Course Registration Survey Link

Event Calendar

Air Pollution Control Engineering - Enviornmental Engineering

Air Pollution Control Engineering - Enviornmental Engineering

Register
Before Mar 18 2017

Air Pollution Control Engineering - Enviornmental Engineering

Start Date	**: 23/03/2017 14:00:00**
End Date	**: 16/04/2017 16:00:00**

Course Outline

Pre-requistes: Students belongs to Aerospace, Civil, Chemical, Environmental, Mechanical, Electrical and Computer Science and Engineering

The Schedule

Session	Topic	Instructor	Time
S1			
	Introduction to air pollution, sources of air pollution, scales of air pollution	SMSN	110 minutes
	problem, effects of air pollution, philosophy of air pollution control and		
	Indian standards and legislations for air quality management		
D1	**Discussions and Interactions S1**	SMSN	10 minutes
S2	Air Pollution Meteorology Concepts-atmospheric stability, dry and wet	SMSN	110 minutes
	adiabatic lapse rates; stability classification; plume shapes.		

	Air Pollution Monitoring : principles used in measurement of gaseous and		
	particulate pollutants, types of sampling and		
D2	**Discussions and Interactions S2**	SMSN	10 minutes
S3	Air Quality Modelling- physical principles; Types of air quality models and	SMSN	110 minutes
	their uses.		
	Control of Air Pollution: engineering control concepts, control devices and		
	their applications		
D3	**Discussions and Interactions S3**	SMSN	10 minutes
S4	Special Topics in Air Quality Management: (i) Air Pollution and Local	SMSN	60 minutes
	Climate Change (ii) low cost sensors in personal exposure monitoring		
DI4	**Preparatory session for assessment: tutorial problem discussion**	SMSN	60 minutes
A	**Assessment**	**Local Faculty**	180 minutes
		Member	

Important References

Arya, S.P., 1999. Air pollution meteorology and dispersion, Oxford University Press, UK.

Boubel, R.W., Fox, D.L., Turner, D.B. and Stern, A.C., 1994. *Fundamentals of air pollution*. 3rdEdition, Academic Press, New York. Lyons and Scott, 1990. *Principles of Air Pollution Meteorology,* CRC Press.

Peavy, H.S. Rowe, D.R. and Tchobanoglous, G., 1985. Environmental

Engineering. McGraw Hill International Editions, New York. Rao, C.S., 1995. Environmental Pollution Control Engineering. Wiley Eastern Limited, New Age International Limited, New Delhi. Theodore, L., 2008. Air Pollution Control Equipment Calculations. John Wiley & Sons Inc Publication, New Jersey.

Wark, K. and Warner, C.F., 1981. Air pollution: its origin and control.

Harper and Row Publishers Inc., New York, USA.

Session Schedule

Name	Start	End
Session 1	**23/03/2017 14:00:00**	**23/03/2017 16:00:00**
Session 2	**24/03/2017 14:00:00**	**24/03/2017 16:00:00**
Session 3	**27/03/2017 14:00:00**	**27/03/2017 16:00:00**

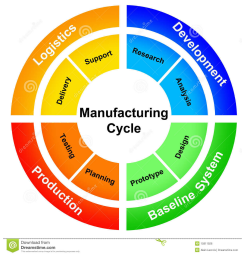
Quiz

Assignment

Delivered by

Prof. Shiv Nagendra IIT Madras

Basic Machine Tools and Metal Cutting Principles - Manufacturing Process



Basic Machine Tools and Metal Cutting Principles - Manufacturing Process

Register Before Feb 04 2017

Basic Machine Tools and Metal Cutting Principles - Manufacturing Process

Start Date	**: 09/02/2017 14:00:00**
End Date	**: 08/03/2017 16:00:00**

Course Outline

Dept: Mechanical
Course Name: Manufacturing Process
Topic Name: Basic Machine Tools and Metal Cutting Principles

Topic Outline:

• cutting tool geometry and chip formation mechanism
• cutting force and cutting temperature
• tool wear and tool life followed by discussion

Session Schedule

Name	Start	End
Session 1	09/02/2017 14:00:00	09/02/2017 16:00:00
Session 2	10/02/2017 14:00:00	10/02/2017 16:00:00
Session 3	16/02/2017 14:00:00	16/02/2017 16:00:00

Quiz

Assignment

Delivered by

Prof. Ajay Kumar Chattopadhyay IIT Kharagpur

Connections - Design of Steel Structures

Connections - Design of Steel Structures

Register Before Feb 24 2017

Connections - Design of Steel Structures

Start Date	: 01/03/2017 14:00:00
End Date	: 23/03/2017 16:00:00

Course Outline

Topic Name: Connections

Relevant Course: Design of Steel Structures

Relevant Department : Civil Engineering

Relevant Semester: 6thSemester

Pre-requisite: Not required

Course Description & Outline :

The Code of Practice for General Construction in Steel in India IS 800:2007 has been revised into Limit State Method. A thorough understanding of the new provisions and their background is required to use the Standard efficiently and effectively. Design of members in tension, compression, flexure and connections will be covered in this module on Basic Design of Steel Structures.

1. Limit State Method and Design of tension members
2. Column Buckling and Design of compression members
3. Local Buckling and section classification
4. Design of beams
5. Design of welded and bolted connections
6. Tutorial

Session Schedule

Name	Start	End
Session 1	01/03/2017 14:00:00	01/03/2017 16:00:00
Session 2	02/03/2017 14:00:00	02/03/2017 16:00:00
Session 3	03/03/2017 14:00:00	03/03/2017 16:00:00

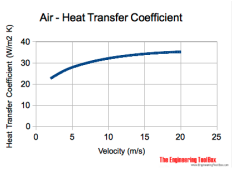
Quiz

Assignment

Delivered by

Prof. S R Satish Kumar IIT Madras

Convection Heat Transfer and Fluid Dynamics Fundamentals - Convection Heat Transfer



Convection Heat Transfer and Fluid Dynamics Fundamentals - Convection Heat Transfer

Register
Before Feb 03 2017

Convection Heat Transfer and Fluid Dynamics Fundamentals - Convection Heat Transfer

Start Date	**: 08/02/2017 10:00:00**
End Date	**: 02/03/2017 12:00:00**

Course Outline

Department: Mechanical

Course title: Convection Heat Transfer

Topic Name: Module – I. Convection heat transfer and fluid dynamics fundamentals.

-1 Introduction to convection heat transfer.

- Energy transport in a fluid. Importance of fluid motion (fluid mechanics
- isothermal fluid mechanics) to heat transfer.
- The domain that participates in heat transfer – external vs. internaldomain.
- Fluid flow in the context of convection heat transfer.
- The domain that participates in heat transfer – external (unbounded)

1. internal (bounded) domain.

- Externally induced flow – forced convection.
- Heat transfer induced flow – natural convection.
- Heat transfer with simultaneous externally induced flow and heattransfer induced flow – mixed convection.
- Fluid flow types (externally- or heat transfer-induced flows): Laminar,turbulent, transition, mixed, periodic.
- Basic differences between laminar and turbulent flows (isothermal or with heat transfer); Fourier's law applied to a fluid in motion.
- Flow in the vicinity of a surface vs absence of surfaces. Influence of asolid surface (stationary of moving) of fluid motion. Free shear flows(wakes and jets) and boundary layers (surface flows).

-2 Conservation equations.

- Concept of no-slip and its corresponding aspect to heat transfer at asurface.
- The (hydrodynamic) boundary layer concept for isothermal flow (i.e. no heat transfer). Its importance to fluid dynamics.
- Local vs global – wall shear stress and skin friction coefficient. Relation to normal velocity gradient.
- Non-isothermal boundary layer – surface temperature greater or less than fluid temperature. The thermal boundary layer and its importance to Newton's law of cooling. Concept of heat transfer coefficient.
- Local heat transfer coefficient definition. Relation to temperature gradients at the surface – in the fluid and in the surface.
- Nusselt number and its significance.
- Stanton number and its significance.
- Continuity (mass conservation) - in differential and integral forms.
- Displacement thickness – its physical significance.
- Conservation of momentum (2nd law of motion) – in differential and integral forms. Momentum thickness – its physical significance.
- Conservation of energy (1st law of thermodynamics to an open system) in differential and integral forms. Energy thickness – its physical significance.

-3 Boundary layers – Fluid flow and heat transfer at a surface.

- Derivation from basics and final form of the equations for 2-dimnesional flows. Details of the mathematics will be available in the notes and will not be derived in the lecture, however, major steps and approximations/assumptions will be discussed.
- Non-dimensional form of the conservation equations.
- Reynolds number, Prandtl number and their physical significance.
- Effects of heat transfer with surface on (isothermal) boundary layer – temperature dependent properties.
- The "simplest" boundary layer: Flat plate boundary layer and boundary layer approximations. "Smooth (hydrodynamically)" surface.
- Boundary conditions for heat transfer (idealizations): Iso-thermal or Isoheat flux surface for practical situations.
- Study of practical situations with flat plate boundary layer approximations and its limitations.

-4 Forced convection at a flat plate.

- Case-I: Laminar freestream & smooth edge for and surface conditions.
- Correlations for local and average skin friction coefficient, heat transfer coefficient and Nusselt number; their limitations. Selection of property values.
- Case-II: Laminar freestream & rough edge for and surface conditions).
- Case-III: Turbulent freestream & smooth/rough edge for and surface conditions.
- Correlations for local and average skin friction coefficient, heat transfer coefficient and Nusselt number; their limitations. Selection of property values.
- Development of hydrodynamic and thermal boundary layers for three Prandtl number ranges

-**5 Forced convection over a cylinder / sphere.**

- Flow over a cylinder – coaxial flow
- Flow over a cylinder – cross flow
- Development of hydrodynamic and thermal boundary layers for three
- Prandtl number ranges (Pr << 1, Pr ï€ 1, Pr >> 1). Separation, wake.
- Correlations for local and average skin friction coefficient, heat transfer coefficient and Nusselt number; their limitations. Selection of property values.
- Flow over a sphere
- Correlations for local and average skin friction coefficient, heat transfer coefficient and Nusselt number; their limitations. Selection of property values.

-6 Forced convection in a tube/duct

- Circular tube
- Development of hydrodynamic and thermal boundary layers.
- Effect of Prandtl number (Pr << 1, Pr ï€ 1, Pr >> 1).
- Entrance region – hydrodynamic and thermal. Fully developed flow: velocity and temperature profiles. Practical geometries of entrance region, e.g. heat exchanger.
- Correlations for hydrodynamic and thermal entry lengths; and local and average skin friction coefficient, heat transfer coefficient and Nusselt number for and wall conditions; their

limitations. Selection of property values.
- Heat transfer in non-circular ducts.

Session Schedule

Name	Start	End
Session 1	08/02/2017 10:00:00	08/02/2017 12:00:00
Session 2	09/02/2017 10:00:00	09/02/2017 12:00:00
Session 3	10/02/2017 10:00:00	10/02/2017 12:00:00

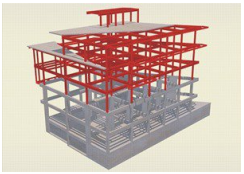
Quiz

Assignment

Delivered by

Prof.S.R. Kale IIT Delhi

Design of Reinforced Concrete Beams - Design of concrete structures



Design of Reinforced Concrete Beams - Design of concrete structures

Register Before Mar 02 2017

Design of Reinforced Concrete Beams - Design of concrete structures

:

Start Date	**07/03/2017 10:00:00**
End Date	**: 29/03/2017 12:00:00**

Course Outline

Topic Name: Design of reinforced concrete beams

Relevant Course Name: Design of RC Structures

Relevant Department: Civil Engineering, Architecture

Relevant Semester: 5th

Pre- requisites: Analysis of Structures

Topic Description and Outline:

The purpose of this course is to establish a basic understanding of design of reinforced concrete structures through Limit State Method. As many structural components (slab, staircase, retaining wall, footing, pile cap etc.) may be idealized as beam, the main emphasis in this course will be given on analysis and design of reinforced concrete beams. The following topics will be covered.

Lecture 1:

Concept of Limit State Method

Characteristic load and characteristic strength

Partial safety factors

Stress strain behaviour steel and concrete

Failure of concrete beam

Balanced, under-reinforced and over-reinforced section

Singly reinforced section and doubly reinforced section

Examples

Lecture 2:

Analysis and design of singly reinforced beam

Introduction to IS codes

Examples

Lecture 3:

Analysis and design of doubly reinforced beam

Examples

Extension of beam design philosophy to other structural components (illustration)

Session Schedule

Name	Start	End
Session	**07/03/2017**	**07/03/2017**

1	10:00:00	12:00:00
Session 2	08/03/2017 10:00:00	08/03/2017 12:00:00
Session 3	09/03/2017 10:00:00	09/03/2017 12:00:00

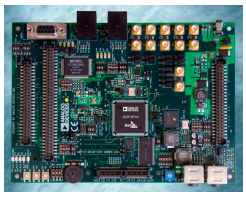
Quiz

Assignment

Delivered by

Prof. Amit Shaw IIT Kharagpur

Differential Amplifiers - Analog Electronic Circuits



Differential Amplifiers - Analog Electronic Circuits

Register Before Feb 24 2017

Differential Amplifiers - Analog Electronic Circuits

Start Date	**: 01/03/2017 10:00:00**
End Date	**: 26/03/2017 12:00:00**

Course Outline

Topic Name: Differential Amplifiers

Relevant Course Name: Analog Electronic Circuits

Relevant Department: Electrical Engineering, Electronics Engineering, Instrumentation Engineering

Relevant Semester: B.Tech third and fourth year

Pre- requisites: Network/Circuit analysis, Control theory

Topic Description and Outline:

Lecture: 1 **[2 hours]**

- Understanding of single ended, pseudo differential, differential and fully differential amplifier
- Differential operation requirement, process, voltage and temperature (PVT) understanding
- Amplifier design check list in industry
- Single ended differential operation, basic differential pair (qualitative and quantitative analysis)

Lecture: 2 **[2 hours]**

- Common mode and small signal gain for differential pair with various loads such as resistive, diode and current
- Miller theorem

Lecture: 3 **[2 hours]**

- Frequency response analysis: poles, zeros and bandwidth calculation (3-dB and unity gain bandwidth)

Session Schedule

Name	Start	End
Session 1	01/03/2017 10:00:00	01/03/2017 12:00:00
Session 2	03/03/2017 10:00:00	03/03/2017 12:00:00
Session 3	06/03/2017 10:00:00	06/03/2017 12:00:00

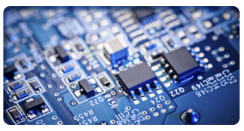
Quiz

Assignment

Delivered by

Prof. Hitesh Shrimali IIT Mandi

Digital System Design - Digital Electronics



Digital System Design - Digital Electronics

Register
Before Feb 01 2017

Digital System Design - Digital Electronics

Start Date	**: 06/02/2017 10:00:00**
End Date	**: 09/03/2017 12:00:00**

Course Outline

Relevant Course: Digital Electronics

Topic Name: Digital System Design

Relevant Department: Electrical and Computer Science

Relevant Semester: 3rd Semester students onwards

Pre- requisites: Nil

Course Outline :

SEQUENTIAL CIRCUITS

Flip-flops: SR, D, T, JK. Meta stability of flip-flops, **Registers**: shift registers, **Counters**: synchronous and asynchronous, Binary counter, Modulo Up and down counter, **Synchronous Counter design** using flip-flops, VHDL models for flip-flops, **Memory devices**: ROM

FINITE STATE MACHINES

Mealy and Moore machines: sequence detector, Mealy and Moore machine comparison, **Sequential network design**: state table, state graph. **State table reduction** using row reduction, using implication tables. State assignment rules, Equivalent state machines.

ASM (ALGORITHMIC STATE MACHINE) CHARTS

State machine design using SM charts, ASM realization using traditional method, MUX based design, one hot method, ROM based method.

Design Examples: Traffic light controller, Dice game. Basics of asynchronous sequential networks

Session Schedule

Name	Start	End
Session 1	06/02/2017 10:00:00	06/02/2017 12:00:00
Session 2	13/02/2017 10:00:00	13/02/2017 12:00:00
Session 3	17/02/2017 10:00:00	17/02/2017 12:00:00

Quiz

Assignment

Delivered by

Prof. Venkatesh TG IIT Madras

Durability of Concrete - Concrete Technology

Durability of Concrete - Concrete Technology

Register
Before Feb 22 2017

Durability of Concrete - Concrete Technology

Start Date : **27/02/2017 14:00:00**

End Date : **30/03/2017 16:00:00**

Course Outline

Relevant Course: Concrete Technology

Topic Name: Durability of Concrete Structures

Relevant Department: Civil

Relevant Semester: 5th to 8thSemester students

Pre- requisites: One course on Construction Materials

Topic Description and Outline:

Module 1: Corrosion of steel in concrete structures (Basics of corrosion, chloride-induced corrosion, carbonation-induced corrosion, measurement techniques, prevention of corrosion)

Module 2: Deterioration concrete materials and systems (Permeability, sulphate attach, alksli-silica reaction, chemical/acid attack,

Module 3: Testing of durability of concrete (Compressive strength test, Oxygen permeability test, Water sorptivity test, Water permeability test, Chloride diffusion test, RCPT, Carbonation test, etc.)

Session Schedule

Name	Start	End
Session 1	27/02/2017 14:00:00	27/02/2017 16:00:00
Session 2	06/03/2017 14:00:00	06/03/2017 16:00:00
Session 3	10/03/2017 14:00:00	10/03/2017 16:00:00

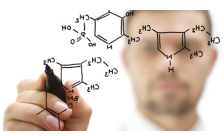
Quiz

Assignment

Delivered by

Prof. Radhakrishna G Pillai IIT Madras

Electrochemistry and its Applications - Engineering Chemistry



Electrochemistry and its Applications - Engineering Chemistry

Register
Before Mar 15 2017

Electrochemistry and its Applications - Engineering Chemistry

Start Date	**: 20/03/2017 10:00:00**
End Date	**: 11/04/2017 16:00:00**

Course Outline

Relevant Course Name: Engineering Chemistry

Relevant Department: Common

Relevant Semester: First years

Pre- requisites: +2 level electrochemistry

Topic Description and Outline:

Syllabus for Electrochemistry Module

- Introduction:
    1. Current potential relationship
    2. Standard hydrogen electrode
    3. Thermodynamics of electrochemical cells
    4. Application of EMF measurements (pH determination (glass electrode), Activity coefficients, Equilibrium constants, Solubility products and Potentiometric titrations)
- Energy Conversion and Storage
    1. Basics of battery chemistry – illustrated with rechargeable Li ion battery
    2. Theoretical limit of energy per unit weight
    3. Quality of a battery
    4. The nickel-metal hydride battery chemistry
    5. Polymer electrolyte membrane fuel cells – principle
    6. Schematic representation of the current-potential relationship in a fuel cell
    7. Oxygen reduction reaction
- Corrosion
    1. Scope and economics of corrosion
    2. The fundamental electrochemistry of corrosion
    3. Potential-pH diagrams
    4. Passivation and its breakdown
    5. Corrosion protection (Bimettalic (galvanic)corrosion, cathodic protection, anodic protection, coatings and inhibitaors)

Session Schedule

Name	Start	End
Session 1	**20/03/2017 10:00:00**	**20/03/2017 12:00:00**

Session 2	**21/03/2017 14:00:00**	**21/03/2017 16:00:00**
Session 3	**22/03/2017 14:00:00**	**22/03/2017 16:00:00**

Quiz

Assignment

Delivered by

Prof. Kothandaraman R IIT Madras

Frequency Domain Representation of Continuous Time Signals - Signal and Systems

Frequency Domain Representation of Continuous Time Signals - Signal and Systems

Register Before Feb 11 2017

Frequency Domain Representation of Continuous Time Signals - Signal and Systems

Start Date	**: 16/02/2017 10:00:00**
End Date	**: 12/03/2017 12:00:00**

Course Outline

asff

Session Schedule

Name	Start	End
Session 1	16/02/2017 10:00:00	16/02/2017 12:00:00
Session 2	17/02/2017 14:00:00	17/02/2017 16:00:00
Session 3	20/02/2017 10:00:00	20/02/2017 12:00:00

Quiz

Assignment

Delivered by

Prof. Arun Pachai Kannu IIT Madras

Fundamentals of Laplace Transform - Engineering Mathematics

Fundamentals of Laplace Transform - Engineering Mathematics

Register Before Jan 20 2017

Fundamentals of Laplace Transform - Engineering Mathematics

Start Date	**: 25/01/2017 14:00:00**
End Date	**: 20/02/2017 12:00:00**

Course Outline

Relevant Topic: Laplace Transforms

Relevant Course: Engineering Mathematics

Relevant Department: Engineering Mathematics

Relevant Semester:

Pre- requisite: Ordinary Differential Equations, Calculus

Course Description and Outline: Laplace transforms play an important role in the solution of differential equations. In this course we shall introduce the basic concepts in the theory.

1) The class of functions of exponential type.

2) Examples of Laplace transforms.

3) Properties related to differentiation and multiplication.

4) Shifting theorems

5) Laplace transforms of periodic functions and some applications.

6) solutions of IVP for ordinary differential equations

7) Integro-differential equations

8) Partial differential equations.

Session Schedule

Name	Start	End
Session 1	25/01/2017 14:00:00	25/01/2017 16:00:00
Session 2	30/01/2017 10:00:00	30/01/2017 12:00:00
Session 3	31/01/2017 10:00:00	31/01/2017 12:00:00

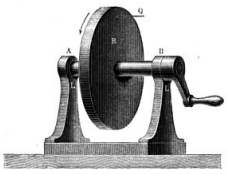
Quiz

Assignment

Delivered by

Prof. Gopal Srinivasan IIT Bombay

Gears and Gear Trains - Kinematics of Machines



Gears and Gear Trains - Kinematics of Machines

Register
Before Jan 19 2017

Gears and Gear Trains - Kinematics of Machines

Start Date	**: 24/01/2017 14:00:00**
End Date	**: 16/02/2017 16:00:00**

Course Outline

Relevant Course: Kinematics of Machines

Topic Name: Gears and Gear Trains

Relevant Department: Mechanical Engineering

Relevant Semester: 3rd / 4th / 5th semester

Pre- requisites: Engineering Mechanics

Topic Description and Outline:

Nomenclature for spur gears, Fundamental law of gearing, Conjugate action for Involute tooth profile, Contact Ratio, Interference and Undercutting, Minimum number of teeth to avoid interference, Simple & Compound Gear train, Planetary Gear train.

Session Schedule

Name	Start	End
Session 1	**24/01/2017 14:00:00**	**24/01/2017 16:00:00**
Session 2	**25/01/2017 14:00:00**	**25/01/2017 16:00:00**
Session 3	**27/01/2017 14:00:00**	**27/01/2017 16:00:00**

Quiz

Assignment

Delivered by

Prof. Abhijit Sarkar IIT Madras

Gradient Divergence and Curl - Engineering Physics

Gradient Divergence and Curl - Engineering Physics

Register Before Jan 27 2017

Gradient Divergence and Curl - Engineering Physics

Start Date	**: 01/02/2017 14:00:00**
End Date	**: 23/02/2017 16:00:00**

Course Outline

Topic Name: Gradient, Divergence and Curl

Relevant Course Name: Engineering Physics

Relevant Department: PHYSICS

Relevant Semester: First and Second Semester of B.E./B.Tech., Third and Fourth semesters of B.Sc.

Pre- requisites: Working knowledge and familiarity with elementary calculus and vector analysis; it is desirable to have exposure to partial derivatives and Cartesian and polar coordinate systems.

Topic Description and Outline:

The mathematical concepts of gradient, divergence and curl form the basics of vector calculus and have relevance to several scientific and engineering applications, as they are useful in describing physical phenomena and processes in a concise manner. They provide a convenient toolbox and formalism to understand and analyze different aspects of dynamics including fluid dynamics and transport phenomena such as particle diffusion, flow of electricity, heat and viscosity. While taught

as a part of a mathematics course, students generally find it difficult to grasp the physical meaning of these topics and are often unable to connect properly with the relevance of these concepts to engineering applications. These lectures address this issue precisely, by providing mathematical definitions, physical examples and training to work out problems related to physics and engineering.

Session Schedule

Name	Start	End
Session 1	01/02/2017 14:00:00	01/02/2017 16:00:00
Session 2	02/02/2017 14:00:00	02/02/2017 16:00:00
Session 3	03/02/2017 14:00:00	03/02/2017 16:00:00

Quiz

Assignment

Delivered by

Prof. Vijayan C IIT Madras

Highway Geometric Design - Transportation Engineering

Highway Geometric Design - Transportation Engineering

Register Before Feb 15 2017

Highway Geometric Design - Transportation Engineering

Start Date	**: 20/02/2017 10:00:00**
End Date	**: 15/03/2017 12:00:00**

Course Outline

Topic name: Highway Geometric Design

Relevant semester: 5th/6th/7th

Relevant department: Civil Engineering

Relevant course: Transportation Engineering

Pre-requisite: None

Course Content:

Highway development in India*:* Road development in 20th Century, Road development in 21st Century, CRRI, NHAI, IRC.

Functional classification of roads as per IRC*:* Methods of classification, rural road Classification, Urban road classification.

Highway Project: Highway planning, Feasibility study, Design requirements, Influencing factors, Special considerations, Engineering surveys, Drawings and Report,

Types of highway project

Design of Sight Distances:

Stopping sight distance (SSD): Influencing factors, Braking distance on level surface, Braking distance on slopes

Overtaking sight distance (OSD): Influencing factors, Overtaking process, Assumptions made in the analysis, Effects of gradient on OSD, Overtaking zones.

Design of Horizontal Alignment & Vertical Alignment: Design controls and criteria, Cross Sectional elements, Horizontal radius, Lateral friction, Superlevation, Extra widening, Horizontal transition curve, Set-back distance, longitudinal gradient, Summit curve, Valley curve, Combination of horizontal and vertical alignment features.

Session Schedule

Name	Start	End
Session 1	**20/02/2017 10:00:00**	**20/02/2017 12:00:00**
Session 2	**21/02/2017 10:00:00**	**21/02/2017 12:00:00**
Session 3	**23/02/2017 10:00:00**	**23/02/2017 12:00:00**

Quiz

Assignment

Delivered by

Prof. Avijit Maji IIT Bombay

Industry Bridge by CII

Industry Bridge by CII

Register
Before Aug 03 2016

Industry Bridge by CII

Start Date	**: 08/08/2016 14:00:00**
End Date	**: 24/10/2016 12:00:00**

Course Outline

Session Schedule

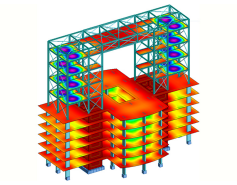
Name	Start	End
Entrepreneurship	**08/08/2016 14:00:00**	**08/08/2016 16:00:00**
Session 2	**04/10/2016 10:00:00**	**04/10/2016 12:00:00**

Quiz

Assignment

Delivered by

IITM CII IIT Madras **Influence Line Diagram - Structural Analysis**



Influence Line Diagram - Structural Analysis

Register
Before Feb 01 2017

Influence Line Diagram - Structural Analysis

Start Date	**: 06/02/2017 10:00:00**
End Date	**: 28/02/2017 12:00:00**

Course Outline

Topic name: Influence Line Diagram

Relevant name: Civil

Course Outline:

Concept, Importance and Methodology of Construction of Influence Line, Simple Examples involving Statically Determinate Beams and Trusses for Reaction, Bending Moment, Shear, Muller-Breslau Principle- application to statically determinate and indeterminate structures, System of Wheel Loads, Maximum Bending and Shear, System of Wheel loads continued for complicated problems, Muller-Breslau Principle for Statically Indeterminate Structures, Closure with discussion of applications to complicated problems

Session Schedule

Name	Start	End
Session 1	06/02/2017 10:00:00	06/02/2017 12:00:00
Session 2	07/02/2017 10:00:00	07/02/2017 12:00:00
Session 3	08/02/2017 10:00:00	08/02/2017 12:00:00

Quiz

Assignment

Delivered by

Sushanta Chakraborty IIT Madras

Introduction to DSP Labs

Dsp Digital Signal Processing Lab

Introduction to DSP Labs

Introduction to DSP Labs

Start Date	:
End Date	:

Course Outline

Session Schedule

Quiz

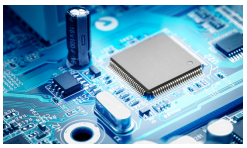
Name	Start	End
Quiz 1	08/08/2016 08:00:00	-
Quiz 2	08/08/2016 08:00:00	-
Quiz 3	01/09/2016 17:00:00	-
Quiz 4	08/09/2016 14:00:00	-
Quiz 5	27/09/2016 17:19:00	-
Quiz 6	13/10/2016 17:00:00	-
Quiz 7	19/08/2016 10:50:00	-

Assignment

Name	Start	End
Assignment 1	08/08/2016 08:00:00	-
Assignment 2	08/08/2016 08:00:00	-
Assignment 3	01/09/2016 17:00:00	-
Assignment 4	08/09/2016 14:00:00	-
Assignment 5	27/09/2016 17:00:00	-
Assignment 6	13/10/2016 17:00:00	-

Delivered by

Prof. Ashok Jhunjhunwala	IIT Madras	Inverters - Power Electronics



Inverters - Power Electronics

Register
Before Feb 16 2017

Inverters - Power Electronics

Start Date	**: 21/02/2017 14:00:00**
End Date	**: 15/03/2017 16:00:00**

Course Outline

afrfsg

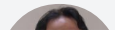
Session Schedule

Name	Start	End
Session 1	**21/02/2017 14:00:00**	**21/02/2017 16:00:00**
Session 2	**22/02/2017 14:00:00**	**22/02/2017 16:00:00**
Session 3	**23/02/2017 14:00:00**	**23/02/2017 16:00:00**

Quiz

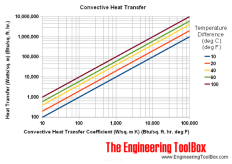
Assignment

Delivered by



Prof. Amit Kumar Jain IIT Delhi

Natural Convection, Boiling and Condensation - Convection Heat Transfer



Natural Convection, Boiling and Condensation - Convection Heat Transfer

Register Before Feb 08 2017

Natural Convection, Boiling and Condensation - Convection Heat Transfer

Start Date	**: 13/02/2017 10:00:00**
End Date	**: 07/03/2017 12:00:00**

Course Outline

Department: Mechanical

Course title: Convection Heat Transfer Module – II. Natural convection, Boiling and Condensation.

-7 Conservation equations – Natural convection.

- Natural convection vs Free convection. Examples of applications.
- Natural convection examples; Free convection phenomena and examples.
- Continuity (mass conservation) - in differential form.
- Conservation of momentum (2nd law of motion) – in differential form.
- Coupling of temperature and velocity fields.
- Conservation of energy (1st law of thermodynamics to an open system) in differential form.
- Non-dimensional form of conservation equations.
- Grashof number. Rayleigh number – their physical significance.

-8 Free convection on a flat plate, cylinder, in an enclosure.

- Vertical smooth plate in still unbounded fluid (free convection)
- Development of hydrodynamic and thermal boundary layers.
- Conservation equations. Effect of Prandtl number (Pr << 1, Pr ï€ 1, Pr >> 1).
- Correlations for local and average skin friction coefficient, heat transfer coefficient and Nusselt number; their limitations. Selection of property values.
- Examples of applications and problem solving.
- Horizontal and inclined smooth plate in still unbounded fluid (free convection)
- Development of hydrodynamic and thermal boundary layers.
- Correlations for local and average skin friction coefficient, heat transfer coefficient and Nusselt number; their limitations. Selection of property values.
- Natural convection in enclosures

- Large parallel plates, concentric cylinders.
- Nature of flow and circulation. Correlations.

-9 Boiling - Pool.

- Configurations: Pool boiling, droplet impingement boiling, boiling inside tubes with examples (boilers, nuclear reactors, solar energy, refrigeration, component cooling, manufacturing, etc.)
- Pool boiling (natural convection/forced?)
- Pool boiling phenomena and regimes; Nucleation sites. Non-uniform nucleation and “hot spots”; burnout.
- Conservation equations – complex two-phases; randomness.Correlations for average Nusselt number for different regimes, and their limitations.
- Examples of applications and problem solving.

-10 Boiling inside tubes.

- Boiling phenomena and regimes.
- Conservation equations – complex two-phases; randomness.
- Correlations for average Nusselt number in different regimes and their limitations.

-11 Condensation - External.

- Configurations: On a flat vertical plate, tube exterior, tube interior, spray condensation, bulk condensation, homogeneous condensation (precipitation). Applications: condensers feedwater heaters power plants, refrigeration, etc.).
- Film condensation on a flat plate
- Conservation equations; Non-dimensional numbers; Correlations; Limitations
- Drop-wise condensation on a flat plate
- Phenomena; Modelling; Correlations; Limitations.

-12 Condensation inside tubes.

- Regimes of condensation.
- Correlations
- Effect of tube surface characteristics.
- Applications

Numerical modelling and simulation.

- Importance of geometrical modelling, conservation equations, boundary conditions, initial conditions on model definition. Domain selection.
- Two-phase flow aspects related to boiling and condensation and complexity of equations, randomness of phenomena, and impact on mathematical formulation.

Session Schedule

Name	Start	End
Session 1	**13/02/2017 10:00:00**	**13/02/2017 12:00:00**
Session 2	**14/02/2017 10:00:00**	**14/02/2017 12:00:00**
Session 3	**15/02/2017 10:00:00**	**15/02/2017 12:00:00**

Quiz

Assignment

Delivered by

Prof.S.R. Kale IIT Delhi

Open Channel Flow - Hydraulics and Hydraulic Machinery

Open Channel Flow - Hydraulics and Hydraulic Machinery

Register Before Mar 02 2017

Open Channel Flow - Hydraulics and Hydraulic Machinery

Start Date	**: 07/03/2017 14:00:00**
End Date	**: 29/03/2017 16:00:00**

Course Outline

Relevant Dept: Civil

Course Name: Hydraulics & Hydraulic Machinery

Topic Name: Open Channel Flow

Relevant semester: 3rd and 4th

Relevant Department : Civil Engineering

Pre requisites: Nil

Topic outline

Characteristics of OCF and Channel properties, uniform flow and most economical open channel cross section, Uniform Flow vs. Gradually varied flow, OCF surface profiles, Specific energy and alternate depths ,Hydraulic jump in OCF, Module level problems

Session Schedule

Name	Start	End
Session 1	07/03/2017 14:00:00	07/03/2017 16:00:00
Session 2	08/03/2017 14:00:00	08/03/2017 16:00:00
Session 3	09/03/2017 14:00:00	09/03/2017 16:00:00

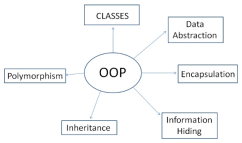
Quiz

Assignment

Delivered by

Prof. Anirban Dhar IIT Kharagpur

Operator Overloading - Object Oriented Programming



Operator Overloading - Object Oriented Programming

Register Before Feb 03 2017

Operator Overloading - Object Oriented Programming

Start Date	**: 08/02/2017 14:00:00**
End	**:**

Date **02/03/2017 16:00:00**

Course Outline

Relevant Course: Object Oriented Programming

Topic Name: Operator Overloading

Relevant Department: Computer Science

Relevant Semester: Fourth to Eighth

Pre- requisites: Programming Experience (C / C++ / Java / Python)

Topic Description and Outline: Overloading operators, rules for overloading operators, overloading of various operators, Overloading the >> and << Operators,Overloading the new and the delete Operators, Overloading the Array Subscript Operator, Overloading the Pointer-to-member(->) Operator (Smart Pointer)

Session Schedule

Name	Start	End
Session 1	08/02/2017 14:00:00	08/02/2017 16:00:00
Session 2	09/02/2017 14:00:00	09/02/2017 16:00:00
Session 3	10/02/2017 14:00:00	10/02/2017 16:00:00

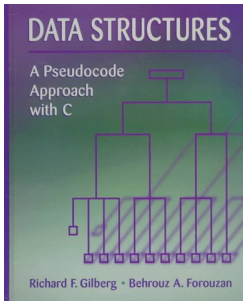
Quiz

Assignment

Delivered by

Prof. Rupesh Nasre IIT Madras

Pointers - Programming in C and Data Structures



Pointers - Programming in C and Data Structures

Register
Before Mar 12 2017

Pointers - Programming in C and Data Structures

Start Date	**: 17/03/2017 14:00:00**
End Date	**: 20/04/2017 16:00:00**

Course Outline

Relevant Course: Programming in C and Data Structures

Topic Name: Pointers

Relevant Department: Computer Science

Relevant Semester:

Pre- requisites: Basic programming skills in C; basics of algorithms

Topic Description and Outline:

- Introduction to pointers as a data type; declaration and use; pointer arithmetic; expression evaluation involving pointers, chain of pointers, structure and pointers.
- Pointers and multi-dimensional arrays; Function definition and call using pointers; static and dynamic memory allocation; introduction to heap memory; use of malloc() and free() for dynamic memory;
- Introducion of a singly list data structure; Basic operations on a singly linked list: traversal(), length(), insertion(), deletion(), merge(); search(); sort(); etc.; intuitive algorithm and worst case time complexity of each operation.
- Implementation of linked lists using struct and pointers; Common runtime errors with use of pointers and their redressal. Use of debuggers to detect pointer related run-time errors. Problem solving using singly linked lists.

Session Schedule

Name	Start	End
Session 1	17/03/2017 14:00:00	17/03/2017 16:00:00
Session 2	24/03/2017 14:00:00	24/03/2017 16:00:00
Session 3	31/03/2017 14:00:00	31/03/2017 16:00:00

Quiz

Assignment

Delivered by

Prof. Supratim Biswas IIT Bombay

Public Key Cryptography - Information Security and Cryptography

Public Key Cryptography - Information Security and Cryptography

Register Before Mar 11 2017

Public Key Cryptography - Information Security and Cryptography

Start Date	**: 16/03/2017 14:00:00**
End Date	**: 11/04/2017 16:00:00**

Course Outline

Relevant Department: Computer Science

Course Name: Information Security and Cryptography

Topic Name: Public Key Cryptography

Topic Outline

Day 1 : RSA, and primality checking algorithms

Day 2 : Attacks on RSA

Day 3 : Digital signatures, side channel analysis, and ECC

Session Schedule

Name	Start	End
Session 1	16/03/2017 14:00:00	16/03/2017 16:00:00
Session 2	20/03/2017 14:00:00	20/03/2017 16:00:00
Session 3	22/03/2017 14:00:00	22/03/2017 16:00:00

Quiz

Assignment

Delivered by

Prof. Chester Rebeiro IIT Madras

Routing Algorithms - Computer Network

Routing Algorithms - Computer Network

Register Before Feb 11 2017

Routing Algorithms - Computer Network

Start Date	**: 16/02/2017 10:00:00**
End Date	**: 13/03/2017 12:00:00**

Course Outline

Course Name: Computer Network

Topic Name: Routing Algorithms

Relevant Dept: CSC

TOPIC OUTLINE:

Routing protocols - both wired and wireless - latest developments

1. Standard Stuff- IP Addresses
2. Practical Deployment (Sockets)
3. Issues related to mobile /wireless system and its latest developments
4. Algorithms and congestion control its interactions with algorithm.
5. Sockets
6. End to end idea how a packet traverse

Session Schedule

Name	Start	End
Session 1	**16/02/2017 10:00:00**	**16/02/2017 12:00:00**
Session 2	**17/02/2017 10:00:00**	**17/02/2017 12:00:00**
Session 3	**21/02/2017 10:00:00**	**21/02/2017 12:00:00**

Quiz

Assignment

Delivered by

Prof.Niloy Ganguly IIT Kharagpur

Software Process and Management - Software Engineering

Software Process and Management - Software Engineering

Register Before Jan 19 2017

Software Process and Management - Software Engineering

Start Date	**: 24/01/2017 10:00:00**
End Date	**: 16/02/2017 12:00:00**

Course Outline

Topic name: Software Process and Management

Relevant semester: For different universities, the relevant semesters can be between 3rd to 8th.

Relevant department: CSE, IT, and MCA

Relevant course: Software Project Management and Software Engineering

Pre requisites: Experience (or familiarity) with program development.

Course outline:

Three main topics would be discussed:

Software Process models, software cost estimations, and task scheduling.

The different agile models such as Scrum, XP, and Lean would be discussed, starting with the traditional heavyweight models.

Subsequently, size, effort, and cost estimations would be discussed. Finally, work breakdown using WBS and task scheduling using

GANTT and PERT charts would be discussed. Relevant open source tools would also be mentioned.

Session Schedule

Name	Start	End
Session 1	24/01/2017 10:00:00	24/01/2017 12:00:00
Session 2	25/01/2017 10:00:00	25/01/2017 12:00:00
Session 3	27/01/2017 10:00:00	27/01/2017 12:00:00

Quiz

Assignment

Delivered by

Prof.Rajib Mall IIT Kharagpur

Solar DC

Solar DC

Solar DC

Start Date :

End Date :

Course Outline

Session Schedule

Quiz

Name	Start	End
Quiz II	11/01/2016 11:56:00	11/02/2016 11:41:00
Quiz I	26/09/2015 11:47:39	-
Qiuz IV	26/09/2015 12:01:08	-
Quiz III	28/09/2015 10:24:54	-
Quiz V	28/09/2015 11:03:50	-

Assignment

Name	Start	End
Assignment	01/10/2015 15:00:00	-

Delivered by

Prof. Ashok Jhunjhunwala IIT Madras

Spectroscopy and Applications - Engineering Chemistry

Spectroscopy and Applications - Engineering Chemistry

Register
Before Feb 08 2017

Spectroscopy and Applications - Engineering Chemistry

Start Date	**: 13/02/2017 14:00:00**
End Date	**: 07/03/2017 16:00:00**

Course Outline

Relevant Dept: Chemistry

Course Name: Engineering Chemistry

Topic Name: Spectroscopy & applications

Pre requisite: The students should be able to explain the basic features of electromagnetic radiation, and structure of atoms.

Topic Outline:

Spectroscopy Fundamentals- I class 2 hours

Spectroscopy Applications: water purification + controlling air pollution - 1 class 2 hours

Spectroscopy Characterization: Materials and Nanosysmtem-1 class 2 hours

Session Schedule

Name	Start	End
Session 1	**13/02/2017 14:00:00**	**13/02/2017 16:00:00**
Session 2	**14/02/2017 14:00:00**	**14/02/2017 16:00:00**
Session 3	**15/02/2017 14:00:00**	**15/02/2017 16:00:00**

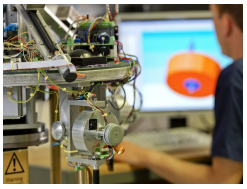
Quiz

Assignment

Delivered by

Prof. Edamana Prasad IIT Madras

Stability Analysis - Control Systems



Stability Analysis - Control Systems

Register Before Jan 13 2017

Stability Analysis - Control Systems

Start Date	**: 18/01/2017 10:00:00**
End Date	**: 12/02/2017 16:00:00**

Course Outline

Topic Name: Stability Analysis

Course Name: Control Systems

Prerequisites: Network analysis / Signals and systems

Intended for: B.Tech (Electrical, Electronics, Mechanical, Instrumentation, Aerospace, Production and Industrial) 3rd and 4th year.

Preamble:

A very important aspect of the dynamic behavior of a system is: when a (finite) input change is implemented on a physical system, does the resulting transient response ultimately settle to a new steady state, or does it grow indefinitely? If it is indeed possible for a dynamical system not to settle eventually to another steady state, but have its output grow indefinitely when disturbed from an initial steady state, what characteristics of the system determine whether or not such behavior will occur? This course is primarily concerned with investigating those issues having to do with the stability properties of linear dynamical systems.

Course Outline:

- Introduction and Origin of Stability Analysis
- Routh-Hurwitz Criterion and Analysis
- Stability analysis using Root-locus method

- Nyquist Stability Criterion and Analysis
- Stability Margins
- Relative Stability
- Input-Output stability
- Stability in the Presence of Uncertainty

Reference:

1. Norman N. Nise. Control Systems Engineering. John Wi ley & Sons, Inc. sixth edition, 2011.
2. Astrom, Karl Johan, and Richard M. Murray. Feedback systems: an introduction for scientists and engineers. Princeton university press, 2010. http: //www.cds.caltech.edu/-murray/amwiki/index.php/Second Edition
3. C. G. Kang, "Origin of Stability Analysis: "On Governors" by J.C. Maxwell [Historical Perspectivesj," in IEEE Control Systems, vol. 36, no. 5, pp. 77-88, Oct. 2016.

Session Schedule

Name	Start	End
Session 1	18/01/2017 10:00:00	18/01/2017 12:00:00
Session 2	20/01/2017 14:00:00	20/01/2017 16:00:00
Session 3	23/01/2017 14:00:00	23/01/2017 16:00:00

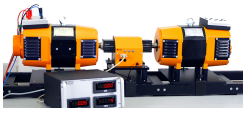
Quiz

Assignment

Delivered by

Prof. Tushar Jain IIT Mandi

Transformer - Electrical Machines



Transformer - Electrical Machines

Register Before Jan 13 2017

Transformer - Electrical Machines

Start Date	**: 18/01/2017 14:00:00**
End Date	**: 09/02/2017 12:00:00**

Course Outline

Topic Name: Transformer

Relevant Course: Electrical Machines

Relevant Department: Electrical Engineering

Relevant Semester:

Pre- requisites:

Topic Description and Outline:

Session 1: Basic configuration, construction - types, principle of operation, Amp-Turn balance, Ideal transformer, Accounting for core losses - Eddy current and hysteresis losses, revisiting construction - reduction of eddy current losses with laminations; magnetizing current and magnetizing reactance; some worked examples

Session 2: Copper losses, leakage reactances - reducing leakage in a transformer; Equivalent circuit of a transformer, transferring values from primary to secondary side and vice-versa. Efficiency and voltage regulation in a transformer; OC and SC tests ; some worked examples

Session 3: Phasor diagrams of transformers; Auto-transformer and its applications; audio frequency transformers, current transformers and voltage transformers. Power and Distribution transformers; all-day efficiency.

Session Schedule

Name	Start	End
Session 1	**18/01/2017 14:00:00**	**18/01/2017 16:00:00**
Session 2	**19/01/2017 14:00:00**	**19/01/2017 16:00:00**
Session 3	**20/01/2017 10:00:00**	**20/01/2017 12:00:00**

Quiz

Assignment

Delivered by

Prof. Bhuvaneshwari G IIT Delhi