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Choice Based Credit System (CBCS) in Light of NEP-2020
MBA+Ph.D. - III SEMESTER (2021-2023)

MBAI301C ADVANCEDHUMAN VALUES AND PROFESSIONAL ETHICS

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MBAI301C	AECC	Advanced Human Values and Professional Ethics	60	20	20	-	-	3	-	-	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC**- Ability Enhancement Compulsory Course

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

The objective of the course is to disseminate the theory and practice of moral code of conduct and familiarize the students with the concepts of "right" and "good" in individual, social and professional context

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. Help the students to understand right conduct in life.
2. To equip students with understanding of the ethical philosophies, principles, models that directly and indirectly affect personal and professional life.

COURSE CONTENT

Unit I: Inculcating Values at Workplace

1. Values: Concept, Sources, Essence
2. Classification of Values.
3. Values in Indian Culture and Management: Four False Views, Value Tree
4. Eastern and Western Values; Values for Global Managers

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MBAI301C	AECC	Advanced Human Values and Professional Ethics	60	20	20	-	-	3	-	-	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC**- Ability Enhancement Compulsory Course

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Unit II: Professional Ethics

1. Ethics: Concept, Five P's of Ethical Power, Organisational Tools to Cultivate Ethics
2. Theories of Ethics: Teleological and Deontological
3. Benefits of Managing Ethics in an Organisation
4. Ethical Leadership

Unit III: Indian Ethos and Management Style

1. Indian Ethos and Workplace
2. Emerging Managerial Practices
3. Ethical Considerations in Decision Making and Indian Management Model
4. Core Strategies in Indian Wisdom and Ethical Constraints

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Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC**- Ability Enhancement Compulsory Course

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Unit IV: Human Behavior – Indian Thoughts

1. Guna Theory
2. Sanskara Theory
3. Nishkama Karma
4. Yoga: Types, Gains; Stress and Yoga

Unit V: Spirituality and Corporate World

1. Spirituality: Concept, Paths to Spirituality
2. Instruments to achieve spirituality
3. Vedantic Approach to Spiritual and Ethical Development
4. Indian Spiritual Tradition.

Suggested Readings

1. Kausahl, Shyam L. (2006). ***Business Ethics – Concepts, Crisis and Solutions***. New Delhi: Deep and Deep Publications Pvt. Limited
2. Murthy, C.S.V. (2012). ***Business Ethics –Text and Cases.*** Himalaya Publishing House: Mumbai
3. Chakraborty, S. K. (1999). ***Values and Ethics for Organizations***. Oxford university press
4. D.Senthil Kumar and A. SenthilRajan (2008). ***Business Ethics and Values.*** Himalaya Publishing House: Mumbai

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Choice Based Credit System (CBCS) in Light of NEP-2020

M.Tech in Industrial Engineering

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MTIE102	DCC	Industrial Engineering Systems	60	20	20	30	20	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:-

1. The primary objective of the course is to Describe the Industrial Engineering System concepts.
2. This course Provides comprehensive Knowledge of Production Planning, Inventory , Artificial Intelligence & Six Sigma .

Course Outcomes:-

1. Student will be able to understand the various Production Planning concepts & how to control the inventory in Industry.
2. Students would be able to understand plant Layout & Material handling equipments .
3. Students would be able to understand which type artificial intelligence work in industry.
4. On completion of this course the students will be able to acquire knowledge of six sigma & lean manufacturing.

Syllabus

Unit-I

Production Planning And Control **(8Hr)**

Definition and importance, types of production -job, batch and mass forecasting, routing, scheduling, dispatching and follow up. Break even analysis and Gantt chart Project scheduling, application of CPM and PERT techniques Analysis and control of project cost in CPM and PERT, numerical problems.

Unit-II

Inventory Control **(8Hr)**

Definition, types of inventory - Codification and standardization ABC analysis. Economic ordering quantity Procurement cost, carrying charges, lead-time, re-order point, simple problems. Definitions, types of inspection and procedure Statistical quality control - Basic theory of quality control,

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Unit-III

Plant Location and Layout **(8Hr)**

Definition, factors affecting the site selection of plant Factor affecting plant layout Types of layout - process, product, combination and fixed position layout Techniques in making layout-Flow diagram, templates, distance volume matrix, travel chart Line balancing, workstation

Material Handling : Principles of economic material handling Hoisting equipment - forklift truck,

Cranes- mobile motor cranes, overhead cranes, travelling bridges crane. Derrick crane. Whiler crane

Conveying equipment - Package conveyors, gravity roller conveyors, screw conveyors, flight or scraper conveyors, bucket conveyors, bucket elevators, belt conveyors, pneumatic conveyors.

Unit-IV

Artificial Intelligence in Manufacturing **(10Hr)**

Introduction to artificial intelligence. Application of artificial intelligence (AI) techniques: Metaheuristics such as simulated annealing, tabu search, genetic algorithms, particle swarm intelligence; Artificial Neural Networks (ANN); Fuzzy Logic Systems (FLS); Knowledge Based Systems (KBS); and Petri nets in manufacturing systems planning and control. Distributed AI and Multi Agent Systems (MAS).

Unit-V

Six Sigma & Lean Manufacturing **(9Hr)**

Lean: Introduction, Lean - Evolution & Steps, Introduction to Lean Manufacturing, Lean - Specify Value - Quality at Source, 5S Concepts, 5S Implementation, Identify Value Stream - Process Mapping, Why is Inventory bad, Process Layouts, Lean - Make It Flow - Setup Time Reduction, Hejunka, Total Productive Maintenance.

Six Sigma :Overview, Six Sigma (basics and history of the approach, methodology and focus), the application of Six Sigma in production and in service industries, Relationship of Six Sigma and Lean Management, linking Six Sigma project goals with organizational strategy.

References

1. Barnes Ralph M., "Motion & Time study: Design and Measurement of Work", Wiley
2. Mukhopadhyay S.K, "Production Planning and Control: Text and Casesby" , PHI, 2009.
3. Dr. R.K. Singal, "Production Planning and Control" by, Katson Books, 2014.

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4. Narasimhan & Seetharama L, "Production Planning and Inventory Control" , PHI, 2015.
5. E. Rich and K. Knight, "Artificial Intelligence", Tata McGraw Hill, 2009.
6. G.J.Klir and B. Yuan, "Fuzzy sets and Fuzzy Logic Theory and Applications", Prentice Hall Inc. NJ. 2008.
7. Jeffrey K. Liker, "Becoming Lean - Inside Stories of U.S. Manufacturers", Productivity Press, Portland, Oregon, 2005.

List of Experiments:

1. To study product design and development.
2. To study the Sequencing Technique and Gantt charts.
3. To study and prepare ABC analysis in given problems.
4. To study and prepare Plant layout design in given situations.
5. To study and construct 5s implementation in given problems.
6. To study and prepare lean six sigma in given situations.

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MTIE203	DCC	Advanced Manufacturing Techniques and System	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

Course Objectives: -
This course provides concepts of advanced manufacturing processes like rapid prototype process, metal forming techniques, metal machining techniques along with conventional manufacturing processes.
Course Outcomes: -

After successfully completing this course, you should be able to:

1. Demonstrate an appropriate degree of competency in the evaluation of rapid manufacturing technologies and their application in modern manufacturing processes.
2. Acquaint with the principles, basic machine tools, and developments in the advanced manufacturing process and research trends in the area of advanced manufacturing process.
3. Make use of the above techniques while modelling and solving the engineering problems of different fields.

SYLLABUS

UNIT – 1 **(8Hr)**
INTRODUCTION
Introduction of Conventional manufacturing Processes such as: Casting, Extrusion, Powder Metallurgy, Forging, Rolling, rod/wire drawing and tube drawing etc. Fundamentals of machining, machining processes i.e. Lathe, Milling, Drilling, Shaper, CNC etc.
Introduction of Advanced machining processes, intelligent manufacturing and micro manufacturing.

UNIT – 2 **(9Hr)**
ADVANCED MACHINING PROCESSES
Principle, working, limitations and applications of processes such as: Ultrasonic machining (USM), Abrasive jet machining (AJM), Water jet machining (WJM), Abrasive water jet machining

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MTIE203	DCC	Advanced Manufacturing Techniques and System	60	20	20	30	20	3	0	2	4

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(AWJM), Electrochemical machining (ECM), Electro-discharge machining (EDM), Electron beam machining (EBM), Laser beam machining (LBM)

UNIT – 3 **(9Hr)**

ADVANCED FORMING PROCESSE-1

Advanced Metal Forming Processes

Details of high energy rate forming (HERF) process, Electro-magnetic forming, explosive forming, Electro-hydraulic forming, Stretch forming, Contour roll forming

UNIT – 4 **(8Hr)**

ADVANCED FORMING PROCESSES-2

Advanced Casting Processes

Metal mould casting, Continuous casting, Squeeze casting, vacuum mould casting, Evaporative pattern casting, ceramic shell casting.

Advanced Welding Processes

Detail s of electron beam welding (EBW), Laser beam welding (LBW), Ultrasonic welding (USW)

UNIT – 5 **(8Hr)**

RAPID PROTOTYPING

Working Principles, Methods, Stereo Lithography, Laser Sintering, Fused Deposition Method, Applications and Limitations, Rapid tooling, Techniques of rapid manufacturing

EVALUATION

Evaluation will be continuous and it will be integral part of class assessment as well as expert assessment.

Text Books:

1. V.K.Jain, "Advanced Machining Processes", Allied Publications, 2008.
2. John A Schey, "Introduction to Manufacturing Processes", Mc Graw Hill, 2009.

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3. E. P. DeGarmo, J. T Black, and R. A. Kohser, "Material s and Processes in Manufacturing", Prentice Hall of India, New Delhi, 2014
4. A. Ghosh, and A. K. Mallik,"Manufacturing Science" Affiliated East - West Press Pvt. Ltd. New Delhi, 2008.
5. G. F. Benedict, Marcel Dekker, "Nontraditional Manufacturing Processes", Inc. New York, 2000.

Reference:

1. Andrew Kusiak, "Intelligent Manufacturing Systems", Prentice Hall, 2006.
2. Mikell.P Groover, "Automation, production systems and computer integrated manufacturing" PHI, 3rd edition, 2012
3. M. Adithan, "Rapid Prototyping", Atlantic Publishers & Distributors (P) Ltd, 2011.
4. Ali K. Kamrani & Emad Abouel Nasr, "Engineering Design and Rapid Prototyping", Springer, 2000.
5. Kalpakijian and Adisson, "Manufacturing Engineering and Technology- I" Wesley, 1995.
6. R. A. Lindburg, "Process and Materials of Manufacturing", 1th edition, PHI 1990.

List of Experiments

1. To study of advanced casting process & Welding Process.
2. To study of Casting and analysis of L and T Junction in Metal casting process on different materials.
3. To study analysis of L and T joint in welding process. (by CAD)
4. To study analysis of forging process with the help of any CAD tool.
5. To study of RP techniques.

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MBAI102 MARKETING MANAGEMENT

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
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MBAI102	CC	Marketing Management	60	20	20	-	-	3	-	-	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; CC- Core Course
***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives

1. The objective of the course is to provide the learners exposure to modern marketing concepts, tools, and techniques.
2. To help them develop abilities and skills required for the performance of marketing functions.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. Demonstrate understanding of marketing management.
2. Apply the concept of marketing in business operations.
3. Develop an understanding of the linkages of marketing management and other functions of an organization.

COURSE CONTENT

Unit I: Marketing Concepts

1. Introduction- Nature and scope of marketing, Evolution, Various marketing orientations
2. Marketing Vs Selling concepts
3. Consumer need, Want and Demand concepts
4. Marketing Environment
5. Marketing challenges in the globalized economic scenario

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MBA1102	CC	Marketing Management	60	20	20	-	-	3	-	-	3

Legends: L --Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; CC- Core Course
***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Unit II: Market Segmentation, Targeting, Positioning and Branding

1. Segmentation-Meaning, Factors influencing segmentation, Basis for segmentation
2. Targeting-Meaning, Basis for identifying target customers, Target Market Strategies
3. Positioning-Meaning, Product differentiation strategies, Tasks involved in positioning
4. Branding- Concept of Branding, Brand Types, Brand equity, Branding Strategies

Unit III: Products and Pricing

1. Product Decisions- Concept and Objectives, Product mix
2. New product development process
3. Product Life cycle strategies
4. Pricing Decisions- Pricing concepts and Objectives
5. Pricing strategies-Value based, Cost based, Market based, Competitor based
6. New product pricing Price Skimming and Penetration pricing

Unit IV: Distribution Decisions

1. Importance and Functions of Distribution Channel
2. Channel alternatives
3. Factors affecting channel choice
4. Channel design
5. Channel conflict and Channel management decisions, Distribution system
6. Multilevel Marketing (Network Marketing)

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Unit V: Integrated Marketing Communications

1. Concept of communication mix, Communication objectives
2. Advertising- Advertising Objectives, Advertising Budget, Advertising Copy
3. AIDA model, Advertising Agency Decisions
4. Sales Promotion: Sales Promotion Mix, Tools and Techniques of sales promotion, Push-pull strategies of promotion
5. Personal selling- Concept, Features, Functions, Steps/process involved in Personal selling
6. Publicity / Public Relation- Meaning, Objectives, Types, Functions of Public Relations
7. Digital Marketing- Basic concepts of E-Marketing

Suggested Readings

1. Kotler, Keller, Koshy and Jha (2009). ***Marketing Management: A South Asian Perspective***. Pearson Education, Latest Edition.
2. Masterson Rosalind and Pickton David (2014). ***Marketing: An Introduction***. Sage Publications, Latest Edition.
3. Panda Tapan (2008). ***Marketing Management. Excel Books***. India Latest Edition.
4. Ramaswamy V. S. and Namakumar S. (2009). ***Marketing Management***. Macmillan Publishers, Latest Edition.
5. Etzel M. J, Walker B J and Stanton William J. (1997). ***Fundamentals of Marketing Management***. Tata McGraw Hill, Latest Edition.
6. Kumar Arun and N Meenakshi (2009). ***Marketing Management***. Vikas Publications, Latest Edition.
7. Karunakaran K. (2009). ***Marketing Management***. Himalaya Publishing House, Latest Edition.
8. SaxenaRajan (2009). ***Marketing Management***. Cengage Learning, Latest Edition.
9. Lamb, Hair, Sharma, McDanniel (2012). ***Marketing. Cengage Learning***. Latest Edition.

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MBA - I SEMESTER (2022-2024)

MBA1106 OPERATIONS RESEARCH

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MBA1106	CC	Operations Research	60	20	20	-	-	3	-	-	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **CC**- Core Course
***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives

1. The objective of this course is to help the students acquire quantitative tools for decision making.
2. Application of Quantitative Techniques for the analysis and solution of business problems.
3. The emphasis will be on the concepts and application rather than derivations.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 24 Marks and consist of three questions, out of which student will be required to attempt any two questions. Section B will comprise of five questions, out of which student will be required to attempt any three cases / problems worth 36 marks.

Course Outcomes

1. To understand the role of operations research in business decisions.
2. Plan effective and efficient use of productive resources of an organization.
3. Develop an understanding of the linkages of operations research and other functions of an organization.

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COURSE CONTENT

Unit I: Introduction to Operations Research

1. Definition, scope of Operations Research, characteristics, advantages and limitations
2. Quantitative approach to decision making
3. Models and modeling in Operations Research

Unit II: Linear programming

1. Meaning of Linear Programming, Assumption, Advantages, Limitations
2. General Mathematical Formulation of LPP
3. Graphical Analysis
4. Simplex Method
5. Duality and Post Optimality Analysis

Unit III: Transportation and Assignment Models

1. Transportation problem – Mathematical Formulation
2. Initial Basic Feasible Solution - (NWCM, LCM and VAM),
3. Test for optimality (MODI Method)
4. Assignment Model as a Particular Case of Transportation Model,
5. Formulation of Assignment Problems
6. Solution of Assignment Problems Using Hungarian Method (Minimization and Maximization)
7. Route Allocation

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Unit IV: Game Theory and Markov Chain Analysis

1. Introduction to Games
2. Maxim in and Minimax Principles
3. Pure and Mixed Strategies
4. Solution of Games Using-Algebraic and Graphical Methods
5. Computation of Sequential Probability of States for Different Periods
6. Steady State Probability of States
7. Application of Markov Chain.

Unit V: Waiting Line Models

1. Introduction
2. Scope in Management Decisions
3. Queuing Models M/M/1 (Infinite and Finite Population)
4. Probability Calculations
5. Application of M/M/C (Infinite Population)

Suggested Readings

1. Sharma S. D and Sharma Himanshu (2002). ***Operations Research: Theory, Methods and Applications.*** KedarNath, Ram Nath And Company, Latest Edition.
2. Taha H. A (2008). ***Operations Research: An Introduction.*** PHI, Latest Edition.
3. Sharma J. K. (2006). ***Operations Research: Theory and Applications.*** Macmilan, India, Latest Edition.
4. Vohra N. D. (2007). ***Quantitative Techniques***. Tata McGraw Hill, New Delhi, Latest Edition.
5. Sharma Anand (2009). ***Operations Research***. Himalaya Publishing House, Latest Edition.
6. Anderson (2008). ***Introduction to Management Science.*** Cengage Learning, Latest Edition.
7. Wagner H.M. (2008). ***Principles of Operations Research with Application to Managerial Decisions.*** Prentice Hall, Latest Edition.

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M.Tech in Thermal and Design Engineering

(2021-2023)

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MTME106	DCC	Stimulation Modeling Lab (FEA, FEM and CFD)	0	0	0	30	20	0	0	4	2

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Course Objectives:-

1. To provide the mathematical foundations of the finite element formulation for engineering applications
2. To expose students to some of the recent trends and research areas in finite element analysis.
3. This course brings together the knowledge gained in fluid mechanics, thermodynamics, heat transfer and numerical methods in order to develop computational techniques for the engineering analysis of heat and fluid flow processes.
4. This course also intends to provide the students with sufficient background to understand the mathematical representation of the governing equations of fluid flow, discretization techniques, grid generation, transformation equations and to numerically solve the flow field problems.

Course Outcomes:-

1. Student are able to solve problems related to finite element formulation for engineering purpose.
2. Define the element properties such as shape function and stiffness matrix for the various elements.
3. Formulate element properties for 1D and 2D elements.
4. Develop skill to solve simple Heat Transfer problems using the steps of FEM **Syllabus**
5. Under stand the governing of fluid flow, heat transfer and numerical solution.

Syllabus

Unit-I **(6Hr)**

Introduction to Finite Element Method & Finite Element Techniques :-

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Basic Concept, Historical Background, Engineering applications, general Description, comparison with other methods. Module boundary value problem, finite element decentralization, element shapes, sizes and node locations, interpolation functions,derivation of element equations, connectivity, boundary conditions, FEM solutions, post processing, Compatibility and completeness requirements, convergence criteria, higher order and iso parametric elements, natural coordinates, Lagrange and Hermit Polynomials

Unit-II **(6Hr)**

Applications to Solid and Structural Mechanics & Heat Transfer Problems :-

External and internal equilibrium equations, one-dimensional stress-strain relations, plane stress and strain problems, axis symmetric and three dimensional stress strain problems, strain displacement relations, boundary conditions compatibility equations, analysis of trusses, frames and solid of revolution, computer programs.

Variational approach, Galerikn approach, one dimensional and two dimensional steady state problems for conduction, convection and radiation, transient problems.

Unit-III **(5Hr)**

Stimulation :-

Monte carlo simulation, generation of stochastic variates , continuous and discrete probability distributions , application of Monte carlo methods for production systems , computr simulation models , Marco dynamic model.

Unit-IV **(6Hr)**

Finite Element Methods :-

Introduction, Calculus of variation, Ritz method, weighted residual methods., Fundamental concepts of the FEM, discretization of the domain, one and two and three dimensional elements and interpolation functions, compatibility and completeness requirements. Assembly and

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boundry conditions, formulation of FEM solutions., application to simple boundry value problems, computer implementation.

Unit-V **(6Hr)**

Computation Fluid Dynamics

Mathematical modeling: Governing equations of fluid flow and heat transfer; Introduction to discretization methods: Finite difference and finite volume methods for heat transfer problems; Time stepping methods for unsteady problems; Solution techniques for system of algebraic equations; Grid generation techniques; Solution techniques for Navier-Stokes equation; Finite element method for heat transfer and fluid flow problems; Turbulence modeling.

References Books

1. Fagan, "Finite Element Analysis-Theory & P,ctice", (Longman Scientific & Technical), 2011.
2. David Hutton, "Fundamentals of Finite Element Analysis", TMH, 2005.
3. H.S. Govinda Rao, "Finite Element Method versus Classical Methods", New Age International Publishers, 2011.
4. J. N. Reddy, "An Introduction to Finite Element Analysis", (Tata McGraw- Hill Pub. Co.), 2005.
5. Martin and Carey, "Introduction to Finite element analysis", Tata McGraw Hill, 2008.
6. Huebner John, "The finite element method for engineering",2000.
7. Ferziger, J. H. and Peric, M. "Computational Methods for Fluid Dynamics:, Third Edition, Springer-Verlag, Berlin., 2003.
8. Versteeg, H. K. and Malalasekara, W. "Introduction to Computational Fluid Dynamics: The Finite Volume Method", Second Edition (Indian Reprint) Pearson Education., 2008.

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9. Anderson, D.A., Tannehill, J.C. and Pletcher, R.H. "Computational Fluid Mechanics and Heat Transfer', Taylor & Francis., 1997.
10. K. Muralidhar, T. Sundarajan, "Computational Fluid Flow and Heat Transfer", Narosa Publishing House, New Delhi, 1997.

List of Practical's:

1. Modeling and analysis of periodic and heat transfer over a bank of tubes
2. Modeling and analysis of external compressible flow over an aero foil blade
3. Analysis of unsteady compressible flow through a nozzle
4. Analysis of flow pattern inside Turbomachines applications
5. Analysis of air quality inside a passenger car
6. Analysis of varies nose body configuration
7. Quantitative description of flow phenomena using measurements
8. Quantitative prediction of flow phenomena using CFD software
9. Identify the forces which cause and influence the fluid motion.
10. Choose a suitable flow model (viewpoint) and reference frame.
11. Use a comprehensive model for combustion of fuel at atmospheric pressure and develop a computer program to estimate the heat released assuming a single step reaction.

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