

KG Reddy College of Engineering & Technology
(AN AUTONOMOUS INSTITUTION)
B. Tech – Computer Science & Engineering
Course Structure & Syllabus - KGR21

B. Tech. I-Year I-Semester

| Sl. No. | Category | Course Code | Course Title | Contact Periods per week | | | | Credits | Scheme of Examination Max. Marks | | |
|--------------|----------|-------------|---|--------------------------|-----------|-----------|-----------|-----------|----------------------------------|------------|-------------|
| | | | | L | T | P | T | | Int. Marks | Ext. Marks | Total Marks |
| 1 | BS | KG21MA101 | Mathematics-I | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 2 | BS | KG21AP102 | Applied Physics | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 3 | ES | KG21CS103 | Programming in C | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 4 | ES | KG21EC104 | Basic Electrical Engineering | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 5 | ES | KG21ME105 | Engineering Workshop | 1 | 0 | 2 | 3 | 2 | 30 | 70 | 100 |
| 6 | BS | KG21AP106 | Applied Physics lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 7 | ES | KG21CS107 | C Programming Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 8 | ES | KG21EC108 | Basic Electrical Engineering Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| Total | | | | 13 | 02 | 08 | 23 | 19 | 240 | 560 | 800 |
| 9 | *SD | KG21SD109 | Design Thinking and Sustainable Development | 1 | 0 | 2 | 3 | 2* | 100 | - | 100 |

***SD (Engineering for Sustainable Development) – Value Added Course**

B. Tech. I-Year II-Semester

| Sl. No. | Category | Course Code | Course Title | Contact Periods per week | | | | Credits | Scheme of Examination Max. Marks | | |
|---------------|----------|-------------|---|--------------------------|-----------|-----------|-----------|-----------|----------------------------------|------------|-------------|
| | | | | L | T | P | T | | Int. Marks | Ext. Marks | Total Marks |
| 1 | BS | KG21MA201 | Mathematics-II | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 2 | BS | KG21CH202 | Engineering Chemistry | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 3 | ES | KG21CS203 | Python Programming | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 4 | ES | KG21ME204 | Engineering Graphics | 1 | 0 | 4 | 5 | 3 | 30 | 70 | 100 |
| 5 | HS | KG21EN205 | English | 2 | 0 | 0 | 2 | 2 | 30 | 70 | 100 |
| 6 | BS | KG21CH206 | Engineering Chemistry Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 7 | HS | KG21EN207 | English Language & Communication Skills Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 8 | ES | KG21CS208 | Python Programming Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| Total: | | | | 12 | 02 | 10 | 24 | 19 | 240 | 560 | 800 |
| 9 | *SD | KG21SD209 | Innovation for Rural Development | 1 | 0 | 2 | 3 | 2* | 100 | - | 100 |

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B. Tech. II-Year I-Semester

| Sl. No. | Category | Course Code | Course Title | Contact Periods per week | | | | Credits | Scheme of Examination Max. Marks | | |
|--------------|----------|-------------|--|--------------------------|-----------|-----------|-----------|-----------|----------------------------------|------------|-------------|
| | | | | L | T | P | T | | Int. Marks | Ext. Marks | Total Marks |
| 1 | BS | KG21MA301 | Computer Oriented Statistical Methods | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 2 | PC | KG21CS302 | Design and Analysis of Algorithms | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 3 | PC | KG21CS303 | Computer Organization and Architecture | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 4 | PC | KG21CS304 | Database Management Systems | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 5 | PC | KG21CS305 | Data Structures | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 6 | PC | KG21CS306 | Database Management Systems Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 7 | PC | KG21CS307 | Data Structures Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 8 | PC | KG21CS308 | IT Workshop Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 9 | MC | KG21MC309 | Constitution of India | 3 | 0 | 0 | 3 | 0 | 100 | - | - |
| Total | | | | 18 | 04 | 06 | 28 | 22 | 340 | 560 | 800 |
| 10 | *SD | KG21SD310 | Social Innovation I | 1 | 0 | 2 | 3 | 2* | 100 | - | 100 |

***SD (Engineering for Sustainable Development) – Value Added Course**

B. Tech. II-Year II-Semester

| Sl. No. | Category | Course Code | Course Title | Contact Periods per week | | | | Credits | Scheme of Examination Max. Marks | | |
|--------------|----------|-------------|---|--------------------------|----------|----------|-----------|-----------|----------------------------------|------------|-------------|
| | | | | L | T | P | T | | Int. Marks | Ext. Marks | Total Marks |
| 1 | EC | KG21EC401 | Analog and Digital Electronics | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 2 | MS | KG21MB402 | Business Economics and Financial Analysis | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 3 | PC | KG21CS403 | Discrete Mathematics | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 4 | PC | KG21CS404 | Operating Systems | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 5 | PC | KG21CS405 | OOP Through Java | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 6 | PC | KG21EC406 | Analog and Digital Electronics Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 7 | PC | KG21CS407 | Java Programming Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 8 | PC | KG21CS408 | Operating Systems Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 9 | MC | KG21MC410 | Gender Sensitization Lab | 0 | 0 | 2 | 2 | 0 | 100 | - | - |
| Total | | | | 15 | 2 | 8 | 25 | 20 | 340 | 560 | 800 |
| 10 | *SD | KG21SD411 | Social Innovation II | 1 | 0 | 2 | 3 | 2* | 100 | - | 100 |

***SD (Engineering for Sustainable Development) – Value Added Course**

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III B. Tech I-Semester

| Sl. No. | Category | Course Code | Course Title | Contact Periods per week | | | | Credits | Scheme of Examination Max. Marks | | |
|---------------|----------|-------------|--|--------------------------|----------|----------|-----------|-----------|----------------------------------|------------|-------------|
| | | | | L | T | P | T | | Int. Marks | Ext. Marks | Total Marks |
| 1 | PC | KG21CD501 | Software Engineering | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 2 | PC | KG21CS502 | Formal Language & Automata Theory | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 3 | PC | KG21CS503 | Computer Networks | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 4 | PE | | Professional Elective-I | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 5 | OE | | Open Elective-I | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 6 | PC | KG21CD504 | Software Engineering Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 7 | PC | KG21CS505 | Computer Networks Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 8 | BS | KG21EN517 | Advanced Communication Skills Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 9 | MC* | KG21MC514 | Intellectual Property Rights | 2 | 0 | 0 | 2 | 0 | 100 | - | - |
| 10 | MC* | KG21MC516 | Fundamentals of AI | 2 | 0 | 0 | 2 | 0 | 100 | - | - |
| 11 | SD* | KG21CS518 | Skill Development Course (Node JS/ React JS/ Django) | 0 | 0 | 2 | 2 | 1 | 100 | - | 100 |
| Total: | | | | 19 | 0 | 8 | 27 | 19 | 540 | 560 | 900 |

III B. Tech II-Semester

| Sl. No. | Category | Course Code | Course Title | Contact Periods per week | | | | Credits | Scheme of Examination Max. Marks | | |
|---------------|----------|-------------|--|--------------------------|----------|-----------|-----------|-----------|----------------------------------|------------|-------------|
| | | | | L | T | P | T | | Int. Marks | Ext. Marks | Total Marks |
| 1 | PC | KG21CM601 | Machine Learning | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 2 | PC | KG21CS602 | Compiler Design | 3 | 1 | 0 | 4 | 4 | 30 | 70 | 100 |
| 3 | PE | | Professional Elective–II | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 4 | PE | | Professional Elective–III | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 5 | OE | | Open Elective-II | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 6 | PC | KG21CS603 | Compiler Design Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 7 | PC | KG21CM607 | Machine Learning Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 8 | PE | | Professional Elective-III Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 9 | PC | KG21MP615 | Industrial Oriented Mini Project /Internship | 0 | 0 | 4 | 4 | 2 | - | 100 | 100 |
| 10 | MC* | KG21MC613 | Environmental Science | 2 | 0 | 0 | 2 | 0 | 100 | - | - |
| 11 | MC* | KG21MC617 | Cyber Security | 2 | 0 | 0 | 2 | 0 | 100 | - | - |
| Total: | | | | 19 | 1 | 10 | 30 | 21 | 440 | 660 | 900 |

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IV B. Tech I-Semester

| Sl. No. | Category | Course Code | Course Title | Contact Periods per week | | | | Credits | Scheme of Examination Max. Marks | | |
|---------------|----------|-------------|---------------------------------------|--------------------------|----------|-----------|-----------|-----------|----------------------------------|------------|-------------|
| | | | | L | T | P | T | | Int. Marks | Ext. Marks | Total Marks |
| 1 | PC | KG21CS701 | Cryptography and Network Security | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 2 | PC | KG21CS702 | DevOps | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 3 | PC | KG21CD710 | Data Mining | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 4 | PC | | Professional Elective-IV | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 5 | PE | | Professional Elective-V | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 6 | OE | | Open Elective –III | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 7 | PC | KG21CS704 | Cryptography and Network Security Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 8 | PC | KG21CS705 | DevOps Lab | 0 | 0 | 2 | 2 | 1 | 30 | 70 | 100 |
| 9 | PC | KG21MP716 | Project Stage-I | 0 | 0 | 6 | 6 | 3 | 100 | - | 100 |
| Total: | | | | 18 | 0 | 10 | 28 | 23 | 340 | 560 | 900 |

IV B. Tech II-Semester

| Sl. No. | Category | Course Code | Course Title | Contact Periods per week | | | | Credits | Scheme of Examination Max. Marks | | |
|---------------|----------|-------------|--------------------------|--------------------------|----------|-----------|-----------|-----------|----------------------------------|------------|-------------|
| | | | | L | T | P | T | | Int. Marks | Ext. Marks | Total Marks |
| 1 | PC | KG21MS801 | Organizational Behavior | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 2 | PC | | Professional Elective–VI | 3 | 0 | 0 | 3 | 3 | 30 | 70 | 100 |
| 3 | PC | KG21MP807 | Project Stage-II | 0 | 0 | 20 | 20 | 10 | 80 | 120 | 200 |
| 4 | PC | KG21SM808 | Seminar | 0 | 0 | 2 | 2 | 1 | 100 | - | 100 |
| Total: | | | | 6 | 0 | 22 | 28 | 17 | 240 | 260 | 500 |

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LIST OF Professional Elective(s):

Professional Elective –I

| | |
|-----------|-------------------------------------|
| KG21CD506 | Quantum Computing |
| KG21CS507 | Advanced Computer Architecture |
| KG21CM508 | Data Analytics |
| KG21CM509 | Image Processing |
| KG21CS510 | Principles of Programming Languages |

Professional Elective-II

| | |
|-----------|-------------------------------|
| KG21CD620 | Computer Graphics |
| KG21CS617 | Elements of Embedded Systems |
| KG21CS607 | Information Retrieval Systems |
| KG21CS608 | Distributed Databases |
| KG21CM603 | Natural Language Processing |

Professional Elective -III

| | |
|-----------|--------------------------------|
| KG21CS610 | Full Stack Development |
| KG21CS611 | Internet of Things |
| KG21CD612 | Scripting Languages |
| KG21CS613 | Mobile Application Development |
| KG21CS614 | Software Testing Methodologies |

Professional Elective -IV

| | |
|-----------|----------------------------|
| KG21CM719 | Graph Theory |
| KG21CS707 | Advanced Operating Systems |
| KG21CS708 | Soft Computing |
| KG21CD717 | Cloud Computing |
| KG21CS710 | Adhoc & Sensor Networks |

Professional Elective-V

| | |
|-----------|---------------------------------------|
| KG21CS711 | Advanced Algorithms |
| KG21CS712 | Agile Methodology |
| KG21CD716 | Blockchain Technology |
| KG21CM713 | Robotic Process Automation |
| KG21CS715 | Software Process & Project Management |

Professional Elective–VI

| | |
|-----------|----------------------------|
| KG21CS802 | Computational Complexity |
| KG21CS803 | Distributed Systems |
| KG21CM811 | Deep Learning |
| KG21CS805 | Human Computer Interaction |
| KG21CS806 | Cyber Forensics |

Courses in PE - III and PE - III Lab must be in 1-correspondence.

Professional Elective –III LABORATORY

| | |
|-----------|------------------------------------|
| KG21CS617 | Full Stack Development Lab |
| KG21CS618 | Internet of Things Lab |
| KG21CD619 | Scripting Languages Lab |
| KG21CS620 | Mobile Application Development Lab |
| KG21CS621 | Software Testing Methodologies Lab |

LIST OF Open Elective(s):

| | III B.Tech. I Semester | III B.Tech. II Semester | IV B.Tech. I Semester |
|---------------|--|--|---|
| S. No. | OE-1 | OE-2 | OE-3 |
| 1. | Introduction to Data Structures (KG21CS511) | Fundamentals of Operating System (KG21CS615) | Introduction to Design and Analysis of Algorithms (KG21CS717) |
| 2. | Fundamentals of Database Management System (KG21CS512) | Basics of Software Engineering (KG21CS616) | Introduction to Computer Networks (KG21CS718) |