

21MBAE67-TALENT ACQUISITION AND MANAGEMENT

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OBJECTIVES:

Equip the students to:

- Orient management students on the fundamentals of employee recruitment and selection.
- Provide contemporary knowledge of the theoretical concepts of employee recruitment and selection.
- Present latest knowledge of the applications and issues related to employee recruitment and selection.

RECRUITMENT AND SELECTION PROCESS

(9)

Workforce Planning – Workforce Assessment – Employee Life Cycle – Organizational Need Assessment – Job Design – Job & Job Families – Position – Occupation. Recruitment Analytics – Causes of Bad Recruitment, Metrics of Effective Recruitment – Yield Pyramid Ratio.

RECRUITMENT ANALYSIS AND SOURCES OF RECRUITMENT

(9)

Motivational Job Specification, Functional Specification – Process – DOT/O*Net – Job Description – Job Element Analysis – Identify Job Competencies – Behavioural Specification – Quan Competence Framework; Screening, Sourcing and Shortlisting –4S Model – Sources of Recruitment, Internal and External Recruitment Methods.

TOOLS AND TECHNIQUES IN RECRUITMENT PROCESS

(9)

Assessment Techniques in Recruitment Process – Interview Techniques – Motivational, Behavioural & Functional. Behavioural Even Interview Process, Key Interviewer Skills – Non-Interview methods – Knowledge Based Filtering – Skill Based Filtering – Attitudinal or Potential Based Filtering.

TALENT MANAGEMENT STRATEGIES

(9)

Selection and Reference Check – Making the Selection Decision. Evaluation Methods – The Ranking Systems – Checklist Scales – Behaviour Anchored Rating Scale (BARS) – Checking References and Checking Scales – Reliability and Validity of Selection Instruments; Nepotism – On-going Recruitment and Selection Issues.

USE OF TECHNOLOGY IN RECRUITMENT AND SELECTION

(9)

Future of Recruitment and Selection. AI for Recruiting – Use of Online Communication Tools – Video Interviews – Mobile Recruitment – Gamification in Recruitment – Predictive Analytics and Use of NLP in Recruitment.

TOTAL: 45 PERIODS

REFERENCES:

1. Dale M. (2003), Handbook of Successful Recruitment and Selection: A Practical Guide for Managers (1st ed.), New Delhi: Crest Publishing House.
2. Edenborough R. (2006), Assessment Methods in Recruitment, Selection & Performance: A Manager's Guide to Psychometric Testing, Interviews and Assessment Centres (3rd ed.), London: Kogan Page.
3. Jonathan Crawshaw, Pawan Budhwar, Ann Davis, "Human Resource Management - Strategic and International Perspectives", Sage Publications Ltd., July-2020.
4. Sonal Minocha, Dean Hristov, "Global Talent Management - An Integrated Approach, Sage Publications, December-2018.
5. Carrie A. Picardi, "Recruitment and Selection - Strategies for Workforce Planning & Assessment, Sage Publications, 2019.

21MBAE66–B2B & B2C Sales & Marketing

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OBJECTIVES

- To illustrate the applications, challenges and the dynamic environment of B2B marketing, including the unique nature of organizational buying behaviour.
- To help the students to understand business-to-business markets which involves planning, conception, product management, pricing, promotion, distribution, and sales of products from one firm to another firm.
- To equip the students with the knowledge about industrial marketing opportunities and competitive strategies.
 - To make the students understand the fundamentals of a business to consumer standpoint.
 - To teach the students to identify & enter international markets, select targets and position their brands in marketing with the 7s approach.

Introduction to B2B Marketing (9)

Business Marketing and Business Market Customers – Market Structure – Environment and Characteristics of Business Marketing – Strategic Role of Marketing – Commercial Enterprises – Commercial and Institutional Customer.

Organizational Buying and Buyer Behaviour (9)

Organizational Buyers' Decision Process – A Stepwise Model and A Process Flow Model – Organizational and Business Markets–Government as a Customer.

B2B Marketing STP (9)

Market Segmentation – Basic Framework of Segmentation – Choosing Target Segments and Positioning – Pricing Strategies for Business Markets – B2B Advertising – Competitive Bidding – Relationship Marketing and CRM.

Introduction to B2C Marketing (9)

B2B Marketing vs. B2C Marketing – CSI (Consumer Science Investigation) in International Marketing – Targeted Mini Vision-Strategy-Action – Marketing to Bottom of Pyramid.

Entry, Targeting and Positioning (9)

Market Landing – Market Targeting – Market Positioning – Self-Positioning – Identify Your Customer: B2C Market Segmentation – Marketing Mix and Cross Country & Cross Industry Growth – 7S of International Marketing Innovation.

TOTAL: 45 PERIODS

REFERENCES:

1. Michael D. Hutt, Dheeraj Sharma, Thomas W. Speh, B2B Marketing: A South Asian Perspective Cengage 2014, 11th ed.
2. Sharad Sarin, Business Marketing: Concepts and Cases McGraw Hill 2013, 1st ed.
3. James C. Anderson, Das Narayandas, James A. Narus and D.V.R. Seshadri, Business Market Management (B2B): Understanding, Creating, and Delivering Value, Pearson 2010, 3rd ed.
4. Robert Vitale, WaldemarPfoertsch, Joseph Giglierano, Business to Business, Marketing, Pearson 2011
5. Krishna K Havaladar, Business Marketing: Text and Cases McGraw Hill 2014, 4th ed
6. In Lee (Western Illinois University, USA), Electronic Commerce Management for Business Activities and Global Enterprises: Competitive Advantages, IGI Global Publisher of Timely Knowledge, 2012
7. Joju Michael Mangalam, Turbocharge Your B2C Marketing Performance: How to leverage Analytics and Data Science in Business-to-Consumer Marketing, Kindle Edition, 2017.

21MBAE68 – LOGISTICS AND SUPPLY CHAIN MANAGEMENT

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OBJECTIVES:

- To sensitize the students towards the whole new domain – L&SCM
- To develop the basic knowledge to come out with the optimized logistics mix
- To judiciously select the service providers
- To have an in-depth knowledge on the warehouse practices
- To understand the latest developments in transport sector
- To have the first-hand knowledge on the SCM practices in the new world norm.

LOGISTICS AND LOGISTICS MIX

(9)

Logistics: Definition, Objectives, Scope, Importance and Functions. System concept of Logistics. Value added logistical services. Logistics at the center of world trade – A paradigm shift – Logistics for business excellence.

Logistics Mix: Warehousing – Inventory management – Material handling – Material storage – Transportation management – packing and packaging – Logistics information system.

LOGISTICS OUTSOURCING, PROVIDERS, PACKING & PACKAGING

(9)

Logistics Outsourcing: Trends - Catalysts for outsourcing – Benefits of outsourcing.

Logistics Providers: 3PL / 4PL / 5 PL – Basis for Selection of service provider.

Packing and Packaging: Labels, Functions of Packaging, Designs, Kinds of Packaging. Packing for Transportation and Marking: Types of Boxes, Container, Procedure, Cost.

WAREHOUSE, CONTAINERIZATION AND CHARTERING

(9)

Warehouse: The role of the warehouse – Types of warehouses - Warehouse operations - Supply chain trends affecting warehouses – Specialized warehouses.

Containerization: Genesis, Concept, Classification, Benefits and Constraints. Inland Container Depot (ICD): Roles and Functions, Container Freight Station (CFS), Export Clearance at ICD; CONCOR; ICDs under CONCOR.

Chartering: Kinds of Charter, Charter Party, and Arbitration.

TRANSPORTATION, E-WAY BILL AND AGENTS

(9)

Transportation: Functionality and Principles; Air, Sea, Rail, Road transportation – Indian and International Scenario, Cargo Tariff structure of each mode.

E-Way Bill: Meaning, Impact on GST, Bill generation procedure, Advantages to various stakeholders.

Multimodal Transportation: Modal Characteristics; Modal Comparisons; Optimisation.

Clearing and Forwarding Agents: Role, Responsibilities and entrepreneurial avenues.

SUPPLY CHAIN MANAGEMENT AND CONTEMPORARY SUPPLY CHAINS

(9)

Supply Chain Management (SCM): Overview, objectives, nature, meaning, Scope, Importance of SCM. Decision phases in a supply chain. Process view of a supply chain – Supply Chain dynamics – Focus areas in SCM – Evolution of SCM.

Contemporary Supply Chains: Lean supply chains – Agile supply chains – Green supply chain – Flexible supply chain – World-class SCM practices. Current Issues in Supply Chain Management.

TOTAL: 45 PERIODS

REFERENCES:

1. James B. Ayers and Mary Ann Odegaard (2018)., "Retail Supply Chain Management", 2nd Edition, CRC Press.
2. Donald J. Bowerson. (2017)Logistic and Supply Chain Management: Prentice Hall of India.
3. Bhat, K. S. (2014). Logistics and supply chain management. Himalaya Publishing House.
4. MuthiahKrishnaveni.(2011) Logistic Management and World Sea Borne Trade: Himalaya Publication.

19HOC31 - COMMUNICATION SKILLS FOR ENGINEERS - I

L	T	P	C
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ASSESSMENT : PRACTICAL

COURSE OUTCOMES

Students will be able to

CO1 : *Gain confidence, enhance Personality and develop positive attitude in their work and life.*

CO2 : *Effectively communicate and present opinions using appropriate functional expressions for a given situation.*

CO3 : *Compose Emails, Reports for a given business scenario using appropriate sentence construction and in the prescribed format.*

CO4 : *Generate ideas and speak on a given topic in a competitive scenario like Debate, Group Discussion, and Public Speaking.*

PERSONALITY DEVELOPMENT

Motivation and Self Confidence, SCOT Analysis - Personality Development - What is Personality, Developing Positive Attitude towards work and life, Building Relationship with others - Personality Development - Paradigms of Human Interaction, Fear Management. **(4)**

VERBAL COMMUNICATION

English Conversation - Asking and Giving Opinions - English Conversation -Thanking People, Asking and Giving Suggestions - English Conversation - Asking for Direction, Agreeing and Disagreeing - Role Play-Business. **(5)**

BUSINESS COMMUNICATION

Email Writing - Format, Etiquettes and Tips - Report Writing -Introduction, elements and tips - Drafting a report - Error Identification - Rules, Common Mistakes and Exercises - Sentence Completion Filler (fill in the blanks using apt words). **(5)**

PUBLIC SPEAKING

How to start and sustain a conversation - Debate - Extempore - Group Discussion - Importance and Process - Public Speaking - Introduction, Tips - Drafting a Public Speech - Interview - Types, Dos and Don'ts - Mock Press. **(6)**

REFERENCES

1. <https://nptel.ac.in/content/storage2/courses/109104030/references/references.pdf> (online resource)
2. John Seelay, *Oxford Guide to Effective Writing and Speaking, 2nd Edition*, Kindle Edition by Oxford University Press, 2007.
3. Sabina Pillai, Agna Fernandez, *Soft Skills and Employability Skills - Published by Cambridge University Press, 2017.*

19HOC41 - COMMUNICATION SKILLS FOR ENGINEERS - II

L	T	P	C
0	0	2	1

ASSESSMENT : PRACTICAL

COURSE OUTCOMES

Students will be able to

CO1 : *Solve objective questions on analogy, Statement and Argument, Statement and Conclusion, Data Sufficiency and Sentence improvement within a given time.*

CO2 : *Construct grammatically correct sentences.*

CO3 : *Speak confidently to describe a process, present information on the specified topic and disseminate information in a professional manner.*

SELF EVALUATION

Self believe and self Esteem - Activities based on Current Events. **(2)**

VERBAL AND LOGICAL RESONING

Analogy - Introduction, Types and Exercises - Statement and Argument - Statement and Conclusion - Data Sufficiency - Sentence Improvement - Critical Reasoning / Theme Detection **(5)**

GRAMMAR

Basic Grammar- Subject Verb Agreement - One word substitute - Preposition- Cause and Effect - Basic level questions and Moderate level questions. **(4)**

PRESENTATION TECHNIQUES

Describing a Process - Presentation Skills - Introduction, Planning and Preparation - Presentation on a Topic - Group Discussion - Dos and Don'ts - Functional Expressions used in Group Discussion - Interview Skills - Ideal Grooming for an interview, Preparing for the Interview **(9)**

REFERENCES

1. *Sanjay Kumar, Pushp Lata, Communication Skills SECOND EDITION, published by Oxford University Press, New Delhi, India, 2015.*
2. *Anthony Manning, Chris Sowton and Craig Thaine, Cambridge Academic English, published by Cambridge University Press, U P, India, 2012.*

19CHL56 - ENTREPRENEURSHIP DEVELOPMENT

L	T	P	C
0	0	2	1

ASSESSMENT : PRACTICAL

COURSE OUTCOMES

Upon successful completion of course, students will be able to

CO1 : To differentiate between wage employment, self-employment and entrepreneurship

CO2 : To appreciate and develop positive thinking and self-confidence for embarking on self-employment / entrepreneurship.

CO3 : To appreciate the importance of systematic planning in setting up and managing a business enterprise.

PART I

MOTIVATION AND CONFIDENCE BUILDING

Positive thinking, shedding negative feelings, Experience Sharing by successful entrepreneurs, Motivational video clips, Scope for Self-employment. **(7)**

PART II

SELF EMPLOYMENT

Advantages over wage employment, Entrepreneurship Development, Need and importance of embarking on self-employment Advantages of self-employment, Assessing self to know entrepreneurial tendencies, Process of Entrepreneurship Development Importance of behavioural changes for entrepreneurship, Difference between Income Generating Activity, Self-Employment and Entrepreneurship, Characteristics of an entrepreneur - Dynamics of Entrepreneurship, Attitude and its impact on Entrepreneurship. **(8)**

TOTAL : 15

TEXT BOOKS

1. Robert D. Hisrich, Michael P. Peters, Dean A. Shepherd, *Entrepreneurship*, Tata McGraw Hill, 10 th Edition.

Mapping of Course Outcomes (Cos) with Program Outcomes (Pos)

Cos	Program Outcomes/Program Specific Outcomes (Pos/PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1								2	1					
CO2									2					
CO3								3	2					

(1: Slight, 2: Moderate 3: Substantial)

19HOC51 - EMPLOYABILITY AND PERSONALITY DEVELOPMENT SKILLS - I

L	T	P	C
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ASSESSMENT : PRACTICAL

COURSE OUTCOMES

Students will be able to

- CO1** : *Solve objective questions on Syllogisms, Data Interpretation, Critical Reasoning, Theme Detection, Sentence Completion and Business Vocabulary*
- CO2** : *Develop appropriate responses for business phone calls and negotiate effectively.*
- CO3** : *Speak with appropriate body language for a technical speaking task.*
- CO4** : *Project the appropriate grooming and the right etiquettes, for interview and group discussion task.*

VERBAL APTITUDE

Syllogisms-Paragraph Comprehension -Data Interpretation -Critical Reasoning/Theme Detection - Grammar -Sentence Completion Filler - Business Vocabulary- Foreign phrases used in English (3)

PROFESSIONAL COMMUNICATION

Telephonic Conversation Skills - Telephonic Interview -Etiquettes - Professional, Dining & Telephone - Employability skills - Importance and Employability level of present Y and Z Generation - Interpersonal Skills - Negotiation Skills - Types, Expressions used in formal and informal negotiations, Stages of Negotiation - Time Management - Pareto principle, Prioritizing tasks, Barriers to time management. (7)

THE ART OF SPEAKING

Types of Speaking - Barriers to Speaking - Presentation on a Technical Topic - Speaking on Current Trends in the Industry. (5)

NON-VERBAL COMMUNICATION

Interview Skills - Non-Verbal Communication - Smiling, Posture, Handshake, Tone of Voice and Eye Contact - GD tips & techniques and Mock GD- Body Language - Grooming. (5)

REFERENCES

1. *Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. Washington, DC: Pfeiffer & Company, 2013.*
2. *Petes S. J., Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw-Hill Education, 2011.*
3. *John Hayes. Interpersonal Skills at Work. Second Edition. Routledge publication. 2005*

19HOC61 - EMPLOYABILITY AND PERSONALITY DEVELOPMENT SKILLS - II

L	T	P	C
0	0	2	1

ASSESSMENT : PRACTICAL

COURSE OUTCOMES

Students will be able to

CO1 : *Exhibit Corporate Etiquettes with assertiveness and personal effectiveness.*

CO2 : *Build teams and solve problems at workplace.*

CO3 : *Manage conflicts in a professional manner*

CO4 : *Simulate an actual Job Interview scenario to prepare a candidate for a real Interview*

CORPORATE ETIQUETTE

Corporate Etiquette: Dos and Don'ts, - Conversational dos and don'ts - Creating elusive first impression- Assertiveness-Personal Effectiveness (4)

LEADERSHIP AND TEAM MANAGEMENT

Leadership Skills - Understanding Traits and Styles - Team Building: Bonding, Development and Delegation - Adaptability and Work Ethics - Handling Team Dynamics- Giving and Receiving Feedback- Problem Solving Skills. (5)

STRESS AND CONFLICT MANAGEMENT

Emotional Intelligence: Recognition, Understanding and Managing - Stress Management: Techniques and Benefits - Conflict Management: Introduction - Handling Conflicts - Conflicts settlement (6)

GROUP DISCUSSION AND INTERVIEW SKILLS

Mock GD - Interview Skills - Answering challenging questions - Common Interview Questions (5)

REFERENCES

1. *Barun K Mitra., Personality Development and Soft Skills. Second Edition. Oxford University Press. 2016*
2. *N.Krishnaswamy & Lalitha Krishnaswamy - Mastering Communication Skills and Soft Skills. New Delhi. Bloomsburry. 2015*
3. *Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and Your Success. Canada: Wiley & Sons, 2006.*

Coimbatore Institute of Technology
Department of Computer Applications
MCA 2 years Programme 2020-2021
Curriculum Design
List of New Electives

IT ELECTIVES

Course Code	Course Name	L	T	P	C
20MCAE109	Basics of Robotics	3	0	0	3
20MCAE110	GPU and Parallel Programming	3	0	0	3
20MCAE111	Digital Image Processing	3	0	0	3
20MCAE112	Blockchain management	3	0	0	3
20MCAE113	Single page web applications	3	0	0	3
20MCAE114	Digital Marketing	3	0	0	3
20MCAE115	Software Project Management	3	0	0	3
20MCAE116	Computer Vision	3	0	0	3
20MCAE117	Software Testing and Quality Assurance	3	0	0	3
20MCAE118	Open Source Ecosystem	3	0	0	3
20MCAE119	Enterprise Management and Computing	3	0	0	3

DATA SCIENCE ELECTIVES

Course Code	Course Name	L	T	P	C
20MCAE205	Natural Language Processing	3	0	0	3
20MCAE206	Social Network Analysis	3	0	0	3

NETWORKING TECHNOLOGY ELECTIVES

Course Code	Course Name	L	T	P	C
20MCAE304	Wireless networks	3	0	0	3
20MCAE305	Ad Hoc Networks	3	0	0	3

MANAGEMENT ELECTIVES

Course Code	Course Name	L	T	P	C
20MCAE401	Organizational Behaviour	3	0	0	3
20MCAE402	Principles of Management	3	0	0	3
20MCAE403	Accounting and Financial Management	3	0	0	3
20MCAE404	E-Commerce	3	0	0	3
20MCAE405	Decision Making	3	0	0	3
20MCAE406	Entrepreneurship Development	3	0	0	3
20MCAE407	Principles of Environmental Science	3	0	0	3

ELECTIVE LABORATORIES

Course Code	Course Name	L	T	P	C
20MCAEL06	GPU and Parallel Programming Laboratory	0	0	4	2
20MCAEL07	Image Processing Laboratory	0	0	4	2
20MCAEL08	Web Frameworks Laboratory	0	0	4	2
20MCAEL09	Natural Language Processing Laboratory	0	0	4	2
20MCAEL10	Social Network Analysis Laboratory	0	0	4	2
20MCAEL11	Networks Programming Laboratory	0	0	4	2
20MCAEL12	Digital Marketing Laboratory	0	0	4	2

20MCAE109- BASICS OF ROBOTICS

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

- CO1 : Understand the architecture of robots by learning paradigms and intelligence.*
- CO2 : Apply the Forward and Inverse Kinematics of manipulators and understand the dynamics in locomotion control and trajectory generation.*
- CO3 : Program an application for industrial robots.*
- CO4 : Synthesize the Machine Intelligence in robots by studying the functions of industrial manipulators using AI approach.*
- CO5 : Understand the automation in robotics by using drive system for gripper movement.*

INTRODUCTION TO ROBOTIC PARADIGMS

Robots-Intelligent Robots-Paradigm-Robotic Paradigms-Primitives Sense-Plan-Act-Overview of Three Paradigms-Hierarchical- Reactive and Hybrid Deliberative/Reactive-Architectures (7)

BASICS OF MECHANICS AND CONTROL

Description of position and orientation Mechanics-Kinematics-Forward and Inverse kinematics of manipulators-Dynamics. Introduction to Jacobian of the Manipulator-Trajectory generation- Programming Robots-Off-line Programming and simulation (9)

ROBOT PROGRAMMING LANGUAGES AND SYSTEMS

Levels of Robot Programming- A Sample Application in industrial robot - Requirements of a Robot Programming Language- Internal world model versus external reality-Context Sensitivity- Error Recovery (9)

TELEOPERATION TO AUTONOMY

Overview-Machine Intelligent-Use of Robots-Implications-Brief History-Industrial Manipulators-Space Robotics and the AI approach-Teleoperation-Telepresence-Semi-autonomous control- Seven Areas of Robotic AI (10)

BASICS OF ROBOTICS TECHNOLOGY AND AUTOMATION

Introduction - End-Effectors-Drive System for Grippers-Mechanical- Magnetic- Vacuum and Adhesive- Design of Multiple DOF- Sensory Devices-Types of Sensors-Robot Vision Systems-Low Level- Sensing-Digitizing--Preprocessing techniques-Noise reduction-enhancement. (10)

TOTAL : 45

REFERENCE BOOKS

1. Bruno Siciliano, Oussam Khatib "Handbook of robotics", 2nd edition, Springer, 2020
2. Robin R. Murphy, "Introduction to AI Robotics", A Bradford Book, 2nd Edition, 2019
3. Kevin M. Lynch, Frank C. Park, "Modern Robotics-Mechanics, Planning and Control" Cambridge University Press, 1st Edition, 2017
4. John J. Craig, "Introduction to Robotics, Mechanics and Control", Pearson Education Inc-3rd Edition, 2013.
5. S.R. DEB, S. DEB "Robotics Technology and Flexible Automation", Tata McGraw Hill Education, 2nd Edition, 2012.
6. S.K. Saha, "Introduction to Robotics", Tata McGraw Hill Education 4th Edition, 2011.
7. Robert J. Schilling, "Fundamentals of Robotics, Analysis & Control", PHI Learning, 2010.
8. Mikell P Groover, Mitchel Weiss, Roger N Nagel, Nicholas G Odrey, Ashish Dutta, "Industrial Robotics Technology, Programming and Applications", 2nd edition, 2012.

MOOCs

1. <http://nptel.ac.in/courses/112101099/>
2. https://onlinecourses.nptel.ac.in/noc16_cs02
3. <http://nptel.ac.in/courses/112103174/39>
4. <http://nptel.ac.in/courses/112101098/download/lecture-1.pdf>
5. <http://nptel.ac.in/courses/106105077/#>

20MCAE110 - GPU AND PARALLEL PROGRAMMING

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PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

- CO1 : Understand the basic concepts of super-computing and parallel programming architecture*
- CO2 : Identify the difference between serial and parallel programming needs to solve real-time problems.*
- CO3 : Demonstrate the ability to use GPUs for parallel programming to solve compute intensive tasks.*
- CO4 : Identify CUDA architecture and its components.*
- CO5 : Apply parallel programming methods and solve problems using CUDA platform*

HISTORY OF SUPER COMPUTING

Von Neumann Architecture - Cray - Connection Machine - Cell Processor - Multinode Computing - The Early Days of GPGPU Coding - The Death of the Single - Core Solution - NVIDIA and CUDA - GPU Hardware Alternatives to CUDA: OpenCL - Direct Compute - CPU alternatives - Directives and libraries. (8)

UNDERSTANDING PARALLELISM WITH GPUS

Introduction - Traditional Serial Code - Serial/Parallel Problems Concurrency: Locality - Types of Parallelism: Task - based parallelism - Data-based parallelism - Flynn's Taxonomy - Some Common Parallel Patterns: Loop-based patterns - Fork/join pattern - Tiling/grids - Divide and conquer. (10)

CUDA HARDWARE- GRIDS- BLOCKS- AND THREADS

PC Architecture - GPU Hardware-CPU's and GPU's - Setting up CUDA - Threads: Problem decomposition - Task execution model - Threading on GPU's - CUDA kernels - Blocks: Block arrangement - Grids: Stride and offset - X and Y thread indexes. (10)

MEMORY HANDLING WITH CUDA

Introduction- Caches : Types of data storage - Register Usage - Shared Memory: Sorting using shared memory - Constant Memory: Constant memory caching - Constant Memory Broadcast - Global Memory - Score boarding - Global memory sorting - Sample sort. (8)

CUDA IN PRACTICE

Introduction - Serial and Parallel Code - Design Goals of CPUs and GPUs - Processing Datasets Using ballot and other intrinsic operations - Profiling - Case Study on AES Algorithm. (9)

TOTAL : 45

REFERENCE BOOKS

1. *Shane Cook, "CUDA Programming: A Developer's Guide to Parallel Computing with GPUs", Morgan Kaufman, 2012.*
2. *David Kirk, Wen-mei Hwu, "Programming Massively Parallel Processors: A Hands-on Approach", Morgan Kaufman, 2010.*

MOOCs

1. <https://www.mooc-list.com/course/parallel-programming-coursera>
2. http://nptel.ac.in/syllabus/syllabus_pdf/106102114.pdf
3. <https://www.mooc-list.com/course/intro-parallel-programming-udacity>

20MCAE111 - DIGITAL IMAGE PROCESSING

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PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

CO1 : Describe different modalities and current techniques in image processing

CO2 : Provide mathematical foundations for digital manipulation of image acquisition- pre-processing- enhancement- segmentation and compression.

CO3 : Apply image processing techniques in both the spatial and frequency (Fourier) domains

CO4 : Develop and compare various Image Compression and Decompression Techniques.

FUNDAMENTALS OF IMAGE PROCESSING

Introduction - Elements of visual perception- Steps in Image Processing Systems - Image Acquisition - Sampling and Quantization
- Pixel Relationships - Colour Fundamentals and Models- File Formats, Introduction to the Mathematical tools. (8)

IMAGE ENHANCEMENT AND RESTORATION

Spatial Domain : Gray level Transformations- Histogram Processing- Spatial Filtering - Smoothing and Sharpening. Frequency Domain: Filtering in Frequency Domain - DFT- FFT- DCT- Smoothing and Sharpening filters - Homomorphic Filtering- Noise models- Constrained and Unconstrained restoration (10)

IMAGE SEGMENTATION AND FEATURE ANALYSIS

Detection of Discontinuities - Edge Operators - Edge Linking and Boundary Detection - Thresholding - Region Based Segmentation - Motion Segmentation- Feature Analysis and Extraction. (8)

MULTI RESOLUTION ANALYSIS AND COMPRESSIONS

Multi Resolution Analysis : Image Pyramids - Multi resolution expansion - Wavelet Transforms- FastWavelet transforms- Wavelet Packets. Image Compression: Fundamentals - Models - Elements of Information Theory - Error Free Compression - Lossy Compression - Compression Standards - JPEG/MPEG. (10)

APPLICATIONS OF IMAGE PROCESSING

Representation and Description- Image Recognition- Image Understanding - Image Classification - Video Motion Analysis - Image Fusion - Steganography - Colour Image Processing (9)

TOTAL : 45

REFERENCE BOOKS

1. *Rafael C.Gonzalez and Richard E.Woods, "Digital Image Processing", 4th Edition, Pearson Education, 2018.*
2. *Milan Sonka, Vaclav Hlavac and Roger Boyle, "Image Processing, Analysis and Machine Vision", 4th, Edition, Brooks Cole, 2015*
3. *Anil K.Jain, "Fundamentals of Digital Image Processing", Pearson Education, 2019.*
4. *Madhuri A. Joshi, "Digital Image Processing: An Algorithmic Approach", 2nd Edition, Prentice Hall India, 2018.*
5. *Rafael C.Gonzalez, Richard E.Woods and Steven L. Eddins, "Digital Image Processing Using MATLAB", 3rd Edition, Pearson Education, 2020.*

MOOCs

1. <http://nptel.ac.in/courses/106105032/#>
2. <http://nptel.ac.in/courses/117105135/3>
3. <http://nptel.ac.in/courses/106105032/22>
4. <http://nptel.ac.in/courses/106105032/38>

20MCAE112 - BLOCKCHAIN MANAGEMENT

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PRE-REQUISITES

Consent of the Instructor

ASSESSMENT: THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

CO 1 : Understand the basics of distributed environment and decentralization.

CO 2 : Describe the fundamentals of Blockchain.

CO 3 : Analyze the working principles of Bitcoin.

CO 4 : Develop Cryptography algorithms and protect Cryptocurrencies.

CO 5 : Examine the development platform ethereum and Hyperledger.

BLOCKCHAIN

Introduction – Distributed Systems- History of blockchain- Introduction to blockchain- Types of blockchain- CAP theorem and blockchain- Benefits and limitations of blockchain. Decentralization – Decentralization using blockchain- methods of decentralization- routes to decentralization- blockchain and full ecosystem decentralization- smart contract- decentralized autonomous organization- corporations- societies- application- Platforms for decentralization – Cryptography. (10)

CRYPTOCURRENCIES

Cryptographic primitives - Hash Functions- Bitcoin- keys and addresses-Public keys in bitcoin Private keys in bitcoin- Bitcoin currency units - Base58Check encoding- Vanity addresses- transactions- Types of transactions- blockchain- bitcoin payments- Alternative coins – theoretical foundations- bitcoin limitations – Block Chain Technologies. (10)

SMART CONTRACTS AND ETHEREUM

Smart Contracts – Recardian Contracts - Ethereum – Introduction- ethereum blockchain- elements- precompiled contracts- accounts- block- ether- messages- mining- clients and wallets- trading and investment- symbols- ethereum network- applications- scalability and security. (9)

CONTRACT DEVELOPMENT AND DEPLOYMENT

Ethereum development - Setting up a development environment- development tools and clients- Solidity Web3. (9)

HYPERLEDGER

Hyperledger - Fabric- Sawtooth lake- CORDA- Case Study in block chain management.

(7)

TOTAL: 45

REFERENCE BOOKS

1. *Imran Bashir- "Mastering Blockchain" Packt Publishing- First Edition- 2017.*
2. *Arvind Narayanan- Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder- "Bitcoin and Cryptocurrency Technologies"- Princeton University Press- 2016.*
3. *Roger Wattenhofer- "The Science of the Blockchain"- Inverted Forest Publishing- First Edition- 2016.*
4. *Don and Alex Tapscott- "Blockchain Revolution". Portfolio Penguin 2016.*
5. *Andreas M. Antonopoulos- "Mastering Bitcoin: Programming the Open Blockchain" O'Reilly- Second Edition- 2017.*

20MCAE113 - SINGLE PAGE WEB APPLICATIONS

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT: THEORY

COURSE OUTCOME

CO1 : Learn to build modern browser-based applications that take advantage of stronger client platforms and more predictable bandwidth.

CO2 : Learn the SPA design approach

CO3 : Explore new techniques like structured java scripts and responsive design

CO4 : Know how to capitalize trends like server side JavaScript and NoSQL data stores

CO5 : Develop frameworks that makes JavaScript more manageable and testable as a first class language.

INTRODUCTION

Build first SPA – user benefits of well-written SPA. Re introducing JavaScript – variable scope, hoisting and execution context– scope chain, prototype chain and functions.

THE WEB SERVER

Role – the Node.js advance routing, authentication and authorization, Web Socket, Socket.IO. The server database, MongoDB, client data validation, CRUD

BUILD THE MODEL

Set up model and files. People object: design and build. Chat model, add avatar support. Chat feature and avatar feature, Data binding and jQuery. Create data module.

SPA CLIENT

Files and name spaces. The feature container – create, render and manage. Manage application state. Feature module: strategy, file design method API,. Implementation API, add frequencies.

READYING SPA FOR PRODUCTION

Optimising SPA for search engines, cloud and third party services, CDN, Caching and Cache Busting.

TOTAL : 45

REFERENCE BOOKS

1. *Michael S. Mikowski and Josh C. Powell, Single Page Web Applications, Manning Publications, September 2018.*
2. *Chris Love, High Performance Single Page Web Applications, Chris Love, kinley edition January 11, 2014.*
3. *Emmit Scott, SPA Design and Architecture: Understanding Single Page Web Applications, Manning Publications, 2015.*

MOOC's

1. <https://www.mooc-list.com/course/single-page-web-applications-angularjs-coursera>
2. <https://www.youtube.com/watch?v=SBdAN12f2bA>

20MCAE114 - DIGITAL MARKETING

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT: THEORY

COURSE OUTCOME

CO1 : Assess the impact of digital technology on the practice of marketing.

CO2 : Analyse the use of different forms of digital marketing in the development of an online presence.

CO3 : Develop a plan for marketing a product of business online.

CO4 : Integrate social media tools into a marketing communications strategy.

CO5 : Use a publishing platform to build a web presence with integrated data collection and links to social media.

Understanding Marketing Management: Importance, Scope, Core Marketing Concepts, Marketing Tasks.
Company Orientation towards Market Place: Evolution, New Marketing Realities. (9)

Introduction to Digital Marketing: Need for digital marketing – Commonly used terminology – 4Cs : Customer, Content, Context and Conversation - three essential ingredients: Traffic, Insights and Conversions - Introduction to customer personas, buying process and their usability - Designing a basic digital marketing plan. (9)

Developing Marketing Strategies: Market Segmentation: Levels, Patterns, Bases, Effective Segmentation Criteria. **Targeting:** Approaches. **Positioning:** Steps, Differentiation Strategies. (9)

Building Online Presence: Introduction to Building online presence for businesses – basic terminology and technology – Website Domain: naming, working & registration – Website operation – Hosting website – Introduction to WordPress - basic concepts of linking content using HTML.

Building Traffic: Different techniques for driving traffic or visitors to a website - Introduction to search engine optimization, Social media marketing, referral traffic, display ads, search engine marketing, affiliate marketing and email marketing. (9)

Getting Insights: Collect and analyze data of visitors to websites - Introduction to Google Analytics and Google Webmaster Tools – Workings of web analytics - Set up Google Analytics for a website - Set up goals and filters in Google Analytics - Access and interpret reports - Set up and use Google Webmaster Tools for effectiveness of search engine optimization.

Driving Conversions: Convert website visitors into buyers - Basic conversion tracking using Google Analytics and ad platforms - Introduction to Landing Pages - Different types of conversions - Campaign optimization – Learn to create a landing page using UnBounce. (9)

TOTAL: 45

REFERENCE BOOKS

1. *Seema Gupta, "Digital Marketing", McGraw Hill, 2018.*
2. *Damian Ryan, "Understanding Digital Marketing - Marketing Strategies for Engaging the Digital Generation", 3rd Edition, Kogan Page Ltd., 2014*
3. *Philip Kotler, Kevin Lane Keller, Abraham Koshy&MithileshwarJha, "Marketing Management: A South Asian Perspective", 14th Edition, Pearson, New Delhi , 2014*
4. *Dave Evans and Jake Mckee, "Social Media Marketing – The Next Generation of Business Engagement", Wiley India pvt. Ltd, New Delhi, 2011.*
5. *Perry Marshall, Thomas Melloche, "Ultimate Guide to Facebook Advertising", Tata McGraw Hill, New Delhi, 2011.*

20MCAE115 - SOFTWARE PROJECT MANAGEMENT

L	T	P	C
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PRE-REQUISITES

20MCA15

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the projects, students will be able to

CO1 : Gain knowledge of how a project will be broken down into stages and what each stage contributes to the project

CO2 : Select appropriate techniques for use in the stages of a project

CO3 : Justify the appropriateness of these techniques- and apply them to practical situations

CO4 : Know the limitations of the project approach in developing information/software systems

CO5 : Test and apply metrics on the developed software to ensure compliance of requirements.

INTRODUCTION

Projects – Software Projects Vs Other type of projects-Management-Requirement Specification. Step-wise Planning – Project Evaluation – strategic assessment – technical assessment – cost-benefit evaluation techniques- risk evaluation. Project analysis and contents list-choice of process models – Waterfall Model-V-Process Model – Software Prototyping – tools.

(9)

SOFTWARE ESTIMATION & RISK MANAGEMENT

Software Estimation – Introduction-problems with over & under estimation – basis for estimation – various types of estimation. Activity Planning – objectives – project schedules and activities from different planning models. Risk Management: Nature- managing risk – evaluating risks. Resource Allocation: Nature – resource requirements-creating critical path and counting the cost.

(9)

MONITORING AND CONTROL

Responsibility – assessing progress-setting check points – taking snapshots – collecting data – visualizing progress-cost monitoring-priority monitoring. Managing People & Organizing teams: Understanding behavior-organization behavior-Motivation – Olman Hackman job characteristics model – working in groups – becoming ateam – decision making & leadership. Planning for small projects – problems with students projects – content of project plan.

(9)

SOFTWARE QUALITY ASSURANCE

Software Quality Factors – Quality Metrics – Software Quality Assurance approach – Software Quality Assurance Plan – ISO 9000 Quality System – SEI CMM – IEEE standards. Software Reliability – definition – concept of reliability and availability – software error and faults – reliability models – availability models.

(9)

CASE STUDY USING MS-PROJECT

MS_PROJECT tool – introduction – project information – task information – Scheduling - resource allocation – leveling resources – cost estimation – reports – case studies and examples.

(9)

TOTAL: 45

REFERENCE BOOKS

1. Bob Hughes , Mike Cotterell & Rajib Mall, “Software Project Management”, Tata McGraw Hill, 6th Edition, 2017.
2. Roger S.Pressman, “Software Engineering: A Practitioners Approach”, Tata McGraw Hill, 7th Edition, 2010.
3. “Microsoft Project Version 2002 Step by Step”, Microsoft Press, 2002.
4. Walker Royce, “Software Project Management – A Unified Framework”, Addison Wesley, 2004.
5. Ramesh Gopaldaswamy, “Managing Global Projects”, Tata McGraw Hill, 2008.

MOOCs

1. <https://nptel.ac.in/courses/106/105/106105218/>
2. https://www.tutorialspoint.com/software_engineering/software_project_management.htm

20MCAE116 - COMPUTER VISION

L	T	P	C
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PRE-REQUISITES

Consent of the Instructor

ASSESSMENT: THEORY

COURSE OUTCOME

Upon completion of this course, the students should be able to

CO1 : *Implement fundamental image processing techniques required for computer vision.*

CO2 : *Perform shape analysis and implement boundary tracking techniques.*

CO3 : *Apply Hough Transform for line, circle, and ellipse detections.*

CO4 : *Apply 3D vision techniques and implement motion related techniques.*

CO5 : *Develop applications using computer vision techniques*

UNIT I IMAGE PROCESSING FOUNDATIONS

Review of image processing techniques – classical filtering operations – thresholding techniques – edge detection techniques – corner and interest point detection – mathematical morphology – texture. (8)

UNIT II SHAPES AND REGIONS

Binary shape analysis – connectedness – object labeling and counting – size filtering – distance functions – skeletons and thinning – deformable shape analysis – boundary tracking procedures – active contours – shape models and shape recognition – centroidal profiles – handling occlusion – boundary length measures – boundary descriptors – chain codes – Fourier descriptors – region descriptors – moments. (9)

UNIT III HOUGH TRANSFORM

Line detection – Hough Transform (HT) for line detection – foot-of-normal method – line localization – line fitting – RANSAC for straight line detection – HT based circular object detection – accurate center location – speed problem – ellipse detection – Case study: Human Iris location – hole detection – generalized Hough Transform (GHT) – spatial matched filtering – GHT for ellipse detection – object location-GHT for feature collation. (10)

UNIT IV 3D VISION AND MOTION

Methods for 3D vision – projection schemes – shape from shading – photometric stereo – shape from texture – shape from focus – active range finding – surface representations – point-based representation – volumetric representations – 3D object recognition – 3D reconstruction – introduction to motion – triangulation – bundle adjustment – translational alignment – parametric motion – spline-based motion – optical flow – layered motion. (9)

UNIT V APPLICATIONS

Application: Photo album – Face detection – Face recognition – Eigen faces – Active appearance and 3D shape models of faces
Application: Surveillance – foreground-background separation – particle filters – Chamfer matching, tracking, and occlusion – combining views from multiple cameras – human gait analysis
Application: In-vehicle vision system: locating roadway – road markings – identifying road signs – locating pedestrians. (9)

TOTAL : 45

REFERENCE BOOKS

1. *D. L. Baggio et al., — 'Mastering OpenCV 3', Second Edition Packt Publishing, 2017.*
2. *E. R. Davies, — 'Computer Vision: Principles, Algorithms, Applications, Learning', Fourth Edition, Academic Press, 2017.*
3. *Jan Erik Solem, —Programming Computer Vision with Python: Tools and algorithms for analyzing images, O'Reilly Media, 2012.*
4. *Mark Nixon and Alberto S. Aquado, —Feature Extraction & Image Processing for Computer Vision, Fourth Edition, Academic Press, 2019.*
5. *R. Szeliski, —Computer Vision: Algorithms and Applications, 2nd Edition Springer 2021.*
6. *Simon J. D. Prince, —Computer Vision: Models, Learning, and Inferencel, Cambridge University Press, Hardback 2019.*

20MCAE117 - SOFTWARE TESTING AND QUALITY ASSURANCE

L	T	P	C
3	0	0	3

PRE-REQUISITES

20MCA15

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

- CO1 : Analyze different approaches to test software, and select applicable techniques for different situations and projects.*
- CO2 : Prepare a software quality plan for a software project considering process evaluation models including issues related to change management, configuration management, verification and validation, and measurement.*
- CO3 : Design test plans, create test procedures and design measures to evaluate result of tests.*
- CO4 : Apply black box and white box testing techniques at various testing levels for given requirements to achieve adequacy criteria.*
- CO5 : Use standards, models and techniques aimed at achieving quality assurance in different software development environments*

INTRODUCTION

The Role of Process in Software Quality - Testing as a Process - Overview of the Testing Maturity Model (TMM) - Basic Definitions - Software testing principles - Origins of defects - Defect classes, The defect repository, and Test Design - defect example : The coin problem. (9)

TESTING STRATEGIES

Test case design strategies - Black box approach - Random testing - Equivalence Class Partitioning - Boundary Value Analysis - Cause and Effect graphing - State Transition testing - Error Guessing- White Box approach - Test adequacy criteria - Coverage and Control Flow Graphs - Covering code logic- Data flow and White box test design - Loop testing - Mutation testing - Evaluating test Adequacy Criteria. (12)

LEVELS OF TESTING

Unit test: functions, procedures, classes and methods as units - Unit test planning - Designing the unit tests - The class as a Testable Unit -The test harness - Integration test : Goal- Integration Strategies for Procedures and Functions - Integration Strategies for Classes - Designing Integration Test - System Test : the different types - Regression testing - Alpha, Beta and Acceptance test- Test planning - Test Plan Components - Test Plan Attachments - Reporting Test Results. (10)

SOFTWARE QUALITY

Theory of software quality : Defining quality - Importance of Quality - Quality control v/s Quality Assurance - Quality Assurance at each phase of SDLC, Hierarchical Models of Quality : Hierarchical Models of Boehm and McCall, Planning for Software Quality Assurance : Software Quality Assurance Plans, Product Quality and Process Quality: Product Quality - Models for Software Product Quality - Process , Walkthroughs and Inspections (7)

SOFTWARE METRICS AND MODELS

Software Measurement and Metrics : Introduction, Classification of Software Metrics, Defect Metrics, Requirement Related Metrics, Earned Value Analysis, Object Oriented Metrics. ISO 9000 series, ISO 9001 : Origins, ISO Standards Development Process, ISO 9000 Family, ISO 9001:2000, ISO Certification, Assessment Process. CMM Model - CMM and ISO Comparative analysis - CMM -I - P-CMM, SPICE, Malcolm Baldrige Award Model - EFQM Excellence Model. (7)

TOTAL : 45

REFERENCE BOOKS

1. *Ilene Burnstein, "Practical Software Testing", Springer International Edition, 1st Indian Reprint, 2004.*
2. *Stephan Goericke " The future of Software Quality Assurance"Springer publications, 1st Edition Kindle, 2020*
3. *Dr.Anand Nayyar "Software testing, An Approach to software testing, Principles,Applications, Techniques and Practices", BPB Publications, 2nd Edition, 2019.*
4. *Rex Black, Erik van veenendaal, Dorothy Graham,"Foundations of Software Testing"Cengage Learning emea Publications, 4th edition, 2019.*
5. *Abu Sayed Mahfuz " Software Quality Assurance", Auerbach Publications; 1st edition, 2016.*

MOOCs

1. <http://nptel.ac.in/courses/106101163/>
2. <http://nptel.ac.in/courses/106105150/>

20MCAE118 - OPEN SOURCE ECOSYSTEM

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course- students will be able to:

- CO1 : Know about the professional management and implementation of Open Source Technologies*
- CO2 : Analyse the differential combination of new technologies with the matured one*
- CO3 : Decide on the boundaries of business which the web changed from building the business case to doing hands-on experimentation*
- CO4 : Self teach the issues faced in transitioning to the new technologies, ranging from business to social concern.*
- CO5 : Understand roles for open source software in organization.*

INTRODUCTION

Open Source Software : Definition- History- Successful Areas with Examples. The Good- Bad and the ugly of Open Source Systems. Open Source Opportunities - Create Lab- Migration- Build Applications- Bring the New Desktop Systems Underserved and Migrate Applications and Databases to Open Source. (7)

ADVANCED OPEN SOURCE OPPORTUNITIES

Introduction - Directory Services - Email - Complex Web Publishing - Manage User Desktops - Other Possibilities'.Open Source Operating Systems - Linux Distribution Vendors- Enterprise Distribution Vendors- Community Supported Distribution Vendors- International Alternatives (12)

SERVER AND DESKTOP APPLICATIONS

Server Applications - Infrastructure services - Web Servers - Database Servers - Mail Servers - Systems Management. Desktop Applications - Graphical Desktops - Web Browsers - The Office Suit - Mail and Calendar Clients. (12)

IMPLEMENTATION AND ARCHITECTURE

Methodology- Language and Cross Platform Code. System Implementation Process- Principles- Key Documents and integration with Open Source Community. Architecture - Managing Tiered Design - Performance and Scalability - Interoperability - Platform. (8)

COST AND LICENSING

Ownership Costs - Staffing- Hardware- Software and Third Party Applications. Pricing - Types of Costs and Scenarios. Licensing - Types - License in use - Dual Licensing - Intellectual Property Issues

(6)

TOTAL : 45

REFERENCE BOOKS

1. *Paul Kavanaugh, "Open Source Software, Implementation and Management", Elsevier Press,*
2. *Stephen Koch, "Free/Open Source Software Development", Idea Group Publishing, 2005.*
3. *Karl Fogel, "Producing Open Source Software: How to Run a Successful FreeSoftware Project", under the Creative Commons Attribution, ShareAlike, 2018.*

MOOCs

1. <https://www.intel.in/content/www/in/en/communications/intel-open-network-platform.html>

20MCAE119 - ENTERPRISE MANAGEMENT AND COMPUTING

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course students will be able to:

CO1 : *Make computing available as a utility under the internet.*

CO2 : *Understand the fundamentals of enterprise architecture and enterprise computing.*

CO3 : *Implement cloud programming paradigms like MapReduce.*

CO4 : *Describe the emerging development paradigms and technologies and discuss how these will change the way the enterprise applications should be architected.*

CO5 : *Understand the benefits of open source technologies on enterprise computing.*

INTRODUCTION

Architecture - Mainframe- Client/Server- 3-tier Architecture with TP monitors- Dev 2.0 Platforms- Cloud Computing. Enterprise Architecture - Data and process- Components- Application Integration and SOA- Data Centre Infrastructure. (9)

CLOUD PLATFORMS

Cloud Economics -Virtualization Technology - Multi-tenant Software. Data in the Cloud- Big Table- HBase and Dynamo. Map Reduce and Extensions. Software Architecture- Enterprise software - ERP- SCM & CRM. Custom Enterprise Applications. (10)

WORKFLOW AND BUSINESS PROCESS

Implementing workflow- Meta Model using ECA rules- ECA WorkFlow Engine- Process Modelling and BPMN. Enterprise Analytics and Search. (10)

ENTERPRISE CLOUD COMPUTING

Ecosystem - Cloud Management Platforms and Tools- Tools for Building Private Clouds. Future of Enterprise Cloud Computing. (8)

OPEN SOURCE ENTERPRISE COMPUTING

Open Source Licenses- Management of Open Source Software Projects- Open Standards.

Business Strategies - Revenue Streams- Analysis and Critical Success Factors. (8)

TOTAL : 45

REFERENCE BOOKS

1. *Wolf Rogner, Allgemeinbeeideter and Gerichtlichzertifizierter Sachverständiger "Open Enterprise Computing", Students Handbook, 2016*
2. *Gautam Shroff, "Enterprise Cloud Computing, Technology, Architecture and Applications", Cambridge University Press, UK, 2010.*
3. *Gunasekaran- Angappa, "Global Implications of Modern Enterprise Information Systems: Technologies and Applications", IGI Global, 2008*

MOOCs

1. <http://www.businessresearchguide.com/faq/what-is-enterprise-computing/>

20MCAE205 - NATURAL LANGUAGE PROCESSING

L	T	P	C
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PRE-REQUISITES

20MCA21

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

CO1 : *Understand core algorithms and data structures used in NLP*

CO2 : *Utilize corpora and annotations added to them*

CO3 : *Build statistical NLP components such as n-gram language models, text classifiers and Parts-of-speech taggers, that learns from such corpora*

CO4 : *Evaluate the merits of different machine learning methods for given NLP tasks*

CO5 : *Appreciate the relationship between linguistic representations and computational applications*

INTRODUCTION

Human languages- Models- Ambiguity- Processing paradigms; Phases in Natural Language Processing- Applications. Text Representation in Computers- Encoding Schemes- Linguistics Resources. (8)

Introduction to Corpus - Elements in Balanced Corpus- TreeBank- PropBank- WordNet- VerbNet. Resource Management with XML- Management of Linguistic Data with the help of GATE- NLTK.

(7)

WORD LEVEL ANALYSIS

Regular Expressions and Automata- Morphology and Finite State Transducer- Probabilistic Models of Pronunciation and Spelling- N-grams- HMMs and Speech Recognition. (9)

SYNTACTIC ANALYSIS

Word classes and Part-of-Speech Tagging- Context - Free Grammars- Parsing with Context- Free Grammars- Features and Unification- Lexicalized and Probabilistic Parsing- Language and Complexity. (11)

SEMANTIC ANALYSIS AND DISCOURSE PROCESSING

Representing Meaning- Semantic Analysis- Lexical Semantics- Word Sense Disambiguation and Information Retrieval. Simple Applications in NLP. (10)

TOTAL : 45

REFERENCE BOOKS

1. Jurafsky D. and J. H. Martin, "Speech and language processing: An Introduction to Natural Language Processing: Computational Linguistics and Speech Recognition", 2nd Edition, Pearson paperback 2013
2. Tanveer Siddiqui, U.S. Tiwary, "Natural Language Processing and Information Retrieval", Oxford University Press- 2008.
3. Jurafsky and Martin, "Speech and Language Processing", Prentice Hall, 1st Edition (January 26-2000)- SBN: 0130950696.
4. James Allen, "Natural Language Understanding", 2nd Edition, Benjamin/Cummings Publishing Company, 1995.

MOOCs

1. <https://www.youtube.com/playlist?list=PL6397E4B26D00A269>
2. <https://www.youtube.com/watch?v=aeOLjFe256E>
3. <https://www.youtube.com/watch?v=FLZvOKSCkxY>

20MCAE206 - SOCIAL NETWORK ANALYSIS

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PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

CO1 : *Understand concept of semantic web and related applications.*

CO2 : *Represent knowledge using ontology.*

CO3 : *Model social network data.*

CO4 : *Understand importance of communities in social network.*

CO5 : *Apply techniques for visualization of social networks.*

INTRODUCTION

Introduction to Semantic Web: Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Social Network analysis: Development of Social Network Analysis - Key Concepts and Measures in Network Analysis - Electronic Sources for Network Analysis: Electronic Discussion Networks- Blogs and Online communities - Web-based Networks - Applications of Social Network Analysis (9)

MODELLING- AGGREGATING AND KNOWLEDGE REPRESENTATION

Ontology and their role in the Semantic Web : Ontology-based Knowledge Representation - Ontology Languages for the Semantic Web: Resource Description Framework - Web Ontology Language. (7)

MODELLING AND AGGREGATING SOCIAL NETWORK DATA :

State-of the-art in network data representation - Ontological representation of Social Individuals - Ontological Representation of Social Relationships - Aggregating and Reasoning with Social Network Data - Advanced Representations. (9)

EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL

Extracting Evolution of Web Community from a Series of Web Archive - Detecting communities in Social Networks - Definition of community - Evaluating Communities - Methods for Community Detection and Mining - Applications of Community Mining Algorithms - Tools for Detecting Communities Social Network Infrastructures and Communities - Decentralized Online Social Networks - Multi- Relational Characterization of Dynamic Social Network Communities. (10)

VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS

Graph theory - Centrality - Clustering - Node-Edge Diagrams - Matrix Representation - Visualizing Online Social Networks- Visualizing Social Networks with Matrix-based Representations - Matrix and Node-Link Diagrams - Hybrid Representations - Applications - Cover Networks - Community Welfare - Collaboration Networks - Co-Citation Networks. (10)

TOTAL : 45

REFERENCE BOOKS

1. Peter Mika, *“Social Networks and the Semantic Web”*, 1st Edition, Springer 2007.
2. Borko Furht, *“Handbook of Social Network Technologies and Applications”* 1st Edition Springer, 2010.
3. Guandong Xu, Yanchun Zhang and Lin Li, *“Web Mining and Social Networking Techniques and Applications”*, 1st Edition, Springer, 2011.
4. Dion Goh and Schubert Foo, *“Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively”*, IGI Global Snippet, 2008.
5. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, *“Collaborative and Social Information Retrieval and Access: Techniques for Improved User Modelling”*, IGI Global Snippet, 2009.
6. John G. Breslin, Alexander Passant and Stefan Decker, *“The Social Semantic Web”*, Springer, 2009.

MOOCs

1. <https://www.youtube.com/watch?v=n3ziCzUGu2M>

20MCAE304 – WIRELESS NETWORKS

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PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOMES

Upon completion of the course, students will be able to

CO1 : Study about wireless network basics, architecture, protocol stack and standards.

CO2 : Understand the working of wireless medium access control layer and network layer.

CO3 : Design and implement wireless network environment using wireless network protocols and standards.

CO4 : Analyze different routing protocols in mobile ad-hoc network.

CO5 : Conversant with advanced wireless networks 3G, 4G and 5G and their architecture.

Wireless Network and LAN technologies: Introduction- Frequencies for Radio Transmission – Signals – Antennas – Signal Propagation-Multiplexing - Modulation - Wireless LAN technologies: Infrared, UHF narrow band, spread spectrum- IEEE 802.11: System Architecture. **(9)**

Medium Access Control Layer : Motivation for a specialized MAC – SDMA – FDMA – TDMA – Fixed TDM, Classical Aloha, Slotted Aloha, Carrier Sense Multiple Access, Demand Assigned Multiple Access, PRMA, Reservation TDMA, Multiple Access with Collision Avoidance, Polling, Inhibit Sense Multiple Access– CDMA – Spread Aloha Multiple Access– Comparison **(9)**

Network Layer : Mobile IP – Session Initiation Protocol – Mobile Ad-hoc Network: Characteristics – Classification of routing protocols - Table driven Routing Protocol – OLSR - Source-initiated On-demand Routing Protocol – DSR – Hybrid Routing Protocols – ZRP. **(8)**

Wireless Wide Area Networks: Overview of UMTS Terrestrial radio access network – UMTS core network architecture : 3G – MSC, 3G-SGSN, 3G-GGSN, SMS-GMSC, SMS-IW MSC, Firewall, DNS, DHCP- High Speed Downlink Packet Access (HSDPA) - LTE network: Architecture and Protocol. **(10)**

4G and 5G Networks: 4G vision - Features and challenges – Applications of 4G - Introduction and Roadmap To 5G: Historical trend and evolution of LTE technology to beyond 4G – 5G use cases and System Concepts – 5G Architecture – Small cells for 5G mobile networks - IoT: relation to 5G. **(9)**

TOTAL: 45

REFERENCE BOOKS:

1. *Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education, 2014.*
 2. *Vijay K Garg, "Wireless Communication and Networking", First Edition, Elsevier, 2011.*
 3. *Jonathan Rodriguez, "Fundamentals of 5G Mobile Networks", John Wiley & Sons, Ltd, 2015.*
- .

20MCAE305 - AD HOC NETWORKS

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PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

CO1 : Describe unique issues in ad-hoc networks and MAC protocols and their classifications

CO2 : Discuss challenges in designing routing and transport protocols for ad-hoc networks

CO3 : Demonstrate familiarity with common wireless sensor node architecture
and the organization of MAC protocols developed for WSN.

CO4 : Demonstrate knowledge of routing in WSN and to analyze and classify wireless mesh networks.

CO5 : Develop simple routing solutions for ad-hoc- WSN and mesh networks.

AD-HOC MAC

Introduction - Issues in Ad-hoc Wireless Networks. MAC Protocols - Issues- Classifications of MAC protocols- Multi channel MAC & Power Control MAC Protocol. (9)

AD-HOC NETWORK ROUTING & TCP

Issues - Classifications of routing protocols-Hierarchical and Power aware. Multicast routing - Classifications: Tree based- Mesh based. Ad-hoc Transport Layer Issues. TCP over Ad-Hoc- Feedback based- TCP with explicit link- TCO-Bus- Ad-Hoc TCP- and Split TCP. (9)

WSN - MAC

Introduction - Sensor Network Architecture- Data dissemination- Gathering. MAC Protocols - Self - organizing- Hybrid TDMA/ FDMA and CSMA based MAC (9)

WSN ROUTING- LOCALIZATION & QOS

Issues in WSN routing - OLSR- AODV- Localization - Indoor and Sensor network Localization. QoS in WSN (9)

MESH NETWORKS

Necessity for Mesh Networks - MAC enhancements - IEEE 802.11s Architecture - Opportunistic routing - Self configuration and Auto configuration - Capacity Models - Fairness- Heterogeneous Mesh Network - Vehicular Mesh Networks. (9)

TOTAL : 45

REFERENCE BOOKS

1. *C. Siva Ram Murthy and B.S. Manoj, "Ad Hoc Wireless Networks : Architectures and Protocols", Pearson Education, 2008.*
2. *Feng Zhao and Leonidas Guibas, "Wireless Sensor Networks", Morgan Kaufman Publishers, 2004.*
3. *C.K.Toh, "Ad Hoc Mobile Wireless Networks : Protocols and Systems", 2nd Edition, Pearson Education, 2002.*
4. *Thomas Krag and Sebastin Buettrich, "Wireless Mesh Networking", O'Reilly Publishers,2007*
5. *Charles E.Perkins, "Ad Hoc Networking", Addison Wesley, 2000.*

MOOCs

1. http://nptel.ac.in/courses/10610516_0/

20MCAE401 - ORGANIZATIONAL BEHAVIOR

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will achieve the following

CO1 : *Given a case study, analyze the behavior of the individual.*

CO2 : *Given a case study, analyze the behavioral pattern of group interaction in organization*

CO3 : *Given a scenario in an organization assess the attitude and personality of the individuals in the organization.*

CO4 : *Given a business problem form groups and finds a solution to the problem.*

CO5 : *Given a problem in an organization, apply emotional intelligence and solve the problem.*

INTRODUCTION TO ORGANIZATIONAL BEHAVIOR

Concept- Nature- Characteristics- Conceptual Foundations and Importance- Models of Organizational Behavior- Management Challenge- A Paradigm Shift- Relationship with Other Fields- Organizational Behavior : Cognitive Framework- Behavioristic Framework and Social Cognitive Framework (8)

PERCEPTION AND ATTRIBUTION

Concept- Nature- Process- Importance. Management and Behavioural Applications of Perception. Attitude: Concept- Process and Importance- Attitude Measurement. Attitudes and Workforce Diversity. Personality: Concept- Nature- Types and Theories of Personality Shaping- Personality Attitude and Job Satisfaction.

Learning : Concept and Theories of Learning. (10)

MOTIVATION

Concepts and Their Application- Principles- Theories- Employee Recognition- Involvement- Motivating a Diverse Workforce. Leadership: Concept- Function- Style and Theories of Leadership-Trait- Behavioural and Situational Theories. Analysis of Interpersonal Relationship- Group Dynamics: Definition- Stages of Group Development- Group Cohesiveness- Formal and Informal Groups- Group Processes and Decision Making- Dysfunctional Groups. (10)

ORGANIZATIONAL POWER AND POLITICS

Concept- Sources of Power- Distinction Between Power- Authority and Influence- Approaches to Power- Political Implications of Power: Dysfunctional Uses of Power. Knowledge Management & Emotional Intelligence in Contemporary Business Organisation.

ORGANIZATIONAL CHANGE

Concept- Nature- Resistance to change- Managing resistance to change- Implementing Change- Kurt Lewin Theory of Change.

(8)

CONFLICT

Concept- Sources- Types- Functionality and Dysfunctionality of Conflict- Classification of Conflict Intra-Individual- Interpersonal- Intergroup and Organizational- Resolution of Conflict- Meaning and Types of Grievance and Process of Grievance Handling. Stress: Understanding Stress and Its Consequences- Causes of Stress- Managing Stress. Organizational Culture: Concept- Characteristics- Elements of Culture- Implications of Organisation culture- Process of Organisational Culture. (9)

TOTAL : 45

REFERENCE BOOKS

1. *Newstrom John W., "Organizational Behaviour: Human Behaviour at Work", Tata Mc Graw Hill- 12th Edition, 2017.*
2. *Luthans Fred, "Organizational Behaviour", Tata McGraw Hill.,3rd edition, 2019.*
3. *Judge and Stephen P.Robbins, "Organizational Behavior",Pearson,13th edition, 2020*
4. *Ace simpson, stewart Clegg, "Positive Organizational Behaviour- A reflective approach", Taylor & Francis, 5th edition, 2020*

MOOCs

1. <http://nptel.ac.in/courses/110105034/>
2. <http://nptel.ac.in/courses/110105033/>

20MCAE402 - PRINCIPLES OF MANAGEMENT

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

CO1 : Describe the principles of management.

CO2 : Prepare a decision tree for a given statement.

CO3 : Given a business plan, specify the management functions (planning- organizing- controlling and evaluating)

CO4 : Construct the organizational chart for given company.

CO5 : Prepare a flow chart of the selection process of a given company.

MANAGEMENT

Concept- Nature- Importance- Management : Art and Science- Management as a Profession- Management Vs. Administration- Management Skills- Levels of Management- Characteristics of Quality Managers. Evolution of Management: Early contributions- Taylor and Scientific Management- Fayol's Administrative Management- Bureaucracy- Hawthorne Experiments and Human Relations- Social System Approach- Decision Theory Approach. Business Ethics and Social Responsibility: Concept- Shift to Ethics- Tools of Ethics. (9)

INTRODUCTION TO FUNCTIONS OF MANAGEMENT

Planning :Nature- Scope- Objectives and Significance of Planning- Types of Planning- Process of Planning- Barriers to Effective Planning- Planning Premises and Forecasting- Key to Planning- Decision Making. Organizing: Concept- Organisation Theories- Forms of Organisational Structure- Combining Jobs: Departmentation- Span of Control- Delegation of Authority- Authority & Responsibility- Organisational Design. (11)

STAFFING

Concept- System Approach- Manpower Planning- Job Design- Recruitment & Selection- Performance Appraisal Directing: Concept- Direction and Supervision Motivation: Concept- Motivation and Performance- Theories Of Motivation- Approaches for Improving Motivation- Pay and Job Performance- Quality of WorkLife- Morale Building. (9)

LEADERSHIP

The Core of Leadership: Influence- Functions of Leaders- Leadership Style- Leadership Development (2)

Communication : Communication Process- Importance of Communication- Communication Channels- Barriers to Communication. Controlling: Concept- Types of Control- Methods: Pre-control: Concurrent Control: Post-control- An Integrated Control System- The Quality Concept Factors affecting Quality- Developing a Quality Control System- Total Quality Control- Pre-control of Inputs- Concurrent Control of Operations. Post Control of Outputs. Change and Development: Model for Managing Change- Forces for Change- Need for Change- Alternative Change Techniques- New Trends in Organisational Change. (7)

Training and Development : Need for training- advantages of training programme- Types of training programmes- Training methods- Selection of a training method- Evaluation of training and development- Training practices in India. (7)

TOTAL : 45

REFERENCE BOOKS

1. Robbins S.P., Coulter Mary & Niharika Vohra, "Management", 10th Edition, Pearson Education, 2019.
2. S.A. Sherlekar, "Ethics in Management", Himalayan Publishing Company. 2016
3. H.R.Appannaiah, G Dinakar, H.A, Bhaskar, "Principles of Management" 6th Edition, Himalaya, 2019
4. Dr.L.M.Prasad, "Principles and practise of management", 10th edition sultan chand & sons, 2020.

MOOCs

1. <http://nptel.ac.in/courses/110105081/>
2. <http://nptel.ac.in/courses/110105079/>
3. <http://nptel.ac.in/courses/110105079/4>
4. <http://nptel.ac.in/courses/122105021/>
5. <http://nptel.ac.in/courses/110105067/#>

20MCAE403 - ACCOUNTING AND FINANCIAL MANAGEMENT

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

- CO1** : *Prepare books of accounts and verify correctness using trial balance, for any business organization.*
- CO2** : *Prepare statements of final accounts to ascertain the profit, for any trading or manufacturing organization.*
- CO3** : *Perform cost estimation and determine the optimum cost/price/profit for a firm using Cost Sheet, CVP analysis and Marginal Costing Techniques.*
- CO4** : *Prepare financial statements using ratio analysis, budgeting, working capital management, capital budgeting and budgetary control techniques and present facts to assist in strategic decision making, given a set of investment options for a business.*
- CO5** : *Develop software solutions to automate a given accounting, costing or financial process, using MS-Excel.*

FINANCIAL ACCOUNTING

Introduction : Accounting Concepts, Principles and Conventions - basic accounting procedures - Journal and Ledger, Trial Balance. (15)

FINAL ACCOUNTS

Manufacturing and Trading Account - Profit and Loss Account - Balance Sheet. Final accounts with adjustments - Working with excel worksheets for automating Final Accounts. Depreciation. Type - Straight Line Method - Written-Down Value Method, Sinking Fund Method - Preparation of Depreciation Account (15)

COST ACCOUNTING

Methods and Techniques of Cost Accounting - Classification of Cost - Material Cost, Labour Cost, Overheads, Fixed and Variable Costs, Cost-Volume-Profit Analysis - Marginal Costing and Decision Making. (9)

FINANCIAL MANAGEMENT

Objective and scope of Financial Management - Analysis and Interpretation of Financial Management - Ratio Analysis - financial system - Working Capital Management - Capital Investment Decision Through Pay-back Period Method - Average Rate of Return - Internal Rate of Return - Cost of Capital - Discounted Cash Flow Analysis by using Spread Sheet. (12)

BUDGETING AND BUDGETARY CONTROL

Types of budgets - Preparation of various functional budgets - Preparation of cash budget - Flexible budget - Advantages of Budgeting and budgetary control (9)

TOTAL : 60

REFERENCE BOOKS

1. *M. C. Shukla, T. C. Grewal, S. C. Gupta, "Financial Accounting I", Sultan Chand & Sons, 2019 Paperback.*
2. *Maheshwari S.N., Dr Suneel K. Maheshwari, CA Sharad K. Maheshwari, "Principles of Management Accounting", Sultan Chand & Sons, 2021.*
3. *R L Gupta & V K Gupta, "Principles and Practice of Accountancy", S.Chand & Co.,Ltd., paperback 2019.*
4. *Jain S.P. & Narang K.L., "Advanced Accountancy - Principles of Accountancy Vol 1", Kalyani Publishers, paperback 2018.*
5. *Sashi K. Gupta & R.K Sharma, Neeti Gupta "Management Accounting", Kalyani Publishers, 2014.*
6. *Khan M.Y. and Jain P.K., "Financial Management", Tata McGraw hill, paperback 2017.*

20MCAE404 - E-COMMERCE

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

- CO1 : Specify Infrastructural requirements & Business models for an e-commerce start up. (From the perspective of Indian Businesses)*
- CO2 : Analyze different types of e marketing and e advertising strategies and e-payment alternatives commonly used in the industry and summarize the relative merits in Indian socio economic scenario.*
- CO3 : Discuss trends in CRM- SCM and Knowledge Management using web technologies and point out the suitable adaptations for a medium scale e-commerce firm in India.*
- CO4 : Appraise the impact of different types of mobile and wireless technologies on success of e-commerce in India.*
- CO5 : Understand ERP and EDI technologies can transform the Indian Business environment into paperless, cashless, easy-to-manage and regulated, with the use of cloud and open source technologies.*

INTRODUCTION

History - Early Business Information Interchange Efforts - Emergence of internet- WWW. E-Commerce - Advantages- Disadvantages - BAM Models - Transition to E-Commerce in India- E-Transmission Challenges- The Information Technology Act 2000 - Business Models - Enabling Technologies of WWW. Social Networks- Auctions- Portals: Social networks and online communities - Online auctions - E-commerce portals. (7)

ELECTRONIC MARKETING- SECURITY AND PAYMENT

Traditional Marketing - Web Presence Goal - Browsing Behavior Model - Online Marketing- E-Advertising- Trends- E-branding- Strategies. E- Security - Internet Security- E-business Risk Management Issues- Information Security Environment in India. E- Payment - Concerns in Internet Banking- Digital Payment Requirements- Token Based E-Payment Classification- E-Cash- Cheque Payment- Risk and E-Payment. (8)

CRM- SCM & SKM

E-CRM Solutions - Business Touch Points - Case Studies. Supply Chain - The new way- e-logistics- Fulfilling Customer's Needs- Smart Chains Smarter Gains. Real Time Benefits and Strategies - Advantages. Knowledge as Key Business Asset- Changes in - Global Business Economy- Technology. Knowledge - Definition- Management - Knowledge Management- Data Warehousing and Data Mining. Virtual value chain - 7 Dimensions - E-Commerce Strategy - planning E-Commerce Project. (10)

MOBILE COMMERCE AND TECHNOLOGIES

E-Business Portals. What? - Issues - Wireless- Cellular- Wireless Spectrum. - Success Stories. Technologies - mobile commerce- WAP Wireless Generations. Portals - Different Types- benefits- features. Requirements for Intell. (10)

ERP & EDI

Introduction -ERP and E2RP - Business Problems- New Paradigm- Drivers - Business processes and supporting processes. Architecture- Implementation- ERP Processes. ERP - Cloud and Open Sources.EDI - Concepts and Technology. (10)

TOTAL : 45

REFERENCE BOOKS

1. *P.T. Joseph S.J, "E-Commerce - An Indian Perspective", PHI Learning Private Limited, 4th Edition, 2012.*
2. *Kenneth C. Laudon, "E-Commerce : Business - Technology - Society", 4th Edition, Pearson.*
3. *Sandeep Desai, Abhishek Srivastava, "ERP to E2RP - A Case Study Approach", Eastern Economy Edition, PHI Learning Pvt. Ltd., 2013.*
4. *Kamalesh K. Bajaj, Debjani Nag, "E-Commerce - The Cutting Edge of Business", McGraw Hill Education (India) Private Limited, 2nd edition, 2005.*
5. *Ravi Kalakota- Marcia Robinson, "E - Business 2.0 - Roadmap for Success", Addison Wesley Professional, 2001.*

MOOCs

1. <http://nptel.ac.in/courses/106108103/pdf/PPTs/mod13.pdf>
2. http://nptel.ac.in/courses/106108103/pdf/Lecture_Notes/LNm13.pdf

20MCAE405 - DECISION MAKING

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to

- CO1 : Critically discuss different theories and theoretical perspectives in leadership - negotiation and decision making.*
- CO2 : Evaluate models to describe how leaders are perceived (leadership style)-analyse a leader's decision-making and role in negotiations.*
- CO3 : Analyse how decision-making and strategies in negotiations affect a leader's perception*
- CO4 : Use decision making tools to quantitatively analyse its impacts in a given situation*
- CO5 : Apply programmed and non-programmed decisions to effectively manage uncertainty*

INTRODUCTION TO DECISION MAKING

Basic concepts of decision making - The art of decision management- Fundamentals of Decision Making - The strategy pyramid . The DM portfolio- drivers of poor decision management- The ten cardinal decision issues and reviews- rationalistic versus evolutionary strategic decision making- Players in a decision-Representation of decision problem. (9)

STRATEGIC DECISION ANALYSIS

Introduction to strategic decision analysis - The decision analysis cycle- Sensitivity analysis- Expert and stakeholder opinions- Risk analysis- Public perception and risk communication- Deliberative democracy and public participation- Good heuristics for decision analysis- Negotiation and bargaining. (9)

RATIONAL DECISION MAKING

The Importance and Limitations of Rational Decision Making: Limited or "bounded" rationality. The Decision Process- Quantitative and qualitative factors- marginal analysis- cost effective analysis. (9)

DECISION ANALYSIS & UNCERTAINTY

Modelling Uncertainty- utility model- risk attitude- Subjective Expected Utility (SEU) modelling- Decision Trees and Influence diagrams. Programmed and Non-Programmed Decisions- the Uncertainty Problem: deal with unknowns. The Madness and wisdom of crowds. (9)

INFORMATION AND COMMUNICATION

Negotiation-Information to support decisions-Framing and Communicating Decisions. (9)

TOTAL : 45

REFERENCE BOOKS

1. French- Simon. Maule- John. & Papamichail- Nadia, “Decision Behaviour- Analysis and Support”, New Delhi: Cambridge University Press-2010.
2. James M. Kouzes, Barry Z.Posner, John Wiley & Sons “The Leadership challenge, How to make Extraordinary things happen in organizations”, 2016.
3. J.Edward Russo and Paul J.H. Shoemaker “Winning decisions : getting it right the first time”, 1st edition, 2002 special markets, currency books.
4. Mark Koscinski, ” Decision Making Essentials” 2nd edition, Vibrant Publishers, 2020
5. Pankaj Garg, ” Mastering the Art of Decision Making”, 4th edition, Notion Press, 2020

MOOCs

1. nptel.ac.in/courses/106101061/21
2. <https://www.youtube.com/watch?v=o6rcKNRe3Ho>

20MCAE406 - ENTREPRENEURSHIP DEVELOPMENT

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

CO1 : Highlight the characteristics of a successful entrepreneur

CO2 : Understand the role of entrepreneurship in the economic development of a country

CO3 : Formulate the business plans for an efficient and successful business

CO4 : Justify the need for developing rural entrepreneurship and agripreneurship in India

CO5 : State the economic factors influencing the emergence and development in country

ENTERPRENEURSIP

Entrepreneur - Types of Entrepreneurs - Difference between Entrepreneur and Intrapreneur - Entrepreneurship in Economic Growth- Factors Affecting Entrepreneurial Growth. (9)

MOTIVATION

Major Motives Influencing an Entrepreneur - Achievement Motivation Training- Self Rating - Business Games- Thematic Apperception Test - Stress Management - Entrepreneurship Development Programs - Need - Objectives. Rural entrepreneurship and agri-preneurship development (9)

BUSINESS

Small Enterprises - Definition- Classification - Characteristics- Ownership Structures - Project Formulation - Steps involved in setting up a Business - identifying- selecting a Good Business opportunity- Market Survey and Research- Techno Economic Feasibility Assessment - Preparation of Preliminary Project Reports - Project Appraisal - Sources of Information - Classification of Needs and Agencies. (9)

FINANCING AND ACCOUNTING

Need - Sources of Finance- Term Loans- Capital Structure- Financial Institution- Management of working Capital- Costing- Break Even Analysis- Taxation - Income Tax- Excise Duty - Sales Tax. (9)

SUPPORT TO ENTREPRENEURS

Sickness in small business - Concept- Magnitude- Causes and Consequences- Corrective Measures - Business Incubators - Government Policy for Small Scale Enterprises - Growth Strategies in small industry - Expansion- Diversification- Joint Venture- Merger and Sub Contracting. (9)

TOTAL: 45

REFERENCE BOOKS

1. Khanka. S.S., *"Entrepreneurial Development"* S.Chand & Co. Ltd., Ram Nagar, New Delhi, 2013.
2. Donald F Kuratko, *"Entrepreneurship Theory Process and Practice"*, Cengage Learning, 9th Edition, 2014.
3. Hisrich R D, Peters M P, *"Entrepreneurship"*, Tata McGraw-Hill, 8th Edition, 2013.
4. Poornima M Charantimath *"Entrepreneurship Development And Small Business Enterprise"*, Pearson Publication, Paper Back, 2006.

MOOCs

1. <http://www.sanfoundry.com/best-reference-books-entrepreneurial-development/>
2. <http://www.tandfonline.com/toc/TEPN20/curre>

20MCAE407 - PRINCIPLES OF ENVIRONMENTAL SCIENCE

L	T	P	C
3	0	0	3

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

CO1 : *Predict the values of biodiversity for the development*

CO2 : *Design the methods for the prevention of environmental pollution and solid waste management.*

CO3 : *Illustrate the use of alternate energy resources for growing energy needs*

CO4 : *Classify the environmental segments, the causes for its deterioration, the measure taken for its prevention and the need for sustainable development.*

CO5 : *Identify the threats to environment, social issues related to it, the necessity for environmental legislation, sustainable development and the applications of bio technology and green chemistry for environmental protection.*

ENVIRONMENTAL CHEMISTRY

Chemistry and the Environment - Environmental segments - Composition and Characteristics of Atmosphere, Hydrosphere, Lithosphere, and Biosphere: Chemical species and particulates present in the environment - reactions occur in the atmosphere. Photochemical smog. Impact of man on the environment. Impact of Environment upon humans. (9)

ECOSYSTEMS AND BIODIVERSITY

Concepts of an ecosystem : types, structure and functions of the ecosystem. Food chains, food webs and ecological pyramids. Biodiversity: Definition - Genetic, species, ecosystem and landscape diversities - India as a mega diversity nation - Hot spots of biodiversity. Importance of biodiversity - loss of biodiversity - causes of reduction in biodiversity. Conservation of biodiversity - restoration of biodiversity. (9)

ENVIRONMENTAL POLLUTION

Sources, causes, effects and management of Air, Water, Soil, Marine, Noise and Radioactive pollution. Sources of Solid, Hazardous, Biomedical and Chemical wastes. Solid Waste Disposal and treatment (9)

ENERGY AND ENVIRONMENT

Energy resources - Growing energy needs - renewable and non-renewable energy sources - use of alternate energy sources - Solar, Wind, Tidal, Geothermal and OTEC - (Principles only) merits and limitations. (3)

SOCIAL ISSUES AND THE ENVIRONMENT

Sustainable development - Urban Population - problems related to energy - Water Conservation. Rainwater harvesting - Environment Ethics - Green house effect, Global warming, climate change, Nuclear hazards and accidents. Issues involved in enforcement of environment legislation - precautionary principle - polluter pays principle - the Beneficiary pays principle - role of an Individual in Environment protection - Environment (Protection) Act - Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act. Wildlife Protection Act and Forest (Conservation) Act. (9)

BIOTECHNOLOGY AND GREEN CHEMISTRY

Biotechnology and its applications in environmental protection - Bioinformatics - Bioremediation. Biological purification of contaminated air. Green chemistry for clean technology: Significance of green chemistry - Basic components of Green chemistry. Industrial applications of green chemistry. Green fuels - e-green Propellants and Biocatalysts. (6)

TOTAL : 45

REFERENCE BOOKS

1. Dara, S.S. "A Text Book of Environmental Chemistry and Pollution Control", S. Chand and Company Ltd, 8th Revised Edition, 2008.
2. Kaushik, A. and Kaushik, C.P. "Environmental Science and Engineering", 2nd Edition, New Age International (P) Limited Publishers, 2006.
3. Dr. Raghavan Nambiar, K. "Text Book of Environmental Studies" Scitech Publications (India) Pvt. Ltd, Chennai, 2007.
4. Benny Joseph, "Environmental Studies" Tata McGraw Hill Publishing Company Ltd, 2008.
5. Surinder Deswal and Anupama Deswal, "A Basic course in Environmental Studies" Dhanpat Rai and Co. (P) Ltd, 2006.

20MCAEL06 - GPU AND PARALLEL PROGRAMMING LABORATORY

L	T	P	C
0	0	4	2

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT: LABORATORY

COURSE OUTCOME

Upon completion of the course, students will be able to:

- CO1 : Learn the basics of CUDA programming.*
- CO2 : Implement data transfer from host to device and vice-versa.*
- CO3 : Develop CUDA code to perform operations on large arrays.*
- CO4 : Implement the concepts of shared memory both static and dynamic*
- CO5 : Develop parallel programming solutions for small real world applications using CUDA/GPU*

CONCEPTS TO BE COVERED

1. Querying device properties
2. Handling CUDA errors
3. Host-Device Synchronization: Copying data between host and device
4. Measuring data transfer times
5. Simple expression evaluation for kernel launch
6. Vector addition
7. Reversing arrays using shared memory Static and Dynamic
8. Matrix Operations
9. Any real time application development like image processing, machine learning etc.

Recommended Software: CUDA C/C++ or CUDA Python

REFERENCE

1. <https://developer.nvidia.com/blog/even-easier-introduction-cuda/>

20MCAEL07 - IMAGE PROCESSING LABORATORY

L	T	P	C
0	0	4	2

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : PRACTICAL

COURSE OUTCOME

Upon completion of the course, students will be able to

CO1 : Implement the image fundamentals and mathematical transforms necessary for image processing.

CO2 : Apply various enhancement and segmentation techniques.

CO3 : Apply image restoration process on different noises using filters.

CO4 : Execute various transforms and filtering on any digital image.

CO5 : Solve real life problems using image processing.

CONCEPTS TO BE COVERED

1. Display of Grayscale Images.
2. Histogram Equalization.
3. Filtering in frequency domain.
4. Display of color images.
5. Conversion between color spaces.
6. Non-linear Filtering.
7. Edge detection using Operators.
8. DFT of images.
9. DWT of images.
10. Apply any segmentation technique on a digital image.

20MCAEL08 - WEB FRAMEWORKS LABORATORY

L	T	P	C
0	0	4	2

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT: PRACTICAL

COURSE OUTCOME

Upon completion of the course, students will be able to

CO1: build a robust framework to support daily development needs

CO2: create dynamic web sites and web applications

CO3: create data models using MongoDB and ExpressDB

CO4: able to build components and bind data to it

CO5: develop single page applications with the front end facilities in the stack

Concepts/Tools to be covered

1. Installing and setting up the framework, environment
2. Server side Node.js. and Express
Add a model with Test for the model,
Add properties,
Add Controller,
Add Route,
Add Categories,
Add Functionality
Add Authentication.
3. MongoDB – Working with basic Shell Commands, List the database, collections and category collections. Create category, Create Category with different schema
Update and delete Category
4. AngularJS Creating the first module, Creating Angular UI Bootstrap, Working with Angular Directives, Add functionality for controller, route and View.
Unit Testing and end to end testing in AngularJS

MOOCs

1. <https://jasonwatmore.com/post/2015/12/26/setup-the-mean-stack-on-windows>
2. <https://hackernoon.com/mean-stack-development-for-developers-4d88c40c4103>
3. <http://www.bradoncode.com/tutorials/learn-mean-stack-tutorial/>

20MCAEL09 - NATURAL LANGUAGE PROCESSING LABORATORY

L	T	P	C
0	0	4	2

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : PRACTICAL

COURSE OUTCOME

Upon completion of the course, students will be able to

CO1 : Apply basic algorithms in the area of Natural Language Processing.

CO2 : Perform morphological analysis on text.

CO3 : Apply techniques for syntactic analysis.

CO4 : Use algorithms at semantics level and resources of natural language data-corpora.

CO5 : Apply techniques for information extraction.

CONCEPTS / TO BE COVERED

Topics will include (but are not restricted to) machine translation, sequence tagging, constituent and dependency parsing, information extraction, semantics.

1. Language Models
2. Machine Translation
3. Morphological and Syntactical analysis
4. Text Classification
5. Sequence Tagging
6. Constituency Parsing
7. Dependency Parsing
8. Information Extraction
9. Machine Comprehension

Structured Prediction, a branch of Machine Learning relevant to NLP can be included if students have studied Machine Learning as a course.

MOOCs

1. <https://www.youtube.com/watch?v=j6BsoiKDat0&list=PLDB034BC533455720>

20MCAEL10 - SOCIAL NETWORK ANALYSIS LABORATORY

L	T	P	C
0	0	4	2

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : PRACTICAL

COURSE OUTCOME

Upon completion of the course, students will be able to:

CO1 : *Input data, represent social networks as a graph and apply visualization techniques.*

CO2 : *Visualize network datasets.*

CO3 : *Perform different network measurements.*

CO4 : *Build and implement social network designs.*

CO5 : *Apply social network theory to social network datasets.*

CONCEPTS TO BE COVERED

1. Data Management
2. Network Visualization
3. Cohesion, centralization and core-periphery
4. Node-level measurements
5. Statistical measurements, multivariate
6. Creating sub-groups
7. Ego-networks
8. Personal networks
9. Triad analysis, roles and equivalence
10. Testing hypotheses

MOOCs

1. <https://www.youtube.com/watch?v=j6BsoiKDat0&list=PLDB034BC533455720>

20MCAEL11 – NETWORK PROGRAMMING LABORATORY

L	T	P	C
0	0	4	2

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : PRACTICAL

COURSE OUTCOME

Upon Completion of the course, the students will be able to:

- CO1 : Understand the key protocols that support the communication.*
- CO2 : Develop and implement connection-oriented and connection-less communication using Socket API.*
- CO3 : Develop and implement concurrent and iterative servers and analyze their functionality.*
- CO4 : Apply advanced programming techniques such as Broadcasting, Multicasting and networking between client and server.*
- CO5 : Develop and implement simple network applications using NS-2 for a given set of requirements and demonstrate its working.*

CONCEPTS TO BE COVERED

1. Basic Network commands
2. Connection oriented one-way communication
3. Connection oriented two-way communication
4. Connection less one-way communication
5. Connection less two-way communication
6. Iterative and Concurrent Server Implementation
7. Broadcasting using UDP
8. Multicast Communication using UDP
9. Simulation of TCP and UDP communication using NS-2
10. Networking between different machines.

MOOCs

1. <http://nptel.ac.in/courses/106105151/>

20MCAEL12 – DIGITAL MARKETING LABORATORY

L	T	P	C
0	0	4	2

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : PRACTICAL

COURSE OUTCOME

Upon Completion of the course, the students will be able to:

CO1 : Generate market context with practical needs of digital marketing.

CO2 : Develop conversational interfaces with customers using connection oriented/connectionless services.

CO3 : Analyse a web site and its traffic using tools

CO4 : Understand the methods of optimizing the website for search engines.

CO5 : Know the improved latest technologies for efficient marketing

CONCEPTS TO BE COVERED

1. Customer, Content and Conversation Management
2. Improve visits for a web site
 - a. Meta element keywords (Search Engine Optimization)
 - b. Push advertisement
 - c. Email marketing
3. Analysing a web site using tools
4. Page ranking methods
5. Develop android app
6. Chat bot facilities / Voice Automation Facilities

MOOCs

1. <http://nptel.ac.in/courses/106105151/>
2. https://onlinecourses.swayam2.ac.in/ugc19_hs26/preview