ISO 9001:2015 AICTE-CII: GOLD Category Institute NAAC-'A' Grade Institute (CGPA: 3.21) NIRF-2020 Rank Band: 201-250

KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE
Opp : Yerragattu Gutta, Hasanparthy (Mandal), WARANGAL - 506 015, Telangana, INDIA.
काकतीय प्रैद्योगिकी एवं विज्ञान संस्थान, वरंगल - ५०६ ०१५ तेलंगाना, भारत
కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ - ౫౦౬ ౦౧౫ తెలంగాణ, భారతదేశము
(An Autonomous Institute under Kakatiya University, Warangal)
(Approved by AICTE, New Delhi; Recognised by UGC under 2(f) & 12(B); Sponsored by EKASILA EDUCATION SOCIETY)
Estd-1980 KITSW
website: www.kitsw.ac.in E-mail: principal@kitsw.ac.in ✆ : +91 9392055211, +91 7382564888

# DEPARTMENT OF CIVIL ENGINEERING

## PG - M. Tech. –
## STRUCTURAL & CONSTRUCTION ENGINNERING

## PRR -20

## SCHEME OF INSTRUCTION & EVALUTION

**(I Semester to IV Semester)**

**(Applicable from the Academic Year 2020-21)**


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# PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

| PG – M.Tech. (STRUCTURAL & CONSTRUCTION ENGINNERING ) | |
|---|---|
| At the time of graduation, the post graduates of S&CE will be able to … | |
| **PEO1 (Research and Innovation)** | *demonstrate an epistemic state of exploring the research-based innovation in structural and construction engineering* |
| **PEO2 (Technical expertise and Successful career)** | *generate best possible outcomes through potent technical expertise and decisions, making them accountable in the construction industry* |
| **PEO3 (Soft skills and Lifelong learning)** | *develop self-efficacy, meta cognition and entrepreneurship, thus laying foundation for lifelong learning in the domain of sustainable construction industry.* |

## 1. NBA POs for M. Tech (*Structural and Construction Engineering*)

| PROGRAM OUTCOMES (POs) | |
|---|---|
| At the time of graduation, the post graduates of S&CE will be able to … | |
| **PO1** | *independently carry out research/investigation and development work to solve practical problems* |
| **PO2** | *write and present an effective technical report/document* |
| **PO3** | *demonstrate competence in the area of structural and construction engineering* |

## 2. M.Tech (*Structural and Construction Engineering*) Program PSOs

| PROGRAM SPECIFIC OUTCOMES (PSOs): | |
|---|---|
| At the time of graduation, the post graduates of S&CE will be able to … | |
| **PSO1** | *apply knowledge of structural and construction engineering for technology transfer from research to innovation.* |
| **PSO2** | *evaluate construction projects with a deeper conceptual coherence and integrity.* |

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**M.TECH. (STRUCTURAL AND CONSTRUCTION ENGINEERING)**

**PRR-20**

## SEMESTER-I

| Sr. No. | Course Type | Course Code | Course Name | Teaching scheme | | | Credits | Evaluation Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIE –TA | | | | | | | ESE | Total Marks |
| | | | | | | | | I²RE | | | | Minor | MSE | Total | | |
| | | | | | | | | ATLP | CRP | CP | PPT | | | | | |
| 1 | PC | P20SC101 | Limit Analysis of Reinforced Concrete Structures | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 2 | PC | P20SC102 | Construction Management | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 3 | PE | P20SC103 | Professional Elective-I/ MOOC-I | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 4 | PE | P20SC104 | Professional Elective-II/ MOOC-II | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 5 | PC | P20SC105 | Structural Engineering Laboratory | - | - | 4 | 2 | - | - | - | - | - | - | 60 | 40 | 100 |
| 6 | PC | P20SC106 | Construction Planning and Scheduling Laboratory | - | - | 4 | 2 | - | - | - | - | - | - | 60 | 40 | 100 |
| 7 | MC | P20MC107 | Research Methodology & IPR | 2 | - | - | 2 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 8 | AC | P20AC108 | Audit Course-I | 2 | - | - | 1 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| | | | Total: | 16 | - | 8 | 19 | | | | | | | 480 | 320 | 800 |

**[L= Lecture, T = Tutorials, P = Practicals, C = Credits, ATLP = Assignments, CRP = Course Research Paper, CP = Course Patent, PPT = Course Presentation, Minor=Minor Examination, MSE=Mid Semester Examination and ESE=End Semester Examination]**

| Elective-1 | Elective-2 | Audit Course-1 |
|---|---|---|
| P20SC103A: Matrix Analysis of Structures | P20SC104A: Behavior of Concrete | P20AC108A: English for Research Paper Writing |
| P20SC103B: Design of Concrete Bridges | P20SC104B: Construction Project Administration | P20AC108B: Sanskrit for Technical Knowledge |
| P20SC103C: Precast Concrete Technology | P20SC104C: Building Services | P20AC108C: Constitution of India |
| P20SC103D: MOOCs | P20SC104D: MOOCs | P20AC108D: Pedagogy Studies |

**Additional Learning: Students are advised to do MOOCs to bridge the gap in the curriculum as suggested in the DAC. The credits will be provided in the grade sheet.**

**Total Contact Periods/Week: 24** **Total Credits: 19**

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**PRR-20**

## SEMESTER-II

| Sr. No. | Course Type | Course Code | Course Name | Teaching scheme | | | Credits | Evaluation Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | CIE - TA | | | | | | | ESE | Total Marks |
| | | | | | | | | I²RE | | | | Minor | MSE | Total | | |
| | | | | L | T | P | | ATLP | CRP | CP | PPT | | | | | |
| 1 | PC | P20SC201 | Dynamics of Structures | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 2 | PC | P20SC202 | Construction Techniques & Equipment | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 3 | PE | P20SC203 | Professional Elective-III/ MOOC-III | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 4 | PE | P20SC204 | Professional Elective-IV/ MOOC-IV | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 5 | PC | P20SC205 | Structural Engineering Software Applications Laboratory | - | - | 4 | 2 | - | - | - | - | - | - | 60 | 40 | 100 |
| 6 | PC | P20SC206 | Infrastructure Design and Drawing laboratory | - | - | 4 | 2 | - | - | - | - | - | - | 60 | 40 | 100 |
| 7 | PROJ | P20SC207 | Mini Project with Seminar | - | - | 4 | 2 | - | - | - | - | - | - | 100 | - | 100 |
| 8 | AC | P20AC208 | Audit Course-II | 2 | - | - | 1 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| | | | Total: | 14 | - | 12 | 19 | | | | | | | 520 | 280 | 800 |

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| Elective- 3 | Elective- 4 | Audit Course - 2 |
|---|---|---|
| P20SC203A: Earthquake Resistant Design of RCC Structures | P20SC204A: Quality and Safety Management | P20AC208A: Stress Management by Yoga |
| P20SC203B: Design of Special Structures | P20SC204B: Sustainable Construction Engineering | P20AC208B: Value Education |
| P20SC203C: Repair, Rehabilitation and Retrofitting of structures | P20SC204C: Urban Infrastructure Planning and Management | P20AC208C: Personality Development through Life Enlightenment Skills |
| P20SC203D: MOOCs | P20SC204D: MOOCs | P20AC208D: Disaster Management |

**Total Contact Periods/Week: 26** **Total Credits: 19**

*Note: The students shall undergo mandatory Industrial training/ Internship for at least 6 to 8 weeks during summer vacation at Industry/R&D organization. Internship evaluation will be done during the III semester.*

**Additional Learning: Students are advised to do MOOCs to bridge the gap in the curriculum as suggested in the DAC. The credits will be provided in the grade sheet.**

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## SEMESTER-III

| Sr. No. | Course Type | Course Code | Course Name | Teaching scheme | | | Credits | Evaluation Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | CIE - TA | | | | | | | ESE | Total Marks |
| | | | | | | | | I²RE | | | | Minor | MSE | Total | | |
| | | | | L | T | P | | ATLP | CRP | CP | PPT | | | | | |
| 1 | PE | P20SC301 | Professional Elective-V/ MOOC-V | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 2 | OE | P20OE302 | Open Elective-I/ MOOC-VI | 3 | - | - | 3 | 8 | 8 | 8 | 6 | 10 | 20 | 60 | 40 | 100 |
| 3 | PROJ | P20SC303 | Dissertation Phase – I/Industrial Project *(to be continued in IV – Semester also as Dissertation Phase – II)* | - | - | 18 | 9 | - | - | - | - | - | - | 100 | - | 100 |
| 4 | PROJ | P20SC304 | Internship Evaluation | - | - | 2 | - | - | - | - | - | - | - | 100 | - | 100 |
| | | | Total: | 6 | - | 20 | 15 | | | | | | | 320 | 80 | 400 |

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| Elective- 5 | Open Elective |
|---|---|
| P20SC301A: AI & ML applications in Construction Engineering | P20OE302A: Business Analytics |
| P20SC301B: Theory of Elasticity | P20OE302B: Industrial Safety |
| P20SC301C: Finite Element Method | P20OE302C: Operations Research |
| P20DS301D:MOOCs | P20OE302D: Cost Management of Engineering Projects |
| | P20OE302E: Composite Materials |
| | P20OE302F: Waste to Energy |
| | P20OE302G: Renewable Energy Sources |
| | P20OE302H: MOOCs |

**Total Contact Periods/Week: 26** **Total Credits: 15**

**Additional Learning: Students are advised to do MOOCs to bridge the gap in the curriculum as suggested in the DAC. The credits will be provided in the grade sheet.**

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## SEMESTER-IV

| Sr. No. | Course Type | Course Code | Course Name | Teaching scheme | | | Credits | Evaluation Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | CIE - TA | | | | | | | ESE | Total Marks |
| | | | | L | T | P | | I²RE | | | | Minor | MSE | Total | | |
| | | | | | | | | ATLP | CRP | CP | PPT | | | | | |
| 1 | PROJ | P20SC401 | Dissertation Phase - II | - | - | 30 | 15 | - | - | - | - | - | - | 60 | 40 | 100 |
| | | | Total: | - | - | 30 | 15 | | | | | | | 60 | 40 | 100 |

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**Total Contact Periods/Week: 30** **Total Credits: 15**

## COURSE CREDIT STRUCTURE COURSE WEIGHTAGE

| Semester | PRR-20 Curriculum | As per Model Curriculum |
|---|---|---|
| **I** | 19 | 18 |
| **II** | 19 | 18 |
| **III** | 15 | 16 |
| **IV** | 15 | 16 |
| **Total:** | **68** | **68** |

| Courses | % Weightage of Courses |
|---|---|
| Professional Theory | 42.85 % (9/21) |
| Professional Lab | 38.1 % (8/21) |
| Other | 19.05 % (4/21) |
| **Total:** | **100 % (21/21)** |

## SEMESTER vs COURSE CATEGORY WEIGHTAGE

Number of Courses / Number of Credits (*Course Category wise*)

| Semester | MC | PC | PE | OE | PROJ | AC | TOTAL |
|---|---|---|---|---|---|---|---|
| **I** | 1/2 | 4/10 | 2/6 | - | - | 1/1 | **8/19** |
| **II** | - | 4/10 | 2/6 | - | 1/2 | 1/1 | **8/19** |
| **III** | - | - | 1/3 | 1/3 | 2/9 | - | **4/15** |
| **IV** | - | - | - | - | 1/15 | - | **1/15** |
| **Total** | **1/2** | **8/20** | **5/15** | **1/3** | **4/26** | **2/2** | **21/68** |
| **% Weightage of Course Category** | **2.94 % (2/68)** | **29.41 % (20/68)** | **22.05 % (15/68)** | **4.41 % (3/68)** | **38.23 % (26/68)** | **2.94 % (2/68)** | **100 % (68/68)** |