------------------------------------|---------------------------|-----------------|---|---|---|--|
| Course<br>Code                                                   | Course<br>Title           | Hours /<br>Week |   |   |   |  |
|                                                                  |                           | L               | T | P | C |  |
| 21LEH101T                                                        | Communicative English     | 2               | 1 | 0 | 3 |  |
| 21LEH102T                                                        | Chinese                   | 2               | 1 | 0 | 3 |  |
| 21LEH103T                                                        | French                    |                 |   |   |   |  |
| 21LEH104T                                                        | German                    |                 |   |   |   |  |
| 21LEH105T                                                        | Japanese                  |                 |   |   |   |  |
| 21LEH106T                                                        | Korean                    |                 |   |   |   |  |
| 21LEH107T                                                        | Spanish                   |                 |   |   |   |  |
| 21LEH108T                                                        | Russian                   |                 |   |   |   |  |
| 21GNH101J                                                        | Philosophy of Engineering | 1               | 0 | 2 | 2 |  |
| 21PDH209T <sup>1</sup>                                           | Social Engineering        | 2               | 0 | 0 | 2 |  |
| 21GNH401TA                                                       | Behavioral Psychology     | 2               | 1 | 0 | 3 |  |
| Total Credits 13                                                 |                           |                 |   |   |   |  |

| Basic Science Courses (B) |                                                    |                 |   |   |   |  |
|---------------------------|----------------------------------------------------|-----------------|---|---|---|--|
| Course<br>Code            | Course<br>Title                                    | Hours /<br>Week |   |   |   |  |
|                           |                                                    | L               | T | P | C |  |
| 21PYB102J                 | Semiconductor Physics and<br>Computational Methods | 3               | 1 | 2 | 5 |  |
| 21CYB101J                 | Chemistry                                          | 3               | 1 | 2 | 5 |  |
| 21MAB101T                 | Calculus and Linear Algebra                        | 3               | 1 | 0 | 4 |  |
| 21MAB102T                 | Advanced Calculus and Complex<br>Analysis          | 3               | 1 | 0 | 4 |  |
| 21MAB201T                 | Transforms and Boundary Value<br>Problems          | 3               | 1 | 0 | 4 |  |
| 21MAB204T                 | Probability and Queueing Theory                    | 3               | 1 | 0 | 4 |  |
| 21MAB302T                 | Discrete Mathematics                               | 3               | 1 | 0 | 4 |  |
| 21BTB102T                 | Introduction to Computational Biology              | 2               | 0 | 0 | 2 |  |
| Total Credits 32          |                                                    |                 |   |   |   |  |

| Engineering Science Courses (S) |                                        |                 |   |   |   |  |
|---------------------------------|----------------------------------------|-----------------|---|---|---|--|
| Course<br>Code                  | Course<br>Title                        | Hours /<br>Week |   |   |   |  |
|                                 |                                        | L               | T | P | C |  |
| 21MES101L <sup>1</sup>          | Basic Civil and Mechanical Workshop    | 0               | 0 | 4 | 2 |  |
| 21MES102L <sup>1</sup>          | Engineering Graphics and Design        | 0               | 0 | 4 | 2 |  |
| 21EES101T                       | Electrical and Electronics Engineering | 3               | 1 | 0 | 4 |  |
| 21CSS101J                       | Programming for Problem Solving        | 3               | 0 | 2 | 4 |  |
| 21CSS201T                       | Computer Organization and Architecture | 3               | 1 | 0 | 4 |  |
| 21DCS201P <sup>1</sup>          | Design Thinking and Methodology        | 1               | 2 | 0 | 3 |  |
| 21CSS303T                       | Data Science                           | 2               | 0 | 0 | 2 |  |
| Total Credits 21                |                                        |                 |   |   |   |  |

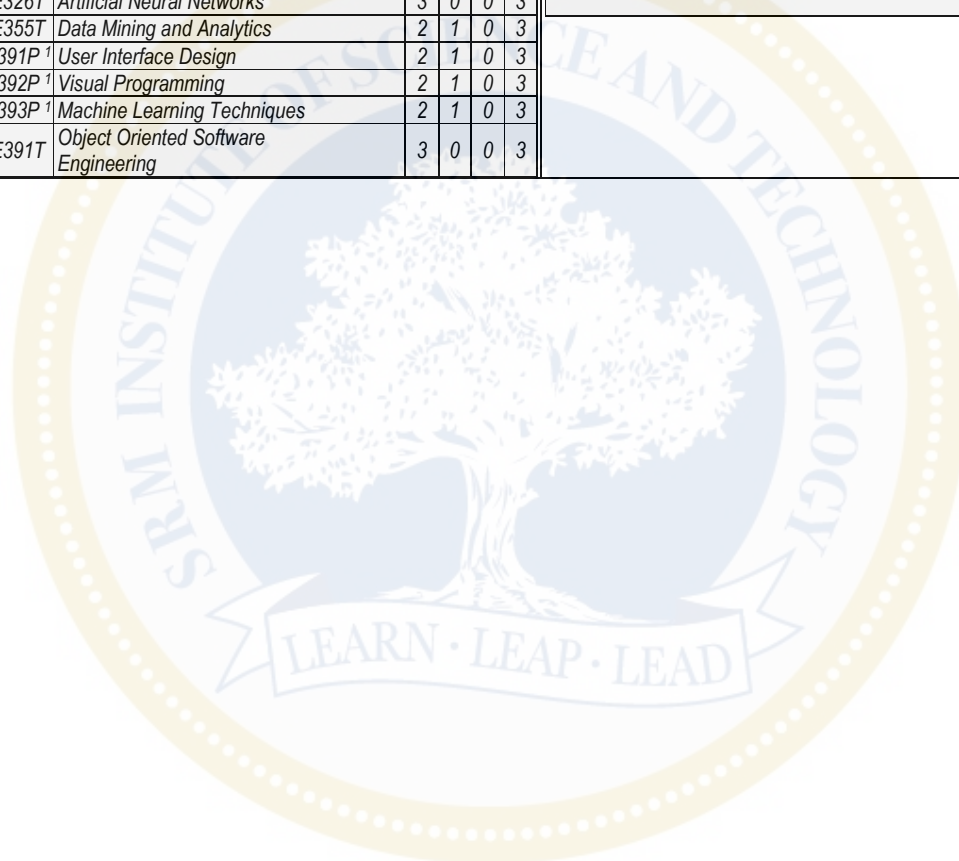
| Professional Core Courses (C) |                                                |                 |   |   |   |  |
|-------------------------------|------------------------------------------------|-----------------|---|---|---|--|
| Course<br>Code                | Course<br>Title                                | Hours /<br>Week |   |   |   |  |
|                               |                                                | L               | T | P | C |  |
| 21CSC101T                     | Object Oriented Design and Programming         | 2               | 1 | 0 | 3 |  |
| 21CSC201J                     | Data Structures and Algorithms                 | 3               | 0 | 2 | 4 |  |
| 21CSC202J                     | Operating Systems                              | 3               | 0 | 2 | 4 |  |
| 21CSC203P <sup>1</sup>        | Advanced Programming Practice                  | 3               | 1 | 0 | 4 |  |
| 21CSC204J                     | Design and Analysis of Algorithms              | 3               | 0 | 2 | 4 |  |
| 21CSC205P <sup>1</sup>        | Database Management Systems                    | 3               | 1 | 0 | 4 |  |
| 21CSC206T                     | Artificial Intelligence                        | 2               | 1 | 0 | 3 |  |
| 21CSC301T                     | Formal Language and Automata                   | 3               | 0 | 0 | 3 |  |
| 21CSC302J                     | Computer Networks                              | 3               | 0 | 2 | 4 |  |
| 21CSC303J                     | Software Engineering and Project<br>Management | 2               | 0 | 2 | 3 |  |
| 21CSC304J                     | Compiler Design                                | 2               | 0 | 2 | 3 |  |
| 21CSC309J                     | Software Architecture and Design               | 2               | 0 | 2 | 3 |  |
| 21CSC403T                     | Software Measurements and Metrics              | 3               | 0 | 0 | 3 |  |
| 21CSC404T                     | Software Verification and Validation           | 3               | 0 | 0 | 3 |  |
| Total Credits 48              |                                                |                 |   |   |   |  |

| Non Credit Courses (M) |                                                                                  |                 |   |   |   |  |
|------------------------|----------------------------------------------------------------------------------|-----------------|---|---|---|--|
| Course<br>Code         | Course<br>Title                                                                  | Hours /<br>Week |   |   |   |  |
|                        |                                                                                  | L               | T | P | C |  |
| 21PDM101L <sup>1</sup> | Professional Skills and Practices                                                | 0               | 0 | 2 | 0 |  |
| 21PDM102L <sup>1</sup> | General Aptitude                                                                 | 0               | 0 | 2 |   |  |
| 21PDM201L <sup>1</sup> | Verbal Reasoning                                                                 | 0               | 0 | 2 |   |  |
| 21PDM202L <sup>1</sup> | Critical and Creative Thinking Skills                                            | 0               | 0 | 2 |   |  |
| 21PDM301L <sup>1</sup> | Analytical and Logical Thinking Skills                                           | 0               | 0 | 2 |   |  |
| 21PDM302L <sup>1</sup> | Employability Skills and Practices                                               | 0               | 0 | 2 |   |  |
| 21CYM101T <sup>1</sup> | Environmental Science                                                            | 1               | 0 | 0 | 0 |  |
| 21LEM101T <sup>1</sup> | Constitution of India                                                            | 1               | 0 | 0 | 0 |  |
| 21LEM102T <sup>1</sup> | Universal Human Values – Introduction                                            | 1               | 0 | 0 | 0 |  |
| 21LEM201T <sup>1</sup> | Professional Ethics                                                              | 1               | 0 | 0 | 0 |  |
| 21LEM202T <sup>1</sup> | Universal Human Values-II:<br>Understanding Harmony and Ethical<br>Human Conduct | 2               | 1 | 0 | 3 |  |
| 21LEM301T <sup>1</sup> | Indian Art Form                                                                  | 1               | 0 | 0 | 0 |  |
| 21LEM302T <sup>1</sup> | Indian Traditional Knowledge                                                     | 1               | 0 | 0 | 0 |  |
| 21GNM101L <sup>1</sup> | Physical and Mental Health using Yoga                                            | 0               | 0 | 2 | 0 |  |
| 21GNM102L <sup>1</sup> | National Service Scheme                                                          |                 |   |   |   |  |
| 21GNM103L <sup>1</sup> | National Cadet Corps                                                             |                 |   |   |   |  |
| 21GNM104L <sup>1</sup> | National Sports Organization                                                     |                 |   |   |   |  |
| Total Credits 03       |                                                                                  |                 |   |   |   |  |

| Project Work, Seminar, Internship in Industry / Higher Technical<br>Institutions (P) |                   |                 |   |    |    |  |
|--------------------------------------------------------------------------------------|-------------------|-----------------|---|----|----|--|
| Course<br>Code                                                                       | Course<br>Title   | Hours /<br>Week |   |    |    |  |
|                                                                                      |                   | L               | T | P  | C  |  |
| 21GNP301L <sup>1</sup>                                                               | Community Connect | 0               | 0 | 2  | 1  |  |
| 21CSP302L <sup>1</sup>                                                               | Project           | 0               | 0 | 6  | 3  |  |
| 21CSP303T <sup>1</sup>                                                               | MOOC              | 3               | 0 | 0  |    |  |
| 21CSP401L                                                                            | Major Project     | 0               | 0 | 30 | 15 |  |
| 21CSP402L                                                                            | Major Project     | 0               | 0 | 20 | 10 |  |
| 21CSP403L                                                                            | Internship#       | 0               | 0 | 10 | 5  |  |
| Total Credits 19                                                                     |                   |                 |   |    |    |  |

| Open Elective Courses (O)<br>(Any 3 courses) |                                |                 |   |   |   |  |
|----------------------------------------------|--------------------------------|-----------------|---|---|---|--|
| Course<br>Code                               | Course<br>Title                | Hours /<br>Week |   |   |   |  |
|                                              |                                | L               | T | P | C |  |
| 21CSO351T                                    | Web Programming                | 2               | 1 | 0 | 3 |  |
| 21CSO352T                                    | Python Programming             | 2               | 1 | 0 | 3 |  |
| 21CSO353T                                    | Mobile Application Development | 2               | 1 | 0 | 3 |  |
| 21CSO354T                                    | Data Analytics                 | 2               | 1 | 0 | 3 |  |
| Total Credits 09                             |                                |                 |   |   |   |  |

| Professional Elective Courses (E)<br>(Any 6 Courses) |                                                                |              |   |   |   | Professional Elective Courses (E) |                                             |              |   |   |           |
|------------------------------------------------------|----------------------------------------------------------------|--------------|---|---|---|-----------------------------------|---------------------------------------------|--------------|---|---|-----------|
| Course Code                                          | Course Title                                                   | Hours / Week |   |   | C | Course Code                       | Course Title                                | Hours / Week |   |   | C         |
|                                                      |                                                                | L            | T | P |   |                                   |                                             | L            | T | P |           |
| 21CSE271T                                            | Programming in Java                                            | 2            | 1 | 0 | 3 | 21CSE392T                         | Python for Software Engineering             | 3            | 0 | 0 | 3         |
| 21CSE275T                                            | Requirements Engineering                                       | 3            | 0 | 0 | 3 | 21CSE393T                         | Analysis of Software Artifacts              | 3            | 0 | 0 | 3         |
| 21CSE276T                                            | Software Quality Management                                    | 3            | 0 | 0 | 3 | 21CSE396T                         | Design Principles of Smart Space Management | 3            | 0 | 0 | 3         |
| 21CSE277T                                            | Software Process                                               | 3            | 0 | 0 | 3 | 21CSE402P <sup>1</sup>            | Intelligent Systems for IoT Applications    | 2            | 1 | 0 | 3         |
| 21CSE301P <sup>1</sup>                               | Digital Health Ecosystem and Application Deployment Techniques | 2            | 1 | 0 | 3 | 21CSE421T                         | Business Intelligence and Analytics         | 2            | 1 | 0 | 3         |
| 21CSE307P <sup>1</sup>                               | Cloud Native AI Deployment                                     | 3            | 0 | 0 | 3 | 21CSE493T                         | Software Security                           | 3            | 0 | 0 | 3         |
| 21CSE306P <sup>1</sup>                               | Applied Generative AI                                          | 2            | 1 | 0 | 3 | 21CSE457T                         | Service Oriented Architecture               | 2            | 1 | 0 | 3         |
| 21CSE310J                                            | Robotic Process Automation                                     | 2            | 0 | 2 | 3 | 21CSE495T                         | Artificial Intelligence in Agile Systems    | 3            | 0 | 0 | 3         |
| 21CSE312P <sup>1</sup>                               | Software Engineering in Artificial Intelligence                | 2            | 1 | 0 | 3 | 21CSE496T <sup>2</sup>            | Deep Learning                               | 3            | 0 | 0 | 3         |
| 21CSE315P <sup>1</sup>                               | Data Orchestration and Management in Cloud Ecosystems          | 2            | 1 | 0 | 3 | 21CSE497T                         | Gaming and Virtual Reality                  | 3            | 0 | 0 | 3         |
| 21CSE326T                                            | Artificial Neural Networks                                     | 3            | 0 | 0 | 3 | 21CSE498T                         | Smartphone Computing and its Applications   | 3            | 0 | 0 | 3         |
| 21CSE355T                                            | Data Mining and Analytics                                      | 2            | 1 | 0 | 3 | <b>Total Credits</b>              |                                             |              |   |   | <b>18</b> |
| 21CSE391P <sup>1</sup>                               | User Interface Design                                          | 2            | 1 | 0 | 3 |                                   |                                             |              |   |   |           |
| 21CSE392P <sup>1</sup>                               | Visual Programming                                             | 2            | 1 | 0 | 3 |                                   |                                             |              |   |   |           |
| 21CSE393P <sup>1</sup>                               | Machine Learning Techniques                                    | 2            | 1 | 0 | 3 |                                   |                                             |              |   |   |           |
| 21CSE391T                                            | Object Oriented Software Engineering                           | 3            | 0 | 0 | 3 |                                   |                                             |              |   |   |           |



**29. (f) Programme Articulation: B.Tech. in Computer Science and Engineering with Specialization in Software Engineering**

| Course Code     | Course Name                                     | Program Outcomes (PO) |                  |                                 |                                            |                   |                          |                              |        |                        |               |                        |                    | PSO   |       |       |
|-----------------|-------------------------------------------------|-----------------------|------------------|---------------------------------|--------------------------------------------|-------------------|--------------------------|------------------------------|--------|------------------------|---------------|------------------------|--------------------|-------|-------|-------|
|                 |                                                 | 1                     | 2                | 3                               | 4                                          | 5                 | 6                        | 7                            | 8      | 9                      | 10            | 11                     | 12                 | 1     | 2     | 3     |
|                 |                                                 | Engineering Knowledge | Problem Analysis | Design/development of solutions | Conduct investigations of complex problems | Modern Tool Usage | The engineer and society | Environment & Sustainability | Ethics | Individual & Team Work | Communication | Project Mgt. & Finance | Life Long Learning | PSO-1 | PSO-2 | PSO-3 |
| 21CSS101J       | Programming for Problem Solving                 | 2                     | 3                | -                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | 2                      | -                  | 3     | -     |       |
| 21CSS303T       | Data Science                                    | -                     | -                | -                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | 1                  | 1     | -     |       |
| 21CSS201T       | Computer Organization and Architecture          | 3                     | 2                | -                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | 1                  | 2     | 1     |       |
| 21CSC201J       | Data Structures and Algorithms                  | 2                     | 3                | 3                               | 1                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | 1                  | 1     | 2     |       |
| 21CSC101T       | Object Oriented Design and Programming          | -                     | 2                | 2                               | -                                          | 2                 | -                        | -                            | -      | -                      | -             | 3                      | -                  | 2     | 2     |       |
| 21CSC204J       | Design and Analysis of Algorithms               | 2                     | 1                | 2                               | 1                                          | -                 | -                        | -                            | -      | 3                      | -             | 3                      | 3                  | 1     | -     |       |
| 21CSC202J       | Operating Systems                               | 3                     | 3                | 3                               | 2                                          | -                 | -                        | -                            | -      | -                      | -             | 3                      | 2                  | -     | -     |       |
| 21CSC303J       | Software Engineering and Project Management     | -                     | 3                | 2                               | -                                          | -                 | -                        | -                            | 2      | -                      | 2             | -                      | 3                  | -     | -     |       |
| 21CSC203P       | Advanced Programming Practice                   | 3                     | 2                | 2                               | 1                                          | 2                 | -                        | -                            | 1      | -                      | -             | -                      | 2                  | -     | -     |       |
| 21CSC301T       | Formal Language and Automata                    | 2                     | 2                | 2                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | -                  | 3     | -     |       |
| 21CSC302J       | Computer Networks                               | 3                     | -                | -                               | 2                                          | 3                 | -                        | -                            | -      | -                      | -             | -                      | 1                  | -     | -     |       |
| 21CSC205P       | Database Management Systems                     | 3                     | 2                | 2                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | 2                  | 1     | -     |       |
| 21CSC304J       | Compiler Design                                 | 3                     | 3                | 2                               | 3                                          | 2                 | -                        | -                            | -      | -                      | -             | -                      | -                  | 1     | -     |       |
| 21CSC206T       | Artificial Intelligence                         | 1                     | 2                | 3                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | 1                  | 2     | -     |       |
| 21CSC309J       | Software Architecture and Design                | 2                     | 3                | -                               | 3                                          | 3                 | -                        | -                            | -      | -                      | -             | -                      | -                  | 2     | 3     |       |
| 21CSC403T       | Software Measurements and Metrics               | 3                     | 3                | 2                               | -                                          | 3                 | -                        | -                            | -      | -                      | 2             | -                      | 2                  | -     | 3     |       |
| 21CSC404T       | Software Verification and Validation            | 3                     | 3                | -                               | -                                          | 3                 | -                        | -                            | -      | -                      | -             | -                      | -                  | 2     | 3     |       |
| 21CSE275T       | Requirements Engineering                        | 3                     | 3                | -                               | 3                                          | 1                 | -                        | -                            | 1      | -                      | -             | -                      | -                  | 1     | 3     |       |
| 21CSE276T       | Software Quality Management                     | 3                     | 2                | 2                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | -                  | 2     | 3     |       |
| 21CSE277T       | Software Process                                | 3                     | -                | -                               | 2                                          | -                 | -                        | -                            | 2      | -                      | -             | -                      | -                  | 2     | 3     |       |
| 21CSE271T       | Programming in Java                             | 3                     | 2                | 1                               | 2                                          | -                 | -                        | -                            | -      | -                      | -             | 1                      | 3                  | 2     | -     |       |
| 21CSE391P       | User Interface Design                           | -                     | -                | 3                               | -                                          | 2                 | -                        | -                            | 2      | -                      | 3             | -                      | -                  | 2     | 3     |       |
| 21CSE392P       | Visual Programming                              | -                     | -                | 3                               | -                                          | 2                 | -                        | -                            | 2      | -                      | 3             | -                      | -                  | 2     | 3     |       |
| 21CSE393P       | Machine Learning Techniques                     | -                     | 3                | -                               | -                                          | 3                 | -                        | -                            | 2      | -                      | 3             | -                      | -                  | 3     | 2     |       |
| 21CSE312P       | Software Engineering in Artificial Intelligence | -                     | 3                | 3                               | -                                          | 3                 | -                        | -                            | -      | -                      | -             | -                      | 2                  | 2     | 3     |       |
| 21CSE391T       | Object Oriented Software Engineering            | 3                     | 3                | 3                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | -                  | 2     | 3     |       |
| 21CSE392T       | Python for Software Engineering                 | 1                     | -                | 3                               | 3                                          | 3                 | -                        | -                            | -      | -                      | 2             | -                      | -                  | 2     | 3     |       |
| 21CSE393T       | Analysis of Software Artifacts                  | -                     | 3                | -                               | 2                                          | 2                 | -                        | -                            | -      | -                      | -             | -                      | -                  | 1     | 3     |       |
| 21CSE326T       | Artificial Neural Networks                      | -                     | -                | -                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | 2                  | 2     | 2     |       |
| 21CSE355T       | Data Mining and Analytics                       | 1                     | 2                | -                               | -                                          | 3                 | -                        | -                            | -      | -                      | -             | -                      | 2                  | -     | -     |       |
| 21CSE396T       | Design Principles of Smart Space Management     | 3                     | 2                | 2                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | 1                  | 2     | 3     |       |
| 21CSE421T       | Business Intelligence and Analytics             |                       |                  |                                 |                                            |                   |                          | 3                            |        | 3                      |               |                        | 2                  | 2     | 2     |       |
| 21CSE493T       | Software Security                               | -                     | 3                | 3                               | 3                                          |                   | -                        | -                            | -      | -                      | -             | -                      |                    | 1     | 3     |       |
| 21CSE457T       | Service Oriented Architecture                   | 2                     | 1                | 2                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | 2                  | -     | -     |       |
| 21CSE495T       | Artificial Intelligence in Agile Systems        | 3                     | 3                | 2                               | -                                          | -                 | -                        | -                            | -      | -                      | -             | -                      | 1                  | 2     | 3     |       |
| 21CSE496T       | Deep Learning                                   | 3                     | 2                | 3                               | -                                          | 3                 | -                        | -                            | -      | -                      | -             | -                      | 1                  | 3     | 2     |       |
| 21CSE497T       | Gaming and Virtual Reality                      | 3                     | -                | 3                               | -                                          | 2                 | -                        | -                            | -      | -                      | -             | 1                      | -                  | 3     | 2     |       |
| 21CSE498T       | Smartphone Computing and its Applications       | 3                     | -                | -                               | 2                                          | 3                 | -                        | 2                            | -      | -                      | -             | -                      | -                  | 2     | 2     |       |
| 21CSP302L       | Project                                         | 2                     | 2                | 2                               | 2                                          | 2                 | 2                        | 2                            | 2      | 2                      | 2             | 2                      | 2                  | 2     | 2     |       |
| 21CSP303T       | MOOC                                            | 2                     | 2                | 2                               | 2                                          | 2                 | 2                        | 2                            | 2      | 2                      | 2             | 2                      | 2                  | 2     | 2     |       |
| 21CSP401L       | Major Project                                   | 3                     | 3                | 3                               | 3                                          | 3                 | 3                        | 3                            | 3      | 3                      | 3             | 3                      | 3                  | 3     | 3     |       |
| 21CSP402L       | Major Project                                   | 3                     | 3                | 3                               | 3                                          | 3                 | 3                        | 3                            | 3      | 3                      | 3             | 3                      | 3                  | 3     | 3     |       |
| 21CSP403L       | Internship                                      | 3                     | 3                | 3                               | 3                                          | 3                 | 3                        | 3                            | 3      | 3                      | 3             | 3                      | 3                  | 3     | 3     |       |
| Program Average |                                                 | 3                     | 3                | 3                               | 3                                          | 3                 | 3                        | 3                            | 3      | 3                      | 3             | 3                      | 3                  | 3     | 3     |       |

29. (g) Implementation Plan: B.Tech. in Computer Science and Engineering with Specialization in Software Engineering

| Semester – I           |                                                 |              |   |   |    |
|------------------------|-------------------------------------------------|--------------|---|---|----|
| Course Code            | Course Title                                    | Hours / Week |   |   |    |
|                        |                                                 | L            | T | P | C  |
| 21LEH101T              | Communicative English                           | 2            | 1 | 0 | 3  |
| 21MAB101T              | Calculus and Linear Algebra                     | 3            | 1 | 0 | 4  |
| 21PYB102J              | Semiconductor Physics and Computational Methods | 3            | 1 | 2 | 5  |
| 21MES102L <sup>1</sup> | Engineering Graphics and Design                 | 0            | 0 | 4 | 2  |
| 21EES101T              | Electrical and Electronics Engineering          | 3            | 1 | 0 | 4  |
| 21CSS101J              | Programming for Problem Solving                 | 3            | 0 | 2 | 4  |
| 21CYM101T <sup>1</sup> | Environmental Science*                          | 1            | 0 | 0 | 0  |
| 21PDM101L <sup>1</sup> | Professional Skills and Practices               | 0            | 0 | 2 | 0  |
| 21LEM101T <sup>1</sup> | Constitution of India                           | 1            | 0 | 0 | 0  |
| Total Credits          |                                                 |              |   |   | 22 |

| Semester – II          |                                        |              |   |   |    |
|------------------------|----------------------------------------|--------------|---|---|----|
| Course Code            | Course Title                           | Hours / Week |   |   |    |
|                        |                                        | L            | T | P | C  |
| 21LEH102T              | Chinese                                | 2            | 1 | 0 | 3  |
| 21LEH103T              | French                                 |              |   |   |    |
| 21LEH104T              | German                                 |              |   |   |    |
| 21LEH105T              | Japanese                               |              |   |   |    |
| 21LEH106T              | Korean                                 |              |   |   |    |
| 21LEH107T              | Spanish                                |              |   |   |    |
| 21LEH108T              | Russian                                |              |   |   |    |
| 21GNH101J              | Philosophy of Engineering              | 1            | 0 | 2 | 2  |
| 21MAB102T              | Advanced Calculus and Complex Analysis | 3            | 1 | 0 | 4  |
| 21CYB101J              | Chemistry                              | 3            | 1 | 2 | 5  |
| 21BTB102T              | Introduction to Computational Biology  | 2            | 0 | 0 | 2  |
| 21CSC101T              | Object Oriented Design and Programming | 2            | 1 | 0 | 3  |
| 21MES101L <sup>1</sup> | Basic Civil and Mechanical Workshop    | 0            | 0 | 4 | 2  |
| 21PDM102L <sup>1</sup> | General Aptitude*                      | 0            | 0 | 2 | 0  |
| 21GNM101L <sup>1</sup> | Physical and Mental Health using Yoga  | 0            | 0 | 2 | 0  |
| 21GNM102L <sup>1</sup> | National Service Scheme                |              |   |   |    |
| 21GNM103L <sup>1</sup> | National Cadet Corps                   |              |   |   |    |
| 21GNM104L <sup>1</sup> | National Sports Organization           |              |   |   |    |
| Total Credits          |                                        |              |   |   | 21 |

| Semester – III         |                                        |             |   |   |    |
|------------------------|----------------------------------------|-------------|---|---|----|
| Course Code            | Course Title                           | Hours/ Week |   |   |    |
|                        |                                        | L           | T | P | C  |
| 21MAB201T              | Transforms and Boundary Value Problems | 3           | 1 | 0 | 4  |
| 21DCS201P <sup>1</sup> | Design Thinking and Methodology        | 1           | 2 | 0 | 3  |
| 21CSS201T              | Computer Organization and Architecture | 3           | 1 | 0 | 4  |
| 21CSC201J              | Data Structures and Algorithms         | 3           | 0 | 2 | 4  |
| 21CSC202J              | Operating Systems                      | 3           | 0 | 2 | 4  |
| 21CSC203P <sup>1</sup> | Advanced Programming Practice          | 3           | 1 | 0 | 4  |
| 21LEM201T <sup>1</sup> | Professional Ethics                    | 1           | 0 | 0 | 0  |
| 21PDM201L <sup>1</sup> | Verbal Reasoning                       | 0           | 0 | 2 | 0  |
| Total Credits          |                                        |             |   |   | 23 |

| Semester – IV          |                                                                            |             |   |   |    |
|------------------------|----------------------------------------------------------------------------|-------------|---|---|----|
| Course Code            | Course Title                                                               | Hours/ Week |   |   |    |
|                        |                                                                            | L           | T | P | C  |
| 21MAB204T              | Probability and Queueing Theory                                            | 3           | 1 | 0 | 4  |
| 21CSC204J              | Design and Analysis of Algorithms                                          | 3           | 0 | 2 | 4  |
| 21CSC205P <sup>1</sup> | Database Management Systems                                                | 3           | 1 | 0 | 4  |
| 21CSC206T              | Artificial Intelligence                                                    | 2           | 1 | 0 | 3  |
| E                      | Professional Elective-I                                                    |             |   |   | 3  |
| 21PDH209T <sup>1</sup> | Social Engineering                                                         | 2           | 0 | 0 | 2  |
| 21PDM202L <sup>1</sup> | Critical and Creative Thinking Skills                                      | 0           | 0 | 2 | 0  |
| 21LEM202T <sup>1</sup> | Universal Human Values-II: Understanding Harmony and Ethical Human Conduct | 2           | 1 | 0 | 3  |
| Total Credits          |                                                                            |             |   |   | 23 |

| Semester – V           |                                             |              |   |   |    |
|------------------------|---------------------------------------------|--------------|---|---|----|
| Course Code            | Course Title                                | Hours / Week |   |   |    |
|                        |                                             | L            | T | P | C  |
| 21MAB302T              | Discrete Mathematics                        | 3            | 1 | 0 | 4  |
| 21CSC301T              | Formal Language and Automata                | 3            | 0 | 0 | 3  |
| 21CSC302J              | Computer Networks                           | 3            | 0 | 2 | 4  |
| 21CSC303J              | Software Engineering and Project Management | 2            | 0 | 2 | 3  |
| E                      | Professional Elective – II                  |              |   |   | 3  |
| O                      | Open Elective – I                           |              |   |   | 3  |
| 21GNP301L <sup>1</sup> | Community Connect                           | 0            | 0 | 2 | 1  |
| 21PDM301L <sup>1</sup> | Analytical and Logical Thinking Skills      | 0            | 0 | 2 | 0  |
| 21LEM301T <sup>1</sup> | Indian Art Form                             | 1            | 0 | 0 | 0  |
| Total Credits          |                                             |              |   |   | 21 |

| Semester – VI          |                                    |              |   |   |    |
|------------------------|------------------------------------|--------------|---|---|----|
| Course Code            | Course Title                       | Hours / Week |   |   |    |
|                        |                                    | L            | T | P | C  |
| 21CSS303T              | Data Science                       | 2            | 0 | 0 | 2  |
| 21CSC309J              | Software Architecture and Design   | 2            | 0 | 2 | 3  |
| 21CSC304J              | Compiler Design                    | 2            | 0 | 2 | 3  |
| E                      | Professional Elective – III        |              |   |   | 3  |
| E                      | Professional Elective – IV         |              |   |   | 3  |
| O                      | Open Elective – II                 |              |   |   | 3  |
| 21CSP302L <sup>1</sup> | Project                            | 0            | 0 | 6 | 3  |
| 21CSP303T <sup>1</sup> | MOOC                               | 3            | 0 | 0 |    |
| 21PDM302L <sup>1</sup> | Employability Skills and Practices | 0            | 0 | 2 | 0  |
| 21LEM302T <sup>1</sup> | Indian Traditional Knowledge       | 1            | 0 | 0 | 0  |
| Total Credits          |                                    |              |   |   | 20 |

| Semester – VII |                                      |              |   |   |    |
|----------------|--------------------------------------|--------------|---|---|----|
| Course Code    | Course Title                         | Hours / Week |   |   |    |
|                |                                      | L            | T | P | C  |
| 21GNH401TA     | Behavioral Psychology                | 2            | 1 | 0 | 3  |
| E              | Professional Elective – V            |              |   |   | 3  |
| E              | Professional Elective – VI           |              |   |   | 3  |
| 21CSC403T      | Software Measurements and Metrics    | 3            | 0 | 0 | 3  |
| 21CSC404T      | Software Verification and Validation | 3            | 0 | 0 | 3  |
| O              | Open Elective –III                   |              |   |   | 3  |
| Total Credits  |                                      |              |   |   | 18 |

| Semester – VIII |               |              |   |    |    |
|-----------------|---------------|--------------|---|----|----|
| Course Code     | Course Title  | Hours / Week |   |    |    |
|                 |               | L            | T | P  | C  |
| 21CSP401L       | Major Project | 0            | 0 | 30 | 15 |
| 21CSP402L       | Major Project | 0            | 0 | 20 | 10 |
| 21CSP403L       | Internship#   | 0            | 0 | 10 | 5  |
| Total Credits   |               |              |   |    | 15 |

#Students have to register either 21CSP401L or 21CSP402L and 21CSP403L both in eighth semester