

Course Code	Course Name	Hours per Week			Total	Total
		L	T	P	Hrs.	Credits
CA5EL05	Design and Analysis of Algorithms	3	1	0	4	4

UNIT – I

Introduction to algorithms, algorithm specification, time space complexities, asymptotic notations, average and worst case analysis.

Graph searching and Traversal: Overview, Graph Representations, Breadth First Search and Traversal ,Depth First Search and Traversal.

UNIT-II

Divide and conquer: Overview of divide-and-conquer algorithms. Examples; Binary search, finding the maximum and minimum, merge sort, Quick Sort, strassen's matrix multiplication. Substitution, Master 's method for solving recurrence relations.

Greedy Method: Overview of the greedy paradigm. Applications: minimum cost spanning tree, Knapsack problem, Single source shortest paths.

UNIT-III

Dynamic programming: Overview of dynamic programming, difference between dynamic Programming and divide and conquer, difference between dynamic programming and Greedy Method. Applications: all pairs shortest paths, single source shortest paths (general weights), 0/1 Knapsack problem, Matrix chain multiplication, longest common subsequence.

UNIT-IV

Back tracking: Overview, 8-queen problem and Knapsack problem.

Branch and bound: FIFO, LIFO and LC branch and bound. Applications: 0/1 Knapsack problem, Traveling Salesman Problem.

UNIT-V

NP-Hard and NP-Complete Problems: Basic Concepts, COOK's Theorem, NP-HARD graph Problems: Clique Decision Problem.

String matching algorithms: Knuth – Morris Pratt algorithm, Boyer-Moore algorithm.

PRAM algorithms. Algebraic algorithms, set algorithms

TEXT BOOKS

1. E. Horowitz, S. Sahni, and S. Rajsekaran, “Fundamentals of Computer Algorithms,” Galgotia Publication

REFERENCE BOOKS

1. Ullman "Analysis and Design of Algorithm" TMH
2. Goodman “Introduction to the Design & Analysis of Algorithms, TMH-2002.
3. Sara Basse, A. V. Gelder, “ Computer Algorithms,” Addison Wesley
4. T. H. Cormen, Leiserson , Rivest and Stein, “Introduction of Computer algorithm,” PHI

Course Code	Course Name	Hours per Week			Total	Total
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CA5EL06	Mobile Communication	3	1	0	4	4

UNIT- I

Overview of OSI Model: Significance of layered Model, PDUs, SDUs, IDUs, Higher layer Protocols. Switching and Components. Introduction, Applications, history of wired & wireless Communication systems. Radio Transmission: frequencies, signal propagation, antenna, types of modulation, FHSS, DSSS. Multiple Access technology for Wireless Communication: FDMA, TDMA, CDMA, SDMA Cellular System: Introduction, types.

UNIT-II

Mobile Data Communication: Cellular Telephony, Structure, Fading, Small scale fading, Multi-path Fading, Hand off Management, Switching and authentication, MTSO interconnections, frequency hopping, frequency reuse. Circuit Switched Data Services & Packet Switched Data Services on Cellular Networks, Personal Communication Systems (PCS) Architecture, Digital Enhanced Cordless Telecommunications (DECT,) Personal Access Comm. System (PACS).

UNIT-III

Digital Cellular Systems and Standards: GSM System overview, Architecture, GSM Protocol Model, GSM Mobility Management, SMS security aspects. Broadcast System overview. General Packet Radio Service (GPRS) Architecture, GPRS Network, Interfaces and Procedures (2.5 G), 3G Mobile Services: UMTS and International Mobile Telecommunications (IMT-2000), W-C DMA and CDMA 2000, Quality of service in 3G.

UNIT- IV

WLAN : Components and working of Wireless LAN, Transmission Media for WLAN, Infrastructure & types of WLAN, IEEE 802.11 Standards, Protocols for WLAN, MACA, MACAW, Infrared technology. Wireless Application Protocol (WAP) model, architecture, Gateway, WAP protocols and WML

UNIT-V

Introduction to Bluetooth technology. Wireless in Local Loop (WLL) architecture, products. Satellite as a switch, Components of VSAT system, VSAT topologies, access schemes.

TEXT BOOKS:

1. Jochen Schiller “Mobile Communication”, Pearson Education.
2. Yi –Bing Lin and Imrich Chlamtac “Wireless and Mobile Network Architectures”, Wiley India.
3. Raj Pandaya “Mobile and Personal Communication System & Services”.

REFERENCE BOOKS:

1. Uwe Hansmann, Lothar Merk “Principles of Mobile Computing” 2nd Ed. Wiley India.
2. Roger L. Freeman “ Telecom Transmission handbook” 4th ed. 1998 John Wiley & Sons Inc. New York.
3. Lee “Mobile Cellular Telecom” 1995 Mc Graw Hill.
4. Raj Kamal “Mobile Computing “Second Edition,Oxford university Press.

Course Code	Course Name	Hours per Week			Total	Total
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CA5EL07	Artificial Intelligence	3	1	0	4	4

Unit-I

Introduction: Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, AI Technique, Applications of Artificial Intelligence. Introduction to LISP programming: Syntax and numeric functions, Basic list manipulation functions, predicates and conditionals, input output and local variables, iteration and recursion, property lists and arrays.

Unit-II

Introduction to Search: Searching for solutions, uniformed search strategies, informed search strategies, Local search algorithms. State space search: Production systems. Problem Characteristics, Heuristic search - Hill climbing, Steepest Ascent Hill Climbing, best first search, OR Graphs, A* Algorithm, Problem Reduction, AND-OR Graphs, AO* Algorithm, Constraint Satisfaction Problems, Cryptarithmic Problems.

Unit-III

Knowledge Representation & Reasoning: Approaches to Knowledge Representation, Types of Knowledge, Propositional logic, Theory of first order logic, Inference in First Order Predicate Logic, Forward & Backward chaining. Horn's Clauses, Skolemization, Resolution, Unification Algorithm, Semantic Networks, Scripts, Conceptual Dependency.

Unit-IV

Game playing: Minimax search procedure, adding alpha, beta cut-off's, Additional Refinements – Waiting for Quiescence, Secondary Search, Using Book Moves, Alternatives to Minimax. Iterative deepening.
 Planning: Overview: An example domain - the block world, component of planning systems, goal stack planning, Non Linear Planning.

Unit-V

Expert systems: Introduction to expert system and benefits and application of expert systems, Capabilities of expert systems, Components of expert systems, Limitations of Expert Systems, Expert system shells, knowledge acquisition. Need and justification for expert systems. Case studies: MYCIN, RI. Learning: Concept of learning, rote learning, learning by induction, explanation based learning.

Text Books:

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata Mcgraw-hill.
2. Dan W. Patterson, "Artificial Intelligence and Expert Systems", Prentice Hall of India.
3. Clocksin & C.S.Melish "Programming in PROLOG", Narosa Publishing House.
4. Nils J. Nilson "Principles of Artificial Intelligence", Narosa Publishing House.

Reference books:

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", Pearson Education
2. E.Charniak and D McDermott, "Introduction to Artificial Intelligence", Pearson Education
3. Sasikumar, M., Ramani, S., "Rule Based Expert System", Narosa Publishing House, 1994. "Artificial Intelligence" 4 ed. Pearson.

Course Code	Course Name	Hours per Week			Total	Total
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CA5EL08	Software Project Management	4	0	0	4	4

UNIT - I

SOFTWARE PROJECT MANAGEMENT BASICS

Project Definition, Project Management Activities, Categorizing Software Projects, Problems with Software Projects, Management Control, Project Management Life Cycle, An Overview of Project Planning- Stepwise Project Planning.

UNIT - II

PROJECT EVALUATION

Strategic Assessment, Technical Assessment, Cost Benefit Analysis, Cash Flow Forecasting, Cost Benefit Evaluation Techniques, Risk Evaluation.

UNIT - III

ACTIVITY PLANNING

Objectives, Project Schedule, Sequencing and Scheduling Activities, Network Planning Models, Forward Pass, Backward Pass, Activity Float, Shortening Project Duration, Activity on Arrow Networks, Risk Management, Nature of Risk, Types of Risk, Managing Risk, Hazard Identification, Hazard Analysis, Risk Planning and Control.

UNIT - IV

MONITORING AND CONTROL

Creating Framework, Collecting The Data, Visualizing Progress, Cost Monitoring, Earned Value, Prioritizing Monitoring, Getting Project Back To Target, Change Control, Managing Contracts, Introduction, Types Of Contract, Stages In Contract Placement, Typical Terms Of A Contract, Contract Management, Acceptance.

UNIT - V

MANAGING PEOPLE AND ORGANIZING TEAMS

Introduction, Understanding Behavior, Organizational Behaviour: A Background, Selecting The Right Person For The Job, Instruction In The Best Methods, Motivation – The Oldman, Hackman Job Characteristics Model, Working In Groups, Becoming A Team, Decision Making, Leadership, Organizational Structures, Stress, Health And Safety, Case Studies.

TEXT BOOK:

1. Software Project Management by Bob Hughes, Mike cotterell, and Rajib Mall, Fifth Edition, Tata McGraw Hill, 2011.

REFERENCE BOOKS:

1. Project Management: A Managerial approach by Jack R Meredith, Samuel J. Mantel Jr., John Wiley & Sons, Inc – Ebook available.
2. Software Project Management: A Unified Framework by Walker Royse forward by Barry Boem, Pearson Education.
3. Software Project Management in Practice by Pankaj Jalote, Pearson Education, 2002.

Course Code	Course Name	Hours per Week			Total	Total
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CA5EL09	Advanced Java	2	0	4	4	4

Unit I

Introduction to Servlet and JSP programming:

An introduction to web programming with Java: An introduction to web Application, An introduction to java web programming, An introduction to java Web development, How to install and use Tomcat: how to get started with Tomcat, A quick guide to troubleshooting, How to manually deploy and run a web application, How to work with Tomcat's Web Application Manager, Configuration issues. How to use the Netbeans IDE for advanced java applications.

Unit II

Essential servlet and JSP skills

A crash course in HTML, How to develop JavaServer Pages, How to develop servlets, How to structure a Web Application with MVC pattern, How to work with Sessions and cookies, How to use standard JSP tags with JavaBeans, How to use the JSP Expression Language (EL), How to use JSP Standard Tag Library (JSTL), How to use custom JSP tags,.

Unit III

Essential database skills

How to use MySql as the DBMS: Introduction to MySQL, Working with MySQL Monitor, SQL statements for data manipulation. How to use JDBC working with a database: Working with JDBC, SQL Gateway application, Working with connection pooling, Email List application.

Unit IV

Advanced servlet and JSP skills

How to use JavaMail to send email: Introduction to JavaMail API, How to create and send email message, How to use SSL to work with a secure connection: An introduction to SSL, How to configure a testing environment for SSL, How to work with secure connection. How to restrict access to a web resource, How to work with HTTP requests and responses, How to work with listeners, How to work with filters.

Unit V

Internet Addressing, InetAddress, Factory Methods, Instance Methods, TCP/IP Client Sockets, URL, URL Connection, TCP/IP Server Sockets, Datagrams, A Sample Website development.

TEXT BOOKS

1. Murach's Java Servlets and JSP, Joel Murach, Andrea Steelman.

REFERENCE BOOKS:

1. Head First Servlets & JSP, Bryan Basham, Kathy Sierra & Bert Bates.
2. "Advanced Java 2 Platform HOW TO PROGRAM" by H. M.Deitel, P. J. Deitel, S. E. Santry – Prentice Hall.

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CA5MC03	Quantitative Aptitude & Personality Development	4	0	0	4	0

UNIT-I

Average, Problems on numbers and ages, Percentage, Profit and loss, Time and Work, Time and distance, Problems on trains, Height and Distance

UNIT-II

Ratio and proportion, Pipes and Cisterns, Boats and streams, Simple interest, Compound Interest, Mixture, Area, Clocks and Calendars, Geometry, Probability.

UNIT-III

Series, Coding and decoding, Blood Relations, Puzzle Test, Directions sense test, Mirror-Images, Water-Images

Unit IV

Speaking skills:

GDs – do's and don't's, Effective Presentation Skills, Successful Interview techniques, Leadership, Stress Management.

Unit V

Effective writing skills:

E mail communication, Summarizing and paraphrasing, Presentation and documentation of collected data, Making effective PPTs, Writing a research paper.

TEXT BOOKS:

1. Quantitative Aptitude by R.S. Aggarwal.
2. Verbal and Non Verbal Reasoning by R. S. Aggarwal
3. Koneru Aruna. Professional Communication. Mc Graw Hill, 2015
4. Sharma RC and Krishna Mohan. *Business correspondence and report writing*. New Delhi: Tata Mc Graw Hill, 2016
5. Rizvi Ashraf. *Effective Technical Communication*. Tata Mc Graw Hill, 2014.