

# Sanjivani College of Engineering, Kopargaon

(An Autonomous Institute) Affiliated to Savitribai Phule Pune University.

At Sahajanandnagar, Post Shingnapur-423603, Ta.: Kopargaon, Dist.: Ahmednagar (MS)

Approved by AICTE, ISO 9001-2015 Certified, Accredited by NBA, Accredited 'A' Grade by NAAC,

Website: www.sanjivanicoe.org.in, Email: principalcoe@sanjivani.org.in,

Ph.No.: (+91) 9130191301, Fax: (02423)-222682



## Department of Structural Engineering

### B.Tech. (Structural Engineering)

#### Members of Board of Studies (BoS)

| Sr. No. | Designation  | Name                    | Address  |
|---------|--|-------------------------|--|
| 1       | Chairman   | Dr. A. S. Sayyad        | Prof. & Head Department of Structural Engineering                                  |
| 2       | Member   | All Faculty             | Department of Structural Engineering   |
| 3       | Member (Subject Experts Outside Parent University) | Dr. Y. M. Ghugal        | Prof. & Head, Department of Civil Engineering, Govt. COE Karad                     |
| 4       | Member (Subject Experts Outside Parent University) | Dr. S. S. Jamkar        | Professor, Applied Mechanics Department, Govt. COE, Aurangabad                     |
| 5       | Co-opt Members (Subject Expert)                    | Dr. Mrs. S. N. Madhekar | Professor, Department of Applied Mechanics, College of Engineering, Pune (COEP)    |
| 6       | Subject Expert (Parent University Nominated by VC) | Dr. M. S. Ranadive      | Prof. & Head, Department of Civil Engineering, College of Engineering, Pune (COEP) |
| 7       | Industry Representative                            | Er. Ravindra Joshi      | Director, PAN GULF Technologies Pvt. Ltd. Mumbai.                                  |
| 8       | Industry Representative                            | Er. Shaikh M. Iqbal     | Executive Engineer, PWD Maharashtra, Aurangabad.                                   |
| 9       | Meritorious Alumni                                 | Er. Sandhya Unde        | Deputy Manager, Technimont Pvt. Ltd. , Mumbai                                      |

#### Course Structure w.e.f. 2020-21

| List of Abbreviations |                         |              |  |
|-----------------------|-------------------------|--------------|--|
| Abbreviation          | Full Form               | Abbreviation | Full Form                                |
| ES                    | Engineering Science     | HS           | Humanity Science                         |
| PC                    | Professional Core       | CA           | Continuous Assessment                    |
| PE                    | Professional Elective   | OR           | Oral                                     |
| OE                    | Open Elective           | PR           | Practical                                |
| ISE                   | In-Semester Evaluation  | TW           | Term work                                |
| ESE                   | End-Semester Evaluation | MLC          | Mandatory Learning Course                |
| BSC                   | Basic Science Course    | PRJ          | Project/Seminar/Internship/Online Course |

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## Department of Structural Engineering

### Second Year B.Tech (2020-Pattern)

#### Semester-I

| Cat          | Course Code | Course Title  | Teaching Scheme (Hrs./Week) |   |   | Credits   | Evaluation Scheme (Marks) |     |     |     |    |    |       |
|--------------|-------------|---|-----------------------------|---|---|-----------|---------------------------|-----|-----|-----|----|----|-------|
|              |             |   | L                           | T | P |           | Theory                    |     |     | OR  | PR | TW | Total |
|              |             |   |                             |   |   |           | ISE                       | ESE | CA  |     |    |    |       |
| PC           | ST201       | Mechanics of Fluids                                   | 3                           | - | - | 3         | 30                        | 50  | 20  | -   | -  | -  | 100   |
| PC           | ST202       | Mechanics of Solids                                   | 4                           | - | - | 4         | 30                        | 50  | 20  | -   | -  | -  | 100   |
| PC           | ST203       | Civil Engineering Materials                           | 3                           | - | - | 3         | 30                        | 50  | 20  | -   | -  | -  | 100   |
| PC           | ST204       | Architectural Planning and Drawing                    | 3                           | - | - | 3         | 30                        | 50  | 20  | -   | -  | -  | 100   |
| HS           | HS205       | Universal Human Values and Ethics.                    | 3                           | - | - | 3         | 30                        | 50  | 20  | -   | -  | -  | 100   |
| PC           | ST206       | Mechanics of Fluids Lab.                              | -                           | - | 2 | 1         | -                         | -   | -   | 50  | -  | -  | 50    |
| PC           | ST207       | Mechanics of Solids Lab.                              | -                           | - | 2 | 1         | -                         | -   | -   | 50  | -  | -  | 50    |
| PC           | ST208       | Civil Engineering Materials Lab                       | -                           | - | 2 | 1         | -                         | -   | -   | 50  | -  | -  | 50    |
| PC           | ST209       | Architectural Planning and Drawing using AutoCAD      | -                           | - | 2 | 1         | -                         | -   | -   | -   | -  | 50 | 50    |
| MLC          | MLC210      | Mandatory learning Course-III-(Constitution of India) | 2                           | - | - | Pass/Fail | -                         | -   | -   | -   | -  | -  | -     |
| <b>Total</b> |             |   | 18                          | - | 8 | 20        | 150                       | 250 | 100 | 150 | -  | 50 | 700   |

\*Oral will be based on term-work submitted

#### Semester-II

| Cat          | Course Code | Course Title                              | Teaching Scheme (Hrs./Week) |   |    | Credits   | Evaluation Scheme (Marks) |     |     |    |    |    |       |
|--------------|-------------|---|-----------------------------|---|----|-----------|---------------------------|-----|-----|----|----|----|-------|
|              |             |   | L                           | T | P  |           | Theory                    |     |     | OR | PR | TW | Total |
|              |             |   |                             |   |    |           | ISE                       | ESE | CIA |    |    |    |       |
| PC           | BS202       | Engineering Mathematics-III               | 3                           | 1 | -  | 4         | 30                        | 50  | 20  | -  | -  | -  | 100   |
| PC           | ST211       | Object Oriented Programming               | 3                           | - | -  | 3         | 30                        | 50  | 20  | -  | -  | -  | 100   |
| PC           | ST212       | Geotechnical Engineering                  | 3                           | - | -  | 3         | 30                        | 50  | 20  | -  | -  | -  | 100   |
| PC           | ST213       | Infrastructure Engineering                | 3                           | - | -  | 3         | 30                        | 50  | 20  | -  | -  | -  | 100   |
| PC           | ST214       | Analysis of Determinate Structures        | 3                           | - | -  | 3         | 30                        | 50  | 20  | -  | -  | -  | 100   |
| PC           | ST215       | Computer Aided Drawings Lab               | -                           | - | 2  | 1         | -                         | -   | -   | -  | 50 | -  | 50    |
| PC           | ST216       | Geotechnical Engineering Lab              | -                           | - | 2  | 1         | -                         | -   | -   | 50 | -  | 25 | 75    |
| PC           | ST217       | Object Oriented Programming Lab           | -                           | - | 2  | 1         | -                         | -   | -   | -  | -  | 25 | 25    |
| PRJ          | ST218       | Seminar/Mini Project                      | -                           | - | 4  | 2         | -                         | -   | -   | 25 | -  | 25 | 50    |
| PRJ          | ST219       | Sports                                    | -                           | - | 2  | 1         | Participation Certificate |     |     |    |    |    |       |
| MLC          | MLC220      | Mandatory Learning Course-IV (Innovation) | 2                           | - | -  | Pass/Fail | -                         | -   | -   | -  | -  | -  | -     |
| <b>Total</b> |             |   | 18                          | 1 | 10 | 22        | 150                       | 250 | 100 | 75 | 50 | 75 | 700   |

BOS Chairman

Dean Academics

Director

## Third Year B.Tech (Course Structure)

### Semester-I

| Cat          | Course Code | Course Title                                    | Teaching Scheme (Hrs./Week) |   |    | Credits   | Evaluation Scheme (Marks) |     |     |    |     |    |            |
|--------------|-------------|---|-----------------------------|---|----|-----------|---------------------------|-----|-----|----|-----|----|------------|
|              |             |   | L                           | T | P  |           | Theory                    |     |     | OR | PR  | TW | Total      |
|              |             |   |                             |   |    |           | ISE                       | ESE | CIA |    |     |    |            |
| PC           | ST301       | Analysis of Indeterminate Structures            | 03                          | - | -  | 03        | 30                        | 50  | 20  | -  | -   | -  | 100        |
| PC           | ST302       | Design of Steel Structures                      | 04                          | - | -  | 04        | 30                        | 50  | 20  | -  | -   | -  | 100        |
| PC           | ST303       | Foundation Engineering                          | 03                          | - | -  | 03        | 30                        | 50  | 20  | -  | -   | -  | 100        |
| PC           | ST304       | Construction Planning and Management            | 03                          | - | -  | 03        | 30                        | 50  | 20  | -  | -   | -  | 100        |
| PE           | ST305       | Professional Elective-I                         | 03                          | - | -  | 03        | 30                        | 50  | 20  | -  | -   | -  | 100        |
| PC           | ST306       | Surveying                                       | 02                          |   |    | 02        | 15                        | 25  | 10  | -  | -   | -  | 50         |
| PC           | ST307       | Surveying Lab                                   | -                           | - | 02 | 01        | -                         | -   | -   | -  | 50  | -  | 50         |
| PC           | ST308       | Structural Analysis and Design using STAAD Pro. | -                           | - | 04 | 02        | -                         | -   | -   | -  | 50  | 50 | 100        |
| MLC          | MLC309      | Mandatory Learning Course-V (Sports)            | 1                           | - | -  | Pass/Fail | -                         | -   | -   | -  | -   | -  | -          |
| <b>Total</b> |             |   | 19                          | - | 06 | <b>21</b> | 165                       | 275 | 110 | 50 | 100 | -  | <b>700</b> |

### Semester-II

| Cat          | Course Code | Course Title                                 | Teaching Scheme (Hrs./Week) |   |    | Credits   | Evaluation Scheme (Marks) |     |     |     |    |     |            |
|--------------|-------------|--|-----------------------------|---|----|-----------|---------------------------|-----|-----|-----|----|-----|------------|
|              |             |  | L                           | T | P  |           | Theory                    |     |     | OR  | PR | TW  | Total      |
|              |             |  |                             |   |    |           | ISE                       | ESE | CIA |     |    |     |            |
| PC           | ST310       | Design of Reinforced Concrete Structures     | 03                          | - | -  | 03        | 30                        | 50  | 20  | -   | -  | -   | 100        |
| PC           | ST311       | Design of Industrial Structures              | 03                          | - | -  | 03        | 30                        | 50  | 20  | -   | -  | -   | 100        |
| PC           | ST312       | Structural Audit and Health Monitoring       | 03                          | - | -  | 03        | 30                        | 50  | 20  | -   | -  | -   | 100        |
| PE           | ST313       | Professional Elective-II                     | 03                          | - | -  | 03        | 30                        | 50  | 20  | -   | -  | -   | 100        |
| HS           | ST314       | Corporate readiness                          | 01                          | - | 02 | 02        | -                         | -   | -   | -   | -  | 50  | 50         |
| PRJ          | HS315       | IPR and EDP                                  | 02                          | - | -  | 02        | 15                        | 25  | 10  | -   | -  | -   | 50         |
| PC           | ST316       | Fundamentals of Earthquake Engineering       | 02                          | - | -  | 02        | 15                        | 25  | 10  | -   | -  | -   | 50         |
| PC           | ST317       | Design of Reinforced Concrete Structures Lab | -                           | - | 02 | 01        | -                         | -   | -   | 50  | -  | 25  | 75         |
| PC           | ST318       | Structural Audit and Health Monitoring Lab   | -                           | - | 02 | 01        | -                         | -   | -   | 50  | -  | 25  | 75         |
| PRJ          | ST319       | Creational Activity (Sports)                 | -                           | - | 02 | 01        | Participation Certificate |     |     |     |    |     |            |
| MLC          | MLC320      | Mandatory Learning Course-VI                 | 1                           | - | -  | Pass/Fail | -                         | -   | -   | -   | -  | -   | -          |
| <b>Total</b> |             |  | 18                          | - | 08 | <b>21</b> | 150                       | 250 | 100 | 100 | -  | 100 | <b>700</b> |

**BOS Chairman**

**Dean Academics**

**Director**

## Final Year B.Tech (Course Structure)

### Semester-I

| Cat          | Course Code | Course Title                               | Teaching Scheme (Hrs./Week) |   |    | Credits   | Evaluation Scheme (Marks) |     |     |     |    |    |            |
|--------------|-------------|--|-----------------------------|---|----|-----------|---------------------------|-----|-----|-----|----|----|------------|
|              |             |  | L                           | T | P  |           | Theory                    |     |     | OR  | PR | TW | Total      |
|              |             |  |                             |   |    |           | ISE                       | ESE | CIA |     |    |    |            |
| PC           | ST401       | Design of Advanced RCC Structures          | 03                          | - | -  | 03        | 30                        | 50  | 20  | -   | -  | -  | 100        |
| PC           | ST402       | International Design Standards             | 03                          | - | -  | 03        | 30                        | 50  | 20  | -   | -  | -  | 100        |
| PC           | ST403       | Finite Element Method                      | 03                          | - | -  | 03        | 30                        | 50  | 20  | -   | -  | -  | 100        |
| PE           | ST404       | Professional Elective-III                  | 03                          | - | -  | 03        | 30                        | 50  | 20  | -   | -  | -  | 100        |
| PE           | ST405       | Professional Elective-IV                   | 03                          | - | -  | 03        | 30                        | 50  | 20  | -   | -  | -  | 100        |
| PC           | ST406       | Design of Advanced RCC Lab                 | -                           | - | 02 | 01        | -                         | -   | -   | 50  | -  | -  | 50         |
| PC           | ST407       | Structural Analysis and Design using ETABS | -                           | - | 04 | 02        | -                         | -   | -   | -   | 50 | -  | 50         |
| PC           | ST408       | Structural Drawing Lab                     | -                           | - | 02 | 01        | -                         | -   | -   | 50  | -  | -  | 50         |
| PRJ          | ST409       | Sports                                     | -                           | - | 02 | 01        | -                         | -   | -   | 50  | -  | -  | 50         |
| MLC          | MLC410      | Mandatory Learning Course-VII              | 1                           | - | -  | Pass/Fail | -                         | -   | -   | -   | -  | -  | -          |
| <b>Total</b> |             |  | 16                          | - | 10 | <b>20</b> | 150                       | 250 | 100 | 150 | 50 | -  | <b>700</b> |

### Semester-II

| Cat          | Course Code | Course Title  | Teaching Scheme (Hrs./Week) |   |    | Credits   | Evaluation Scheme (Marks) |     |     |    |    |     |            |
|--------------|-------------|---|-----------------------------|---|----|-----------|---------------------------|-----|-----|----|----|-----|------------|
|              |             |   | L                           | T | P  |           | Theory                    |     |     | OR | PR | TW  | Total      |
|              |             |   |                             |   |    |           | ISE                       | ESE | CIA |    |    |     |            |
| OE           | ST411       | Open Elective-I   | 04                          | - | -  | 04        | 30                        | 50  | 20  | -  | -  | -   | 100        |
| OE           | ST412       | Open Elective-II  | 03                          | - | -  | 03        | 30                        | 50  | 20  | -  | -  | -   | 100        |
| OE           | ST413       | Open Elective-III   | 02                          | - | -  | 02        | -                         | -   | 50  | -  | -  | -   | 50         |
| PRJ          | ST414       | Project Seminar   | -                           | - | 06 | 03        | -                         | -   | 100 | -  | -  | -   | 100        |
| PRJ          | ST415       | Project/Industrial Internship/ Entrepreneurship Development Project | -                           | - | 12 | 06        | -                         | -   | -   | 50 | -  | 100 | 150        |
| MLC          | MLC416      | Mandatory Learning Course-VIII                                      | 1                           | - | -  | Pass/Fail | -                         | -   | -   | -  | -  | -   | -          |
| <b>Total</b> |             |   | 10                          | - | 18 | <b>18</b> | 60                        | 100 | 190 | 50 | -  | 100 | <b>500</b> |

### List of Professional Electives

| Track                        | Professional Elective -I              | Professional Elective -II            | Professional Elective -III                    | Professional Elective -IV               |
|------------------------------|---------------------------------------|--------------------------------------|---|---|
| Competitive Services         | Advanced Surveying                    | Hydrology and Irrigation Engineering | Environmental Engineering                     | Quantity Survey, Estimating and Costing |
| Entrepreneur/ Private sector | Design of Formwork                    | Design of STP and ETP                | Design of Pre-cast and Prestressed structures | Design of Bridges                       |
| Higher Studies               | Matrix Methods of Structural Analysis | Advanced Concrete Technology         | Theory of Elasticity                          | Theory of Plates and Shells             |

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## Department of Structural Engineering

### B.Tech. Honors

#### Honors Course – I: Computers and Structures

| Semester     | Course Code | Course Title   | Teaching Scheme (Hrs./Week) |          |           | Credits   | Evaluation Scheme (Marks) |          |          |          |            |            |            |
|--------------|-------------|--|-----------------------------|----------|-----------|-----------|---------------------------|----------|----------|----------|------------|------------|------------|
|              |             |  | L                           | T        | P         |           | Theory                    |          |          | OR       | PR         | TW         | Total      |
|              |             |  |                             |          |           |           | CIA                       | ISE      | ESE      |          |            |            |            |
| V            | ST8101      | Introduction to Data Processing Tools                    | 04                          | -        | -         | 04        | 20                        | -        | -        | 30       | 50         | -          | 100        |
| VI           | ST8102      | Problem Solving using Python                             | 04                          | -        | -         | 04        | 20                        | -        | -        | 30       | 50         | -          | 100        |
| VII          | ST8103      | Advanced Structural Analysis and Design using STAAD Pro. | 04                          | -        | -         | 04        | 20                        | -        | -        | 30       | 50         | -          | 100        |
| VIII         | ST8104      | Advanced Structural Analysis and Design using ETABs      | 04                          | -        | -         | 04        | 20                        | -        | -        | 30       | 50         | -          | 100        |
| VII          | ST8105      | Computers and Structures Lab-I                           | -                           | -        | 02        | 01        | -                         | -        | -        | -        | -          | 50         | 50         |
| VIII         | ST8106      | Computers and Structures Lab-II                          | -                           | -        | 02        | 01        | -                         | -        | -        | -        | -          | 50         | 50         |
| <b>Total</b> |             |  | <b>16</b>                   | <b>-</b> | <b>04</b> | <b>18</b> | <b>160</b>                | <b>-</b> | <b>-</b> | <b>-</b> | <b>240</b> | <b>100</b> | <b>500</b> |

#### Honors Course – II: Building Information Modeling

| Semester     | Course Code | Course Title       | Teaching Scheme (Hrs./Week) |          |           | Credits   | Evaluation Scheme (Marks) |          |          |          |            |            |            |
|--------------|-------------|--------------------|-----------------------------|----------|-----------|-----------|---------------------------|----------|----------|----------|------------|------------|------------|
|              |             |                    | L                           | T        | P         |           | Theory                    |          |          | OR       | PR         | TW         | Total      |
|              |             |                    |                             |          |           |           | CIA                       | ISE      | ESE      |          |            |            |            |
| V            | ST8101      | Revit Architecture | 04                          | -        | -         | 04        | 20                        | -        | -        | 30       | 50         | -          | 100        |
| VI           | ST8102      | Revit Structure    | 04                          | -        | -         | 04        | 20                        | -        | -        | 30       | 50         | -          | 100        |
| VII          | ST8103      | Revit MEP - I      | 04                          | -        | -         | 04        | 20                        | -        | -        | 30       | 50         | -          | 100        |
| VIII         | ST8104      | Revit MEP - II     | 04                          | -        | -         | 04        | 20                        | -        | -        | 30       | 50         | -          | 100        |
| VII          | ST8105      | BIM Lab-I          | -                           | -        | 02        | 01        | -                         | -        | -        | -        | -          | 50         | 50         |
| VIII         | ST8106      | BIM Lab-II         | -                           | -        | 02        | 01        | -                         | -        | -        | -        | -          | 50         | 50         |
| <b>Total</b> |             |                    | <b>16</b>                   | <b>-</b> | <b>04</b> | <b>18</b> | <b>160</b>                | <b>-</b> | <b>-</b> | <b>-</b> | <b>240</b> | <b>100</b> | <b>500</b> |

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