B.TECH CIVIL ENGINEERING – R22

Quality Assurance & Quality Control in Construction

SEMESTER III

L/T/P/C
3/0/0/S

Unit 1: Fundamentals of Quality in Construction

- Concept of quality in construction projects
- Importance of QA/QC in civil engineering
- Principles of Total Quality Management (TQM)
- Standards and codes relevant to construction quality
- Roles and responsibilities of QA/QC engineers

Unit 2: Quality Assurance Processes

- Planning for quality in construction projects
- Documentation and quality manuals
- Inspection and test plans (ITPs)
- Audits and compliance checks
- Preventive measures and continuous improvement

Unit 3: Quality Control Techniques

- On-site inspection methods
- Material testing and verification
- Non-destructive testing (NDT) techniques
- Statistical quality control methods
- Monitoring workmanship and construction practices

Unit 4: Standards, Codes, and Safety

- ISO standards in construction
- National and international codes of practice

- Safety and risk management in QA/QC
- Legal and contractual aspects of quality
- Case studies of quality failures and lessons learned

Unit 5: Modern Practices and Future Trends

- Use of technology in QA/QC (BIM, drones, sensors)
- Digital quality management systems
- Lean construction and Six Sigma approaches
- Sustainability and green construction quality standards
- Future challenges and opportunities in QA/QC

Course Outcomes (COs): CO1: Explain the fundamental concepts of quality assurance and quality control in construction projects. CO2: Develop and implement quality assurance plans, documentation, and inspection procedures. CO3: Apply quality control techniques to evaluate materials, workmanship, and construction processes. CO4: Interpret and comply with relevant standards, codes, and safety regulations in construction quality management. CO5: Assess modern practices, technologies, and future trends in QA/QC for sustainable construction.