UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Advanced Structural Design
Course Code: SCE 201
L-T Scheme: 4-0 **Course Credits: 4**

Introduction:

This course examines the basic concepts of advanced structural design which includes the design of cylinders and shells. Also the structures for handling materials like silo and bunkers are taken into consideration.

Objectives:

The students will have a clear understanding of the advanced structural design. The advanced structural design concepts will be introduced like cylindrical shell, Structures for handing materialslike silo and bunkers and Liquid retaining structures.

Learning Outcomes: The students will have a clear idea of the following concepts: Flat slab, Grid slab, Deep beam, Shear wall, Frame shear wall interaction, Cylindrical shell, Structures for handing materialslike silo and bunkers, Liquid retaining structures, Pile and Pile cap.

Course Contents:

Unit 1:Flat slab, Grid slab, Deep beam, Shear wall, Frame shear wall interaction, Cylindrical shell, Structures for handing materialslike silo and bunkers, Liquid retaining structures, Pile and Pile cap.

Unit 2: Design provisions as envisaged in various Indian Standards.

Text Books

1) Design of Reinforce Concrete Structures A. K. Gupta.
2) Limit State Design of RCC A.K. Jain.
3) Limit State Design of RCC Structure by Pillai &Menon.

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Structural Dynamics And Earthquake Engineering
Course Code: SCE 202
L-T Scheme: 4-0 **Course Credits: 4**

Introduction:

The concepts of structural dynamics and earthquake engineering will be introduced in this course. The topics broadly covered under these course includes: Introduction – Single and multi-degree freedom systems, undamped and damped systems, numerical integration scheme,modal analysis for undamped and damped systems.Codal provision for design of buildings, design of liquid storage tanks, liquefaction, non-engineered construction.

Objectives:

In this course we will study the basic concepts of structural dynamics and earthquake engineering. The concept of damped and undamped vibrations will be taken into consideration. Also the concept earthquake response of structures and concept of earthquake resistant design will be introduced.

Learning Outcomes: The students will have a clear understanding of the following concepts: Introduction – Single and multi-degree freedom systems, undamped and damped systems, numerical integration scheme,modal analysis for undamped and damped systems. Vibration of continuous elastic media – Beam, Plates.Characteristics of earthquake, Earthquake response of structures, Concept of earthquake resistant design. Codal provision for design of buildings, design of liquid storage tanks, liquefaction, non-engineered construction, special topics.

Course Contents:

Unit 1: Introduction – Single and multi-degree freedom systems, undamped and damped systems, numerical integration scheme,modal analysis for undamped and damped systems. Vibration of continuous elastic media – Beam, Plates.

Unit 2: Characteristics of earthquake, Earthquake response of structures, Concept of earthquake resistant design.

Unit 3: Codal provision for design of buildings, design of liquid storage tanks, liquefaction, non-engineered construction, special topics.

Text Books

1) Structural dynamics theory and computation by Paz Mario.
2) Seismic analysis of the Structure by T.K.Dutta.
3) Introduction to Structural Dynamics by John M. Biggs (McGraw Hill).
4) Dynamics of Structures by Jagmohan L. Humar (A. A. Balkema Publisher).

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Theory Of Elasticity And Plasticity
Course Code: SCE 203
L-T Scheme: 4-0Course Credits: 4

Introduction:

The concept of elasticity and plasticity is introduced. The topics broadly covered under this course includes: Elasticity: Introduction to tensor analysis; three dimensional stress and strain analysis.Torsion of rectangular bars including hollow sections, bending problems.Plasticity: basic concepts and yield criteria. Equations of plasticity, elasto-plastic analysis of torsion and bending problems,torsion of a bar of oval section (Sokoloskey's method).

Objectives:

In this course the basic concepts of elasticity and plasticity is introduced. The students will have a clear understanding of the three dimensional stress strain analysis and two dimensional problems in Cartesian, polar and curvilinear co-ordinates. The concept of bending of beams, complex variable and harmonic and bi harmonic functions are introduced.

Learning Outcomes: The students will have a clear idea of the following concepts:Elasticity: Introduction to tensor analysis; three dimensional stress and strain analysis. Two dimensional problems incartesian, polar and curvilinear co-ordinates, bending of a beam, thick cylinder under pressure, complex variable, harmonicand bi-harmonic functions.Torsion of rectangular bars including hollow sections, bending problems. Energy principles,variational methods and numerical methods.Plasticity: basic concepts and yield criteria. Equations of plasticity, elasto-plastic analysis of torsion and bending problems,torsion of a bar of oval section (Sokoloskey's method), problems of spherical and axial symmetry, slip lines and plastic flow,strain hardening.

Course Contents:

Unit 1: Elasticity: Introduction to tensor analysis; three dimensional stress and strain analysis. Two dimensional problems incartesian, polar and curvilinear co-ordinates, bending of a beam, thick cylinder under pressure, complex variable, harmonicand bi-harmonic functions.

Unit 2: Torsion of rectangular bars including hollow sections, bending problems. Energy principles,variational methods and numerical methods.

Unit 3: Plasticity: basic concepts and yield criteria. Equations of plasticity, elasto-plastic analysis of torsion and bending problems,torsion of a bar of oval section (Sokoloskey's method), problems of spherical and axial symmetry, slip lines and plastic flow,strain hardening.

Text Books

1) Theory of Plasticity by Chakraborty.
2) Theory of Elasticity by Timoshenko S.P. and Goodier.
3) Theory of Elasticity and Plasticity by Timoshenko S.P. and Woinowsky-Kreiger.
4) Plasticity Theory by Jacob Lubliner.
5) Theory of Elasticity and Plasticity by Harold Malcolm Westergaard (HUP).

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Pre Stressed Concrete Structures
Course Code: SCE 204B
L-T Scheme: 4-0 **Course Credits: 4**

Introduction:

This course examines the concept of pre-stressed concrete structures. The topics covered includes Specification of materials, methods of pre-stressing, losses, analysis and design of members for moment and shear, stresses inanchorage zones of pre-tensioned and post tensioned members, design of end block, pre-stressed concrete compressionmembers.Partial pre-stressing, composite construction with pre-stressed concrete and reinforced concrete. Two-way pre-stressing, circular pre-stressing, indeterminate structures.

Objectives:

In this course we will study the following concepts likeSpecification of materials, methods of pre-stressing, losses, analysis and design of members for moment and shear, stresses inanchorage zones of pre-tensioned and post tensioned members, design of end block, pre-stressed concrete compressionmembers.Partial pre-stressing, composite construction with pre-stressed concrete and reinforced concrete.

Learning Outcomes: The students will have a clear understanding of the following concepts:Specification of materials, methods of pre-stressing, losses, analysis and design of members for moment and shear, stresses inanchorage zones of pre-tensioned and post tensioned members, design of end block, pre-stressed concrete compressionmembers.Partial pre-stressing, composite construction with pre-stressed concrete and reinforced concrete.Two-way pre-stressing, circular pre-stressing, indeterminate structures. Review of IS code.

Course Contents:

Unit 1: Specification of materials, methods of pre-stressing, losses, analysis and design of members for moment and shear, stresses inanchorage zones of pre-tensioned and post tensioned members, design of end block, pre-stressed concrete compressionmembers.

Unit 2: Partial pre-stressing, composite construction with pre-stressed concrete and reinforced concrete.

Unit 3: Two-way pre-stressing, circular pre-stressing, indeterminate structures. Review of IS code.

Text Books

1) Design of prestressed concrete structure by Lin.
2) Design of pre stressed Concrete by Krishna Raju.
3) Design of Prestressed Concrete by Mallik& Gupta.

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Advanced Foundation Engineering
Course Code: SCE 204A
L-T Scheme: 4-0 **Course Credits: 4**

Introduction:

The topics broadly covered under this course includes Footings on slopes, Foundation with uplift ortension forces.Settlements: Settlement Analysis of shallow foundations in sand, clay, and layered deposits, Reliability of settlementcalculations, Structural tolerances.Design of rectangular footings, combined footings and mat foundations.Deep foundations: Pile foundations under vertical and lateral loads.

Objectives:

In this course we will study the basic components of advanced foundation engineering. The following concepts are introduced such as Settlements: Settlement Analysis of shallow foundations in sand, clay, and layered deposits, Reliability of settlementcalculations, Structural tolerances.Design of rectangular footings, combined footings and mat foundations.Deep foundations: Pile foundations under vertical and lateral loads, Negative skin friction of piles.

Learning Outcomes: The students will have a clear understanding of the following concepts: Bearing capacity: Bearing capacity of shallow foundation in layered soils, Footings on slopes, Foundation with uplift ortension forces.Settlements: Settlement Analysis of shallow foundations in sand, clay, and layered deposits, Reliability of settlementcalculations, Structural tolerances.Design of rectangular footings, combined footings and mat foundations.Deep foundations: Pile foundations under vertical and lateral loads, Negative skin friction of piles; Uplift capacity of pilesand anchors, Well foundations.Foundations on expansive soils; Introduction to soil dynamics and machine foundation.

Course Contents:

Unit 1: Bearing capacity: Bearing capacity of shallow foundation in layered soils, Footings on slopes, Foundation with uplift ortension forces.

Unit 2: Settlements: Settlement Analysis of shallow foundations in sand, clay, and layered deposits, Reliability of settlementcalculations, Structural tolerances.

Unit 3: Design of rectangular footings, combined footings and mat foundations.

Unit 4: Deep foundations: Pile foundations under vertical and lateral loads, Negative skin friction of piles; Uplift capacity of pilesand anchors, Well foundations.

Unit 5: Foundations on expansive soils; Introduction to soil dynamics and machine foundation.

Text Books

1) Foundation Analysis & Design By J.E. Bowels (McGraw Hill).
2) Principles of Foundation Engg. By B.M. Das (PWS Publishing
3) Pile Foundation- Analysis & Design Poulus& Davis.
4) Constructional methods in Foundation Engineering Koener.
5) Foundation design and construction by Tomlinson .M.J.
6) Raft foundation design and analysis with practical approach by Gupta .s.c.

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Composite Material And Structures
Course Code: SCE 204C
L-T Scheme: 4-0 Course Credits: 4

Introduction:

This course examinesFRP composites, Types, Mechanics, behavior, properties, application. Steel: Concrete composite structures, design philosophy, shear connectors, beams, girders and slabs, Concrete: Prestressed concrete composite structures.

Objectives:

In this course we will studyFRP composites, Types, Mechanics, behavior, properties, application. Steel: Concrete composite structures, design philosophy, shear connectors, beams, girders and slabs, Concrete: Prestressed concrete composite structures.

Learning Outcomes: The students will have a clear understanding of the following concepts like FRP composites, Types, Mechanics, behavior, properties, application.Steel: Concrete composite structures, design philosophy, shear connectors, beams, girders and slabs, Concrete: Prestressed concrete composite structures.

Course Contents:

Unit 1: FRP composites, Types, Mechanics, behavior, properties, application.

Unit 2: Steel: Concrete composite structures, design philosophy, shear connectors, beams, girders and slabs, Concrete: Prestressed concrete composite structures.

Text Books

1) Composite structure of steel and concrete (by Johnson).
2) Mechanics of composite material and structure by M. Mukhopadhay (university press).
3) An Introduction to Composite Material by D. Hull (Cambridge University Press).
4) Engineering Mechanics of Composite Material by Isaac M. Daniel &OriIshai (OUP).
5) Steel Concrete and Composite Design of Tall Building by BungateTaranath (McGraw Hill).

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Environmental Impact Assessment
Course Code: SCE 205A
L-T Scheme: 4-0 **Course Credits: 4**

Introduction:

This course examines Legal Aspects of EIA, Objectives of EIA, General Methodology of EIA, Base line Studies, Screening. PublicConsultation, Data Collection, Environmental Impact Analysis, Mitigation and Impact Management, Case Studies,Environmental Audit.

Objectives:

In this course we will study the Legal Aspects of EIA, Objectives of EIA, General Methodology of EIA, Base line Studies, Screening. PublicConsultation, Data Collection, Environmental Impact Analysis, Mitigation and Impact Management, Case Studies,Environmental Audit.

Learning Outcomes: The students will have a clear understanding of the following concepts: Legal Aspects of EIA, Objectives of EIA, General Methodology of EIA, Base line Studies, Screening, Scoping. PublicConsultation, Data Collection, Environmental Impact Analysis, Mitigation and Impact Management, Case Studies,Environmental Audit.

Course Contents:

Unit 1:Legal Aspects of EIA, Objectives of EIA, General Methodology of EIA, Base line Studies, Screening, Scoping.

Unit 2: PublicConsultation, Data Collection, Environmental Impact Analysis, Mitigation and Impact Management, Case Studies,Environmental Audit.

Text Books

1) Environmental Impact Assessment by Bartwal R. R. (New Age).
2) Introduction to Environmental Impact Assessment by John Glasson, RikiTherivel, Andrew Chadwick (Taylors &Francis).
3) Environmental Impact Assessment Practice & Participation by Fevin Stuart Hanna (OUP).
4) Methods of Environmental Impact Assessment by Peter Morris (Taylor & Francis).
5) Environmental Impact Assessment by Alan Gilpin (CUP).

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Advanced Concrete Technology
Course Code: SCE 205B
L-T Scheme: 4-0Course Credits: 4

Introduction:

This course examinesMicrostructural aspects of cement paste; Models of hydrated Portland cement gel; Mechanism, application and specificationof chemical admixtures, mineral admixtures and other cement replacement materials; Special cementitious systems, viz.,phosphate cement, magnesium oxy-chloride cement, regulated set cement, high alumina cement etc.

Objectives:

In this course we will study theMicrostructural aspects of cement paste; Models of hydrated Portland cement gel; Mechanism, application and specificationof chemical admixtures, mineral admixtures and other cement replacement materials; Special cementitious systems, viz.,phosphate cement, magnesium oxy-chloride cement, regulated set cement, high alumina cement etc. Concrete- environment interaction; Marine concrete; Resistance of concrete to Fire and influence of temperature; Extreme weather concreting.

Learning Outcomes: The students will have a clear understanding of the following concepts: Microstructural aspects of cement paste; Models of hydrated Portland cement gel; Mechanism, application and specificationof chemical admixtures, mineral admixtures and other cement replacement materials; Special cementitious systems, viz.,phosphate cement, magnesium oxy-chloride cement, regulated set cement, high alumina cement etc.Concrete- environment interaction; Marine concrete; Resistance of concrete to Fire and influence of temperature; Extreme weather concreting.Properties and mix proportioning of flyash concrete, silica fume concrete, fibre reinforced concrete, sprayed concrete, high performance concrete, self-compacting concrete and geo-polymer concrete.

Course Contents:

Unit 1: Microstructural aspects of cement paste; Models of hydrated Portland cement gel; Mechanism, application and specificationof chemical admixtures, mineral admixtures and other cement replacement materials; Special cementitious systems, viz.,phosphate cement, magnesium oxy-chloride cement, regulated set cement, high alumina cement etc.

Unit 2: Concrete- environment interaction; Marine concrete; Resistance of concrete to Fire and influence of temperature; Extreme weather concreting.

Unit 3: Properties and mix proportioning of flyash concrete, silica fume concrete, fibre reinforced concrete, sprayed concrete, high performance concrete, self-compacting concrete and geopolymer concrete.

Text Books

1) Design of Concrete Mixes by Krishna Raju.
2) Concrete Microstructure, Properties and Material by P.kumar Mehta &Paulo J. M. Monteiro.
3) Concrete Technology by M.S. Shetty (S. Chand).

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Construction Technology And Management
Course Code: SCE 205C
L-T Scheme: 4-0 **Course Credits: 4**

Introduction:

This course examines Different Construction techniques — equipments used — new technologies;Network scheduling CPM, PERT, Planning &Scheduling of activity Networks. Scheduling with limited resource, Resource Planning, Resource Allocation, Project Schedule Compression, ProjectScheduling, Estimation of Project Cost, Monitoring Project Progress, ProjectAppraisal & Selection, Recent Trends inProject Management.

Objectives:

In this course we will study theDifferent Construction techniques — equipments used — new technologies;Network scheduling CPM, PERT, Planning &Scheduling of activity Networks. Scheduling with limited resource, Resource Planning, Resource Allocation, Project Schedule Compression, ProjectScheduling, Estimation of Project Cost, Monitoring Project Progress, ProjectAppraisal & Selection, Recent Trends inProject Management.

Learning Outcomes: The students will have a clear understanding of the following concepts:Different Construction techniques — equipments used — new technologies;Network scheduling CPM, PERT, Planning &Scheduling of activity Networks.Scheduling with limited resource, Resource Planning, Resource Allocation, Project Schedule Compression, ProjectScheduling, Estimation of Project Cost, Monitoring Project Progress, ProjectAppraisal & Selection, Recent Trends inProject Management.

Course Contents:

Unit 1: Different Construction techniques — equipments used — new technologies;Network scheduling CPM, PERT, Planning &Scheduling of activity Networks.

Unit 2: Scheduling with limited resource, Resource Planning, Resource Allocation, Project Schedule Compression, ProjectScheduling, Estimation of Project Cost, Monitoring Project Progress, ProjectAppraisal & Selection, Recent Trends inProject Management.

Text Books

1) Construction and project management for Engineer—Krishnamurthy.
2) Urban Construction Project Management (McGraw-Hill Construction Series) by Richard Lambeck, JohnEschemuller.
3) Construction Management Fundamentals By: Kraig Knutson, Clifford J. Schexnayder, Christine M. Fiori, RichardMayo.
4) Construction Method and Management by Stephens W. Nunnally (Prentice Hall).

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Theory Of Elastic Stability And Behavior Of Metal Structures
Course Code: SCE 205D
L-T Scheme: 4-0Course Credits: 4

Introduction:

This course examinesFundamental principles and models for elastic stability, stability of column; classification of dynamicalsystems, linear and nonlinear eigen value problems. Stability of plates, frames, beams and arches Lateral buckling of beams, combined bending and axial force, combined bending and torsion. Buckling of thin elements Torsional buckling of thin walled structures and open sections Column-strength curves.

Objectives:

In this course we will study theFundamental principles and models for elastic stability, stability of column; classification of dynamicalsystems, linear and nonlinear eigen value problems. Stability of plates, frames, beams and arches Lateral buckling of beams, combined bending and axial force, combined bending and torsion. Buckling of thin elements Torsional buckling of thin walled structures and open sections Column-strength curves.

Learning Outcomes: The students will have a clear understanding of the following concepts: Introduction; Fundamental principles and models for elastic stability, stability of column; classification of dynamicalsystems, linear and nonlinear eigen value problems. Stability of plates, frames, beams and arches Lateral buckling of beams, combined bending and axial force, combined bending and torsion. Buckling of thin elements Torsional buckling of thin walled structures and open sections Column-strength curves. Buckling and post-buckling strength of plate elements with special references to the codal provisions. Behaviour of light gauge steel structures.

Course Contents:

Unit 1: Introduction; Fundamental principles and models for elastic stability, stability of column; classification of dynamicalsystems, linear and nonlinear eigen value problems.

Unit 2: Stability of plates, frames, beams and arches Lateral buckling of beams, combined bending and axial force, combined bending and torsion.

Unit 3: Buckling of thin elements Torsional buckling of thin walled structures and open sections Column-strength curves. Buckling and post-buckling strength of plate elements with special references to the codal provisions. Behaviour of light gauge steel structures.

Text Books

1) Fundamental of Structural Stability by Simitses.
2) Stability Analysis and Design of Structures, New Delhi by Gambhir M.L.
3) Stability of structure by Banzant.
4) Structural Stabilty of steel- Concepts and Applications for structural engineers- Galambos Theodore V.
5) Advanced Design in Structural Steel – Lothers – Prentice – Hall.

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Seminar
Course Code: SCE281
L-T-P scheme: 0-2-0 **Course Credit: 1**

The overall aim of the seminar series is to help develop an emerging field at the intersection of multi-disciplinary understandings of culture and education. It will build on the existing body of work on education and culture, but its aim is explore and develop new perspectives in this area.
The objectives of the six exploratory seminars are:

- **to explore new research from a range of academic disciplines which sheds light on the questions outlined above**
- **to showcase cutting edge research on education and culture from outstanding academic researchers from the UK and internationally**
- **to bring together seminar participants from different disciplines such as Sociology, Philosophy, Psychology, Human Geography, Media Studies as well as Education and Cultural Studies**
- **to encourage and financially support the participation of PhD students**
- **to actively involve practitioners and users from each venue**
- **to engage a core group of policy makers**
- **to use the seminars to develop links between academics and stakeholders in the arts, library, media, community and educational sectors**

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

Course Description

Title of Course: Structural Laboratory II
Course Code: SCE 292
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:
1. The students will be able to develop the concepts of Computer Aided Design Of Structures.
2. They will be exposed to latest CAD CAM software environment and will be able to develop efficiently the detailed design and drawings including the floor plans of different kinds of structures.
3. The students will be able to prepare the detailed drawings of different structural elements including the ductility detailing of RCC slab, beam, column and footing design.

Learning Outcomes: The students will be able to develop the understanding of CAD software and develop a clear understanding of the analysis and design of a multistoried buildings using softwares. The students will be able to prepare the detailed drawings of different structural elements including the ductility detailing of RCC slab, beam, column and footing design.

Course Contents:
Exercises that must be done in this course are listed below:

1. Introduction and important features ofa software dealing with analysis and design of structures.
2. Analysis and design of a multistoried building using software, Preparation of detailed drawings of different structural elements including ductility detailing RCC Slab, beam, column and footing design.

Text Book:
1. CAD CAM Standard Manual.