

SRIT R20

COURSE STRUCTURE

&

SYLLABUS

B. Tech Regular Four Year Degree Program (Applied for the Batches admitted from 2020-2021)

&

B. Tech (LES) for the batches admitted from 2021-2022



**SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY**

[AUTONOMOUS]

Affiliated to JNTUA & Approved by AICTE

Accredited by NAAC with ‘A’ Grade & Accredited by NBA (CSE, ECE & EEE)

Rotarypuram Village, B K Samudram Mandal,

Ananthapuramu - 515701

**COURSE STRUCTURE AND SYLLABI**

**(Based on AICTE Model Curriculum)**

**SRIT-R20**

Bachelor of Technology

In

Computer Science and Engineering

**B. Tech (Regular- Full time)**

(Effective for the students admitted into I Year from the Academic year **2020- 2021**)

**&**

**B. Tech (Lateral Entry Scheme)**

(Effective for the students admitted into II Year from the Academic year **2021- 2022**)



**SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY**

**(Autonomous)**

## Affiliated to JNTUA & Approved by AICTE Accredited by NAAC with ‘A’ Grade & NBA (CSE, ECE & EEE)

Rotarypuram Village, B K Samudram Mandal,

Ananthapuramu - 515701.

**B. Tech Course Structure**

Semester 0

(Common for all branches of Engineering)

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Course Name** | **L – T – P - C** |
| 1. | Physical Activities -- Sports, Yoga and Meditation, Plantation | 0 – 0 – 6 - 0 |
| 2. | Career Counseling | 2 – 0 – 2 - 0 |
| 3. | Orientation to all branches -- career options, tools, etc. | 3 – 0 – 0 - 0 |
| 4. | Orientation on admitted Branch --corresponding labs, tools and platforms | 2 – 0 – 3 - 0 |
| 5. | Proficiency Modules & Productivity Tools | 2 – 1 – 2 - 0 |
| 6. | Assessment on basic aptitude and mathematical skills | 2 – 0 – 3 - 0 |
| 7. | Remedial Training in Foundation Courses | 2 – 1 – 2 - 0 |
| 8. | Human Values & Professional Ethics | 3- 0 – 0 - 0 |
| 9. | Communication Skills -- focus on Listening, Speaking, Reading, Writing skills | 2 – 1 – 2 - 0 |
| 10. | Concepts of Programming | 2 – 0 – 2 - 0 |

**I Semester: I B. Tech I Semester (5 Theory + 3 Labs)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **Subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max. Marks** | | |
| L | T | P | CIA | SEE | Total |
| **R204GA54101** | Linear Algebra and  Calculus | BSC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| **R204GA56101** | Applied Physics | BSC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| **R204GA52101** | Communicative English-I | HSMC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05101** | Problem Solving &  Programming | ESC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA03101** | Engineering Graphics | ESC | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| **R204GA52102** | Communicative English-I Lab | HSMC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA56102** | Applied Physics Lab | BSC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05102** | Problem Solving &  Programming Lab | ESC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **Total** | | | | | | 19.5 | 320 | 480 | 800 |

**II Semester: I B. Tech II Semester (4 Theory + 4 Labs)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| L | T | P | CIA | SEE | Total |
| **R204GA54201** | Transforms & Partial  Differential Equations | BSC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| **R204GA51102** | Applied Chemistry | BSC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA02101** | Basic Electrical & Electronics Engineering | ESC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05201** | Data Structures | ESC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA03104** | Engineering Workshop  Practice | ESC | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| **R204GA02102** | Basic Electrical &  Electronics Engineering Lab | ESC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA51104** | Applied Chemistry Lab | BSC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05202** | Data Structures Lab | ESC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **Total** | | | | | | 19.5 | 320 | 480 | 800 |

**III Semester: II B. Tech I Semester (5 Theory + 3 Labs+1 NCMC+SOC)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| L | T | P | CIA | SEE | Total |
| **R204GA54302** | Probability & Statistics | BSC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05301** | Database Management Systems | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA52301** | English Language & Employment Skills for Engineers | HSS | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05302** | Object Oriented Programming | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05303** | Software Engineering | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05304** | Database Management Systems Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05305** | Object Oriented Programming Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05306** | Software Engineering Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA5MC01** | Environmental Science | NCMC | 2 | 0 | 0 | 0 | 40 | - | 40 |
| **R204GA05307** | **Skill oriented course\*** | SOC | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| **Total** | | | | | | 21.5 | 400 | 540 | 940 |

**IV Semester: II B. Tech II Semester (5 Theory + 3 Labs+1 NCMC+SOC)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| L | T | P | CIA | SEE | Total |
| **R204GA05401** | Discrete Mathematics | BSC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05402** | Formal Languages and Automata Theory | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05403** | Python Programming | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05404** | Design and Analysis of Algorithms | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA04407** | Digital Logic Design | ESC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05405** | Python Programming Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05406** | Design and Analysis of Algorithms Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05407** | Linux Programming Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA5MC02** | **Indian Constitution** | NCMC | 2 | 0 | 0 | 0 | 40 | - | 40 |
| **R204GA05408** | **Skill oriented course\*** | SOC | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| **Total** | | | | | | 21.5 | 400 | 540 | 940 |
| **Internship 2 Months (Mandatory) during summer vacation** | | | | | | | | | |

**V Semester: III B. Tech I Semester (5 Theory + 2 Labs+1NCMC+SAC+Internship)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| L | T | P | CIA | SEE | Total |
| **R204GA05501** | Web Development Technologies | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05502** | Computer Networks | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05503** | Operating Systems | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **Professional Elective courses – I** | |  |  |  |  |  |  |  |  |
| **R204GA05504** | 1.Data Warehousing and Data Mining | PEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05505** | 2. Wireless Sensor Networks |
| **R204GA05506** | 3. Software Testing Methodologies |
| **Open Elective-I** | | OEC | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| **R204GA05509** | Web Development Technologies Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05510** | Computer Networks and Operating Systems Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05511** | **Skill Advanced Course/ soft skill course\*** | SAC/SSC | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| **R204GA5MC03** | Essence of Indian Traditional Knowledge | NCMC | 2 | 0 | 0 | 0 | 40 | - | 40 |
| **R204GA05512** | Summer Internship | SI | 0 | 0 | 0 | 1.5 | 100 | - | 100 |
| **Total** | | | | | | 21.5 | 460 | 480 | 940 |

**VI Semester: III B. Tech II Semester (5 Theory + 3 Labs+1 NCMC+SAC)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| L | T | P | CIA | SEE | Total |
| **R204GA05513** | Compiler Design | PCC | 3 | 1 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05601** | Artificial Intelligence & Machine Learning | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05602** | Android Application Development | PCC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **Professional Elective Courses –II** | |  |  |  |  |  |  |  |  |
| **R204GA05603** | 1.Introduction to Big data | PEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05604** | 2. Cloud Computing |
| **R204GA05605** | 3. Software Project Management |
| **Open Elective – II** | | OEC | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| **R204GA05608** | Compiler Design Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05609** | Artificial Intelligence & Machine Learning Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05610** | Android Application Development Lab | PCC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **R204GA05611** | **Skill Advanced Course/ soft skill course\*** | SAC/SSC | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| **R204GA5MC04** | **Life Sciences for Engineers** | NCMC | 2 | 0 | 0 | 0 | 40 | - | 40 |
| **Total** | | | | | | 21.5 | 400 | 540 | 940 |
| **Industrial/Research Internship (Mandatory) 2 Months during summer vacation** | | | | | | | | | |

**VII Semester: IV B. Tech I Semester (5 Theory + SAC+ HSS+ Internship)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| L | T | P | CIA | SEE | Total |
| **Professional Elective Courses – III** | |  |  |  |  |  |  |  |  |
| **R204GA05701** | 1.Data Analytics | PEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05702** | 2. Mobile Computing |
| **R204GA05703** | 3. Software Requirements & Estimation |
| **Professional Elective Courses – IV** | |  |  |  |  |  |  |  |  |
| **R204GA05704** | 1. Artificial Neural Networks | PEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05705** | 2. Cyber Security |
| **R204GA05706** | 3. Software Quality Assurance |
| **Professional Elective Courses – V** | |  |  |  |  |  |  |  |  |
| **R204GA32702** | 1. Deep Learning | PEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05707** | 2. Block Chain Fundamentals |
| **R204GA05708** | 3. Agile Methodologies |
| Open Elective – III | | OEC | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| Open Elective – IV | | OEC | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
|  | **\*Humanities and Social Science Elective** | HSS | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| **R204GA05713** | **Skill advanced course/ soft skill course\*** | SAC/SSC | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| **R204GA05714** | **Industrial/Research Internship 2 Months (Mandatory after third year, to be evaluated during VII semester)** | II/RI | 0 | 0 | 0 | 3 | 100 | - | 100 |
| **Total** | | | | | | 23 | 380 | 420 | 800 |

**VIII Semester: IV B. Tech II Semester (Project work, seminar and internship in industry)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| L | T | P | CIA | SEE | Total |
| **R204GA05801** | Project work, seminar and internship in industry | Major Project | 0 | 0 | 0 | 12 | 80 | 120 | 200 |
| **Total** | | | | | | 12 | 80 | 120 | 200 |

Open Elective-I (V Semester, III B. Tech, I-Semester)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **Subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| **L** | **T** | **P** | **CIA** | **SEE** | **Total** |
| R204GA01504 | Air Pollution and  Control | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA01505 | Construction Technology  and Project Management | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA02504 | System Reliability  Concepts | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA02505 | Design of PV Systems | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA03508 | Entrepreneurship | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA03509 | Additive Manufacturing | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA04507 | Digital Electronics | OEC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| R204GA04508 | Principles of Communication Systems | OEC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| R204GA05507 | Essentials of Python Programming | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA05508 | Computer Organization & Operating System | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA52501 | Business  Environment & Policies | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA52502 | Managerial  Economics and  Financial Analysis | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Open Elective-II (VI Semester, III B. Tech, II-Semester)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **Subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| **L** | **T** | **P** | **CIA** | **SEE** | **Total** |
| R204GA01608 | Architecture and  Town Planning Measurements | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA01609 | Sustainable Development  And Environment  Management | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA02606 | Energy Storage  Systems | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA02607 | Electrical Safety  Measures | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA03608 | Non-Destructive Testing and Evaluation | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA03609 | Total Quality Management | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA04607 | Basics of VLSI | OEC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| R204GA04608 | Principles of Digital Signal Processing | OEC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| R204GA05606 | Mean Stack Technology | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA05607 | Introduction to Artificial Intelligence | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA56601 | Optical Physics and Its  Applications | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA52503 | Management Science | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Open Elective-III (VII Semester, IV B. Tech, I-Semester)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **Subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| **L** | **T** | **P** | **CIA** | **SEE** | **Total** |
| R204GA01713 | Disaster Management and Mitigation | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA01714 | Sustainable Energy  Efficient Building Materials  & Technologies | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA02709 | Electrical Engineering Materials | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA02710 | Solar Energy Conversion Systems | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA03713 | Basics of Electric Vehicles | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA03714 | Supply Chain Management | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA04710 | Principles of Microcontrollers & Applications | OEC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| R204GA04711 | Basics of Image Processing | OEC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| R204GA05709 | Data Science | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA05710 | Fundamentals of Security in Computing | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA54701 | Mathematical  Modelling | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA56701 | Thin Film Technology and Its Applications | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Open Elective-IV (VII Semester, IV B. Tech, I-Semester)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **Subject Area** | **Periods per week** | | | **Credits** | **Scheme of Examination Max.**  **Marks** | | |
| **L** | **T** | **P** | **CIA** | **SEE** | **Total** |
| R204GA01715 | Low Cost Housing  Techniques | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA01716 | Green Buildings | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA02711 | Wind Energy Conversion Systems | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA02712 | Soft Computing  Techniques | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA03715 | Industrial Automation and Robotics | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA03716 | Alternative Sources of Energy | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA04712 | Principles of Embedded Systems | OEC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| R204GA04713 | Design Thinking | OEC | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| R204GA05711 | Virtualization and Cloud Computing | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA05712 | Blockchain Technology and Applications | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA54702 | Optimization  Techniques | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| R204GA51701 | Global Warming and  Climate Changes | OEC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |