

Mechanical Engineering (B. Tech.), VIII Semester

Credits	L	T	P	Course Code	Course Title	Category of Course
03	0	0	0	PEC-ME -405	RAPID PROTOTYPING	PEC

Unit-I

Introduction: Introduction to Prototyping, Traditional Prototyping Vs. Rapid Prototyping (RP), Need for time compression in product development, Usage of RP parts, Generic RP process, Distinction between RP and CNC, other related technologies, Classification of RP

Unit-II

CAD Modelling and Data Processing for RP: CAD model preparation, Data Requirements, Data formats (STL, SLC, CLI, RPI, LEAF, IGES, HP/GL, CT, STEP), Data interfacing, Part orientation and support generation, Support structure design, Model Slicing and contour data organization, direct and adaptive slicing, Tool path generation

Unit-III

RP Systems: Photo polymerization Stereo lithography (SL), SL resin curing process, SL scan patterns, Microstereolithography, Applications of Photo polymerization Processes. Powder Bed Fusion: Selective laser Sintering (SLS), Powder fusion mechanism and powder handling, SLS Metal and ceramic part creation, Electron Beam melting (EBM), Applications of Powder Bed

Unit-IV

Fusion Processes. Extrusion-Based RP Systems: Fused Deposition Modelling (FDM), Principles, Plotting and path control, Applications of Extrusion-Based Processes. 3D Printing : 3D printing (3DP), Research achievements in printing deposition, Technical challenges in printing, Printing process modelling, Applications of Printing Processes. Sheet Lamination : Laminated Object Manufacturing (LOM), Ultrasonic Consolidation (UC), Gluing, Thermal bonding, LOM and UC applications. Beam Deposition: Laser Engineered Net Shaping (LENS), Direct Metal Deposition (DMD), Processing-structure-properties, relationships, Benefits and drawbacks.

Unit-IV

Errors in RP Processes: Pre-processing, processing, post-processing errors, Part building errors in SLA, SLS.

RP Applications: Design, Engineering Analysis and planning applications, Rapid Tooling, Reverse Engineering, Medical Applications of RP.

Text and Reference Books:

1. Chua C K, Leong K F, Chu S L, Rapid Prototyping: Principles and Applications in Manufacturing, World Scientific.
2. Gibson D W Rosen, Brent Stucker., Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing, Springer.
3. Chua C K, Leong K F, Chu S L, Rapid Prototyping: Principles and Applications in Manufacturing, World Scientific.
4. . Noorani R, Rapid Prototyping: Principles and Applications in Manufacturing, John Wiley & Sons.
5. . Liou W L, Liou F W, Rapid Prototyping and Engineering applications: A tool box for prototype development, CRC Press

Mechanical Engineering (B. Tech.), VIII Semester

Credits	L	T	P	Course Code	Course Title	Category of Course
03	3	3	0	PEC-ME 409	Advance Manufacturing Processes	PEC

Unit-I

ADVANCE MECHANICAL MACHINING PROCESSES: Classification of AMPs-process selection; Ultrasonic machining; machining setup; mechanics of cutting; parameter analysis; process capability; application. Abrasive water jet machining.

Unit-II

ADVANCE CHEMICAL AND THERMAL MACHINING PROCESSES: Electrochemical machining; electrochemical grinding; electrochemical honing; chemical machining; electric discharge machining; wire cut EDM; electron beam machining; laser beam machining.

Unit-III

ADVANCE CASTING PROCESSES: Metal mold casting: low and high pressure; continuous casting; squeeze casting; vacuum mold casting; evaporative pattern casting; chemical shell casting.

Unit-IV

ADVANCE WELDING PROCESSES: Electron beam welding; laser beam welding; ultrasonic welding

Unit-V

ADVANCE METAL FORMING PROCESSES: High rate energy forming(HERF) processes; electromagnetic forming; explosive forming; electro-hydraulic forming; stretch forming; contour roll forming.

Text and References books:

1. Manufacturing Engineering & Technology, 7th Edition Serope Kalpakjian, Illinois Institute of Technology Steven Schmid, The University of Notre Dame ©2014 |Pearson
2. Non traditional Manufacturing Processes Gary F. Benedict CRC Pres
3. Manufacturing Science by ghosh and mallik ; Prentice hall of India, 8th Edition
4. Shan & Pandey; Non traditional manufacturing

Mechanical Engineering (B. Tech.), VII Semester

Credits	L	T	P	Course Code	Course Title	Category of Course
03	3	0	0	OEC-401	NON CONVENTIOANL ENERGY SOURCES	OEC

Unit-I

Global and National scenarios, Form and characteristics of renewable energy sources.

Solar Energy: Solar radiation, its measurements and prediction, Solar thermal collectors, flat plate collectors, concentrating collectors, Basic theory of flat plate collectors, solar heating of buildings, solar still, solar water heaters, solar driers, conversion of heat energy in to mechanical energy, solar thermal power generation systems.

Solar Photovoltaic: Principle of photovoltaic conversion of solar energy, types of solar cells and fabrication, **Photovoltaic applications:** battery charger, domestic lighting, street lighting, water pumping, power generation schemes.

Unit -II

Wind Energy: Atmospheric circulations, classification, factors influencing wind, wind shear, turbulence, wind speed monitoring, Betz limit, WECS- classification, characteristics and applications.

Unit -III

Ocean Energy: Ocean energy resources, ocean energy routes, Principles of ocean thermal energy conversion systems, ocean thermal power plants, Principles of ocean wave energy conversion and tidal energy conversion.

Unit-IV

Other Sources: Nuclear fission and fusion, Geothermal energy- Origin, types of geothermal energy sites, site selection, geothermal power plants, Magneto-hydro-dynamic (MHD) energy conversion, Formation of biomass, photosynthesis, Biomass resources and their classification, Chemical constituents and physicochemical characteristics of biomass, Biomass conversion processes.

Unit-V

Fuel Cells: Thermodynamics and electrochemical principles, Basic design, types, applications.

Hydrogen Energy: Economics of hydrogen, Production methods.

Text and References Books:

1. Power Generation through Renewable Source of Energy, Rai and Ram Prasad, Tata McGraw-Hill,
2. Ashok V. Desai, "Nonconventional Energy", New Age International Publishers Ltd.
3. Bansal Keemann, Meliss, "Renewable energy soucesa and conversion technology", Tata McGraw Hill

Mechanical Engineering (B. Tech.), VIII Semester

Credits	L	T	P	Course Code	Course Title	Category of Course
03	3	0	0	OEC-404	Utilization of electrical power & traction	OEC

Unit-1

Electric Heating: Different methods of electric heating. Principle of high frequency induction and di-electric heating. Construction, operation, performance and applications of arc furnace and induction furnace.

Electric Welding: Welding process, welding transformer, Classification of Electric Welding: arc welding, resistance welding, welding of various metals.

Unit-2

Illuminations: Definitions, laws of illuminations, polar curves, luminous efficiency, photometer, incandescent lamps: filament materials, halogen lamp. electric discharge lamps: sodium vapour lamp mercury vapour lamp and fluorescent lamp.

Light Calculations: commercial, industrial, street and flood lighting.

Unit-3

Electrolytic Process: Principles and applications of electrolysis, electro-deposition, manufactures of chemicals, anodizing, electro polishing electro-cleaning, electroextraction, electrorefinig, electro-stripping (parting) power supplies for electrolytic process.

Unit-4

Electric Traction & Means of Supplying Power: Systems of Electric Traction: DC & AC Systems, Power Supply for Electric Traction System: Comparison and application of different systems. Sub-station equipment and layout, conductor rail & pantograph.

Unit-5

Traction Methods: Types of services, speed time and speed distance curves, estimation of power and energy requirements, Mechanics of train movement. Co-efficient of adhesion, Adhesive weight, effective weight.

Traction Motor Controls: DC and AC traction motors, Series parallel starting. Methods of electric braking of traction motors.

Text and Reference Books

1. H. Partab, "Art and Science of Electrical Energy" DhanpatRai& Sons
2. H. Partab, "Modern Electric Traction" DhanpatRai& Sons.
3. C.L. Wadhwa – Utilization of Electric Traction Electric Power.
4. G.K.Dubey, "Fundamentals of Electric Drives" Narosa Publishing House

Mechanical Engineering (B. Tech.), VI Semester

Credits	L	T	P	Course Code	Course Title	Category of Course
04	3	1	0	PEC-ME-302	TRIBOLOGY	PEC

Unit -I

Introduction to the concept of tribo design: Principles of tribodesign, tribological problems in machine design, Plain sliding bearings, Rolling contact bearings, piston rings and cylinder liners.

Unit-II

Elements of Contact mechanics: Introduction, Concentrated and distributed forces on plane surfaces, Contact between two elastic bodies in the form of spheres, Contact between cylinders and between bodies of general shape, Failures of contacting surfaces. Thermal effects in surface contact.

Unit -III

Friction, lubrication and wear in lower kinematic pairs: Introduction, The concept of friction angle, Friction in screws with a square thread, Friction in screws with a triangular thread, , Boundary lubricated sliding bearings.

Unit -IV

Sliding-element bearings : Derivation of the Reynolds equation, Hydrostatic bearings Squeeze-film lubrication bearings, Thrust bearings, Journal bearings, Journal bearings for specialized applications, Gas bearings, Dynamically loaded journal bearings Modern developments in journal bearing design, Selection and design of thrust bearings self-lubricating bearings.

Unit -V

Rolling contact bearings: Introduction, Analysis of friction in rolling-contact bearings, Deformations in rolling contact bearings, Kinematics of rolling-contact bearings, Lubrication of rolling-contact bearings, Acoustic emission in rolling-contact bearings.

Text and Reference books

1. Dudley D.Fulier" Theory and practice of Lubrication for Engineers", New York Company.1998
2. Moore "Principles and applications of Tribology" Pergamon press, 1975
3. Oscar Pinkus, Beno Sternlicht, "Theory of hydrodynamic lubrication", McGraw-Hill, 1961
7. Tribology in Machine Design by T.A. Stolarski

Mechanical Engineering (B. Tech.), VI Semester

Credits	L	T	P	Course Code	Course Title	Category of Course
03	3	0	0	OEC-302	Total Quality Management	OEC

UNIT-I

Introduction: Evolution of Quality Management, Philosophy, Concepts of Product and Service Quality, Dimensions of Quality, Quality Guru's, Quality Awards, Quality Cost.

UNIT-II

Quality Assurance: Inspection, Quality control, Quality assurance, Concept and Advantage of quality assurance, Quality rating, Quality survey/audit, Vendor rating, Quality function deployment.

Process Quality Improvement: Introduction to Process Quality, Graphical and statistical techniques for Process Quality Improvement, Graphical tools for data representation, 7QC tools, Process capability analysis, Measurement system analysis.

UNIT-III

Acceptance Sampling: Concept of acceptance sampling, advantage and limitations of sampling inspection, Sampling methods, Operating characteristics curve, producer and consumer risk, Average outgoing quality limits, sampling plans, sampling plans for variables, Problems.

UNIT-IV

Control Charts: Chance and assignable causes of process variation, statistical basis of the control chart, control charts for variables - \bar{x} and R charts, attribute control charts - p, np, c and u- Construction and application, Problems.

UNIT-V

Contemporary Trends in Quality Engineering & Management: Introduction to Quality Management Standards – ISO : 9000, ISO:14000, Reliability, Quality circles, Concept of Six sigma, Basic steps involve in six sigma, National and International bodies for quality aspects, Introduction to Japanese's quality techniques such as 5S, Kaizen, SMED, TQM,TPM.

Text and References Books:

1. Lt. Gen. H.LaI, "Total Quality management", Wiley Eastern Limited, 1990. .
2. Greg Bounds. "Beyond Total Quality Management".McGraw Hill, 1994.
3. Menon, H.G, "TQM in New Product manufacturing", McGraw Hill 1992.

Mechanical Engineering (B. Tech.), VI Semester

Credits	L	T	P	Course Code	Course Title	Category of Course
01	0	0	2	PEC-ME-315	Robotics lab	PEC

LIST OF EXPERIMENTS

1. To detect the sensor scanning system to overcome limitation of fixed sensors on various robotic applications, ultrasonic sensor, laser range finders, infrared detectors and miniature.
2. To find the horizontal and vertical movement up to 180° in either direction.
3. To detect objects with infrared ray detector.
4. To determine object distance (3cm – 300cm).
5. To detect distance (10cm to 80 cm) with infrared object detector.
6. To determine 5 Axis Robotic Arm movement and its degree of rotation.
7. To lift the object and place 100m away in various directions.
8. To find the gripper movement (0 to 50mm).
9. To study various Robotic Arm Configurations.

Mechanical Engineering (B. Tech.), VII Semester

Credits	L	T	P	Course Code	Course Title	Category of Course
01	0	0	2	PEC-ME-404	Cad lab	PEC

LIST OF EXPERIMENTS

- 1 Introduction and different features of the CAD Software.
- 2 2-D Drafting.
- 3 3-D Modelling.
- 4 3-D Advanced Modelling.
- 5 Assembly modelling.
- 6 Feature Modification and Manipulation.
- 7 Detailing.
- 8 Sheet Metal Operations.
- 9 Surface Modelling.
- 10 One Dimensional problems of Finite Element Method.

BACHELOR OF COMPUTER APPLICATION PROGRAMME III Sem

Credits	L	T	P	Course Code	Course Title
04	3	0	0	BCA-207	Digital Electronics

Digital Electronics

Unit –I

Overview of electronics: Electronic Components-Resistor, capacitor and Inductors, Semiconductor devices: Diodes, transistors (BJT and FET). Integrated circuits, Popular IC packages, Analog vs digital electronics, Transistor as a switch.

Boolean algebra: Representation of values and complements, De’Morgans theorem-simplifying expressions.

Unit –II

Logic gates: AND, OR, NOT, XOR, XNOR, NAND, NOR gates and their truth tables, combining logic circuits for expressions using NAND and NOR gates, Logic circuit families and characteristics, SSI, MSI, LSI and VLSI circuits. Combinational and sequential circuits: (Simple block diagrams, truth tables and IC packages only required).

Adders, decoders, multiplexers, encoder circuits , Flip-flops: RS, clocked RS, JK, D and T flip flops, Master-slave flip flops, edge and level triggering, Multivibrators - A stable, Bistable, Monostable, counters-ripple and decade. Registers, latches and Tristate buffers.

Unit –III

Building blocks of a computer system: Basic building blocks-I/O, memory, ALU, Control and their interconnections, Control unit and its functions- Instruction-word, Instruction execution cycle, organizational sequence of operation of control registers; controlling of arithmetic operations; branch, skip, jump and shift instructions, ALU-its components.

Unit –IV

Addressing techniques and registers: Addressing Techniques-Direct, immediate addressing; paging, relative, Indirect and indexed addressing. Memory buffer register; accumulators; Registers- Indexed, General purpose, Special purpose; overflow, carry, shift, scratch registers; stack pointers; floating point; status information and buffer registers

Unit –V

Memory: Main, RAM, static and Dynamic, ROM, EPROM, EAROM, EEPROM, Cache and Virtual memory.

Interconnecting System components: Buses, Interfacing buses, Bus formats-address, data and control, Interfacing keyboard, display, auxiliary storage devices, and printers. I/O cards in personal computers. Development of Indian Super Computer 'PARAM': History, Characteristics, Strengths, Weakness and basic Architecture.

Text / Reference Books

1. A.S.Tannenbaum : Structured Computer Organization, Pearson
2. Thomas C. Bartee : Digital Computer Fundamentals, McGraw-Hill
3. Duglus V Hall : Microprocessors and Interfacing: programming and Hardware, McGraw-Hill, 1986.
4. Introduction to Computer Architecture, Stone S.Galgotia Publicatons 1996.
5. Microprocessor Architecture Programming & Applications, R. Gaonkar, Wiley Eastern-1987.
6. Computer Architecture and Organization by N.P. Carter, 4th Edition, McGraw-Hill, 2014

BACHELOR OF COMPUTER APPLICATION PROGRAMME IV Sem

Credits	L	T	P	Course Code	Course Title
04	3	0	0	BCA-204	Database management

Unit – I

Database Management System

Introduction to Databases and Transactions. What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management,

Unit- II

Data Models The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction.

Unit-III

Database Design ,ER-Diagram and Unified Modeling Language Database design and ER Model: overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, weak entity sets, Codd's rules, Relational Schemas, Introduction to UML Relational database model: Logical view of data, keys, integrity rules.

Relational Database design: features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF).

Unit- IV

Relational Algebra and Calculus Relational algebra: introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison. Calculus: Tuple relational calculus, Domain relational Calculus, calculus vs algebra, computational capabilities.

Unit- V

Constraints, Views and SQL .What is constraints, types of constrains, Integrity constraints, Views: Introduction to views, data independence, security, updates on views, comparison between tables and views SQL: data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers.

Unit-VI

Transaction management and Concurrency control

Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks),Time stamping methods, optimistic methods, database recovery management

Text books:

1. "Database System Concepts" by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan
2. "Fundamentals of Database Systems" by Ramez Elmasri and Shamkant B. Navathe
3. Database Management Systems" by Raghu Ramakrishnan and Johannes Gehrke
4. "SQL Performance Explained" by Markus Winand
5. The Data Warehouse Toolkit" by Ralph Kimball and Margy Ross

BACHELOR OF COMPUTER APPLICATION PROGRAMME IV Sem

Credits	L	T	P	Course Code	Course Title
04	3	0	0	BCA-208	Programming inPython

Unit I

Basics: Python Interpreter, writing code in Jupyter Notebook, Indentation, comments, importing a module, binary operators, standard scalar data types, type casting, if-else statements, loops(while, for), pass, range, ternary expressions.

Unit II

Data Structures and Sequences: Tuples, Lists and slicing, Built-in Sequence functions, Dictionary, Sets; List, Set, and Dict Comprehensions. Functions: Namespaces, Scope, and Local Functions; Returning Multiple Values.

Unit III

Functions: Anonymous (Lambda) Functions, Partial Argument Application, Generators. Objects and Methods in Python. NumPy: creating N-dimensional arrays, arithmetic with NumPy arrays, basic indexing and slicing, Pseudorandom number generation.

Unit IV

Pandas: Overview of Series and DataFrames, reading data from csv file,

Data Frame operations- working with data using functions like head, tail t, info, shape, reshape, columns, isnull, dropna, mean, sum, describe, value_counts,corr, loc, iloc, apply.

Unit V

Matplotlib- plotting basic figures, subplots, line plots, bar plots, histograms, scatter plots. Overview of Scikit-learn, SciPy, networkx. Basic Errors and Exception handling. Basic File Handling. Applications of python.

Suggested Readings:

1. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Ipython, by Wes McKinney, O'Reilly Media, 2017

BACHELOR OF COMPUTER APPLICATION PROGRAMME V Sem

Credits	L	T	P	Course Code	Course Title
04	3	0	0	BCA-303 (a)	Mobile Application Development

UNIT – I

Mobile Application Development - Mobile Applications and Device Platforms - Alternatives for Building Mobile Apps -Comparing Native vs. Hybrid Applications -The Mobile Application

Development Lifecycle-The Mobile Application Front-End-The Mobile Application Back-EndKey Mobile Application Services-What is Android-Android version history-Obtaining the Required Tools- Launching Your First Android Application-Exploring the IDE- Debugging Your Application-Publishing Your Application

UNIT – II

Understanding Activities-Linking Activities Using Intents-Fragments-Displaying Notifications Understanding the Components of a Screen-Adapting to Display Orientation- Managing Changes to Screen Orientation- Utilizing the Action Bar-Creating the User Interface Programmatically Listening for UI Notifications

UNIT – III

Using Basic Views-Using Picker Views -Using List Views to Display Long Lists- Understanding Specialized Fragments - Using Image Views to Display Pictures -Using

Menus with Views Using WebView- Saving and Loading User Preferences-Persisting Data to Files-Creating and Using Databases.

UNIT – IV

Sharing Data in Android-Creating Your Own Content Providers -Using the Content Provider SMS Messaging -Sending Email-Displaying Maps- Getting Location Data- Monitoring a Location.

UNIT – V

Consuming Web Services Using HTTP-Consuming JSON Services- Creating Your Own Services - Binding Activities to Services -Understanding Threading.

BACHELOR OF COMPUTER APPLICATION PROGRAMME VI Sem

Credits	L	T	P	Course Code	Course Title
04	3	0	0	BCA-302	Machine learning

UNIT I

INTRODUCTION TO MACHINE LEARNING: Machine Learning basic concepts, Perspectives and Issues in Machine Learning, Types of Machine Learning, supervised – unsupervised – reinforcement, Data Representations: Data representation, Numerical representation, Graph representation, Applications of Machine Learning.

UNIT II

SUPERVISED LEARNING: Nearest-Neighbours, Decision Trees, Naïve Bayes, Linear classification, univariate linear regression, multivariate linear regression, regularized regression, Logistic regression, Support Vector Machines, Nonlinearity and Kernel Methods.

UNIT III

UNSUPERVISED LEARNING: Clustering: K-means, Kernel K-means, Cluster analysis, Vector Quantization, Self-Organizing Feature Map, Association Rule Mining: Apriority algorithms

UNIT IV

TECHNIQUES AND APPLICATIONS: Scalable Machine Learning, Introduction to Bayesian Learning and Inference, Recent trends in various learning techniques of machine learning and classification methods.

Text Books/Reference Books

1. Kevin Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 2012
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, "The Elements of Statistical Learning", Springer 2009 (freely available online)
3. Ethem Alpaydin, —Introduction to Machine Learning 3e (Adaptive Computation and Machine Learning Series)l, Third Edition, MIT Press, 2014
4. Tom M Mitchell, —Machine Learningl, First Edition, McGraw Hil Education

BTECH CSE IV SEM 2022-23

Category	Code	Course title	Hours Per week			Credit
			L	T	P	
PCC	PCC-CSE-209	Digital Electronics	4	1	0	5

Unit –I

Overview of electronics: Electronic Components-Resistor, capacitor and Inductors, Semiconductor devices: Diodes, transistors (BJT and FET). Integrated circuits, Popular IC packages, Analog vs digital electronics, Transistor as a switch.

Boolean algebra: Representation of values and complements, De’Morgans theorem-simplifying expressions.

Unit –II

Logic gates: AND, OR, NOT, XOR, XNOR, NAND, NOR gates and their truth tables, combining logic circuits for expressions using NAND and NOR gates, Logic circuit families and characteristics, SSI, MSI, LSI and VLSI circuits. Combinational and sequential circuits: (Simple block diagrams, truth tables and IC packages only required).

Adders, decoders, multiplexers, encoder circuits , Flip-flops: RS, clocked RS, JK, D and T flip flops, Master-slave flip flops, edge and level triggering, Multivibrators - A stable, Bistable, Monostable, counters-ripple and decade. Registers, latches and Tristate buffers.

Unit –III

Building blocks of a computer system: Basic building blocks-I/O, memory, ALU, Control and their interconnections, Control unit and its functions- Instruction-word, Instruction execution cycle, organizational sequence of operation of control registers; controlling of arithmetic operations; branch, skip, jump and shift instructions, ALU-its components.

Unit –IV

Addressing techniques and registers: Addressing Techniques-Direct, immediate addressing; paging, relative, Indirect and indexed addressing. Memory buffer register; accumulators; Registers-Indexed, General purpose, Special purpose; overflow, carry, shift, scratch registers; stack pointers; floating point; status information and buffer registers

Unit –V

Memory: Main, RAM, static and Dynamic, ROM, EPROM, EAROM, EEPROM, Cache and Virtual memory.

Interconnecting System components: Buses, Interfacing buses, Bus formats-address, data and control, Interfacing keyboard, display, auxiliary storage devices, and printers. I/O cards in personal computers. Development of Indian Super Computer ‘PARAM’: History, Characteristics, Strengths, Weakness and basic Architecture.

Text / Reference Books

1. A.S.Tannenbaum : Structured Computer Organization, Pearson
2. Thomas C. Bartee : Digital Computer Fundamentals, McGraw-Hill
3. Duglus V Hall : Microprocessors and Interfacing: programming and Hardware, McGraw-Hill, 1986.
4. Introduction to Computer Architecture, Stone S.Galgotia Publicatons 1996.
5. Microprocessor Architecture Programming & Applications, R. Gaonkar, Wiley Eastern-1987.
6. Computer Architecture and Organization by N.P. Carter, 4th Edition, McGraw-Hill, 2014

MBA III SEM 2022-23

Code	Course title	Hours Per week			Credit
		L	T	P	
MGTM301S	ESSENTIALS OF SUPPLY CHAIN MANAGEMENT	3	0	0	4

UNIT I- Introduction to Supply Chain Management

Basic Concept & Philosophy of Supply Chain Management; Essential features, various flows (cash, value and information); Key Issues in SCM; benefits and case examples

UNIT II- Logistics Management and Purchasing & Vendor management

Logistics as part of SCM, Logistics costs, Inbound and outbound logistics, bullwhip effect in logistics, Centralized and decentralized purchasing, functions of purchase department and purchase policies, single vendor concept, management of stores.

UNIT III- Inventory Management in SC

Inventory fundamentals, Basic EOQ models; Inventory review policies; Just-in-time manufacturing; Kanban System of Inventory Management, Enterprise resource planning.

UNIT IV- Strategic Issues in Supply Chain

Quick Response Systems, Vendor Management Inventory, Supplier Relationship, Supplier Certification; Supplier Selection Process, Supplier Contracts, Mass Customization & Principle of Postponement, Role of network design in Supply Chains.

UNIT V- Warehousing decisions & Emerging Issues

Warehousing and its uses and types; Total distribution concepts, Integrated logistics, Materials handling, Packaging and transportation system.

TEXT BOOKS

- Chopra, S., & Meindl, P. (2007). Supply chain management (3rd ed.). Pearson.
- Raghuram, G. (2000). Logistics and supply chain management (1st ed.). Macmillan.
- Sahay, B. S. (2003). Supply chain management (1st ed.). Macmillan.
- Agarwal, D. K. (2003). A text book of logistics and supply chain management (1st ed.). Macmillan.

Note: Latest edition of readings may be used

Teaching Learning Process

Interactive class room sessions with the help of power point presentations, case discussions and Group discussions to ensure active participation and continuous learning.

Assessment Methods

Class tests/Assignments, Class participation, Presentations, End-semester examination

Keywords

Supply Chain Management, Just-in-time, Enterprise resource planning, Integrated logistics, Materials handling

MBA III SEM 2022-23

Code	Course title	Hours Per week			Credit
		L	T	P	
MGTM302S	Procurement Management	3	0	0	4

Unit-I: Introduction to Procurement management

Function of procurement, purchasing cycle, roles in the purchasing organization for a large project, contribution of shipping and freight forwarding agents in procurement management, preparation of purchase specifications, nature and relevance of purchase requisition, importance of procurement management.

Unit-II: Supplier Selection

Supplier identification, Key issues in Supplier selection, Supplier selection Methods, Contract with the supplier, bidding process, Bargaining and Negotiation.

Unit-III: Sourcing

Global sourcing and international procurement, problems associated with international sourcing and recommend solutions, nature of arbitration in international sourcing, implications of customs and countertrade in global sourcing.

Unit-IV: Outsourcing

Meaning and nature of outsourcing; Methodologies of outsourcing; Drawbacks of outsourcing and ways of avoiding or managing such drawbacks.

Unit-V: E-Procurement Systems

Meaning by an e-procurement system, Benefits of e-procurement, barriers to e-procurement, and key indicators for measuring the benefits of e-procurement.

TEXT BOOKS

- Bailey, P., Farmer, D., Jessop, D., & Jones, D. (2008). *Procurement: Principles and management*. Prentice Hall.
- Lysons, K., & Farrington, B. (2008). *Excellence in procurement: How to optimise costs and add value*. Kogan
- Menon, K. S. (2010). *Purchasing and materials management*.

Note: Latest edition of readings may be used

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Keywords

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MBA III SEM 2022-23

Code	Course title	Hours Per week			Credit
		L	T	P	
MGTM303S	Service Operations Management	3	0	0	4

Unit I: Introduction to Service Operations Management

- Nature and characteristics of services
- The role of services in the economy
- Service strategy and competitiveness
- Service process design and service blueprinting
- Service encounter and customer experience management

Unit II: Service Design and Delivery

- Service product development and innovation
- Designing the service delivery system
- Facility location and layout in services
- Managing service supply relationships
- Technology in service operations (self-service, automation, AI)

Unit III: Service Quality Management

- Dimensions of service quality
- SERVQUAL model and its application

- Managing customer expectations and perceptions
- Techniques for measuring service quality
- Continuous improvement in service operations (Six Sigma, Lean)

Unit IV: Capacity and Demand Management in Services

- Service capacity planning and management
- Strategies for managing service demand (yield management, pricing, promotions)
- Inventory management in services
- Scheduling and workforce management in service operations
- Managing queues and customer wait times

Unit V: Service Recovery and Supply Chain Management

- Service recovery strategies and systems
- Managing service failures and customer complaints
- Integration of service supply chains
- Outsourcing and offshoring of services
- Ethical issues in service operations

TEXTBOOKS

- Fitzsimmons, J. A., & Fitzsimmons, M. J. (2013). **Service Management: Operations, Strategy, Information Technology** (8th ed.). McGraw-Hill Education.
- Haksever, C., & Render, B. (2013). **Service Management: An Integrated Approach to Supply Chain Management and Operations** (2nd ed.). Pearson Education.
- Metters, R. D., King-Metters, K. H., Pullman, M. E., & Walton, S. (2006). **Successful Service Operations Management** (2nd ed.). Thomson South-Western.
- Johnston, R., & Clark, G. (2008). **Service Operations Management: Improving Service Delivery** (3rd ed.). Pearson Education.

Note: Latest edition of readings may be used

Teaching Learning Process

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Assessment Methods

Class tests/Assignments, Class participation, Presentations, End-semester examination

Keywords

Service Operations, Service Design, Service Quality, Capacity Management, Service Recovery, Service Supply Chain, Service Strategy, Customer Experience, Technology in Services

MBA IVSEM 2022-23

Code	Course title	Hours Per week			Credit
		L	T	P	
MGTM-404S	APPLICATION OF QUALITY MANAGEMENT	3	0	0	4

Unit I: Introduction to Quality Management

- Evolution of Quality Management: Historical perspective, key contributors.
- Definitions and Concepts: Quality, quality control, quality assurance, and quality management.
- Quality Management Philosophies: Deming, Juran, Crosby, and Ishikawa.
- Importance of Quality in Business: Customer satisfaction, cost of quality, and competitive advantage.

Unit II: Quality Management Tools and Techniques

- Basic Quality Tools: Flowcharts, check sheets, Pareto charts, cause-and-effect diagrams, histograms, scatter diagrams, and control charts.
- Advanced Quality Tools: Failure Mode and Effects Analysis (FMEA), Design of Experiments (DOE), and Statistical Process Control (SPC).
- Quality Function Deployment (QFD) and its application in product design.
- Benchmarking and its role in quality improvement.

Unit III: Total Quality Management (TQM)

- Principles of TQM: Customer focus, continuous improvement, employee involvement.
- TQM Implementation: Strategies, challenges, and best practices.
- Role of Leadership in TQM: Creating a quality culture, management commitment.
- Case Studies: TQM in manufacturing and service industries.

Unit IV: Six Sigma and Lean Management

- Six Sigma Methodology: DMAIC (Define, Measure, Analyze, Improve, Control) process.
- Six Sigma Tools: Process mapping, root cause analysis, regression analysis.
- Lean Management: Principles, tools, and techniques.
- Integrating Lean and Six Sigma for operational excellence.

Unit V: Quality Management in the Global Context

- International Quality Standards: ISO 9000, ISO 14000, and other relevant standards.
- Quality Audits: Purpose, process, and benefits.
- Quality in Supply Chain Management: Supplier quality management, outsourcing.
- Sustainability and Quality: Environmental quality management, corporate social responsibility(CSR).

TEXT BOOKS:

- Evans, J. R., & Lindsay, W. M. (2017). *Managing for Quality and Performance Excellence* (10th ed.). Cengage Learning.
- Dale, B. G., Van der Wiele, T., & Van Iwaarden, J. (2013). *Managing Quality* (6th ed.). Wiley.
- Goetsch, D. L., & Davis, S. B. (2014). *Quality Management for Organizational Excellence: Introduction to Total Quality* (7th ed.). Pearson.
- Montgomery, D. C. (2012). *Introduction to Statistical Quality Control* (7th ed.). Wiley.
- Pyzdek, T., & Keller, P. (2014). *The Six Sigma Handbook* (4th ed.). McGraw-Hill Education.

Note: Latest edition of readings may be used

Teaching Learning Process

Interactive class room sessions with the help of power point presentations, case discussions and Group discussions to ensure active participation and continuous learning.

Assessment Methods

Class tests/Assignments, Class participation, Presentations, End-semester examination

Keywords

Quality Management; Total Quality Management (TQM); Six Sigma; Lean Management; Continuous Improvement; Customer Satisfaction; ISO Standards

MBA IVSEM 2022-23

Code	Course title	Hours Per week			Credit
		L	T	P	
MGTM-405S	PROCESS MANAGEMENT AND CONSULTANCY	3	0	0	4

Unit-I: Introduction to Business Process Management

Process Management Lifecycle, Process Architectures, Core versus Support Processes, Process Modeling, People-Centric and System Centric Processes, Preparing a Process for Automation, Workflow and Decisions, Task and Resource Allocation, Process Improvement.

Unit-II: Business Process Reengineering

Introduction to BPR, Need for reengineering, BPR and Performance improvement, Pitfalls and Myths of BPR.

Unit-III: BPR in Action

BPR and management concepts: TQM, Quality Function Deployment, ISO Standards, ERP. BPR implementation methodology, success factors of BPR, BPR in manufacturing Industry, Change management in BPR.

Unit-IV: Consultancy

Consultants: Types, Skills and Values, Consulting as a Profession, Marketing and Selling of Consulting Services, The Changing Consulting Industry.

Unit-V: Trends in Consultancy

Strategic and Organization Information Technology Consulting, Strategic Marketing Consulting, Strategy and Operations Management Consulting, Consulting to CEOs and Boards, Consulting in the Public and Not-for-profit Sector, Consulting to Global Clients, Intervention and Change, Merger and Acquisition Integration, The Future of Consulting.

TEXT BOOKS:

- Harmon, P. (2007). *Business process change: A guide for business managers and BPM and Six Sigma professionals* (2nd ed.). Morgan Kaufmann.
- Barcus, S. W., & Wilkinson, J. W. (Eds.). (1986). *Handbook of management consulting services*. McGraw-Hill.
- Dey, B. R. (2001). *Business process reengineering and change management*. Wiley.

- Bell, C. R., & Nadler, L. (1990). *Clients and consultants: Meeting and exceeding expectations* (2nd ed.). Gulf Publishing Company.
 - Connor, D. (1995). *Increasing revenue from your clients*. John Wiley & Sons.
 - Connor, D., & Davidson, J. (1990). *Marketing your consulting and professional services*. John Wiley & Sons.
 - Holtz, H. (1990). *Choosing and using a consultant*. John Wiley & Sons.
 - Sethi, V., & King, W. R. (1998). *Organizational transformation through BPR*. Pearson.
- Note: Latest edition of readings may be used**

Teaching Learning Process

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Assessment Methods

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Keywords

Business Process Management, Business Process Reengineering (BPR), ISO Standards, Merger and Acquisition

MBA IVSEM 2022-23

Code	Course title	Hours Per week			Credit
		L	T	P	
MGTM-406S	BIG DATA ANALYTICS	3	0	0	4

Unit I: Introduction to Big Data

- Overview of Big Data: Definition, characteristics, and significance.
- Types of Big Data: Structured, semi-structured, and unstructured data.
- Big Data vs. Traditional Data: Challenges and opportunities.
- Big Data Technologies: Hadoop, NoSQL databases, and data warehousing.

Unit II: Data Collection, Storage, and Processing

- Data Sources: Social media, sensors, transactions, etc.
- Data Storage: Distributed file systems, Hadoop Distributed File System (HDFS).
- Data Processing: MapReduce, parallel processing, and in-memory computing.
- Data Quality and Pre-processing: Cleaning, integration, and transformation.

Unit III: Data Analytics Techniques

- Descriptive Analytics: Statistical methods, data summarization.
- Predictive Analytics: Regression analysis, classification, and clustering.
- Prescriptive Analytics: Optimization, simulation, and decision analysis.
- Advanced Analytics: Machine learning, neural networks, and deep learning.

Unit IV: Data Visualization and Interpretation

- Data Visualization Tools: Tableau, Power BI, and D3.js.
- Techniques for Visualizing Large Datasets: Dashboards, infographics, and interactive visualizations.
- Interpreting Data: Trends, patterns, and anomalies.
- Storytelling with Data: Communicating insights effectively.

Unit V: Applications and Ethical Considerations

- Big Data in Industry: Case studies in finance, healthcare, marketing, and supply chain management.
- Ethical and Legal Considerations: Privacy, security, and governance in big data.
- Challenges in Big Data Analytics: Data privacy, bias, and transparency.
- Future Trends in Big Data: AI integration, real-time analytics, and edge computing.

TEXT BOOKS:

- Mayer-Schönberger, V., & Cukier, K. (2013). *Big Data: A Revolution That Will Transform How We Live, Work, and Think*. Houghton Mifflin Harcourt.
- Provost, F., & Fawcett, T. (2013). *Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking*. O'Reilly Media.
- Zikopoulos, P. C., Eaton, C., deRoos, D., Deutsch, T., & Lapis, G. (2012). *Understanding BigData: Analytics for Enterprise Class Hadoop and Streaming Data*. McGraw-Hill Osborne Media.

Note: Latest edition of readings may be used

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Keywords

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Merger and Acquisition