MCA III-Semester

MCA 301: COMPUTER ORIENTED OPERATIONS RESEARCH

UNIT-I

Origin and Development of Operations Research - Nature and Scope of Operations Research-Models and Modeling in Operations Research- Computer Software for Operations Research-Applications of Operations Research-Linear Programming-Model formulation, Graphical Method, Simplex Method, Duality, Revised Simplex Method-Integer Programming Problem using Excel solver.

UNIT-II

Transportation Problem–Transshipment Model–Assignment Problem–Goal Programming -Network Techniques: Shortest-Path Model, Minimum Spanning Tree Problem, Maximum Flow Problem.

UNIT-III

Non-Linear Programming-Unconstrained Optimization, Constrained Optimization with and without inequalities-Kuhn-Tucker Conditions-Graphical Solution of Non–Linear Programming Problem-Quadratic Programming-Separable Programming-Convex and Non-Convex Programming.

UNIT-IV

Queuing Theory-Basic structure of Queuing System-Classification of Queuing Models-Single-Server Queuing Models-Multi-Server Queuing Models-Applications of Queuing Theory-Simulation-Monte-Carlo Simulation-Role of Computers in Simulation-Applications of Simulation.

UNIT – V

Decision Theory-Steps in Decision Theory Approach-Decision-Making Environments-Decision Making under Certainty, Uncertainty and Risk-Decision Tree Analysis-Game Theory.

Text Books:
1. Taha H.A., Operations Research: An Introduction, Prentice-Hall of India
2. S.D.Sharma., Operations Research, Kedar Nath Ram Nath, Delhi

Reference Books:
1. R.Pannerselvam., Operations Research, Prentice-Hall of India
2. J.K.Sharma., Operations Research -Theory and Applications, Macmillian India Ltd
3. Kanti Swarup., P.K.Gupta and Mam Mohan, Sultan chand& Sons

MCA 302: DATA COMMUNICAITON AND COMPUTER NETWORKS

UNIT – I

Introduction, Network models – Internet model, OSI model Physical Layer: Signals – Analog, Digital, Digital Transmission – Coding, Sampling, Analog Transmission – Modulation of digital and analog signal, Multiplexing – FDM, WDM, TDM, Transmission Media – cable, wireless, Circuit switching and Telephone network, DSL Technology, Cable modern, SONET.

UNIT – II

Data Link Layer: Error detection and correction, Data link control and Protocols – Stop and wait,
Go-back-n, Selective repeat, HDLC, Point to point access, Channelization, LANS – Traditional
Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless LAN's – IEEE 802.11, Blue tooth, Connecting LANs – Connecting devices, Backbone networks, Virtual LANS, Cellular telephony, Satellite networks, Virtual circuit switching, Frame relay, ATM.

UNIT – III

Network Layer: Inter-networks, Addressing, Routing, Network layer Protocols – ARP, IP, JCMP. IPV6, Routing – Introduction, Unicast routing, Protocols – RIP, OSPF, BGP, Multicast Routing, Protocols – DVMRP, MOSPF, CBT, PIM.

UNIT – IV

Transport Layer: Process-to-Process Delivery, UDP, TCP, Data traffic, Congestion and Control, Quality of service (QOS) and techniques to improve QOS, Integrated services, QOS in Switched networks. Security: Introduction. Symmetric-key cryptography, Public key cryptography, Message security, Digital signature, User authentication, Key management, Kerberos. Communication Security, Authentications Protocols, E-mail Security, Web security, Social Issues.

UNIT – V

Application Layer: Design issues, file transfer, access and management. Client-Server model, Socket interface Introduction to DNS, Distribution of name space, . DNS in the Internet. Electronic mail, SMTP, File Transfer, FTP, HTTP, World Wide web.

Text Books:
1. Forouzan B A, Data Communications and Networking, 4th edition, Tata McGraw-Hill, 2007.
2. Tanenbaum A S, Computer Networks, 4th edition, Pearson Education, 2003.

Reference Books:
1. Stallings W, Data and Computer Communications, 7th edition, Pearson Education, 2004.
2. Gallo M A, and Hancock W M, Computer Communications and Networking Technologies, Thomson Brooks/Cole, 2002.
3. Comer D E, Computer Networks – and Internets with Internet Applications, 4th edition, Pearson Education, 2004.
4. Kutose J F, and Ross K W, Computer Networking – A Top-down Approach Fealuring the Internet, Pearson Education, 2001.
5. Tomasi W, Introduction to Data Communications and Networking, Pearson Education, 2004.

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MCA 303: SOFTWARE ENGINEERING

UNIT – I

Software Engineering – Introduction, Generic view of process, models, an agile view of process. Software Engineering practice – Software Engineering, communication, planning, modeling, construction practices and deployment.

UNIT-II

System Engineering – Computer-based systems, the system engineering Hierarchy, business process engineering, product engineering and system modeling. Building the analysis model

– Requirement analysis, modeling approaches, data modeling. Behavioral model. The web engineering process, analysis models for web apps.

UNIT –III

Design Engineering-Design process and quality, design concepts the design model, and pattern-used software design. Architectural design – Software architecture, data design, architectural styles and patterns, architectural design mapping data flow into a software architecture. Component-based software engineering, Critical systems development, Software reuse, User interface design, web apps design issues and architecture design.

UNIT –IV

Testing strategies – Strategies and issues, testing strategies for and object-oriented software. Validation testing and system testing. Software testing tactics – Fundamentals, black-box and white-box testing white-box testing basis path testing. Control structure testing, black-box testing, object-oriented testing methods. Testing methods applicable at the class level inter class testing case design. Testing for specialized environments, architectures and applications, web application testing – concepts, testing process, component level testing.

UNIT – V

Product metrics – Software quality, framework, metrics for analysis model design model, source case and testing. Managing software projects – The management spectrum, the W^5 HH principle, metrics in process, software measurement, metrics for software quality integrating metrics within the software process. Estimation – observations, decomposition techniques, empirical models, estimation for object-oriented projects other estimation techniques, project scheduling, risk management, reengineering, Security engineering, Service-oriented software engineering, Aspect-oriented software development.

Text Books:

1. Roger, S, Pressman, Software Engineering, A Practitioner's Approach, Six Edition, McGraw-Hill, International Edition, 2005.
2. Ian Sommerville, Software Engineering, Pearson Education, 8th Edition.

REFERENCE BOOKS:
1. James F Peters, Software Engineering, John Wiley
2. Waruan S Jawadekar, Software Engineering, Tata McGraw Hill, 2004.
3. Carlo Ghezzi, Mehdi Jazayeri, Dino Manrioli, Fundamentals of Software Engineering, PHI, 2001 Pankaj Jalote, An Integrated approach to Software Engineering Narosa

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MCA 304: COMPUTER GRAPHICS

UNIT I

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, Raster-scan systems, random scan systems, graphics monitors and work stations and input devices Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT II

2-D Geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. 2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT III

3-D Object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and B-spline surfaces. Basic illumination models, polygon rendering methods.

UNIT IV

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping

UNIT V

Digital Image Processing: Introduction, fundamental steps, components, sampling and quantization, image enhancements.

Text Books:
1. Donald Hearn and M.Pauline Baker, Computer Graphics C Version, Second Edition, Pearson Educations.2005.
2. Digital Image Processing, Rafeal C.Gonzalez, Richard E.Woods, SecondEdition,PearsonEducation/PHI.

Reference Books:
1. Steven Harrington (1987), Computer Graphics – A Programming Approach, Second Edition, Mc Graw – Hill International Editions.

2. William M. Newman and Robert F. Sprowli (1979), Principles of Interactive Computer Graphics, second Edition, Mc Graw – Hill International Editions.

3. FS Hill Jr. Cmputer Graphics using Open Gl, second Editions, 2005.

4. J.D.Foley Wesley,199, second Edition in C.R.C.S Asthana and N.K.Sinha "Computer Graphics for Scientists and Engineers" New Age International Limited, Second
Revised Edition.

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MCA 305: TECHNICAL COMMUNICATION AND COMPUTER ETHICS

UNIT I
Phonetics and Spoken English, The Phonemes, The Syllable, Prosodic Features. The sounds of English – Voweis and Consonants, Word Accent, Features of Connected Speech, Pronunciation, spelling, Suggestions for improvement of Indian English. Effective Speaking – Oral Presentations. Listening Comprehension. Reading Comprehension.

UNIT II
Introduction to Technical Writing – Objective of technical writing Audience Recognition and Involvement, Preparation of Resume, Techniques for writing effective E-mail. Writing User Manuals, Writing Technical Reports and Summaries.

UNIT III
Introduction to Computer Ethics – Policy vacuum, Moral and Legal issues, Computer Ethics Professional Ethics – Characteristics of professions, Conflicting Responsibilities, Code of Ethics and Professional conduct. Philosophical Ethics – Ethical Relativism, Utilitarianism, Rights individual and Social Policy Ethics.

UNIT IV
Ethics Online – Hacking and Hacker Ethics computer crime Netiquetie. Privacy – Computers and Privacy issue. Proposals for better Privacy Protection property Rights in Computer Software – Current Legal Protection. Software Piracy, The Moral question.

UNIT V
Accountability – Buying and Selling Software – Accountability issues, Social Change, Democratic values in the Internet, Freedom of Speech, Future issues. The Rights and Responsibilities of Engineers – Professional Responsibilities, Ethics and Rights Ethics in Research and Experimentation.

Text Books:
1. Gerson S.J., and Gerson S.M. Technical Writing – Process and product, 3rd edition, Pearson Education Asia, 2001.
2. Johnson D.G. Computer Ethics 3rd edition, Pearson Education Asia. 2001.
3. Bansal R.K. and Harrison J.B. Spoken English 2nd Edition, Orient Longman,

1994.

4. Fleddermann C.B. Engineering Ethics 2nd edition, Pearson Education 2004.

References Books:

1. Krishna Mohan, and Meenakshi Raman, Effective English Communciation, Tata McGray Hill, 2000.

2. Martin M.W. and Schinzunger R. Ethics in Engineering 3rd Edition Tata Mc-Gray-Hill, 1996.

3. Division of Humanities and Social Sciences, Anna University, English for Engineer and Technologists, Vols, 1and 2nd edition, Orient Longman, 2002.

4. NHT Ethics and Security Management on the Web, Prentice – Hall of India 2003.

5. Rutherford A.J. Basic Communication Skills for Technology 2nd edition Pearson Education Asia, 2001.

6. Jayanthi Dakshina Murthy, Contemporary English Grammar, Book Palave, Delhi.

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