



# STELLA MARY'S COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)  
(Accredited by NAAC and Accredited by NBA(Mech & CSE))

Aruthenganvilai, Kallukatti Junction Azhikal Post, Kanyakumari District-629202, Tamil Nadu.

## Important Note

\*Kind attention to the institutions: the web portal is open for the selection of additional subjects for B.E./B.Tech. (Hons) and B.E./B.Tech. (Minor). Select Examination Menu—Elective Selection—Honours Selection UG and Minor Degree Selection UG menus, respectively. Institutions are instructed to upload the same on or before 29-02-2024. ~~2024~~

The information on Elective Selection is received from Anna University on 24. 02.2024

HoD

Dr. R. K. MADHUMATHI, M.E., Ph.D.  
Associate Professor and Head,  
Department of Civil Engineering,  
Stella Mary's College of Engineering,  
Aruthenganvilai, K.K. Dist.- 629 202.

Principal

Dr. R. Suresh Premil Kumar M.E., Ph.D.  
PRINCIPAL  
STELLA MARY'S COLLEGE OF ENGINEERING  
ARUTHENGANVILAI, AZHICKAL POST-629 202  
KANYAKUMARI DISTRICT



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(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)

Aruthenganvilai, Kallukatti Junction Azhikal Post, Kanyakumari District-629202, Tamil Nadu.

Examinations

April / May Special Examination 2022  
April / May Examination 2022  
April / May Examination 2023  
Nov / Dec. Special Examinations 2022  
Nov / Dec. Examination 2022

Important Note

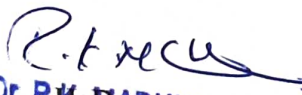
\*Web Portal is opened for upload the details of UG/PG (EXCEPT FIRST YEAR)- Readmission / Transfer cum Readmission Students details (Even semester) April/May 2023 Examinations. ●

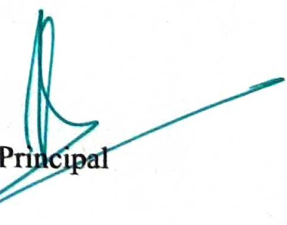
\*Kind Attention to the Institutions:-  
Change of Exam Centres - Nov./Dec. 2022 Examinations FIRST YEAR UG AND PG(M.E./M.TECH./M.ARCH.)-III Semester - [Click Here](#) ●

\*Kind Attention to the Institutions: - Web Portal is opened for UG/PG Elective selection for the April / May Examinations 2023(EXCEPT FIRST YEAR).last date is 21-03-2023. ●

\*Kind Attention to the Institutions:-  
Revised Notification - November/December 2022 - UG First Semester AND PG (M.E./M.TECH./M.ARCH.) III Semester Practical Schedule - [Click Here](#) ●

The information on Elective Selection is received from Anna University on 16.03.2023

  
Dr. R. Suresh Premil Kumar  
Associate Professor  
Department of Civil Engineering,  
Stella Mary's College of Engineering,  
Aruthenganvilai, K.K. Dist.- 629 202.

  
Principal  
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# STELLA MARYS COLLEGE OF ENGINEERING

Aruthenganvilai, Kallukatti Junction, Azhikal Post, Kanyakumari District,  
Tamil Nadu - 629 202

## STANDARD PRACTICE RECORD FOR CHOICE OF ELECTIVES

1. Discussions regarding choice of electives to be done in department meeting and approved by the BoS.
2. Selection of suitable electives should also depend on the academic level of students.
3. Transparency should be maintained in the selection process.
4. Circulate the list of electives and discuss the details and intensity of electives among students to get their willingness.
5. When willingness is given by the students, if a minimum of 20 students opt for one particular elective that should be considered for approval.
6. If any student opts for special elective based on interest and need, it should be considered for approval.
7. Electives chosen are to be properly communicated to the college office and to the university through the Principal.

Dr. R. Suresh Kumar, M.E., Ph.D.  
PRINCIPAL

STELLA MARY'S COLLEGE OF ENGINEERING  
ARUTHENGANVILAI, AZHICKAL POST - 629 202  
KANYAKUMARI DISTRICT





## STELLA MARY'S COLLEGE OF ENGINEERING

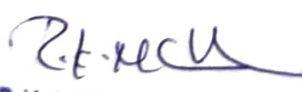
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Aruthenganvilai, Kallukatti Junction Azhikal Post, Kanyakumari District-  
629202, Tamil Nadu.

### DEPARTMENT OF CIVIL ENGINEERING

#### ELECTIVE COURSE SYSTEM

| 2023-2024(ODD)  |              |                                                      |                 |          |
|-----------------|--------------|------------------------------------------------------|-----------------|----------|
| SL.No.          | Subject code | Subject                                              | No. Of Students | Year/Sem |
| 1.              | CE3013       | Advanced Construction Techniques                     | 33              | III/V    |
| 2.              | CE 3032      | Climate change Adaptation and Mitigation             | 33              | III/V    |
| 3.              | MX3084       | Disaster Risk Reduction and Management               | 33              | III/V    |
| 3.              | CE3004       | Prestressed Concrete Structures                      | 33              | III/V    |
| 5.              | OME754       | Industrial Safety                                    | 28              | IV/VII   |
| 2023-2024(Even) |              |                                                      |                 |          |
| 1.              | CE8013       | Coastal Engineering                                  | 28              | IV/VIII  |
| 2.              | CE8020       | Maintenance, Repair and Rehabilitation of Structures | 28              | IV/VIII  |
| 3.              | CE3005       | Rehabilitation/ Heritage Restoration                 | 33              | III/VI   |
| 4.              | CE3009       | Construction Equipment and Machinery                 | 33              | III/VI   |
| 5.              | MX3089       | Industrial Safety                                    | 33              | III/VI   |
| 6.              | OCS353       | Data Science Fundamentals                            | 33              | III/VI   |

  
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*Aruthenganvilai, Kallukatti Junction Azhikal Post, Kanyakumari District-  
629202, Tamil Nadu.*

### **DEPARTMENT OF CIVIL ENGINEERING**

**Academic Year 2023-24(Even)**

|                         |                                                                                                |
|-------------------------|------------------------------------------------------------------------------------------------|
| <b>Year/Sem: III/06</b> | <b>Subject code/ Subject Title: CE3005Rehabilitation/ Heritage Restoration</b>                 |
| <b>Year/Sem: III/06</b> | <b>Subject code/ Subject Title:CE3009Construction Equipment and Machinery</b>                  |
| <b>Year/Sem: III/06</b> | <b>Subject code/ Subject Title: MX3089Industrial Safety</b>                                    |
| <b>Year/Sem: III/06</b> | <b>Subject code/ Subject Title: OCS353Data Science Fundamentals</b>                            |
| <b>Year/Sem: III/08</b> | <b>Subject code/ Subject Title: CE8013Coastal Engineering</b>                                  |
| <b>Year/Sem: III/08</b> | <b>Subject code/ Subject Title: CE8020Maintenance, Repair and Rehabilitation of Structures</b> |

### **ELECTIVE CHOICE WILLINGNESS FORM**



## STELLA MARY'S COLLEGE OF ENGINEERING

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**Elective choice form IV CIVIL (OPEN ELECTIVE & PROFESSIONAL ELECTIVE) 2023-2024 (Even)**

### PROFESSIONAL ELECTIVE IV

| S.NO | SUB.CODE | SUB.TITLE                                 |
|------|----------|-------------------------------------------|
| 1.   | CE8013   | Coastal Engineering                       |
| 2.   | CE8014   | Participatory Water Resources Management  |
| 3.   | CE8015   | Integrated Water Resources Management     |
| 4.   | CE8016   | Groundwater Engineering                   |
| 5.   | CE8017   | Water Resources Systems Engineering       |
| 6.   | CE8018   | Geo-Environmental Engineering             |
| 7.   | CE8091   | Hydrology and Water Resources Engineering |
| 8.   | GE8076   | Professional Ethics in Engineering        |

### PROFESSIONAL ELECTIVE V

| S.NO | SUB.CODE | SUB.TITLE                                            |
|------|----------|------------------------------------------------------|
| 1.   | CE8019   | Computer Aided Design of Structures                  |
| 2.   | CE8020   | Maintenance, Repair and Rehabilitation of Structures |
| 3.   | CE8021   | Structural Dynamics and Earthquake Engineering       |
| 4.   | CE8022   | Prefabricated Structures                             |
| 5.   | CE8023   | Bridge Engineering                                   |
| 6.   | GE8073   | Fundamentals of Nanoscience                          |

| Sl. No | Reg.No.      | Name of the Student     | CE801 | CE8014 | CE8015 | CE8016 | CE8017 | CE8018 | CE8019 | GE801 | Signature                |
|--------|--------------|-------------------------|-------|--------|--------|--------|--------|--------|--------|-------|--------------------------|
| 1.     | 963520103004 | ANO LEVER SHEYA C       |       |        |        |        |        |        |        |       |                          |
| 2.     | 963520103005 | ANSE MICHEL S           | ✓     |        |        |        |        |        |        |       | Anse Michel              |
| 3.     | 963520103006 | ARAVINDH R S            |       |        |        |        |        |        |        |       | Aravindh R S             |
| 4.     | 963520103007 | JAISIL K                | ✓     |        |        |        |        |        |        |       | Jaisil K                 |
| 5.     | 963520103008 | JENISHA VARSHINI J      |       |        |        |        |        |        |        |       | Jenisha Varshini J       |
| 6.     | 963520103009 | JEYA PRATHEKSHA J       | ✓     |        |        |        |        |        |        |       | Jeya Pratheksha J        |
| 7.     | 963520103010 | KANNITHA MICHEAL J      | ✓     |        |        |        |        |        |        |       | Kannitha Micheal J       |
| 8.     | 963520103011 | LIBIN ROY G             | ✓     |        |        |        |        |        |        |       | Libin Roy G              |
| 9.     | 963520103012 | MARIA GERSONE J N       |       |        |        |        |        |        |        |       | Maria Gerson J N         |
| 10.    | 963520103013 | MARSHAL VISHAN S        |       |        |        |        |        |        |        |       | Marshal Vishan S         |
| 11.    | 963520103014 | PRADESH B J             | ✓     |        |        |        |        |        |        |       | Pradesh B J              |
| 12.    | 963520103015 | RATHIKA R               |       |        |        |        |        |        |        |       | Rathika R                |
| 13.    | 963520103016 | SNOWLIN SOBIKA U        |       |        |        |        |        |        |        |       | Snowlin Sobika U         |
| 14.    | 963520103017 | SWETHA M                |       |        |        |        |        |        |        |       | Swetha M                 |
| 15.    | 963520103301 | ABINESH C               | ✓     |        |        |        |        |        |        |       | Abinesh C                |
| 16.    | 963520103302 | AJAY PRAJAN . T         | ✓     |        |        |        |        |        |        |       | Ajay Prajan . T          |
| 17.    | 963520103303 | AKASH. S                | ✓     |        |        |        |        |        |        |       | Akash S                  |
| 18.    | 963520103304 | ANTONIA SHALVIN S       |       |        | ✓      |        |        |        |        |       | Antonia Shalvin S        |
| 19.    | 963520103305 | ARUN SELVAN S           |       |        | ✓      |        |        |        |        |       | Arun Selvan S            |
| 20.    | 963520103307 | EDWIN PRINTH M F        |       |        |        | ✓      |        |        |        |       | Edwin Printh M F         |
| 21.    | 963520103310 | JEBIN J                 | ✓     |        |        |        |        |        |        |       | Jebin J                  |
| 22.    | 963520103312 | JOSHAN S                | ✓     |        |        |        |        |        |        |       | Joshan S                 |
| 23.    | 963520103313 | MOHAMED SJAKE BAREETH M | ✓     |        |        |        |        |        |        |       | Mohamed S Jake Bareeth M |
| 24.    | 963520103314 | NIKHIL M                | ✓     |        |        |        |        |        |        |       | Nikhil M                 |
| 25.    | 963520103315 | NISHANTH A P K          | ✓     |        |        |        |        |        |        |       | Nishanth A P K           |
| 26.    | 963520103316 | SREE KARTHICK.A         | ✓     |        |        |        |        |        |        |       | Sree Karthick.A          |
| 27.    | 963520103317 | VARSHATH S J            |       |        | ✓      |        |        |        |        |       | Varshath S J             |
| 28.    | 963520103701 | GEONITHISH S            | ✓     |        |        |        |        |        |        |       | Geonithish S             |

Dr. R.K. MARI  
Associate P  
Department  
Stella Mary's  
Aruthangudi



| Sl. No | Reg.No.      | Name of the Student     | CE8019 | CE8020 | CE8021 | CE8022 | CE8023 | GE8073 | Signature                |
|--------|--------------|-------------------------|--------|--------|--------|--------|--------|--------|--------------------------|
| 1.     | 963520103004 | ANO LEVER SHEYA C       |        | ✓      |        |        |        |        | Ano Leversheya C         |
| 2.     | 963520103005 | ANSE MICHEL S           |        | ✓      |        |        |        |        | Anse Michel S            |
| 3.     | 963520103006 | ARAVINDH R S            |        | ✓      |        |        |        |        | Aravindh R S             |
| 4.     | 963520103007 | JAISIL K                |        | ✓      |        |        |        |        | Jaisil K                 |
| 5.     | 963520103008 | JENISHA VARSHINI J      |        | ✓      |        |        |        |        | Jenisha Varshini J       |
| 6.     | 963520103009 | JEYA PRATHEKSHA J       |        | ✓      |        |        |        |        | Jeya Pratheksha J        |
| 7.     | 963520103010 | KANNITHA MICHEAL J      |        | ✓      |        |        |        |        | Kannitha Micheal J       |
| 8.     | 963520103011 | LIBIN ROY G             |        | ✓      |        |        |        |        | Libin Roy G              |
| 9.     | 963520103012 | MARIA GERSONE J N       |        | ✓      |        |        |        |        | Maria Gerson J N         |
| 10.    | 963520103013 | MARSHAL VISHAN S        |        | ✓      |        |        |        |        | Marshal Vishan S         |
| 11.    | 963520103014 | PRADESH B J             |        | ✓      |        |        |        |        | Pradesh B J              |
| 12.    | 963520103015 | RATHIKA R               |        | ✓      |        |        |        |        | Rathika R                |
| 13.    | 963520103016 | SNOWLIN SOBIKA U        |        | ✓      |        |        |        |        | Sobika U                 |
| 14.    | 963520103017 | SWETHA M                |        | ✓      |        |        |        |        | Swetha M                 |
| 15.    | 963520103301 | ABINESH C               |        | ✓      |        |        |        |        | Abinesh C                |
| 16.    | 963520103302 | AJAY PRAJAN . T         |        | ✓      |        |        |        |        | Ajay Prajan . T          |
| 17.    | 963520103303 | AKASH. S                |        | ✓      |        |        |        |        | Akash. S                 |
| 18.    | 963520103304 | ANTONIA SHALVIN S       |        | ✓      |        |        |        |        | Antonia Shalvin S        |
| 19.    | 963520103305 | ARUN SELVAN S           |        |        | ✓      |        |        |        | Arun Selvan S            |
| 20.    | 963520103307 | EDWIN PRINTH M F        |        |        | ✓      |        |        |        | Edwin Printh M F         |
| 21.    | 963520103310 | JEBIN J                 |        | ✓      |        |        |        |        | Jebin J                  |
| 22.    | 963520103312 | JOSHAN S                |        | ✓      |        |        |        |        | Joshana S                |
| 23.    | 963520103313 | MOHAMED SJAKE BAREETH M |        | ✓      |        |        |        |        | Mohamed S Jake Bareeth M |
| 24.    | 963520103314 | NIKHIL M                | ✓      |        |        |        |        |        | Nikhil M                 |
| 25.    | 963520103315 | NISHANTH A P K          |        |        | ✓      |        |        |        | Nishanth A P K           |
| 26.    | 963520103316 | SREE KARTHICK A         | ✓      |        |        |        |        |        | Sree Karthick A          |
| 27.    | 963520103317 | VARSHATH S J            |        | ✓      |        |        |        |        | Varshath S J             |
| 28.    | 963520103701 | GEONITHISH S            |        | ✓      |        |        |        |        | Geonithish S             |

  
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Aruthenganvilai, Kallukatti Junction Azhikal Post, Kanyakumari District-629202,

Elective Willingness

Department of Civil Engineering

Academic Year 2023-24(Odd/Even)

OPEN ELECTIVE I

Name: A.Arul Gino

Year/Sem: III year / 6<sup>th</sup> sem

| SL. NO. | COURSE CODE | COURSE TITLE                                              | CATEGORY | PERIODS PER WEEK |   |   | TOTAL CONTACT PERIODS | CREDITS |
|---------|-------------|-----------------------------------------------------------|----------|------------------|---|---|-----------------------|---------|
|         |             |                                                           |          | L                | T | P |                       |         |
| 1.      | OCS351      | Artificial Intelligence and Machine Learning Fundamentals | OEC      | 2                | 0 | 2 | 4                     | 3       |
| 2.      | OCS352      | IoT Concepts and Applications                             | OEC      | 2                | 0 | 2 | 4                     | 3       |
| 3.      | OCS353      | Data Science Fundamentals                                 | OEC      | 2                | 0 | 2 | 4                     | 3       |
| 4.      | CCS333      | Augmented Reality /Virtual Reality                        | OEC      | 2                | 0 | 2 | 4                     | 3       |

OCS353 - Data Science Fundamentals

Signature



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Elective Willingness  
Department of Civil Engineering  
Academic Year 2023-24(Odd/Even)  
MANDATORY COURSES II

Name: A. Arul Gino  
Year/Sem: III<sup>rd</sup> / 6<sup>th</sup>

| S. NO. | COURSE CODE | COURSE TITLE                                                      | CATEGORY | PERIODS PER WEEK |   |   | TOTAL CONTACT PERIODS |
|--------|-------------|-------------------------------------------------------------------|----------|------------------|---|---|-----------------------|
|        |             |                                                                   |          | L                | T | P |                       |
| 1.     | MX3085      | Well Being with Traditional Practices - Yoga, Ayurveda and Siddha | MC       | 3                | 0 | 0 | 3                     |
| 2.     | MX3086      | History of Science and Technology in India                        | MC       | 3                | 0 | 0 | 3                     |
| 3.     | MX3087      | Political and Economic Thought for a Humane Society               | MC       | 3                | 0 | 0 | 3                     |
| 4.     | MX3088      | State, Nation Building and Politics in India                      | MC       | 3                | 0 | 0 | 3                     |
| 5.     | MX3089      | Industrial Safety                                                 | MC       | 3                | 0 | 0 | 3                     |

MX3089 - Industrial Safety

A. Arul Gino  
Signature



Name: A. Arul Gino  
 Year/Sem: III<sup>rd</sup> / 6<sup>th</sup>

Elective Willingness  
 Department of Civil Engineering  
 Academic Year 2023-24 (Odd/Even)

**PROFESSIONAL ELECTIVE COURSES : VERTICALS**

| VERTICAL I<br>(Structures)                   | VERTICAL II<br>(Construction techniques and Practices) | VERTICAL III<br>(Geotechnical)        | VERTICAL IV<br>(Geo-Informatics)       | VERTICAL V<br>(Transportation Infrastructure) | VERTICAL VI<br>(Environment)                | VERTICAL VII<br>(Water Resources)     | VERTICAL VIII<br>(Ocean Engineering)       | VERTICAL IX<br>(Diversified Course) |
|----------------------------------------------|--------------------------------------------------------|---------------------------------------|----------------------------------------|-----------------------------------------------|---------------------------------------------|---------------------------------------|--------------------------------------------|-------------------------------------|
| Concrete Structures                          | Formwork Engineering                                   | Geo-Environmental Engineering         | Total Station and GPS Surveying        | Airports and Harbours                         | Climate Change Adaptation and Mitigation    | Irrigation Engineering and Drawing    | Ocean Wave Dynamics                        | Steel Concrete Composite Structures |
| Steel Structures                             | Construction Equipment and Machinery                   | Ground Improvement Techniques         | Remote Sensing Concepts                | Traffic Engineering and Management            | Air and Noise Pollution Control Engineering | Groundwater Engineering               | Marine Geotechnical Engineering            | Finance For Engineers               |
| Prefabricated Structures                     | Sustainable Construction and Lean Construction         | Soil Dynamics and Machine Foundations | Satellite Image Processing             | Urban Planning and Development                | Environmental Impact Assessment             | Water Resources Systems Engineering   | Coastal Engineering                        | Earth and Rockfill Dams             |
| Prestressed Concrete Structures              | Digitalized Construction Lab                           | Rock Mechanics                        | Cartography and GIS                    | Smart cities                                  | Industrial Wastewater Management            | Watershed Conservation and Management | Off shore Structures                       | Computational Fluid Dynamics        |
| Rehabilitation/Heritage Restoration          | Construction Management and Safety                     | Earth and Earth Retaining Structures  | Photogrammetry                         | Intelligent Transportation Systems            | Solid and Hazardous Waste Management        | Integrated Water Resources Management | Port and Harbour Engineering               | Rainwater Harvesting                |
| Dynamics and Earthquake Resistant Structures | Advanced Construction Techniques                       | Pile Foundation                       | Airborne and Terrestrial laser mapping | Pavement Engineering                          | Environmental Policy and Legislations       | Urban Water Infrastructure            | Coastal Hazards and Mitigation             | Transport and Environment           |
| Introduction to Finite Element Method        | Energy Efficient Buildings                             | Tunnelling Engineering                | Hydrographic Surveying                 | Transportation planning Process               | Environment, Health and Safety              | Water Quality and Management          | Coastal Zone Management and Remote Sensing | Environmental quality Monitoring    |

A. Arul Gino  
 Signature





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### **DEPARTMENT OF CIVIL ENGINEERING**

**Academic Year 2023-24(Odd)**

|                         |                                                                                     |
|-------------------------|-------------------------------------------------------------------------------------|
| <b>Year/Sem: III/05</b> | <b>Subject code/ Subject Title: CE3013Advanced Construction Techniques</b>          |
| <b>Year/Sem: III/05</b> | <b>Subject code/ Subject Title: CE 3032Climate change Adaptation and Mitigation</b> |
| <b>Year/Sem: III/05</b> | <b>Subject code/ Subject Title: MX3084 Diaster Risk Reduction and Management</b>    |
| <b>Year/Sem: III/05</b> | <b>Subject code/ Subject Title: CE3004 Prestressed Concrete Structures</b>          |
| <b>Year/Sem: III/07</b> | <b>Subject code/ Subject Title: OME754 Industrial Safety</b>                        |

### **ELECTIVE CHOICE WILLINGNESS FORM**





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Aruthenganvilai, Kallukatti Junction Azhikal Post, Kanyakumari District-629202,

Elective Willingness

Department of Civil Engineering

Academic Year 2023-24(Odd/Even)

MANDATORY COURSES I

Name: U. Donel Haras

Year/Sem: III<sup>rd</sup> OS

| S.<br>NO. | COURSE<br>CODE | COURSE TITLE                                | CATE<br>GORY | PERIODS<br>PER WEEK |   |   | TOTAL<br>CONTACT<br>PERIODS |
|-----------|----------------|---------------------------------------------|--------------|---------------------|---|---|-----------------------------|
|           |                |                                             |              | L                   | T | P |                             |
| 1.        | MX3081         | Introduction to Women<br>and Gender Studies | MC           | 3                   | 0 | 0 | 3                           |
| 2.        | MX3082         | Elements of Literature                      | MC           | 3                   | 0 | 0 | 3                           |
| 3.        | MX3083         | Film Appreciation                           | MC           | 3                   | 0 | 0 | 3                           |
| 4.        | MX3084         | Disaster Risk Reduction<br>and Management   | MC           | 3                   | 0 | 0 | 3                           |

U. Donel Haras

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## Elective choice form IV CIVIL (OPEN ELECTIVE) 2023-2024 (ODD)

### OPEN ELECTIVE II

| S.NO | SUB.CODE | SUB.TITLE                                      |
|------|----------|------------------------------------------------|
| 1.   | OAI751   | Agricultural Finance, Banking and Co-operation |
| 2.   | OGI751   | Climate Change and Its Impact                  |
| 3.   | OGI752   | Fundamentals of Planetary Remote Sensing       |
| 4.   | OEN751   | Green Building Design                          |
| 5.   | OME754   | Industrial Safety                              |
| 6.   | OCS752   | Introduction to C Programming                  |
| 7.   | OIE751   | Robotics                                       |
| 8.   | OML753   | Selection of Materials                         |
| 9.   | OML751   | Testing of Materials                           |
| 10.  | OTT752   | Textile effluent treatments                    |

| Sl. No | Reg.No.      | Name of the Student | OAI751 | OGI751 | OGI752 | OEN751 | OME754 | OCS752 | OIE751 | OML753 | OML751 | OTT752 | Signature          |
|--------|--------------|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------------|
| 1.     | 963520103004 | ANO LEVER SHEYA C   |        |        |        |        | ✓      |        |        |        |        |        | Ano Leversheya C   |
| 2.     | 963520103005 | ANSE MICHEL S       |        |        |        |        | ✓      |        |        |        |        |        | Anse Michel S      |
| 3.     | 963520103006 | ARAVINDH R S        |        |        |        |        | ✓      |        |        |        |        |        | Aravindh R S       |
| 4.     | 963520103007 | JAISIL K            |        |        |        |        | ✓      |        |        |        |        |        | Jaisil K           |
| 5.     | 963520103008 | JENISHA VARSHINI J  |        |        |        |        | ✓      |        |        |        |        |        | Jenisha Varshini J |
| 6.     | 963520103009 | JEYA PRATHEKSHA J   |        |        |        |        | ✓      |        |        |        |        |        | Jeya Pratheeksha J |
| 7.     | 963520103010 | KANNITHA            |        |        |        |        | ✓      |        |        |        |        |        | Kannitha           |







**COURSE OBJECTIVE:**

- To study and understand the latest construction techniques applied to engineering construction for sub structure, super structure, special structures, rehabilitation and strengthening techniques and demolition techniques.

**UNIT I SUB STRUCTURE CONSTRUCTION**

9

Construction Methodology - Box jacking - Pipe jacking - Under water construction of diaphragm walls and basement - Tunneling techniques - Piling techniques - Driving well and caisson - sinking cofferdam - cable anchoring and grouting - Driving diaphragm walls, Sheet piles - Laying operations for built up offshore system - Shoring for deep cutting - Large reservoir construction - well points - Dewatering for underground open excavation.

**UNIT II SUPER STRUCTURE CONSTRUCTION FOR BUILDINGS**

9

Vacuum dewatering of concrete flooring - Concrete paving technology - Techniques of construction for continuous concreting operation in tall buildings of various shapes and varying sections - Erection techniques of tall structures, Large span structures - launching techniques for heavy decks - in-situ prestressing in high rise structures, Post tensioning of slab- aerial transporting - Handling and erecting lightweight components on tall structures.

**UNIT III CONSTRUCTION OF SPECIAL STRUCTURES**

9

Erection of lattice towers - Rigging of transmission line structures - Construction sequence in cooling towers, Silos, chimney, sky scrapers - Bow string bridges, Cable stayed bridges - Launching and pushing of box decks - Construction of jetties and break water structures - Construction sequence and methods in domes - Support structure for heavy equipment and machinery in heavy industries - Erection of articulated structures and space decks.

**UNIT IV REHABILITATION AND STRENGTHENING TECHNIQUES**

9

Seismic retrofitting - Strengthening of beams - Strengthening of columns - Strengthening of slab - Strengthening of masonry wall, Protection methods of structures, Mud jacking and grouting for foundation - Micro piling and underpinning for strengthening floor and shallow profile - Sub grade water proofing, Soil Stabilization techniques.

**UNIT V DEMOLITION**

9

Demolition Techniques, Demolition by Machines, Demolition by Explosives, Advanced techniques using Robotic Machines, Demolition Sequence, Dismantling Techniques, Safety precaution in Demolition and Dismantling.

**COURSE OUTCOMES:****TOTAL: 45 PERIODS**

- On completion of the course, the student is expected to be able to
- CO1 Understand the modern construction techniques used in the sub structure construction.  
 CO2 Demonstrate knowledge and understanding of the principles and concepts relevant to super structure construction for buildings  
 CO3 Understand the concepts used in the construction of special structures  
 CO4 Knowledge on Various strengthening and repair methods for different cases.  
 CO5 Identify the suitable demolition technique for demolishing a building.

**REFERENCES:**

- Jerry Irvine, Advanced Construction Techniques, CA Rocket, 1984
- Patrick Powers. J., Construction Dewatering: New Methods and Applications, John Wiley & Sons, 1992.
- Peter H.Emmons, "Concrete repair and maintenance illustrated", Galgotia Publications Pvt. Ltd., 2001.Press, 2008.
- Robertwade Brown, Practical foundation engineering hand book, McGraw Hill Publications, 1995.
- Sankar, S.K. and Saraswati, S., Construction Technology, Oxford University, New Delhi, 2008.

### COs- PO's & PSO's MAPPING

| PO/PSO                          |                                                                                       | Course Outcome |     |     |     |     | Overall Correlation of CO s to POs |
|---------------------------------|---------------------------------------------------------------------------------------|----------------|-----|-----|-----|-----|------------------------------------|
|                                 |                                                                                       | CO1            | CO2 | CO3 | CO4 | CO5 |                                    |
| PROGRAM OUTCOMES(PO)            |                                                                                       |                |     |     |     |     |                                    |
| PO1                             | Knowledge of Engineering Sciences                                                     | 2              | 1   | 2   | 2   | 1   | 2                                  |
| PO2                             | Problem analysis                                                                      | 2              | -   | 3   | 3   | 3   | 3                                  |
| PO3                             | Design / development of solutions                                                     | 1              | -   | 3   | 3   | 3   | 3                                  |
| PO4                             | Investigation                                                                         | 3              | 2   | 2   | 3   | 3   | 3                                  |
| PO5                             | Modern Tool Usage                                                                     | 3              | 2   | 3   | 2   | 2   | 2                                  |
| PO6                             | Engineer and Society                                                                  | 2              | 2   | 3   | 1   | 2   | 2                                  |
| PO7                             | Environment and Sustainability                                                        | 2              | 3   | 2   | 2   | 1   | 2                                  |
| PO8                             | Ethics                                                                                | -              | -   | 1   | 1   | 1   | 1                                  |
| PO9                             | Individual and Team work                                                              | 1              | 1   | 2   | 1   | 2   | 1                                  |
| PO10                            | Communication                                                                         | 1              | 1   | 2   | 1   | 2   | 1                                  |
| PO11                            | Project Management and Finance                                                        | 2              | 2   | 3   | 2   | 3   | 2                                  |
| PO12                            | Life Long Learning                                                                    | 1              | 1   | 2   | 1   | 2   | 1                                  |
| PROGRAM SPECIFIC OUTCOMES (PSO) |                                                                                       |                |     |     |     |     |                                    |
| PSO1                            | Knowledge of Civil Engineering discipline                                             | 3              | 2   | 3   | 3   | 2   | 3                                  |
| PSO2                            | Critical analysis of Civil Engineering problems and innovation                        | 2              | 3   | 3   | 3   | 3   | 3                                  |
| PSO3                            | Conceptualization and evaluation of engineering solutions to Civil Engineering Issues | 3              | 2   | 3   | 3   | 2   | 3                                  |



**COURSE OBJECTIVE:**

- To impart knowledge on the global warming, the impact of climate change on society and the adaptation and mitigation measures to the students

**UNIT I INTRODUCTION**

9

Atmosphere – weather and Climate - climate parameters – Temperature, Rainfall, Humidity, Wind  
– Global ocean circulation – El Nino and its effect - Carbon cycle

**UNIT II ELEMENTS RELATED TO CLIMATE CHANGE**

7

Greenhouse gases - Total carbon dioxide emissions by energy sector – industrial, commercial, transportation, residential – Impacts – air quality, hydrology, green space - Causes of global and regional climate change – Changes in patterns of temperature, precipitation and sea level rise – Greenhouse effect

**UNIT III IMPACTS OF CLIMATE CHANGE**

10

Effects of Climate Changes on living things – health effects, malnutrition, human migration, socioeconomic impacts- tourism, industry and business, vulnerability assessment- infrastructure, population and sector – Agriculture, forestry, human health, coastal areas

**UNIT IV MITIGATING CLIMATE CHANGE**

9

IPCC Technical Guidelines for Assessing Climate Change Impact and Adaptation -Identifying adaption options – designing and implementing adaption measures – surface albedo environment-reflective roofing and reflective paving – enhancement of evapotranspiration - tree planting programme – green roofing strategies – energy conservation in buildings – energy efficiencies – carbon sequestration.

**UNIT V ALTERNATE FUELS AND RENEWABLE ENERGY**

10

Energy source – coal, natural gas – wind energy, hydropower, solar energy, nuclear energy, geothermal energy – biofuels – Energy policies for a cool future - Energy Audit.

**TOTAL: 45 PERIODS****COURSE OUTCOMES**

The students completing the course will have

- CO1 an insight into carbon cycle, physical basis of the natural greenhouse effect, including the meaning of the term radiative forcing, climate change, global warming and measures to adapt and to mitigate the impacts of climate change
- CO2 understanding on the growing scientific consensus established through the IPCC as well as the complexities and uncertainties
- CO3 ability to plan climate change mitigation and adaptation projects including the use of alternate fuels and renewable energy
- CO4 Gain in-depth knowledge on climate models
- CO5 Post process the model outputs for climate impact assessment, know about adaptation strategies

**TEXTBOOKS:**

- Ruddiman W.F, freeman W.H. and Company, "Earth's Climate Past and Future", 2001
- Velma. I. Grover "Global Warming and Climate" Change. Vol I an II. Science Publishers, 2005.
- Dash Sushil Kumar, "Climate Change – An Indian Perspective", Cambridge University Press India Pvt. Ltd, 2007

## REFERENCES:

1. IPCC Fourth Assessment Report, Cambridge University Press, Cambridge, UK, 2007
2. Thomas E, Lovejoy and Lee Hannah "Climate Change and Biodiversity", TERI Publishers, 2005
3. Jan C. van Dam, Impacts of "Climate Change and Climate Variability on Hydrological Regimes", Cambridge University Press, 2003.

## COs- PO's & PSO's MAPPING

| PO/PSO                          |                                                                                       | Course Outcome |     |     |     |     | Over all<br>Correlation of<br>COs to POs |
|---------------------------------|---------------------------------------------------------------------------------------|----------------|-----|-----|-----|-----|------------------------------------------|
|                                 |                                                                                       | CO1            | CO2 | CO3 | CO4 | CO5 |                                          |
| PROGRAMOUTCOMES(PO)             |                                                                                       |                |     |     |     |     |                                          |
| PO1                             | Knowledge of Engineering Sciences                                                     |                |     | 2   | 2   |     | 2                                        |
| PO2                             | Problem analysis                                                                      | 3              |     | 3   |     | 3   | 3                                        |
| PO3                             | Design / development of solutions                                                     |                |     |     | 2   |     | 2                                        |
| PO4                             | Investigation                                                                         |                |     | 2   | 2   |     | 2                                        |
| PO5                             | Modern Tool Usage                                                                     |                |     | 3   | 3   | 3   | 3                                        |
| PO6                             | Engineer and Society                                                                  |                | 2   |     |     | 2   | 2                                        |
| PO7                             | Environment and sustainability                                                        |                | 3   |     |     |     | 3                                        |
| PO8                             | Ethics                                                                                |                |     |     |     |     |                                          |
| PO9                             | Individual and Team work                                                              |                |     |     | 3   | 3   | 3                                        |
| PO10                            | Communication                                                                         | 1              |     |     |     | 2   | 1                                        |
| PO11                            | Project Management and Finance                                                        |                |     |     |     | 3   | 3                                        |
| PO12                            | Life Long Learning                                                                    | 2              |     | 3   |     | 2   | 2                                        |
| PROGRAM SPECIFIC OUTCOMES (PSO) |                                                                                       |                |     |     |     |     |                                          |
| PSO1                            | Knowledge of Civil Engineering discipline                                             |                | 2   |     |     |     | 2                                        |
| PSO2                            | Critical analysis of Civil Engineering problems and innovation                        |                |     |     |     | 2   | 2                                        |
| PSO3                            | Conceptualization and evaluation of engineering solutions to Civil Engineering Issues |                | 3   |     |     |     | 3                                        |

**COURSE OBJECTIVE**

- To impart knowledge on concepts related to disaster, disaster risk reduction, disaster management
- To acquaint with the skills for planning and organizing disaster response

**UNIT I HAZARDS, VULNERABILITY AND DISASTER RISKS**

9

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Types of Disasters: Natural, Human induced, Climate change induced –Earthquake, Landslide, Flood, Drought, Fire etc – Technological disasters- Structural collapse, Industrial accidents, oil spills -Causes, Impacts including social, Economic, political, environmental, health, psychosocial, etc.- Disaster vulnerability profile of India and Tamil Nadu - Global trends in disasters: urban disasters, pandemics, Complex emergencies, -, Inter relations between Disasters and Sustainable development Goals

**UNIT II DISASTER RISK REDUCTION (DRR)**

9

Sendai Framework for Disaster Risk Reduction, Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community Based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions / Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders- Early Warning System – Advisories from Appropriate Agencies.- Relevance of indigenous Knowledge, appropriate technology and Local resources.

**UNIT III DISASTER MANAGEMENT**

9

Components of Disaster Management – Preparedness of rescue and relief, mitigation, rehabilitation and reconstruction- Disaster Risk Management and post disaster management – Compensation and Insurance- Disaster Management Act (2005) and Policy - Other related policies, plans, programmes



and legislation - Institutional Processes and Framework at State and Central Level- (NDMA –SDMA-DDMA-NRDF- Civic Volunteers)

**UNIT IV TOOLS AND TECHNOLOGY FOR DISASTER MANAGEMENT 9**  
Early warning systems -Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment. - Elements of Climate Resilient Development –Standard operation Procedure for disaster response – Financial planning for disaster Management

**UNIT V DISASTER MANAGEMENT: CASE STUDIES 9**  
Discussion on selected case studies to analyse the potential impacts and actions in the contest of disasters-Landslide Hazard Zonation: Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.- Field work-Mock drill -

**TOTAL : 45 PERIODS**

#### TEXT BOOKS:

- 1 Taimpo (2016), Disaster Management and Preparedness, CRC Publications
- 2 Singh R (2017), Disaster Management Guidelines for earthquakes, Landslides, Avalanches and tsunami, Horizon Press Publications
- 3 Singhal J.P. "Disaster Management", Laxmi Publications, 2010. ISBN-10: 9380386427 ISBN-13: 978-9380386423
- 4 Tushar Bhattacharya, "Disaster Science and Management", McGraw Hill India Education Pvt. Ltd., 2012. ISBN-10: 1259007367, ISBN-13: 978-1259007361]

#### REFERENCES

1. Govt. of India: Disaster Management Act, Government of India, New Delhi, 2005.
2. Government of India, National Disaster Management Policy, 2009.
3. Shaw R (2016), Community based Disaster risk reduction, Oxford University Press

#### COURSE OUTCOME:

**CO1:** To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)

**CO2:** To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction

**CO3:** To develop disaster response skills by adopting relevant tools and technology

**CO4:** Enhance awareness of institutional processes for Disaster response in the country and

**CO5:** Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity

#### CO's – PO's & PSO's MAPPING

| CO's | PO's |   |   |   |   |   |   |   |   |    |    |    | PSO's |   |   |
|------|------|---|---|---|---|---|---|---|---|----|----|----|-------|---|---|
|      | 1    | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1     | 2 | 3 |
| 1    | 3    | 3 | 2 | 3 | - | - | 2 | 2 | - | -  | 2  | -  | 2     | - | 1 |
| 2    | 3    | 3 | 3 | 3 | - | - | 2 | 1 | - | -  | 2  | -  | 2     | - | 1 |
| 3    | 3    | 3 | 3 | 3 | - | - | 2 | 2 | - | -  | -  | -  | 2     | - | 1 |
| 4    | 3    | 3 | 2 | 3 | - | - | 2 | 1 | - | -  | 2  | -  | 2     | - | 1 |
| 5    | 3    | 3 | 2 | 3 | - | - | 2 | 2 | - | -  | 2  | -  | 3     | - | 1 |
| AVG  | 3    | 3 | 3 | 3 | - | - | 2 | 2 | - | -  | 2  | -  | 2     | - | 1 |

**COURSE OBJECTIVE**

- To understand the methods and types of prestressing and to enable the students to design prestressed concrete structural elements and systems

**UNIT I INTRODUCTION – THEORY AND BEHAVIOUR 9**

Basic principles of prestressing – Classification and types – Advantages over ordinary reinforced concrete – Materials – High strength concrete and high tensile steel – Methods of prestressing – Freyssinet, Magnel, Lee-McCall and Gifford Udall anchorage systems – Analysis of sections of stresses by stress concept, strength concept and load balancing concept – Losses of prestress in post-tensioned and pre-tensioned members.

**UNIT II DESIGN FOR FLEXURE AND SHEAR 9**

Basic assumptions of flexural design – Permissible stresses in steel and concrete as per I.S.1343 Code – Different Types of sections - Design of sections of Type I and Type II post-tensioned and pre-tensioned beams – Check for flexural capacity based on I.S. 1343 Code – Influence of Layout of cables in post-tensioned beams – Location of wires in pre-tensioned beams – Design for shear based on I.S. 1343 Code.

**UNIT III DEFLECTION AND DESIGN OF ANCHORAGE ZONE 9**

Factors influencing deflections – Short-term deflections of uncracked members – Prediction of long-term deflections due to creep and shrinkage – Check for serviceability limit states. Determination of anchorage zone stresses in post-tensioned beams by Magnel's method, Guyon's method and I.S. 1343 code – design of anchorage zone reinforcement – Check for transfer bond length in pre-tensioned beams – design of anchorage zone reinforcement – Check for transfer bond length in pre-tensioned beams.

**UNIT IV COMPOSITE BEAMS AND CONTINUOUS BEAMS 9**

Analysis and design of composite beams – Shrinkage strain and its importance – Differential shrinkage - Methods of achieving continuity in continuous beams – Analysis for secondary moments – Concordant cable and linear transformation – Calculation of stresses – Principles of design.

**UNIT V MISCELLANEOUS STRUCTURES 9**

Role of prestressing in members subjected to Tensile forces and compressive forces – Design of Tension members and Compression members - Design of Tanks, Pipes, Sleepers and Poles – Partial prestressing – methods of achieving partial prestressing, merits and demerits of partial prestressing.

**TOTAL: 45 PERIODS****COURSE OUTCOMES:**

Students will be able to

- CO1 Design a prestressed concrete beam accounting for losses.
- CO2 Design for flexure and shear.
- CO3 Design the anchorage zone for post-tensioned members and estimate the deflection in beams.
- CO4 Design composite members and continuous beams.
- CO5 Design water tanks, pipes, poles and sleepers.

**TEXTBOOKS:**

- Krishna Raju N., "Prestressed concrete", 5th Edition, Tata McGraw Hill Company, New Delhi, 2012
- Pandit.G.S. and Gupta. S.P., "Prestressed Concrete", CBS Publishers and Distributors Pvt. Ltd, 2014

**REFERENCES:**

- Lin T.Y. and Ned.H.Burns, "Design of prestressed Concrete Structures", Third Edition, Wiley India Pvt. Ltd., New Delhi, 2013.

**COURSE OBJECTIVE:**

- To study and understand the latest construction techniques applied to engineering construction for sub structure, super structure, special structures, rehabilitation and strengthening techniques and demolition techniques.

**UNIT I SUB STRUCTURE CONSTRUCTION**

9

Construction Methodology - Box jacking - Pipe jacking - Under water construction of diaphragm walls and basement - Tunneling techniques - Piling techniques - Driving well and caisson - sinking cofferdam - cable anchoring and grouting - Driving diaphragm walls, Sheet piles - Laying operations for built up offshore system - Shoring for deep cutting - Large reservoir construction - well points - Dewatering for underground open excavation.

**UNIT II SUPER STRUCTURE CONSTRUCTION FOR BUILDINGS**

9

Vacuum dewatering of concrete flooring - Concrete paving technology - Techniques of construction for continuous concreting operation in tall buildings of various shapes and varying sections - Erection techniques of tall structures, Large span structures - launching techniques for heavy decks - in-situ prestressing in high rise structures, Post tensioning of slab- aerial transporting - Handling and erecting lightweight components on tall structures.

**UNIT III CONSTRUCTION OF SPECIAL STRUCTURES**

9

Erection of lattice towers - Rigging of transmission line structures - Construction sequence in cooling towers, Silos, chimney, sky scrapers - Bow string bridges, Cable stayed bridges - Launching and pushing of box decks - Construction of jetties and break water structures - Construction sequence and methods in domes - Support structure for heavy equipment and machinery in heavy industries - Erection of articulated structures and space decks.

**UNIT IV REHABILITATION AND STRENGTHENING TECHNIQUES**

9

Seismic retrofitting - Strengthening of beams - Strengthening of columns - Strengthening of slab - Strengthening of masonry wall, Protection methods of structures, Mud jacking and grouting for foundation - Micro piling and underpinning for strengthening floor and shallow profile - Sub grade water proofing, Soil Stabilization techniques.

**UNIT V DEMOLITION**

9

Demolition Techniques, Demolition by Machines, Demolition by Explosives, Advanced techniques using Robotic Machines, Demolition Sequence, Dismantling Techniques, Safety precaution in Demolition and Dismantling.

**COURSE OUTCOMES:****TOTAL: 45 PERIODS**

- On completion of the course, the student is expected to be able to
- CO1 Understand the modern construction techniques used in the sub structure construction.  
 CO2 Demonstrate knowledge and understanding of the principles and concepts relevant to super structure construction for buildings  
 CO3 Understand the concepts used in the construction of special structures  
 CO4 Knowledge on Various strengthening and repair methods for different cases.  
 CO5 Identify the suitable demolition technique for demolishing a building.

**REFERENCES:**

- Jerry Irvine, Advanced Construction Techniques, CA Rocket, 1984
- Patrick Powers. J., Construction Dewatering: New Methods and Applications, John Wiley & Sons, 1992.
- Peter H.Emmons, "Concrete repair and maintenance illustrated", Galgotia Publications Pvt. Ltd., 2001.Press, 2008.
- Robertwade Brown, Practical foundation engineering hand book, McGraw Hill Publications, 1995.
- Sankar, S.K. and Saraswati, S., Construction Technology, Oxford University, New Delhi, 2008.



# COs- PO's & PSO's MAPPING

| PO/PSO                          |                                                                                       | Course Outcome |     |     |     |     | Overall Correlation of CO s to POs |
|---------------------------------|---------------------------------------------------------------------------------------|----------------|-----|-----|-----|-----|------------------------------------|
|                                 |                                                                                       | CO1            | CO2 | CO3 | CO4 | CO5 |                                    |
| PROGRAM OUTCOMES(PO)            |                                                                                       |                |     |     |     |     |                                    |
| PO1                             | Knowledge of Engineering Sciences                                                     | 2              | 1   | 2   | 2   | 1   | 2                                  |
| PO2                             | Problem analysis                                                                      | 2              | -   | 3   | 3   | 3   | 3                                  |
| PO3                             | Design / development of solutions                                                     | 1              | -   | 3   | 3   | 3   | 3                                  |
| PO4                             | Investigation                                                                         | 3              | 2   | 2   | 3   | 3   | 3                                  |
| PO5                             | Modern Tool Usage                                                                     | 3              | 2   | 3   | 2   | 2   | 2                                  |
| PO6                             | Engineer and Society                                                                  | 2              | 2   | 3   | 1   | 2   | 2                                  |
| PO7                             | Environment and Sustainability                                                        | 2              | 3   | 2   | 2   | 1   | 2                                  |
| PO8                             | Ethics                                                                                | -              | -   | 1   | 1   | 1   | 1                                  |
| PO9                             | Individual and Team work                                                              | 1              | 1   | 2   | 1   | 2   | 1                                  |
| PO10                            | Communication                                                                         | 1              | 1   | 2   | 1   | 2   | 1                                  |
| PO11                            | Project Management and Finance                                                        | 2              | 2   | 3   | 2   | 3   | 2                                  |
| PO12                            | Life Long Learning                                                                    | 1              | 1   | 2   | 1   | 2   | 1                                  |
| PROGRAM SPECIFIC OUTCOMES (PSO) |                                                                                       |                |     |     |     |     |                                    |
| PSO1                            | Knowledge of Civil Engineering discipline                                             | 3              | 2   | 3   | 3   | 2   | 3                                  |
| PSO2                            | Critical analysis of Civil Engineering problems and innovation                        | 2              | 3   | 3   | 3   | 3   | 3                                  |
| PSO3                            | Conceptualization and evaluation of engineering solutions to Civil Engineering Issues | 3              | 2   | 3   | 3   | 2   | 3                                  |

**COURSE OBJECTIVE:**

- To impart knowledge on the global warming, the impact of climate change on society and the adaptation and mitigation measures to the students

**UNIT I INTRODUCTION**

9

Atmosphere – weather and Climate - climate parameters – Temperature, Rainfall, Humidity, Wind  
– Global ocean circulation – El Nino and its effect - Carbon cycle

**UNIT II ELEMENTS RELATED TO CLIMATE CHANGE**

7

Greenhouse gases - Total carbon dioxide emissions by energy sector – industrial, commercial, transportation, residential – Impacts – air quality, hydrology, green space - Causes of global and regional climate change – Changes in patterns of temperature, precipitation and sea level rise – Greenhouse effect

**UNIT III IMPACTS OF CLIMATE CHANGE**

10

Effects of Climate Changes on living things – health effects, malnutrition, human migration, socioeconomic impacts- tourism, industry and business, vulnerability assessment- infrastructure, population and sector – Agriculture, forestry, human health, coastal areas

**UNIT IV MITIGATING CLIMATE CHANGE**

9

IPCC Technical Guidelines for Assessing Climate Change Impact and Adaptation -Identifying adaption options – designing and implementing adaption measures – surface albedo environment-reflective roofing and reflective paving – enhancement of evapotranspiration - tree planting programme – green roofing strategies – energy conservation in buildings – energy efficiencies – carbon sequestration.

**UNIT V ALTERNATE FUELS AND RENEWABLE ENERGY**

10

Energy source – coal, natural gas – wind energy, hydropower, solar energy, nuclear energy, geothermal energy – biofuels – Energy policies for a cool future - Energy Audit.

**TOTAL: 45 PERIODS****COURSE OUTCOMES**

The students completing the course will have

- CO1 an insight into carbon cycle, physical basis of the natural greenhouse effect, including the meaning of the term radiative forcing, climate change, global warming and measures to adapt and to mitigate the impacts of climate change
- CO2 understanding on the growing scientific consensus established through the IPCC as well as the complexities and uncertainties
- CO3 ability to plan climate change mitigation and adaptation projects including the use of alternate fuels and renewable energy
- CO4 Gain in-depth knowledge on climate models
- CO5 Post process the model outputs for climate impact assessment, know about adaptation strategies

**TEXTBOOKS:**

- Ruddiman W.F, freeman W.H. and Company, "Earth's Climate Past and Future", 2001
- Velma. I. Grover "Global Warming and Climate" Change. Vol I an II. Science Publishers, 2005.
- Dash Sushil Kumar, "Climate Change – An Indian Perspective", Cambridge University Press India Pvt. Ltd, 2007

## REFERENCES:

1. IPCC Fourth Assessment Report, Cambridge University Press, Cambridge, UK, 2007
2. Thomas E, Lovejoy and Lee Hannah "Climate Change and Biodiversity", TERI Publishers, 2005
3. Jan C. van Dam, Impacts of "Climate Change and Climate Variability on Hydrological Regimes", Cambridge University Press, 2003.

## COs- PO's & PSO's MAPPING

| PO/PSO                          |                                                                                       | Course Outcome |     |     |     |     | Over all<br>Correlation of<br>COs to POs |
|---------------------------------|---------------------------------------------------------------------------------------|----------------|-----|-----|-----|-----|------------------------------------------|
|                                 |                                                                                       | CO1            | CO2 | CO3 | CO4 | CO5 |                                          |
| PROGRAMOUTCOMES(PO)             |                                                                                       |                |     |     |     |     |                                          |
| PO1                             | Knowledge of Engineering Sciences                                                     |                |     | 2   | 2   |     | 2                                        |
| PO2                             | Problem analysis                                                                      | 3              |     | 3   |     | 3   | 3                                        |
| PO3                             | Design / development of solutions                                                     |                |     |     | 2   |     | 2                                        |
| PO4                             | Investigation                                                                         |                |     | 2   | 2   |     | 2                                        |
| PO5                             | Modern Tool Usage                                                                     |                |     | 3   | 3   | 3   | 3                                        |
| PO6                             | Engineer and Society                                                                  |                | 2   |     |     | 2   | 2                                        |
| PO7                             | Environment and sustainability                                                        |                | 3   |     |     |     | 3                                        |
| PO8                             | Ethics                                                                                |                |     |     |     |     |                                          |
| PO9                             | Individual and Team work                                                              |                |     |     | 3   | 3   | 3                                        |
| PO10                            | Communication                                                                         | 1              |     |     |     | 2   | 1                                        |
| PO11                            | Project Management and Finance                                                        |                |     |     |     | 3   | 3                                        |
| PO12                            | Life Long Learning                                                                    | 2              |     | 3   |     | 2   | 2                                        |
| PROGRAM SPECIFIC OUTCOMES (PSO) |                                                                                       |                |     |     |     |     |                                          |
| PSO1                            | Knowledge of Civil Engineering discipline                                             |                | 2   |     |     |     | 2                                        |
| PSO2                            | Critical analysis of Civil Engineering problems and innovation                        |                |     |     |     | 2   | 2                                        |
| PSO3                            | Conceptualization and evaluation of engineering solutions to Civil Engineering Issues |                | 3   |     |     |     | 3                                        |



**COURSE OBJECTIVE**

- To impart knowledge on concepts related to disaster, disaster risk reduction, disaster management
- To acquaint with the skills for planning and organizing disaster response

**UNIT I HAZARDS, VULNERABILITY AND DISASTER RISKS**

9

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Types of Disasters: Natural, Human induced, Climate change induced –Earthquake, Landslide, Flood, Drought, Fire etc – Technological disasters- Structural collapse, Industrial accidents, oil spills -Causes, Impacts including social, Economic, political, environmental, health, psychosocial, etc.- Disaster vulnerability profile of India and Tamil Nadu - Global trends in disasters: urban disasters, pandemics, Complex emergencies, -, Inter relations between Disasters and Sustainable development Goals

**UNIT II DISASTER RISK REDUCTION (DRR)**

9

Sendai Framework for Disaster Risk Reduction, Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community Based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions / Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders- Early Warning System – Advisories from Appropriate Agencies.- Relevance of indigenous Knowledge, appropriate technology and Local resources.

**UNIT III DISASTER MANAGEMENT**

9

Components of Disaster Management – Preparedness of rescue and relief, mitigation, rehabilitation and reconstruction- Disaster Risk Management and post disaster management – Compensation and Insurance- Disaster Management Act (2005) and Policy - Other related policies, plans, programmes

and legislation - Institutional Processes and Framework at State and Central Level- (NDMA –SDMA-DDMA-NRDF- Civic Volunteers)

#### UNIT IV **TOOLS AND TECHNOLOGY FOR DISASTER MANAGEMENT** 9

Early warning systems -Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment. - Elements of Climate Resilient Development –Standard operation Procedure for disaster response – Financial planning for disaster Management

#### UNIT V **DISASTER MANAGEMENT: CASE STUDIES** 9

Discussion on selected case studies to analyse the potential impacts and actions in the contest of disasters-Landslide Hazard Zonation: Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.- Field work-Mock drill -

**TOTAL : 45 PERIODS**

#### TEXT BOOKS:

- 1 Taimpo (2016), Disaster Management and Preparedness, CRC Publications
- 2 Singh R (2017), Disaster Management Guidelines for earthquakes, Landslides, Avalanches and tsunami, Horizon Press Publications
- 3 Singhal J.P. "Disaster Management", Laxmi Publications, 2010. ISBN-10: 9380386427 ISBN-13: 978-9380386423
- 4 Tushar Bhattacharya, "Disaster Science and Management", McGraw Hill India Education Pvt. Ltd., 2012. ISBN-10: 1259007367, ISBN-13: 978-1259007361]

#### REFERENCES

1. Govt. of India: Disaster Management Act, Government of India, New Delhi, 2005.
2. Government of India, National Disaster Management Policy, 2009.
3. Shaw R (2016), Community based Disaster risk reduction, Oxford University Press

#### COURSE OUTCOME:

CO1: To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)

CO2: To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction

CO3: To develop disaster response skills by adopting relevant tools and technology

CO4: Enhance awareness of institutional processes for Disaster response in the country and

CO5: Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity

#### CO's – PO's & PSO's MAPPING

| CO's | PO's |   |   |   |   |   |   |   |   |    |    |    | PSO's |   |   |
|------|------|---|---|---|---|---|---|---|---|----|----|----|-------|---|---|
|      | 1    | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1     | 2 | 3 |
| 1    | 3    | 3 | 2 | 3 | - | - | 2 | 2 | - | -  | 2  | -  | 2     | - | 1 |
| 2    | 3    | 3 | 3 | 3 | - | - | 2 | 1 | - | -  | 2  | -  | 2     | - | 1 |
| 3    | 3    | 3 | 3 | 3 | - | - | 2 | 2 | - | -  | -  | -  | 2     | - | 1 |
| 4    | 3    | 3 | 2 | 3 | - | - | 2 | 1 | - | -  | 2  | -  | 2     | - | 1 |
| 5    | 3    | 3 | 2 | 3 | - | - | 2 | 2 | - | -  | 2  | -  | 3     | - | 1 |
| AVG  | 3    | 3 | 3 | 3 | - | - | 2 | 2 | - | -  | 2  | -  | 2     | - | 1 |

**COURSE OBJECTIVE**

- To understand the methods and types of prestressing and to enable the students to design prestressed concrete structural elements and systems

**UNIT I INTRODUCTION – THEORY AND BEHAVIOUR 9**

Basic principles of prestressing – Classification and types – Advantages over ordinary reinforced concrete – Materials – High strength concrete and high tensile steel – Methods of prestressing – Freyssinet, Magnel, Lee-McCall and Gifford Udall anchorage systems – Analysis of sections of stresses by stress concept, strength concept and load balancing concept – Losses of prestress in post-tensioned and pre-tensioned members.

**UNIT II DESIGN FOR FLEXURE AND SHEAR 9**

Basic assumptions of flexural design – Permissible stresses in steel and concrete as per I.S.1343 Code – Different Types of sections - Design of sections of Type I and Type II post-tensioned and pre-tensioned beams – Check for flexural capacity based on I.S. 1343 Code – Influence of Layout of cables in post-tensioned beams – Location of wires in pre-tensioned beams – Design for shear based on I.S. 1343 Code.

**UNIT III DEFLECTION AND DESIGN OF ANCHORAGE ZONE 9**

Factors influencing deflections – Short-term deflections of uncracked members – Prediction of long-term deflections due to creep and shrinkage – Check for serviceability limit states. Determination of anchorage zone stresses in post-tensioned beams by Magnel's method, Guyon's method and I.S. 1343 code – design of anchorage zone reinforcement – Check for transfer bond length in pre-tensioned beams – design of anchorage zone reinforcement – Check for transfer bond length in pre-tensioned beams.

**UNIT IV COMPOSITE BEAMS AND CONTINUOUS BEAMS 9**

Analysis and design of composite beams – Shrinkage strain and its importance – Differential shrinkage - Methods of achieving continuity in continuous beams – Analysis for secondary moments – Concordant cable and linear transformation – Calculation of stresses – Principles of design.

**UNIT V MISCELLANEOUS STRUCTURES 9**

Role of prestressing in members subjected to Tensile forces and compressive forces – Design of Tension members and Compression members - Design of Tanks, Pipes, Sleepers and Poles – Partial prestressing – methods of achieving partial prestressing, merits and demerits of partial prestressing.

**TOTAL: 45 PERIODS****COURSE OUTCOMES:**

Students will be able to

- CO1 Design a prestressed concrete beam accounting for losses.
- CO2 Design for flexure and shear.
- CO3 Design the anchorage zone for post-tensioned members and estimate the deflection in beams.
- CO4 Design composite members and continuous beams.
- CO5 Design water tanks, pipes, poles and sleepers.

**TEXTBOOKS:**

- Krishna Raju N., "Prestressed concrete", 5th Edition, Tata McGraw Hill Company, New Delhi, 2012
- Pandit.G.S. and Gupta. S.P., "Prestressed Concrete", CBS Publishers and Distributors Pvt. Ltd, 2014

**REFERENCES:**

- Lin T.Y. and Ned.H.Burns, "Design of prestressed Concrete Structures", Third Edition, Wiley India Pvt. Ltd., New Delhi, 2013.