B.TECH
COMPUTER SCIENCE AND BUSINESS SYSTEM SEMESTER VIII SYLLABUS

SCHOOL OF INFORMATION TECHNOLOGY, RGPV BHOPAL

SYLLABUS

B.Tech(Computer Science and Business System) VIII Semester

CB-801 SERVICES SCIENCE & SERVICE OPERATIONAL MANAGEMENT

Objectives:

- Understand the services and service operations management concepts.
- Comprehend the techniques of service operations.
- Understand the service quality and service design aspects.
- Understand the service innovation aspects.
- To analyse how services are different from products by its characteristics.

UNIT-I INTRODUCTION

Introduction to the course, Introduction to service operations, Role of service in economy and society, Introduction to Indian service sector. Nature of Services and Service Encounters: Differences between services and operations, Service package, characteristics, various frameworks to design service operation system, Kind of service encounter, importance of encounters. Service-Dominant Logic: From Goods-Dominant logic to Service-Dominant logic, Value co-creation.

UNIT-II SERVICE STRATEGY AND COMPETITIVENESS

Development of Strategic Service Vision (SSV), Data Envelopment Analysis-New Service Development: NSD cycle, Service Blueprinting, Elements of service delivery system - Service Design: Customer Journey and Service Design, Design Thinking methods to aid Service Design Locating facilities and designing their layout: models of facility locations (Huff's retail model), Role of service-scape in layout design - Service Quality: SERVQUAL, Walk through Audit, Dimensions of Service quality & other quality tools.

UNIT-III SERVICE GUARANTEE & SERVICE RECOVERY

Service quality GAP analysis, Service guarantee-Service encounter-service profit chain.

UNIT-IV FORECASTING DEMAND FOR SERVICES

Types of demand forecasting methods for Managing Capacity and Demand: Strategies for matching capacity and demand, managing waiting line in services. Managing Facilitating Goods: inventory models, Role of inventory in services - Managing service supply relationship: Understanding the supply chain, Strategies for managing suppliers of service - Vehicle Routing Problem: understanding services that involve transportation of people and vehicle.

UNIT-V SERVICE INNOVATION

Services Productivity, Need for Services Innovation, service innovation in different service sector – educational, health and hospitality sectors.

LABORATORY

Perform lab on the basis of following primary activities of operations management:
Job design, scheduling, materials management, capacity management, facilities management, and quality management.

Course Outcomes:

On completion of the course, the students will be able to

- Understand concepts about services and distinguish it from goods.
- Able to identify characteristics and nature of services.
- Comprehend ways to design services and evaluate them using service qualities.
- Understand how various methods can be used to operate and manage service businesses.
- Understand how innovation can be approached from services point of view.

Text Book:

1 Fitzsimmons & Fitzsimmons, “Service Management: Operations, Strategy, Information Technology”, McGraw Hill publications, 7th Edition, 2017.

2 Christopher H.Lovelock and JochenWirtz, “Services Marketing”, Pearson Education, New Delhi, 7th Edition, 2011.

3 Richard Metters, Karthryn King-Metters, Madeleine pullman, Steve Walton, “Successful Service Operations Management”, South-Western, Cengage Learning, 2nd Edition, 2008.

4 Cengiz Haksever, Barry Render, Roberta S Russell, Pobert G Mirdick, “Service Management and Operations”, Pearson Education, 2nd Edition, 2000.

Reference Books:

1. Wilson, A., Zeithaml, V. A., Bitner, M. J., & Gremler, D. D., " Services marketing: Integrating customer focus across the firm", McGraw Hill, 2012
2. Lovelock, C,Services, " Marketing", Pearson Education India, 7th Edition ,2011.
3. Robert Johnson, Graham clark, "Service Operations Management", Pearson Education, 2nd Edition, 2005.
4. Reason, Ben, and Lovlie, Lavrans, "Service Design for Business: A Practical Guide to Optimizing the Customer Experience", Pan Macmillan India, 2016.
5. Chesbrough, H, "Open Services Innovation: Rethinking Your Business To Grow and Compete in a New Era". John Wiley & Sons, 2010.

SCHOOL OF INFORMATION TECHNOLOGY, RGPV BHOPAL

CB-802 IT PROJECT MANAGEMENT

Objectives:

- Gain knowledge on fundamental concepts of project and project scheduling.
- Understand Project Cost Control, Scheduling and Management Features.
- Obtain knowledge on Agile Project Management.
- Know about the Scrum framework in detail.
- Obtain knowledge on DevOps and its related concepts.

UNIT-I PROJECT OVERVIEW AND PROJECT SCHEDULING

Project Overview and Feasibility Studies: Identification, Market and Demand Analysis, Project Cost Estimate, Financial Appraisal- Project Scheduling: Project Scheduling, Introduction to PERT and CPM, Critical Path Calculation, Precedence Relationship, Difference between PERT and CPM, Float Calculation and its importance, Cost reduction by Crashing of activity.

UNIT-II COST CONTROL, SCHEDULING AND MANAGEMENT FEATURES

Cost Control and Scheduling: Project Cost Control (PERT/Cost), Resource Scheduling & Resource Leveling - Project Management Features: Risk Analysis, Project Control, Project Audit and Project Termination.

UNIT-III AGILE PROJECT MANAGEMENT

Agile Project Management: Introduction, Agile Principles, Agile methodologies, Relationship between Agile Scrum, Lean, DevOps and IT Service Management (ITIL). Other Agile Methodologies: Introduction to XP, FDD, DSDM, Crystal.

UNIT-IV SCRUM

Scrum: Various terminologies used in Scrum (Sprint, product backlog, sprint backlog, sprint review, retro perspective), various roles (Roles in Scrum), Best practices of Scrum, Case Study.

UNIT-V DEVOPS

DevOps: Overview and its Components, Containerization Using Docker, Managing Source Code and Automating Builds, Automated Testing and Test Driven Development, Continuous Integration, Configuration Management, Continuous Deployment, Automated Monitoring, Case Study.

List of Experiments

A mini-project to be identified in the given domain (Crowd Source System, Day Book, Smart Transport System, Resume Builder, E-Commerce, Expert System, Puzzle Corner) to apply the IT Project Management Principles.

1. Estimation of project cost and control activity using open-source tools.
2. Scheduling of project with PERT and CPM techniques to estimate the completion time.
3. Assessment of IT Project Risk Analysis using open-source tools.
4. Perform IT Project Audit and generate a report using open-source tools.
5. Study of Agile project management tools.
6. Application of Scrum practices in the project.
7. Design and perform automated testing.

Course Outcomes:

On completion of the course, the students will be able to

- Learn to effectively plan, and schedule projects within time and cost targets.
- Have Knowledge in Cost Control, Scheduling and Management Features.
- Be aware of different Agile Project Methodologies.
- Know in detail about Scrum.
- Obtain good knowledge in DevOps.

Text Book:

1. Mike Cohn, “Succeeding with Agile: Software Development Using Scrum”, Addison-Wesley Professional Publisher, 1st Edition, 2009.

Reference Bookss:

1. Roman Pichler, “Agile Product Management with Scrum”, Addison-Wesley publisher, 1st Edition, 2010.
2. Ken Schwaber, “Agile Project Management with Scrum (Microsoft Professional)”, Microsoft Press US publisher, 1st Edition, 2004.

SCHOOL OF INFORMATION TECHNOLOGY, RGPV BHOPAL

CB-803 MARKETING RESEARCH & MARKETING MANAGEMENT

Objectives:

- The course will enable in understanding the concepts of marketing with respect to the changing business environment. It will also provide a balance of the theoretical and practical aspects of marketing research and encourage the students to take up a critical and analytical thinking through research.

UNIT-I MARKETING CONCEPTS

Introduction to marketing —Core concepts — Marketing of Services ; importance of marketing in service sector — Marketing planning and Environment ; Elements of marketing mix; analyzing the needs and trends in Environment- Macro, Economical, Political, Technical and Social — Understanding the Consumers – Determinants and factors - Market Segmentation – Meaning and concept; Basis of segmentation, selection of segments, Segmentation strategies, Target marketing, target Positioning.

UNIT-II PRODUCT MANAGEMENT

Product Life cycle concept, New Product development & strategy, Stages in New Product development, Product decision and strategies, Branding & packaging.

UNIT-III PRICING, PROMOTION AND DISTRIBUTION STRATEGY

Policies & Practices – Pricing Methods & Price determination Policies. Marketing Communication – The promotion mix, Advertising & Publicity, 5 M's of Advertising Management. Marketing Channels, Retailing, Marketing Communication, Advertising.

UNIT-IV MARKETING RESEARCH

Introduction, Type of Market Research, Scope, Objectives & Limitations - Marketing Research Techniques, Survey Questionnaire design & drafting, Pricing Research, Media Research, Qualitative Research.

Data Analysis: Use of various statistical tools – Descriptive & Inference Statistics, Statistical Hypothesis Testing, Multivariate Analysis - Discriminant Analysis, Cluster Analysis, Segmenting and Positioning, Factor Analysis.

UNIT-V INTERNET MARKETING

Introduction to Internet Marketing. Mapping fundamental concepts of Marketing (7Ps, STP); Strategy and Planning for Internet Marketing. **Business to Business Marketing:** Fundamental of business markets. Organizational buying process. Business buyer needs. Market and sales potential. Product in business markets. Price in business markets. Place in business markets. Promotion in business markets. Relationship, networks and customer relationship management. Business to Business marketing strategy

Course Outcomes:

On completion of the course, the students will be able to

- Understand the basic marketing concepts.
- Comprehend the dynamics of marketing and analyze how various components interact with each other in the real world.
- Leverage marketing concepts for effective decision making.
- Understand the basic concepts and the application of statistical tools in marketing research.
- Understand internet marketing, Business to Business marketing, Promotion in business markets, CRM and Strategies adopted in B2B markets.

Text Books:

1. Philip Kotler and Kevin Lane Keller, "Marketing Management", PHI 14th Edition, 2012.
2. Donald R. Cooper, Pamela S. Schindler and J K Sharma, "Business Research Methods", 11th Edition, Tata McGraw Hill, New Delhi, 2012.
3. Uma Sekaran and Roger Bougie, "Research methods for Business", 5th Edition, Wiley India, New Delhi, 2012.
4. KS Chandrasekar, "Marketing management-Text and Cases", Tata McGraw Hill First edition, 2010.

Reference Books:

1. Paul Baines, Chris Fill and Kelly Page, "Marketing", Oxford University Press, 2nd Edition, 2011.
2. William G Zikmund, Barry J Babin, Jon C.Carr, Atanu Adhikari,Mitch Griffin, "Business Research methods, A South Asian Perspective", 8th Edition, Cengage Learning, New Delhi, 2012.

SCHOOL OF INFORMATION TECHNOLOGY, RGPV BHOPAL

CB-804(A) BEHAVIORAL ECONOMICS

Objectives:

- To understand the concept and theory of economics.
- To acquire knowledge on the choices and behavior of firms, households and other economics entities.
- To learn the behavioral science perspective in economics.
- To know the current ideas and concepts regarding decision making in economics.
- To study the intertemporal choice in economics.

UNIT-I INTRODUCTION

The neoclassical/standard model and behavioral economics in contrast; historical background; behavioral economics and other social sciences; theory and evidence in the social sciences and in behavioral economics; applications – gains and losses, money illusion, charitable donation.

UNIT-II BASICS OF CHOICE THEORY

Revisiting the neoclassical model; utility in economics and psychology; models of rationality; connections with evolutionary biology and cognitive neuroscience; policy analysis – consumption and addiction, environmental protection, retail therapy; applications – pricing, valuation, public goods, choice anomalies.

UNIT-III BELIEFS, HEURISTICS AND BIASES

Revisiting rationality; causal aspects of irrationality; different kinds of biases and beliefs; self-evaluation and self-projection; inconsistent and biased beliefs; probability estimation; trading applications – trade in counterfeit goods, financial trading behavior, trade in memorabilia, policy analysis – norms and markets, labor markets, market clearing, public goods; applications – logic and knowledge, voluntary contribution, compensation design.

UNIT-IV CHOICE UNDER UNCERTAINTY

Background and expected utility theory; prospect theory and other theories; reference points; loss aversion; marginal utility; decision and probability weighting; applications – ownership and trade, income and consumption, performance in sports. Strategic choice-Review of game theory and Nash equilibrium – strategies, information, equilibrium in pure and mixed strategies, iterated games, bargaining, signaling, learning; applications – competitive sports, bargaining and negotiation, monopoly and market entry.

UNIT-V INTERTEMPORAL CHOICE

Geometric discounting; preferences over time; anomalies of inter-temporal decisions; hyperbolic discounting; instantaneous utility; alternative concepts – future projection, mental accounts, heterogeneous selves, procedural choice; policy analysis – mobile calls, credit cards, organization of government; applications – consumption and savings, clubs and membership, consumption planning.

Individual preferences; choice anomalies and inconsistencies; social preferences; altruism; fairness; reciprocity; trust; learning; communication; intention; demographic and cultural aspects; social norms; compliance and punishment; inequity aversion.

Course Outcomes:

On completion of the course, the students will be able to

- Understand and apply various concepts in traditional and modern Microeconomics.
- Focus on decision making, and develop a holistic understanding of these concepts and their interconnections.
- Explore the knowledge on behavioral science perspective in Economics.
- Understand current ideas and concepts regarding decision making in Economics.
- Students will be able to understand the intertemporal choice in Economics.

Text Books:

1. N. Wilkinson and M. Klaes , “An Introduction to Behavioral Economics”, 2017.
2. Paul A. Samuelson, William D. Nordhaus, Sudip Chaudhuri and AnindyaSen, “Economics”, 19th edition, Tata McGraw Hill, 2010.
3. M.L.Trivedi, “Managerial Economics:Theory & Applications”, Tata McGraw-Hill Education, 4th Edition, 2002.
4. Robert H. Frank, 2014, “Microeconomics and Behaviour”, McGraw-Hill, 9th Edition, 2014.
5. Philip Corr, Anke Plagnol, “Behavioral Economics: The Basic”, Routledge; 1st edition, 2018.

Reference Books:

1. William Boyes and Michael Melvin, “Textbook of Economics”, DTECH, 6th Edition, 2004.
2. N. Gregory Mankiw, “Principles of Economics”, Thomson learning, 3rd Edition, 2003.
3. Richard Lipsey and Alec Charystal, “Economics”, Oxford, University Press, 12th Edition, 2011.

SCHOOL OF INFORMATION TECHNOLOGY, RGPV BHOPAL

CB-804(B) COMPUTATIONAL FINANCE & MODELING

Objectives:

- To make the students to understand how the techniques in computational finance applied in risk hedging and pricing of options.

UNIT-I NUMERICAL METHODS AND MODELS

Numerical methods relevant to integration, differentiation and solving the partial differential equations of mathematical finance- examples of exact solutions including Black Scholes and its relatives. Finite difference methods including algorithms and question of stability and convergence. Treatment of near and far boundary conditions-the connection with binomial models- interest rate model- early exercise- the corresponding free boundary problems. Introduction to numerical methods for solving multi-factor models.

UNIT-II BLACK-SCHOLES FRAMEWORK

Black-Scholes PDE: simple European calls and puts; put-call parity. The PDE for pricing commodity and currency options. Discontinuous payoffs - Binary and Digital options. Option Greeks and their role in hedging. The mathematics of early exercise - American options: perpetual calls and puts; optimal exercise strategy and the smooth pasting condition. Volatility considerations - actual, historical, and implied volatility; local volatility surfaces.

Simulation including random variable generation, variance reduction methods and statistical analysis of simulation output. Pseudo random numbers, Linear congruential generator, Mersenne twister RNG. The use of Monte Carlo simulation in solving applied problems on derivative pricing discussed in the current finance literature. The technical topics addressed include importance sampling, Monte Carlo integration, Simulation of Random walk and approximations to diffusion processes, martingale control variables, stratification, and the estimation of the "Greeks."

UNIT-III FINANCIAL PRODUCTS AND MARKETS

Introduction to the financial markets and the products which are traded in them: Equities, indices, foreign exchange, and commodities. Options contracts and strategies for speculation and hedging.

UNIT-IV APPLICATION AREAS

The pricing of American options- pricing interest rate dependent claims, and credit risk. The use of importance of sampling for Monte Carlo simulation of VaR for portfolios of options.

UNIT-V STATISTICAL ANALYSIS OF FINANCIAL RETURNS

Fat-tailed and skewed distributions, outliers, stylized facts of volatility, implied volatility surface, and volatility estimation using high frequency data. Copulas, Hedging in incomplete markets, American Options, Exotic options, Electronic trading, Jump Diffusion Processes, High-dimensional covariance matrices, Extreme value theory, Statistical Arbitrage.

Course Outcomes:

On completion of the course, the students will be able to

- Understand existing financial models in a quantitative and mathematical way.
- Apply these quantitative tools to solve complex problems in the areas of portfolio management, risk management and financial engineering.
- Explain the approaches required to calculate the price of options.
- Identify the methods required to analyze information from financial data and trading systems.
- Understand the various statistical methods to analyze the financial data.

Text Books

1. R. Seydel, "Tools for Computational Finance", 2nd edition, Springer-Verlag, New York, 2004
2. P. Glasserman, "Monte Carlo Methods in Financial Engineering", Springer-Verlag, New York, 2004.
3. W. Press, S. Teukolsky, W. Vetterling and B. Flannery, "Numerical Recipes in C: The Art of Scientific Computing", 1997. Cambridge University Press, Cambridge, UK. Available on-line at: http://www.nr.com/
4. A. Lewis, " Option Valuation under Stochastic Volatility", Finance Press, Newport Beach, California, 2000
5. A. Pelsser, "Efficient Methods for Valuing Interest Rate Derivatives", Springer-Verlag, New York, 2000.

SCHOOL OF INFORMATION TECHNOLOGY, RGPV BHOPAL

CB-804(C) PSYCHOLOGY

Objectives:

- Introduces students to the content areas of industrial psychology and the application of psychological theory to organizational issues. Topics include employment law, job analysis, recruitment and selection, training, performance appraisal and discipline, employee motivation, and workplace safety. Using an applied approach, this course will help prepare students for their roles as employees and managers.

UNIT-I

Industrial/Organizational Psychology : Research Methods, Statistics, and Evidence-based Practice, Introduction & Legal Context of Industrial Psychology, Job Analysis & Competency Modeling, Job Evaluation & Compensation, Job Design & Employee Well-Being, Recruitment.

UNIT-II

Identifying Criteria & Validating Tests and Measures, Screening Methods, Intensive Methods.

UNIT-III

Performance Goals and Feedback, Performance Coaching and Evaluation, Evaluating Employee Performance.

UNIT-IV

Employee Motivation, Satisfaction and Commitment, Fairness and Diversity.

UNIT-V

Leadership, Organizational Climate, Culture, and Development, Teams in Organizations, The Organization of Work Behavior, Stress Management: Demands of Life and Work.

Course Outcomes:

On completion of the course, the students will be able to

- Become conversant about the major content areas of Industrial Psychology.
- Gain further comfort with statistical concepts in the context of making personnel decisions.
- Gain practical experience by completing a series of hands-on projects involving job analysis, selection decisions, training programs, and employee well-being.
- Deepen your understanding of tests and measurements so that you can collect accurate information and make sound data-based decisions.
- Prepare for other focused seminar courses in Industrial/Organizational Psychology or Human Resource Management.

Text Books

1. Elmes, D., Kantowitz, B., & Roediger, H, "Research methods in psychology", Cengage Learning, 9th Edition, 2011.
2. Landy, F. J. and Conte, J. M, "Work in the 21st Century", Oxford: Blackwell Publishing, 4th Edition, 2013.
3. TV.Rao, "Performance Management towards Organizational Excellence", Sage, 2nd Edition, 2016.
4. Stephen Robbins, Tim Judge, Neharika Vohra, "Organizational Behaviour", Pearson, 18th Edition, 2019.
5. Pratibha Goyal , Alok Chakrawal , "Stress Management", Studera Press, 1st Edition, 2016.

Reference Books

1. Breakwell, G.M., Smith, J.A., &Wright, D.B, "Research methods in psychology", Sage, 4th Edition, 2012.

SCHOOL OF INFORMATION TECHNOLOGY, RGPV BHOPAL

CB-805(A) ENTERPRISE SYSTEMS

Objectives:

- Understand the concept of Simple Web Applications using MVC.
- Be exposed to different models in SOA and ERP.
- Be exposed to CRM models.
- Be exposed to interactive networks and applications.
- Be familiar with configuration of networking.

UNIT-I WEB APPLICATIONS USING MVC

Overview of Database Management Systems; Overview of Model - View - Control (MVC); Control (MVC) method of software development in a 3 tier environment - Tools and Technologies; Brief overview of the following : Java server pages; Related Java Technologies; Microsoft .NET framework; PHP; Ruby on Rails; JavaScript; Ajax; Angular/React JS.

UNIT-II SOA AND ERP MODELS

Service Oriented Architecture (SOA); Principles of loose coupling, encapsulation; Inter-operatibility; Web Services as the implementation vehicle protocols, usage; Enterprise Resource Planning (ERP); systems and their architecture; Overview of SAP and Oracle Applications; Generic ERP Modules : Finance; HR; Materials Management; Investment, etc. ; examples of Domain Specific Modules.

UNIT-III CRM MODELS

Electronic Data Exchange; Customer Relationship Management (CRM); Customer Relationship Management (CRM); Supplier Relationship Management (SRM) ; Security Issues - Authentication, Authorisation, Access control ; Roles; single-sign-on ; Directory servers, Audit trails; Digital signatures; Encryption: review of IPSec, SSL and other technologies; Simple Applications Demo; Case study.

UNIT-IV INTERACTIVE NETWORK AND APPLICATION

Overview of : MPLS ; Virtual Private Networks (VPN) ; Firewalls ; Network monitoring and enforcement of policies ; Software Acquisition Process ; Tendering; conditions of contract ; Commercial off the shelf software (COTS) versus Bespoke Implementations; Total cost of ownership; Issues on using Open source software or free software; Licensed software; Case study.

UNIT-V CONFIGURATION OF NETWORKING

Hardware Architectures for Enterprise Systems; Servers; Clustering; Storage area networks; Storage units; Back-up strategies; Local Area Network (LAN) technologies and products; Data Centres; Disaster recovery site design and implementation issues; Hardware Acquisition Issues; Case study.

List of Experiments

1. Create a Movie Database Application using MVC.
2. Creating an ASP.NET MVC Web Application Project.
3. Explore the client/server architecture of SAP. Learn how to use the user interface.
4. Create customer, material master data. Execute the sales process in SAP.
5. Create vendor, material master data for purchasing. Execute the Purchasing process in SAP.
6. A model of customer relationship management and business intelligence systems for catalogue and online retailers.
7. A model of customer relationship management and business intelligence systems for catalogue and online retailers with access control.
8. Configure firewall settings for an interactive network.
9. Configure and Implement a COTS.
10. Mini project.

Course Outcomes:

On completion of the course, the students will be able to

- Design and deploy Simple Web Applications using MVC.
- Design SOA and ERP models.
- Design of CRM models.
- Design interactive network and application.
- Manage Maintain and configuration of Networking.

Text Books:

1. Alexis Leon, "Enterprise Resource Planning", Tata McGraw Hill, 3rd Edition, 2017.
2. Alexis Leon, "Enterprise Resource Planning – Diversified",TMH, 2nd Edition.

Reference Books:

1. Ravi Shankar & S. Jaiswal, Galgotia, "Enterprise Resource Planning", 1st Edition, 1999.
2. Dr. Ravi Kalakota, "E-Business Network Resource planning using SAP R/3 Baan and Peoples soft: A Practical Roadmap For Success", Pearson, 2nd Edition, 2001.

SCHOOL OF INFORMATION TECHNOLOGY, RGPV BHOPAL

CB-805(B) ADVANCE FINANCE

Objectives:

- Imbibe knowledge about the decisions and decision variables in Finance.
- Comprehend the technique of making decisions related to finance function.

UNIT-I SOURCES OF FUNDS

Sources of Funds (including regulatory framework) Types of securities- Issuing the capital in market- Pricing of issue - Valuation of Stocks and bonds

Dividend Decisions: Traditional Approach, Dividend Relevance Model, Miller and Modigliani Model, Stability of Dividends, Forms of Dividends, Issue of bonus shares, Stock Split.

UNIT-II EVALUATION OF LEASE CONTRACTS

Evaluation of Lease Contracts- Corporate Restructuring -Mergers and Acquisitions- Types of Mergers, Evaluation of Merger Proposal-Take-over-Amalgamation-Leverage buy-out-Management buy-out-Corporate Failure and Liquidation.

UNIT-III FINANCIAL RESTRUCTURING

Share Split – Consolidation -Cancellation of Paid-up Capital -Other Mechanisms.

UNIT-IV WORKING CAPITAL MANAGEMENT

Working Capital Planning- Monitoring and Control of Working Capital-Working Capital Financing -Managing the Components of Working Capital- Cash Management- Receivable Management -Inventory Management.

UNIT-V INTRODUCTION TO DERIVATIVES

Basics of Futures, Forwards, Options, Swaps -Interest rate Payoff Diagrams, Pricing of Futures, Put Call Parity, Option Pricing using Binomial Model and Black Scholes Model -Use of Derivatives for Risk-Return Management- Credit Default Swaps

LABORATORY

Perform lab based on the case study of various financial schemes.

Course Outcomes:

On completion of the course, the students will be able to

- Understand the sources of funds including regulatory framework.
- Understand the Corporate Restructuring.
- Develop skills for the interpretation of business information and application of financial theory in corporate investment decisions.
- Predict the working capital requirements of a concern.
- Understand Basics of Derivatives.

Text Books

1. John.C.Hull, Options, "Futures and other Derivative Securities", PHI Learning, 9th Edition, 2012.
2. Fred Weston, Kwang S Chung, Susan E Hoag Mergers, "Restructuring And Corporate Control", Pearson Education, 4th Edition.
3. I.M.Pandey, "Financial Management", Vikas Publishing House Pvt. Ltd., 9th Edition, 2014.

Reference Books

1. Stulz, "Risk Management and Derivatives", Cengage Learning, 2nd Edition, 2011.
2. Rajinder S. Aurora, Kavita Shetty and Sharad R. Kale, "Mergers and Acquisitions", Oxford University Press, 2011.
3. M.Y.Khan and P.K.Jain, "Financial Management, Text, Problems and Cases", Tata McGrawHill,5th edition, 2008.

SCHOOL OF INFORMATION TECHNOLOGY, RGPV, BHOPAL

CB-805(C) IMAGE PROCESSING AND PATTERN RECOGNITION

Objectives:

- To learn the fundamentals of image formation and formats.
- To understand the intensity transformations and filtering techniques.
- To acquire knowledge on image segmentation operations.
- To learn the feature extraction and image registration process.
- To understand the components of colour image processing.

UNIT-I INTRODUCTION AND IMAGE FORMATION

Introduction - Image processing systems and its applications - Basic image file formats.
Image formation: Geometric and photometric models; Digitization - sampling, quantization; Image definition and its representation, neighborhood metrics.

UNIT-II INTENSITY TRANSFORMATIONS AND SPATIAL FILTERING

Enhancement, contrast stretching, histogram specification, local contrast enhancement; Smoothing, linear and order statistic filtering, sharpening, spatial convolution, Gaussian smoothing, DoG, LoG- Morphological Filtering Basics - Dilation and Erosion Operators, Top Hat Filters.

UNIT-III IMAGE SEGMENTATION

Pixel classification; Grey level thresholding, global/local thresholding; Optimum thresholding - Bayes analysis, Otsu method; Derivative based edge detection operators, edge detection/linking, Canny edge detector; Region growing, split/merge techniques, line detection, Hough transform.

UNIT-IV FEATURE EXTRACTION AND IMAGE REGISTRATION

Textural features - gray level co-occurrence matrix; Moments; Connected component analysis; Convex hull; Distance transform, medial axis transform, skeletonization/thinning, shape properties. Mono-modal/multimodal image registration; Global/local registration; Transform and similarity measures for registration; Intensity/pixel interpolation.

UNIT-V COLOUR IMAGE PROCESSING

Fundamentals of different Colour models - RGB, CMY, HSI, YCbCr, Lab; False Colour; Pseudo Colour; Enhancement.

List of Experiments

1 Write a program for Histogram Mapping and Equalization.
2 Write a program for Image Smoothening and Sharpening.
3 Write a program for Morphological Operations on Binary Images.
4 Write a program for Edge Detection using Sobel, Prewitt and Roberts Operators.
5 Write a program for Canny Edge Detector.
6 Write a program to calculate the GLCM of the given image.
7 Write a program to perform image registration of the given images.
8 Write a program to implement colour model conversion.
9 Write a program for pseudo-colour operation on the given image.
10 Write a program for Image Intensity slicing technique for image enhancement.
11 Write a program to analyze the given set of camera captured images and identify the nature of the image.
12 Write a program to detect the face from the given set of images and determine the type of animal.

Course Outcomes:

On completion of the course, the students will be able to

- Be familiar with the fundamentals of image formation and formats.
- Perform image transformation functions and filtering operations.
- Apply the segmentation techniques on the images.
- Extract the features of an image and perform image registration.
- Able to do colour image processing and conversion operations.

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Text Books:

1. R. C. Gonzalez and R. E. Woods, "Digital Image Processing", Pearson, 4th Edition, 2018.
2. Maria Petrou and Panagiota Bosdogianni, "Image Processing: The Fundamentals", John Wiley & Sons, Ltd, 2nd Edition , 2010.
3. K. R. Castleman, "Digital Image Processing", Prentice Hall, Englewood Cliffs, 1st Edition, 1995.

Reference Books:

1. A. Blake and A. Zisserman, "Visual Reconstruction", MIT Press, Cambridge. https://doi.org/10.7551/mitpress/7132.001.0001
2. A. N. Netravali and B. G. Haskell, "Digital Pictures", Plenum Press, 2nd Edition, 1995
3. A. B. Watson, "Digital Images and Human Vision", MIT Press, Cambridge, 1993.