COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	Advanced Mathematics	MA-102	Min "D"	Min "D"	5.0

ADVANCED MATHEMATICS

UNIT – I :

Vector space, linearly dependent and independent vectors. Linear transformation. Hermite polynomial properties of fourier transformation, DPT,WFT, Heavsites unit function.

UNIT – II :

Solution of Partial Differential Equation (PDE) by separation of variable method, one dimensional heat wave equation. numerical solution of PDE (Laplace, Posisson's, Parabolic) using finite difference methods.

UNIT – III :

Probability , compound and probability, discrete random variable. Binomial Normal and Poisson's distribution, Sampling distribution, elementary concept of estimation and theory of hypothesis, recurred relations.

UNIT – IV :

Stochastic process, Markov process transition probability transition probability matrix, just and higher order Markov process, Application of Eigen value problems in Markov Process, Markov chain. Queuing system, transient and steady state, traffic intensity, distribution queuing system, concepts of queuing models (M/M1: Infinity/FC FS),1:N/Infinity/FC FS), / M/S : Infinity / Infinity/ FCFS)

UNIT – V : FEM:

Variational functional,Euler Lagrange's equation, Variational forms, Ritzmethod, Galerkin's method, descretization, finite element method for one dimensional problems.

References:

1. Higher Engineering Mathematics by B.V.Ramana,Tata Mc Hill.
2. Advance Engineering Mathematics by Ervin Kreszig,Wiley Easten Edd.
3. Applied Numerical Methods with MATLAB Steven C Chapra TMH
4. Introductory Methods of Numerical Analysis by S.S.Shastry,
5. Introduction of Numerical Analysis by Forberg
6. Numerical Solution of Differential Equation by M.K.Jain
7. Numerical Mathematical Analysis by James B.Scraborogh
8. Fourier Transforms by J.N.Sheddon
9. Advance Mathematics for Engr and Sc,Spiegel,Schaum Series,TMH

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	ADVANCED THERMODYNAMICS	**ME-101**	Min "D"	Min "D"	5.0

ADVANCED THERMODYNAMICS

UNIT – I : Reviw of Zeroth, first and second law of thermodynamics. Entropy, entropy balance for closed and open systems and application of entropy principle. Entropy changes for an ideal gas during various process, physical interpretation of entropy.

UNIT – II : AVAILABILITY : Available and unavailable energy, availability of the closed and open system, availability of the steady flow stream; irreversibility open and close system effectiveness, second law analysis of power plant and refrigeration cycles. Thermodynamic optimization of irreversible systems, finite time thermodynamics principles optimizations studies of various thermal system.

UNIT – III : PVT RELATIONS FOR REAL GASES : Deviation of real gas from ideal gas behavior ; equations of state; Compressibility factor and Chart, principles of corresponding states, tests of equation state, various equations of state : Vander Waals, Dietarici, Bertholot, Redlich-Kwong, beattie Bridgeman, Benedict Webb-Rubin, Martin Han, Bird-Spots, deviation equations for gases.

UNIT – IV : REAL GAS MIXTURES: Dalton Amagat and Barlett rules,psevdo-critical temperature and pressure Kay's and Joffe's rules. Equilibrium and The Third Law: Extensive property equations, chemical potential, phase equilibrium, chemical reaction equilibrium. The chemical potential of ideal gases, fugacity evaluation of fugacity in mixtures, Equilibrium constants, Fugacity of solids and liquids. The third Law, Enthalpy and free energy formation AH, AG and AS of reaction. Thermodynamics of reactive system condition of equilibrium of multiphase-multicomponent systems.

UNIT – IV : THERMODYNAMIC RELATION : Mathematical theorems, Maxwell's equations, Difference Ratio of heat Capacities Energy Equation, Joule Kelvin Effect, Clausius Clapeyron Equation.

References :

1.Concept of Thermodynamics by Obert (McGraw Hill).

2.Analytical Thermodynamics by Soo (Prentics Hall)

2.Heat and Thermodynamics by Zemansky (McGraw Hill)

3. Thermodynamics by Sears (Addivion Wesley)

4.Engineering Thermodynamics by P.K.Nag

5.Engineering Thermodynamics by Gurdon Rogers Yon Mahew

6.Thermodynamics for Engineers by M.A.Saad

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	ADVANCED FLUID MECHANICS	ME-102	Min "D"	Min "D"	5.0

ADVANCED FLUID MECHANICS

UNIT – I :

Review of basic laws of fluid in integral and differential form.

UNIT – II :

Kinematics of Fluid : Description of properties in a moving fluid, Local and material derivatives, Control mass and control volume analysis, Reynolds Transport theorem and its application.

UNIT – III :

Ideal fluid flow: Introduction, Elementary flows in a 2-D plane, Flow Nets, Superposition of Elementary flows.

UNIT – IV : Viscous Incompressible flows :

Introduction, Equations of motion, N-S equations and its application.

UNIT – V :

Boundary Layer Theory : Prandtl's boundary layer equations, Flat plate boundary layer Approximate solution –Integral method, Laminar and turbulent boundary layer, Separation, Lift and Drag.

Fundamentals of Compressible Flows : Introduction, Thermodynamics relations of prefect gases, Speed of sound, Pressure wave propagation, Stagnation and Sonic properties, Shocks.

References:

1.Fluid Mechanics by Frank M.White (Mc-Graw Hill)
2. Fluid Mechanics by Shames (Mc-Graw Hill)
3.Mechanics of Fluid by Massey (EL-BS)
4.Fluid Mechanics and Applications by Gupta & Gupta (New Age)
5.Fluid Mechanics and Machines by Som & Biswas (TMH)
6 Fluid Mechanics by Subramanya (TMH)

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	HEAT TRANSFER	ME-103	Min "D"	Min "D"	5.0

HEAT TRANSFER

UNIT – I :

Introduction : Modes of heat flow , Basic laws of heat transfer. Combined heat transfer. Combined heat transfer Mechanism.

UNIT – II :

Conduction: Steady state conduction, System with internal generation of heat, 2D Heat conduction, Transient Conduction, Extended surface (FINS),Heat transfer with moving bodies.

UNIT – III :

Convectrion : Governing Equation in laminar and Turbulent flow, Free and Forced convection, Tubes, Ducts and exterior surfaces, TUBE Bundles in cross flow, Correlations, Dimensional analysis.

UNIT – IV :

Condensation and Boiling: Condensation and boiling, heat transfer phenomena, Correlations for heat transfer coefficients.

UNIT – V :

Radiation: Radiation properties and law, Electrical analogy, Radiation exchange between surfaces, Application to cavities and enclosures.

References:

1.Heat Transfer by J.Pholman
2. Heat and Mass Transfer by Sarit K Das
3.Compact Heat Exchangers by Kays and London
4.Refrigeration and Air Conditioning by W.F.Stoecker
5.ASHRAE : Fundamental Handbook
6.Convection-W.M.Kays
7.Heat Transfer-CENGAL
8.Heat Transfer-Dewitt and Incropera

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	EXPERIMENTAL TECHNIQUES IN THERMAL ENGINEERING	ME-104	Min "D"	Min "D"	5.0

EXPERIMENTAL TECHNIQUES IN THERMAL ENGINEERING

Unit - I : Measurement Characteristics :

Introduction, need of measurements, typical application of instrument, Elements of measurement system, instrument classification, basic characteristics of instruments like accuracy, precision, errors, repeatability, span range calibration etc. Static and dynamic characteristics, experimental error analysis, systematic and random error, uncertainty, experimental planning and selection of measuring instruments, reliability of instruments.

UNIT-II : FLOW MEASUREMENT :

Introduction, classification of metering devices, orifice meter, venturimeter, rotameter and flow nozzles, elbow meter, Pitot tube, head type of flow meter, electromagnetic flow meter, mechanical flow meter, Anemometer, Ultrasonic flow meter, vortex flow meter, other flow meter, Mass flow measurements.

UNIT - III : PRESSURE AND TEMPERATURE MEASUREMENT :

Pressure Standards and calibration, basic method of pressure measurements, manometers, elastic transducers, dynamic testing of pressure measuring system, high pressure measurements, low pressure (vacuum) measurements. Temperature standards and calibration, thermal expansion methods, thermo- electric sensors (thermocouples), electrical - resistance sensors, junction semi conductor sensors, digital thermometers, radiation methods.

UNIT - IV : MICROPROCESSOR AND COMPUTERS IN MEASUREMENT :

Introduction, signal conditioning of the inputs, signal channel data acquisition system, multichannel data acquisition system, data conversion, digital to analog converter, analog to digital converter, multiplexer. Introduction to microprocessors and accessories, internal structure of microprocessor, application fields, Interfacing with computers , introduction to PLC, basic structure, types, programming, applications.

Unit – V : Miscellaneous Measurements :

Measurement of liquid level, Optical instruments, Measurement of PH value, Measurement of thermal conductivity, Gas chromatography and analyzers, Measurement of smoke, dust and moisture.

References :

1. Instrumentation Measurement and Analysis by B.C. Nakra,K.K. Choudhary
2. Measurement System by Ernest O Doebelin(TMH
3. Instrumentation Device & System by CS Rangan,GR Sarma,VSV Mani
4. Experimental Method by J.P.Holman

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	HEAT TRANSFER & FLUID MECHANICS LAB	ME-105L	Min "D"	Min "D"	5.0

The exercises in this component shall be designed to demonstrate the basic principles outlined in different units of the theory paper. After completing the exercises the student should have developed a good grasp of the practical utilities of the theory content.

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	EXPERIMENTAL TECHNIQUES & SIMULATION IN THERMAL ENGINEERING LAB	ME-106L	Min "D"	Min "D"	5.0

The exercises in this component shall be designed to demonstrate the basic principles outlined in different units of the theory paper. After completing the exercises the student should have developed a good grasp of the practical utilities of the theory content.