

**DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY  
LUCKNOW**



**Evaluation Scheme & Syllabus**

**for**

**MCA First Year**

**On**

**Choice Based Credit System**

**(Effective from the Session: 2016-17)**

# Dr. APJ Abdul Kalam Technical University, Lucknow

## Study and Evaluation Scheme

MCA (Master of Computer Applications)

(Effective From Session 2016-17)

### Year – I Semester - I

Sl. No.	Subject Code	Subject Name	Periods			Evaluation Scheme					Credit
			L	T	P	Session Exams			ESE	Subject Total	
						CT	TA	Total			
1	RCA105	Professional Communication	3	1	0	20	10	30	70	100	04
2	RCA101	Computer Concepts & Principals of Programming	3	1	0	20	10	30	70	100	04
3	RCA102	Accounting & Financial Management	3	1	0	20	10	30	70	100	04
4	RCA103	Discrete Mathematics	3	1	0	20	10	30	70	100	04
5	RCA104	Computer Organization & Architecture	3	1	0	20	10	30	70	100	04
<b>Practical</b>											
6	RCA151	Professional Communication Lab	0	0	3	30	20	50	50	100	02
7	RCA152	Programming Lab	0	0	3	30	20	50	50	100	02
		<b>Total</b>	<b>15</b>	<b>4</b>	<b>5</b>					<b>700</b>	<b>24</b>

## Year – I Semester - II

Sl. No.	Subject Code	Subject Name	Periods			Evaluation Scheme					Credit
			L	T	P	Session Exams			ESE	Subject Total	
						CT	TA	Total			
1	RCA201	Computer Based Numerical & Statistical Techniques	3	1	0	20	10	30	70	100	04
2	RCA202	Data Structures	3	1	0	20	10	30	70	100	04
3	RCA203	Introduction to Automata Theory & Languages	3	1	0	20	10	30	70	100	04
4	RCA204	Innovation & Entrepreneurship	3	1	0	20	10	30	70	100	04
5	RHU001	Human Values & Professional Ethics	3	0	0	20	10	30	70	100	03
<b>Practical</b>											
6	RCA251	Computer Based Numerical & Statistical Techniques Lab	0	0	3	30	20	50	50	100	02
7	RCA252	Data Structure Lab	0	0	6	30	20	50	50	100	03
		<b>Total</b>	<b>14</b>	<b>4</b>	<b>6</b>					<b>700</b>	<b>24</b>

# Professional Communication

## MCA I Semester

### Unit-1:

Fundamentals of Communication Technical Communication: features: Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communications; The flow of Communication: Downward, Upward, Lateral of Horizontal (Peer group): Importance of technical communication; Barriers to Communication.

### Unit-II:

Constituents of Technical Written Communication Words and Phrases: Word formation. Synonyms and Antonyms; Homophones; Select vocabulary of about 500-1000 New words; Correct Usage: all Parts of Speech; Modals; Concord; Articles; Infinitives; Requisites of Sentence Construction: Paragraph

Development: Techniques and Methods- Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of Condensation-various steps.

### Unit-III

Business Communication Principles, Sales & Credit letters; Claim and Adjustment Letters; Job application and Resumes. Reports: Types; Significance; Structure, Style & Writing of Reports. Technical Proposal; Parts; Types; Writing of Proposal; Significance, Negotiation & Business Presentation skills

### Unit-IV

Presentation Strategies and Listening Skills. Defining Purpose; Audience & Local; Organizing Contents; Preparing Outline; Audio-visual Aids; Nuances of Delivery; Body Language; Dimensions of Speech: Syllable; Accent; Pitch; Rhythm; Intonation; Paralinguistic features of voice; Listening Skills: Active Listening, Passive Listening. methods for improving Listening Skills

### Unit-V

Value-Based Text Readings Following essays form the suggested text book with emphasis on Mechanics of writing.

- (i) Humanistic and Scientific Approaches to Human Activity by Moody E. Prior
- (ii) The Language of Literature and Science by A. Huxley
- (iii) Man and Nature by J.Bronowski
- (iv) The Social Function of Literature by Ian Watt
- (v) Science and Survival by Barry Commoner
- (vi) The Mother of the Sciences by A.J.Bahm
- (vii) The Effect of Scientific Temper on Man by Bertrand Russell.

### Text Books

1. Improve Your Writing ed. V.N.Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi
2. Technical Communication: A Practical Approach: Madhu Rani and Seema Verma- Acme Learning
3. Technical Communication- Principles and Practices by Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press

### Reference Books

1. Communication Skills for Engineers and Scientists, Sangeeta Sharma et.al. PHI Learning Pvt.Ltd,2011, New Delhi
2. Business Correspondence and Report Writing by Prof. R.C.Sharma & Krishna Mohan, Tata McGraw Hill & Co.Ltd.,2001, New Delhi
3. Word Power Made Easy by Norman Lewis, W.R.Goyal Pub. & Distributors, 2009, Delhi.
4. Developing Communication Skills by Krishna Mohan, Mecra Bannerji- Macmillan India Ltd. 1990, Delhi
5. Manual of Practical Communication by L.U.B.Pandey: A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi
6. English Grammar and Usage by R.P.Sinha, Oxford University Press, 2005, New Delhi.
7. Spoken English- A manual of Speech and Phonetics by R.K.Bansal & J.B.Harrison, Orient Blackswan, 2013, New Delhi
8. Business English by Ken Taylor, Orient Blackswan, 2011, New Delhi

## MCA 1<sup>st</sup> Semester

Effective from 2016-17

### COMPUTER CONCEPTS AND PRINCIPLES OF PROGRAMMING

#### UNIT 1:

08 Hours

##### Introduction to Computers:

Generations of Computer, Classification of Computers on various Parameters viz. Size, Purpose, Number of Users, Software, Application and System Software, Computer Hardware, Storage Devices, Memory Hierarchy, Magnetic Tape, Flash Memory, Cache and its Levels, SSD.

**Number System:** Binary, Octal and Hexadecimal Number Systems, Inter-Conversions in Various Numbers Systems, Binary Arithmetic.

#### UNIT 1:

06 Hours

Introduction to Operating System, Its Various Functions, Popular Operating Systems— Android, Windows, Difference between Linux and Unix, iOS, Google Chrome, Modern Computing Models: Cloud Computing Model and Its Benefits, Grid Computing, Green Computing, Internet of Things (IoT), Big Data Analytics, Modern Applications of IT

#### UNIT 1:

10 Hours

A Short History of Programming Languages, Development of Early Languages, Evolution of Software Architectures, Role of Programming Languages, Attributes of a Good Language? Approaches to Problem Solving, Concept of Algorithm and Flow Charts, Machine Language, Assembly Language and High Level Language, Concept of Assembler, Compiler, Loader and Linker.

Language Standardization and Internationalization Translators and Virtual Architectures, Binding Times, Syntactic Elements of a Programming Language, Program-Sub Program Structure, Stages in Translation, Analysis of Source Program, Synthesis of Object Program, Introduction to Python Programming.

#### UNIT 1:

08 Hours

Data Objects, Variables and Constants, Data Types, Declarations, Type Checking and Type Conversion, Assignment and Initialization, Condition Checking, Looping, Structured Data Types, Arrays, Records, Lists, Executable Objects, Methods

#### UNIT 1:

08 Hours

Naming and Referencing Environments, Recursive Sub Programs, Static and Dynamic Scope, Encapsulation, Abstraction, Abstract Data Types, Classes, Inheritance, Objects and Message Passing,

Text Books:

1. Programming Languages: Design and Implementation by Terrance W. Pratt, Marvin V. Zalkowitz, T. V. Gopal, Fourth Edition, Pearson
2. Fundamentals of Computers, V. Raja Raman and Neeharika Adabala, Sixth Edition, PHI
3. Concepts, Techniques and Models of Computer Programming by Peter Van Roy and Seif Haridi, MIT Press
4. Computer Concepts: Introductory by June Jamrich Parsons & Dam Oja Eighth Edition Cengage Learning

Reference:

1. Programming Languages: Design and Implementation, Terrence W. Pratt, Prentice Hall Publishers
2. Computer Science- A Structured Programming Approach Using C, by Behrouz A. Forouzan, Richard F. Gilberg, Thomson, Third Edition [India Edition], 2007.
3. Object- Oriented Programming with C++ by E. Balagurusamy

## MCA I Semester

### ACCOUNTING AND FINANCIAL MANAGEMENT

**Unit I:** (6 Hrs)

Overview: Accounting concepts, conventions and principles; Accounting Equation, International Accounting principles and standards; Matching of Indian Accounting Standards with International Accounting Standards

**Unit II:** (12 Sessions)

Mechanics of Accounting: Double entry system of accounting, journalizing of transactions; preparation of final accounts, Trading Account, Manufacturing Accounts, Profit & Loss Account, Profit & Loss Appropriation account and Balance Sheet, Policies related with depreciation, inventory and intangible assets like copyright, trademark, patents and goodwill.

**Unit III** (12 Sessions)

Analysis of financial statement: Ratio Analysis- solvency ratios, profitability ratios, activity ratios, liquidity ratios, market capitalization ratios ; Common Size Statement ; Comparative Balance Sheet and Trend Analysis of manufacturing, service & banking organizations.

**Unit IV** (10 Sessions)

Funds Flow Statement: Meaning, Concept of Gross and Net Working Capital, Preparation of Schedule of Changes in Working Capital, Preparation of Funds Flow Statement and its analysis ; Cash Flow Statement: Various cash and non-cash transactions, flow of cash, preparation of Cash Flow Statement and its analysis.

#### Suggested Readings

- 1) Narayanswami - Financial Accounting: A Managerial Perspective (PHI, 2nd Edition)
- 2) Mukherjee - Financial Accounting for Management (TMH, 1st Edition)
- 3) Ramchandran&Kakani - Financial Accounting for Management (TMH, 2nd Edition)
- 4) Ghosh T P - Accounting and Finance for Managers (Taxman, 1st Edition).
- 5) Maheshwari S.N &Maheshwari S K – An Introduction to Accountancy (Vikas, 9th Edition)
- 6) Ashish K. Bhattacharya- Essentials of Financial Accounting (PHI, New Delhi)
- 7) Ghosh T.P- Financial Accounting for Managers (Taxman, 3rd Edition)
- 8) Maheshwari S.N &Maheshwari S K – A text book of Accounting for Management (Vikas, 1st Edition)
- 9) Gupta Ambrish - Financial Accounting for Management (Pearson Education, 2nd Edition)
- 10) Chowdhary Anil - Fundamentals of Accounting and Financial Analysis (Pearson Education, 1st Edition).



# DISCRETE MATHEMATICS

## MCA I Semester

### Unit-I:

(10 Hrs)

**Set Theory:** Introduction, Size of sets and cardinals, Venn diagrams, Combination of sets, Multisets, Ordered pairs and Set identities.

**Relations & Functions:** Relations - Definition, Operations on relations, Composite relations, Properties of relations, Equality of relations, Partial order relation. Functions - Definition, Classification of functions, Operations on functions, Recursively defined functions.

**Notion of Proof:** Introduction, Mathematical Induction, Strong Induction and Induction with Nonzero base cases.

### Unit-II:

(08 Hrs)

**Lattices:** Introduction, Partial order sets, Combination of partial order sets, Hasse diagram, Introduction of lattices, Properties of lattices – Bounded, Complemented, Modular and Complete lattice.

### Unit-III:

(08 Hrs)

**Boolean Algebra:** Introduction, Axioms and Theorems of Boolean algebra, Boolean functions. Simplification of Boolean Functions, Karnaugh maps, Logic gates, Digital circuits and Boolean algebra.

### Unit-IV:

(08 Hrs)

**Propositional & Predicate Logic:** Propositions, Truth tables, Tautology, Contradiction, Algebra of propositions, Theory of Inference and Natural Deduction. Theory of predicates, First order predicate, Predicate formulas, quantifiers, Inference theory of predicate logic.

### Unit-V:

(06 Hrs)

**Recurrence Relations:** Introduction, Growth of functions, Recurrences from algorithms, Methods of solving recurrences.

**Combinatorics:** Introduction, Counting Techniques, Pigeonhole Principle, Pólya's Counting Theory.

### Text Books:

1. Discrete Mathematics and Its Applications, Kenneth H. Rosen, McGraw-Hill, 2006.
2. Discrete Mathematical Structures, B. Kolman, R. C. Busby, and S. C. Ross, Prentice Hall, 2004.
3. Discrete and Combinatorial Mathematics, R.P. Grimaldi, Addison Wesley, 2004.
4. Discrete Mathematical Structures, Y N Singh, Wiley-India, First Edition, 2010.

# Computer Organization

## MCA I Semester

### **Unit-1: Digital Electronics** (08 Hrs)

#### **Data Representation in Computer Systems**

Introduction, Positional Numbering Systems, Converting Between Bases, Signed Integer Representation, Floating-Point Representation, Character Codes

#### **Arithmetic**

Overview, Fixed Point Addition and Subtraction, Fixed Point Multiplication and Division, Floating Point Arithmetic

#### **Boolean Algebra and Digital Logic**

Introduction, Boolean Algebra, Boolean Expressions, Boolean Identities, K-Maps & Map minimization, Logic Gates, Digital Components, Combinational Circuits, Sequential Circuits

### **Unit-2: Memory, Register and Register transfer** (08 Hrs)

Register Transfer Language, Bus and Memory Transfers, Bus Architecture, Bus Arbitration, Arithmetic Logic, Shift Micro-operation, Arithmetic Logic Shift Unit, Design of Fast address, Arithmetic Algorithms (addition, subtraction, Booth Multiplication), IEEE standard for Floating point numbers.

Memory Hierarchy, Main Memory (RAM and ROM Chips), organization of 2D and  $2^{1/2}$  D, Auxiliary memory, Cache memory, Virtual Memory, Memory management hardware

### **Unit 3: Control Design** (08 Hrs)

Hardwired & Micro Programmed (Control Unit): Fundamental Concepts (Register Transfers, Performing of arithmetic or logical operations, Fetching a word from memory, storing a word in memory), Execution of a complete instruction, Multiple-Bus organization, Hardwired Control, Micro programmed control (Microinstruction, Microprogram sequencing, Wide-Branch addressing, Microinstruction with Next-address field, Prefetching Microinstruction).

### **Unit 4:** (08 Hrs)

**Processor Design:** Processor Organization: General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, Program Control, Reduced Instruction Set Computer.

**Input-Output Organization:** I/O Interface, Modes of transfer, Interrupts & Interrupt handling, Programmed I/O, Direct Memory access, Input-Output processor, Serial Communication.

### **Unit 5:** (8 Hrs)

RISC & CICS Architecture, Basic MIPS Implementation, Pipelining, Instruction-level Parallelism, Parallel Processing Challenges, Flynn's Classification, Hardware Multi-threading, Multicore processing.

**Text-Books(TB)**

1. Logic and Digital Design, *Morris mano and Kimicharels 4<sup>th</sup> Edition, Prentice Hall.*
2. Computer System Architecture, M. Mano(PHI)
3. Computer Organization, Vravice, Zaky&Hamacher (TMH Publication)

**Reference Books (RB)**

1. Structured Computer Organization, Tannenbaum(PHI)
2. Computer Organization, Stallings(PHI)
3. Computer Organization, John P.Hayes (McGraw Hill)

# MCA – II Semester

## Computer Based Numerical & Statistical Techniques

1. **Unit-I**
2. **Floating point Arithmetic:** Representation of floating point numbers, Operations, Normalization, Pitfalls of floating point representation, Errors in numerical computation
3. **Iterative Methods:** Zeros of a single transcendental equation and zeros of polynomial using Bisection Method, Iteration Method, Regula-Falsi method, Newton Raphson method, Secant method, Rate of convergence of iterative methods.
- 4.
5. **Unit-II**
6. **Simultaneous Linear Equations:** Solutions of system of Linear equations, Gauss Elimination direct method and pivoting, Ill Conditioned system of equations, Refinement of solution. Gauss Seidal iterative method, Rate of Convergence
7. **Interpolation and approximation:** Finite Differences, Difference tables  
Polynomial Interpolation: Newton's forward and backward formula  
Central Difference Formulae: Gauss forward and backward formula, Stirling's, Bessel's
8. **Interpolation with unequal intervals:** Lagrange's Interpolation, Newton Divided difference formula
- 9.
10. **Unit-III**
11. **Numerical Differentiation and Integration:** Introduction, Numerical Differentiation, Numerical Integration, Trapezoidal rule, Simpson's rules, Boole's Rule
12. **Solution of differential equations:** Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta methods, Predictor-corrector method, Automatic error monitoring, stability of solution.
- 13.
14. **Unit-IV**
15. **Curve fitting, Cubic Spline and Approximation:** Method of least squares, fitting of straight lines, polynomials, exponential curves etc
16. **Frequency Chart:** Different frequency chart like Histogram, Frequency curve, Pi-chart.
17. **Regression analysis:** Linear and Non-linear regression, Multiple regression
- 18.
19. **Unit-V**
20. **Time series and forecasting:** Moving averages, smoothening of curves, forecasting models and methods.

21. **Testing of Hypothesis:** Test of significance, Chi-square test, t-test, F-Test Application to medicine, agriculture etc.

22.

**23. References:**

24. 1. Rajaraman V., "Computer Oriented Numerical Methods", PHI

25. 2. Gerald & Wheatley, "Applied Numerical Analyses", AW

26. 3. Jain, Iyengar and Jain, "Numerical Methods for Scientific and Engineering Computations", New Age Int.

27. 4. Grewal B. S., "Numerical methods in Engineering and Science", Khanna Publishers, Delhi

28. 5. T. Veerarajan, T Ramachandran, "Theory and Problems in Numerical Methods", TMH

29. 6. Pradip Niyogi, "Numerical Analysis and Algorithms", TMH

30. 7. Francis Scheld, "Numerical Analysis", TMH

31. 9. Gupta S. P., "Statistical Methods", Sultan and Sons

## **MCA II Semester**

### **Subject: Data Structures**

1. **Unit –I:** Introduction:
2. Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time-Space trade-off.
3. **Arrays:** Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Ordered List, Sparse Matrices and Vectors.
4. **Stacks:** Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks,
5. **Application of stack:** Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Recursion: Recursive definition and processes, recursion in C, example of recursion, Tower of Hanoi Problem, simulating recursion.
- 6.
7. **Unit - II**
8. **Queues:** Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty. Circular queue, Deque, and Priority Queue.
9. **Linked list:** Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists algorithm (Beginning, end and middle), Doubly linked list, Linked List in Array, Polynomial representation and addition, Generalized linked list, Garbage Collection and Compaction.
- 10.
11. **Unit - III**
12. **Trees:** Basic terminology, Binary Trees, Binary Tree Representation, Algebraic Expressions, Complete Binary Tree. Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Traversing Threaded Binary trees,
- 13.
14. **Binary Search Trees:** Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees.
- 15..
16. **Unit -IV**
17. **Searching :** Sequential search, binary search, comparison and analysis
- 18.
19. **Sorting:** Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting

**20..**

**21. Unit - V**

**22. Graphs:**

**23.** Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees.

**24. File Structures:** Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices, B+ Tree index Files, B Tree index Files, Indexing and Hashing Techniques and their Comparisons.

**25.**

**26. References**

**27.**

**28. Text Books**

**29.1.** Y. Langsam, M. Augenstein and A. Tannenbaum, Data Structures using C and C++, Pearson Education Asia, 2nd Edition, 2002.

**30.2.** Ellis Horowitz, S. Sahni, D. Mehta Fundamentals of Data Structures in C++, Galgotia Book Source, New Delhi.

**31.**

**32. Reference Books**

**33.1.** S. Lipschutz, Data Structures Mc-Graw Hill International Editions

**34.2.** Jean-Paul Tremblay, Paul. G. Soresan, An introduction to data structures with Applications, Tata Mc-Graw Hill International Editions

**35.3.** A. Michael Berman, Data structures via C++, Oxford University Press

**36.4.** M. Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education

**37.**

# Introduction to Automata Theory & Formal Languages

## MCA II Semester

### 1. Unit-I:

**Basic concepts of Automata Theory:** Alphabets, Strings and Languages, Deterministic Finite Automata (DFA) and Nondeterministic Finite Automata (NFA) – Definition, Representation using Transition Tables and State Diagrams, Language of DFA and NFA. NFA with  $\epsilon$ -transitions, Language of NFA with  $\epsilon$ -transitions, Equivalence of NFA and DFA

38.

### 2. Unit – II:

3. **Regular Expressions and Languages:** Introduction, Definition of regular expression, Kleen's Theorem, Equivalence of regular expression and Finite Automata, Pumping Lemma for regular Languages, Closure properties of Regular Languages, Decision properties of Regular Languages, Finite Automata with Output: Moore and Mealy Machine, Equivalence of Moore and Mealy Machines.

4.

### 5. Unit – III:

6. **Non-Regular Grammars:** Definition of Grammar, Classification of Grammars, Chomosky's Hierarchy. Context Free Grammars (CFG) and Context Free Languages (CFL) - Definition, Examples, Derivation trees, Ambiguous Grammars, Simplification of Grammars, Normal forms of CFGs: CNF and GNF, Closure properties of CFLs, Decision Properties of CFLs, Pumping lemma for CFLs. Push Down Automata (PDA): Definition and Description, Language of PDA and its applications.

7.

### 8. Unit – IV:

9. **Turing Machines:** Introduction, Basic Features of a Turing Machine, Language of a Turing Machine, Variants of Turing Machine: Multitapes, Nondeterministic Turing Machine, Universal Turing Machine. Turing Machine as Computer of Integer functions, Halting problem of Turing Machine, Church-Turing Thesis

10.

### 11. Unit – V:

12. **Undecidability:** Introduction, Undecidable problems about Turing Machines, Rice's Theorem, Post's Correspondence problem (PCP) and Modified PCP. Tractable and Intractable Problems: P and NP, NPComplete Problems, Introduction to recursive function theory

13.

14.

### 15. Text Books:

16. 1. Introduction to Automata theory, Languages and Computation, J.E.Hopcraft, R.Motwani, and Ullman. 2nd edition, Pearson Education Asia

17. 2. Introduction to languages and the theory of computation, J Martin, 3rd Edition, Tata McGraw Hill

18. 3. Elements and Theory of Computation, C Papadimitrou and C. L. Lewis, PHI

19. 4. Mathematical Foundation of Computer Science, Y.N.Singh, New Age International

## Subject: Innovation and Entrepreneurship

### MCA II Semester

Unit-I: Innovation and Entrepreneurship

(8 Hrs)



What is innovation and entrepreneurship? Innovation Types and sources, recognizing opportunities, acting on the opportunities, innovation strategies and management, strengthening the national innovation system, fostering innovation and entrepreneurship

## **Unit II: Entrepreneurship**

**(8 Hrs)**

Meaning, Definition and concept of Enterprise, Entrepreneurship and Entrepreneurship Development, Evolution of Entrepreneurship, Theories of Entrepreneurship, Characteristics and Skills of Entrepreneurship, Entrepreneurship and Economic Development; Classification and Types of Entrepreneurs; Entrepreneurial Competencies; Factor Affecting Entrepreneurial Growth – Economic, Non-Economic Factors; Concepts of Intrapreneurship, Entrepreneur v/s Intrapreneur, Traits/Qualities of an Entrepreneur; Manager Vs. Entrepreneur, Problems of Entrepreneurship.

## **Unit III: Opportunity / Identification and Product Selection**

**(8 Hrs)**

Meaning and concept of Entrepreneurial Competency, Developing Entrepreneurial Competencies, Entrepreneurial Culture, Entrepreneurial Mobility, Factors affecting Entrepreneurial mobility, Types of Entrepreneurial mobility. Entrepreneurial Opportunity Search and Identification; Criteria to Select a Product; Conducting Feasibility Studies; Project Finalization; Sources of Information

## **Unit IV:**

**(8 Hrs)**

Role of Government in promoting Entrepreneurship, MSME policy in India,

**Agencies for Policy Formulation and Implementation:** District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship & Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB),

**Financial Support System:** Forms of Financial support, Long term and Short term financial support, Sources of Financial support, Development Financial Institutions, Investment Institutions

## **Unit V:**

**(8 Hrs)**

Women Entrepreneurship: Meaning, Characteristic features, Problems of Women Entrepreneurship in India, Developing Women Entrepreneurship in India, Concept of Social Enterprise and Social Entrepreneurship, Social Entrepreneurs, Sustainability Issues in Social Entrepreneurship, Rural Entrepreneurship, Family Business Entrepreneurship

**Project Management:** Concept, Features, Classification of projects, Issues in Project Management, Project Identification, Project Formulation, Project Design and Network Analysis, Project Evaluation, Project Appraisal, Project Report Preparation, Specimen of a Project Report

**Case Studies** - At least 4 (four) during this Course

## **Suggested Readings:**

1. Lall & Sahai: Entrepreneurship (Excel Books)
2. Couger, C- Creativity and Innovation (IPP, 1999)
3. Kakkar D N - Entrepreneurship Development (Wiley Dreamtech)
4. A.K.Rai – Entrepreneurship Development, (Vikas Publishing)
5. Sehgal & Chaturvedi-Entrepreneurship Development (UDH Publishing)
6. R.V. Badi & N.V. Badi - Entrepreneurship (Vrinda Publications)
7. Holt - Entrepreneurship : New Venture Creation (Prentice-Hall).
8. Barringer M J - Entrepreneurship (Prentice-Hall)
9. Nina Jacob, - Creativity in Organisations (Wheeler, 1998) Desai, Vasant (2003). Small-Scale Industries and Entrepreneurship. Himalaya Publishing House, Delhi.

10. Kaulgud, Aruna (2003). Entrepreneurship Management. Vikas Publishing House, Delhi.38
11. Cynthia, L. Greene (2004). Entrepreneurship Ideas in Action. Thomson Asia Pvt. Ltd., Singapore.
12. Chandra, Ravi (2003). Entrepreneurial Success: A Psychological Study. Sterling Publication Pvt.Ltd., New Delhi.
13. Balaraju, Theduri (2004). Entrepreneurship Development: An Analytical Study. Akansha Publishing House, Uttam Nagar, New Delhi.
14. David, Otes (2004). A Guide to Entrepreneurship. Jaico Books Publishing House, Delhi.
- Taneja (2004). Entrepreneurship. Galgotia Publishers.

## Semester II

### Cyber Security

#### UNIT-1

Introduction to information systems, Types of information Systems, Introduction to Cyber Security: Information Security, Computer Security, Network Security, and Application Security, Need for Information security, Information Assurance and Security Risk Analysis.

#### UNIT-2

Introduction to Threats and Threat Vectors, Threat Sources and Targets, Types of Threats: Viruses, Worms, Trojans, Advanced Persistent Threats (APT's), Steganography, Types of Attacks: Manual, Physical, Network and Application Layer Attacks; Electronic Payment System, e- Cash, Credit/Debit Cards.

#### UNIT-3

**Data/Information Security:** Introduction to Structured and Unstructured Data, Approaches to Securing Unstructured Data, Data Loss Prevention (DLP), Overview of Information Rights Management (IRM); Introduction to Encryption: Symmetric Key Cryptography, Public Key Infrastructure, Digital Signatures.

#### UNIT-4

**Network Security:** Overview of Firewalls, Types of Firewalls, Functions of Firewall, Overview of Virtual Private Networks (VPN's), Types of VPN's, Basics of VPN Protocols, Overview of Intrusion Detection Systems (IDS), Types and Features of IDS

#### UNIT-5

Overview of ISO Standard for Computer and Information Security, IT Act 2000 and subsequent amendments, Copyright Act, Patent Law; Intellectual Property Law: Copy Right Law, Software License, Semiconductor Law and Patent Law.

#### **References :**

1. Rhodes-Ousley, Mark. Information Security: The Complete Reference, Second Edition, McGraw Hill.
2. V.K. Pachghare, "Cryptography and information Security", PHI Learning Private Limited, Delhi India.
3. Dr. Surya PrakashTripathi, RitendraGoyal, Praveen kumarShukla , "Introduction to Information Security and Cyber Law" Willey Dreamtech Press.
4. CHANDER, HARISH, "Cyber Laws and It Protection", PHI Learning Private Ltd.