MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

MASTER OF COMPUTER APPLICATIONS

(For those who are admitted in the first year M.C.A Programmes during the

Academic Year **2019-2020** onwards)

PROGRAM EDUCATIONAL OBJECTIVES: The Programme Educational

Objectives of MCA program are:

1. To prepare graduates who will be successful professionals in software industry, government, academia, research, entrepreneurial pursuit.

2. To prepare graduates who will contribute to society as broadly educated, expressive, ethical and responsible citizens with proven expertise

3. To prepare graduates who will achieve peer-recognition; as an individual or in a team; through demonstration of good analytical, design and implementation skills

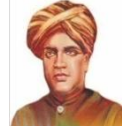4. To prepare graduates who will thrive to pursue life-long learning to fulfill their goals

PROGRAMME OUTCOMES (POs):

At the end of the duration of the MCA programme the students are expected to have the:

1. ability to apply knowledge of computing techniques and other related specialisation for the abstraction and conceptualisation of computing models from the user requirements
2. ability to select modern computing tools and techniques and use them confidently
3. ability to transform complex business challenges in to well defined problems, investigate, understand and propose integrated solutions using emerging technologies
4. ability to understand the impact of system solutions in a contemporary, global, economical, environmental, and societal context for sustainable development
5. ability to function professionally with ethical responsibility as an individual as well as in multidisciplinary teams with positive attitude
6. ability to communicate the technical information effectively both orally and in writing
7. ability to appreciate the importance of goal setting and to recognize the need for life-long learning
8. ability to work collaboratively as a member or leader in multidisciplinary teams

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

SEMESTER : **I**

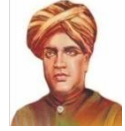| S.No	SUB CODE	SUBJECT TITLE	C	L	T	P	INT	EXT
1	19CAT11	Mathematical Foundations for Computer Applications	4	3	1	0	25	75
2	19CAT12	Fundamentals of Digital Computers	4	3	1	0	25	75
3	19CAT13	Programming with C and C + +	4	3	1	0	25	75
4	19CAT14	System Programming and Compiler Design	4	3	1	0	25	75
5	19CAT15	Principles of Operating Systems (E – Learning through E- PG Pathsala)	4	4	0	0	25	75
6	19CAL11	C + + Programming Laboratory	2	0	0	4	50	50
7	19CAL12	Communication Skill Laboratory	2	1	0	2	50	50
Total Credits 24 Total Hours 27								

C – Credit   L – Lecture   T – Tutorial   P – Practical INT – internal Mark Ext - External

COURSE NAME : **MCA**
SEMESTER : **II**

S.No	SUB CODE	SUBJECT TITLE	C	L	T	P	INT	EXT
1	19CAT21	Optimization Techniques	4	3	1	0	25	75
2	19CAT22	JAVA Programming	4	3	1	0	25	75
3	19CAT23	Data Structures and Algorithms	4	3	1	0	25	75
4	19CAT24	Computer System Architecture	4	4	0	0	25	75
5	19CAS21	Supportive Course I	3	3	0	0	25	75
6	19CAL21	Data Structures Lab	2	0	0	4	50	50
7	19CAL22	JAVA Programming Lab	2	0	0	4	50	50
TOTAL CREDITS 23 TOTAL HOURS 27								

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)
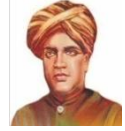
COURSE NAME : **MCA**
SEMESTER : **III**

S.No	SUB CODE	SUBJECT TITLE	C	L	T	P	INT	EXT
1	19CAT31	Internet Programming Essentials	4	3	1	0	25	75
2	19CAT32	Computer Graphics and Visualization	4	4	0	0	25	75
3	19CAT33	Relational Database Management System	4	4	0	0	25	75
4	19CAT34	Computer Networks	4	4	0	0	25	75
5	19CAS32	Supportive Course II	3	3	0	0	25	75
6	19CAL31	Internet Programming Laboratory	2	0	0	4	50	50
7	19CAL32	RDBMS Lab	2	0	0	4	50	50
Total Credits 23 Total Hours 27								

COURSE NAME : **MCA**
SEMESTER : **IV**

S.No	SUB CODE	SUBJECT TITLE	C	L	T	P	INT	EXT
1	19CAT41	Software Engineering (E – Learning through E- PG Pathsala)	4	4	0	0	25	75
2	19CAT42	Advanced Concepts in Databases and Data Mining	4	4	0	0	25	75
3	19CAT43	Visual Programming	4	4	0	0	25	75
4	19CAT44	Mobile Computing	4	4	0	0	25	75
5	19CAT45	Advanced Java Programming	4	3	1	0	25	75
6	19CAL41	Visual Programming Laboratory	2	0	0	4	50	50
7	19CAL42	Advanced Java Programming Laboratory	2	0	0	4	50	50
Total Credits 24 Total Hours 28								

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

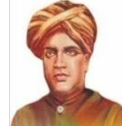**(With effect from the Academic year 2019-2020)**

COURSE NAME : **MCA**
SEMESTER : **V**

S.No	SUB CODE	SUBJECT TITLE	C	L	T	P	INT	EXT
1	19CAT51	Cloud Computing	4	3	1	0	25	75
2	19CAT51	Software Testing and Quality Assurance	4	4	0	0	25	75
3		Elective I (From Group I)	3	3	0	0	25	75
4		Elective II (From Group II)	3	3	0	0	25	75
5		Elective III (From Group III)	3	3	0	0	25	75
6	19CAL51	Software Testing Laboratory	2	0	0	4	50	50
7	19CAL52	Mini Project	6	0	0	6	50	50
8	19CAI51	Industry Seminar and Report Writing	1	2	0	0	50	50
Total Credits 26 Total Hours 29								

*One lecture per week in the 5th semester by an industry representative who would present the current application of computer in their industry.

COURSE NAME : **MCA**
SEMESTER : **VI**

S.No	SUB CODE	SUBJECT TITLE	C	L	T	P	INT	EXT
1	19CAL61	Project Work & Viva – voce	20	-	-	20	50	50
TOTAL CREDITS 20								

CREDIT SUMMARY FOR M.C.A.

SEMESTER I	24
SEMESTER II	23
SEMESTER III	23
SEMESTER IV	24
SEMESTER V	26
SEMESTER VI	20
TOTAL CREDITS	**140**

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

COURSE NAME　　　　　　：　　　**M.C.A**
LIST OF ELECTIVE COURSES

Group	SUB CODE	SUBJECT TITLE	C	L	T	P	INT	EXT
GROUP I	19CAE5A	Professional Ethics	3	3	0	0	25	75
	19CAE5B	Entrepreneurship	3	3	0	0	25	75
	19CAE5C	Principles of Management	3	3	0	0	25	75
	19CAE5D	Management Information Systems	3	3	0	0	25	75
	19CAE5E	Electronic Commerce	3	3	0	0	25	75
	19CAE5F	Accounting and Finance Management	3	3	0	0	25	75
	19CAE5G	Software Project Management	3	3	0	0	25	75
GROUP 2	19CAE5H	Mobile Operating System	3	3	0	0	25	75
	19CAE5I	Object Oriented Analysis and Design	3	3	0	0	25	75
	19CAE5J	Network Security	3	3	0	0	25	75
	19CAE5K	Embedded Systems	3	3	0	0	25	75
	19CAE5L	Wireless Application Protocol	3	3	0	0	25	75
	19CAE5M	Open Source Technologies	3	3	0	0	25	75
	19CAE5N	Cyber Forensic	3	3	0	0	25	75
GROUP 3	19CAE5O	Digital Image Processing	3	3	0	0	25	75
	19CAE5P	Internet Of Things	3	3	0	0	25	75
	19CAE5Q	Block Chain Technology	3	3	0	0	25	75
	19CAE5R	Natural Language Processing	3	3	0	0	25	75
	19CAE5S	Big data Analytics	3	3	0	0	25	75
	19CAE5T	Service Oriented Architecture	3	3	0	0	25	75
	19CAE5U	Distributed Computing	3	3	0	0	25	75

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Mathematical Foundations for Computer Applications   L T P C 3 1 0 4

Objectives:

- To provide the strong fundamentals that will help the students in writing programs.

- To improve the logical reasoning while programming with computer languages.

Unit I: Mathematical Logic   12

Statements and Notations – Connectives: Negation – Conjunction - Disjunction – Statement formulas and Truth tables – Well Formed Formulae - Tautology – Conditional and Biconditional. Normal forms: Disjunctive. Conjunctive – Ordering and uniqueness. Therory of Inference: Rules of inference – Validity using truth tables – Predicate Calculus: Predicates – The statement functions – Variables and Quantifiers.

Unit II: Set Theory   12

Basic Concept of set Theory: Notation – The Power Sets. Operation on sets – Some basic set identities – Ordered Pairs and n-tupules – Cartesian Product Relations and Ordering: Properties of Binary relations in a Set – Equivalence relations – Composition of Binary relations. Functions: Composition of functions – Inverse Functions – Characterstic function of a set – Pigeonhole Principle – Inclusion-Exclusion Principle – Measures for Information.

Unit III: Algebraic Structure   12

Algebraic systems – Properties – Semigroups – Monoids – homomorphism – Subsemigroups and submonoids. Algebraic Systems with two binary Operations. The application of Residue arithmetic to Computers: Introduction of Number Systems – residue Arithmetic.

Unit IV: Lattices and Boolean Algebra   12

Partial Ordering – Poset – Hassae diagram – Lattices and their Properties – Sublattices – Some Special Lattices – Boolean algebra: Subalgebra. Direct Product and Homomorphism – Boolean Functions: Boolean Forms and free Boolean algebra.

Unit V: Graph Theory   12

Basic definitions – Paths, rechability and connectiedness – Regular and Bipartite Graphs- Cycles and Circuits – Trees – Distance and centers in Tree – rooted and Binary trees – Spanning Trees – Eccentricity of a vertex, radius and

diameter of graph – Hamiltonian and Eulerian Graph – Planner Graph – Note: Definitions and Examples only on Unit III, IV & V, No Theorem Proofs.

Outcomes:

At the end of the course the students will:

- ✓ Be familiar with the mathematical logic and the other related concepts.

- ✓ Understand the importance of the Boolean algebra and graph theory.

- ✓ Be in a position to apply the concepts such as set theory and algebraic structure.

Text Books:

1. J.P.Trembley, R.Manohar, "Discrete Mathematical Structures with Applications to Computer Science" – Tata Mc – Graw Hill Publication, Edition – 2000.
2. Narsingh Deo, "Graph Theory and its Applications", Tata Mc - Graw Hill Publication – 1989.
3. Kenneth. H. Rosen –"Discrete Mathematics and its Applications" - Tata Mc – Graw Hill Publication, Edition –1999.
4. B.S.Vatsa Wishwa Prakashan, "Discrete Mathematics" - Tata Mc Graw Hill Publication – 2001.
5. Kamala Krithivasan, "Discrete Mathematics & Its Applications" - Tata Mc Graw Hill Publication – 2011.

Reference Books:

1. V. Krishnamurthy, "Graph Theory", 1988.
2. T. Sengadir, "Discrete Mathematics and Combinatorics" , 2009
3. Richard A. Brualdi, "Introductory Combinatorics", 4th Ed, Pearson Education, 2008.

Fundamentals of Digital Computers   L T P C 3 1 0 4

Objectives:

- ✓   To learn the fundamental concepts on digital computer.
- ✓   To understand the digital circuits and its usage.

Unit – I   12

Number Systems and Codes: Inter Conversion of Numbers – Binary, Decimal, Octal and Hexadecimal Numbers - Signed Binary Numbers – Floating point representation of   numbers – Binary Arithmetic – Complement Binary Arithmetic – Codes

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Unit – II   **12**

TTL – ECL and C-MOS Gates - Boolean algebra – Definitions, Basic theorems and properties, of Boolean Algebra - Boolean Functions, Minterm and Maxterm - Simplification of Boolean Expression - product and sums simplification - The map method: Two, Three, Four and Five variable maps, simplification by Tabulation method

Unit – III   **12**

Combinational logic – Adders, Subtractors, ALU, Comparator, Parity generator - Multiplexers, De-Multiplexers, code converters: Binary to BCD and BCD to binary, Binary to gray and Gray to binary.

Unit – IV   **12**

Sequential Logic – Flip-flops – Flip-flop conversions – Registers - Counters - Shift registers - Ring counter – Ripple counter – Flip-flop excitation tables - Synchronous counter design – UP/Down counter

Unit – V   **12**

Analysis and design **C**locked sequential circuits: State table - state diagram – state reduction – state assignment – Algorithmic State Machines: State box- Decision box – conditional box – ASM chart – Programmable logic array – Block diagram – Combinational logic design using PLA.

Outcomes:

After undergoing this course the students will:

- ✓   Have thorough knowledge on the fundamental digital circuits
- ✓   Understand the importance of logic circuits.
- ✓   Understand the functioning of digital computers.

References:

1. G.K. Kharate, Digital Electronics, Oxford university Press, 2012.
2. M.Morris Mono, Digital Logic and Computer design, Prentice Hall of India, 2007
3. Donald D.Givone – Digital Principles and Design, Tata mccrraue Hall,2002
4. V.Rajaraman & T.Radhakrishnan, Digital Logic and Computer Organization, Prentice Hall of India Private LTD, 2006.

Programming with C and C++   **L T P C 3 1 0 4**

Objectives:

- ✓ To make the students to understand the object oriented paradigm.

- ✓ To make the students to design and write the C++ Program.

Unit I:

Introduction to Programming in C – Elements of C – Tokens, Identifiers and Constants – Data Types in C – User Defined Data Types – Simple C Programs

Unit II

Control Structures in C – Sequence – Selection and Iterations – Structured Data Types in C – Arrarys – Struct, Union, String and Pointers

Unit III   **12**

Principles of Object Oriented Programming : Basic Concepts of Object Oriented Programming-Benefits of OOP – Applications of OOP – Tokens, Expressions and Control Structures : Tokens-Keywords- Identifiers and constants-Basic data types- User Defined Data Types – Derived Data types – Symbolic Constants –Type Compatibility – Declaration of Variables –Operators in C++ - Expressions and their types – Control Structures. - Classes and Objects Specifying a class –Defining Member functions – Memory allocation for objects – Static Member functions –Arrays of Objects –Objects as Function Arguments – Friendly functions – Returning Objects – Pointers to Members . Constructors and Destructors – Parameterized Constructors –Multiple Constructors – Constructors with Default Arguments – Copy Constructor – Destructors.

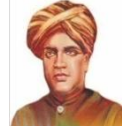**Unit IV**   **12**

Operator Overloading and Type conversions : Defining Operator Overloading – Overloading Unary Operators –Overloading binary Operators – Overloading binary operators using friends – Manipulation of Strings using operators – Rules for overloading operators – Type Conversions . Inheritance : Defining derived classes – single inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Virtual base classes – Abstract Classes –Constructors in Derived classes – Nesting of classes.

Unit V   **12**

Pointers, Virtual Functions and Polymorphism - Pointers – Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual functions – Pure virtual

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

functions Managing Console I/O Operations : C++ streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Managing Output with Manipulators .

Outcomes:

At the end of the course the students will be:

- ✓ Able to understand the object oriented concepts and classes.

- ✓ Able to apply the Object Oriented concepts for writing simple programs

- ✓ Able to design a solution for the real world problem

Books :

1.Object Oriented Programming with C++ - E. Balagurusamy ,Tata Mcgraw Hill Publications – 2006

2. Object Oriented Programming with ANSI and Turbo C++ -Ashok N.Kamthane, Pearson Education Asia Publications.

3. Object Oriented Programming with C++-Thareja, Oxford University Press,2015.

SYSTEM PROGRAMMING AND COMPILER DESIGN   L T P C 3 1 0 4
Objectives:

- ➢ To enable the students to understand the internal functioning of a computer system.

- ➢ To make the students to learn the important concepts on assembler, linker, compiler, etc.

- ➢ To make the students to learn the fundamentals of compilers and their uses in the real life computing.
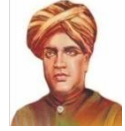
Unit I   **12**

System Software Overview and Assemblers: Overview of System Software, Life Cycle of a Source Program, System Software Development, Recent Trends in Software Development. Overview of Language Processors, Language Processing Activities, Program Execution, Assemblers: Elements of Assembly Language Programming, Design of the Assembler, Types of Assemblers, Two-Pass Assemblers, One-Pass Assemblers, Multi-Pass Assemblers.

Unit II   **12**

Macro Processors, Linkers, Loaders and Language Processing: Introduction of a Macro Processor, Functions of a Macro Processor, Two-Pass and One-Pass Macro Processors. Design of a Linker, Relocation of Linking Concept, Self-Relocating Programs, Dynamic Linking. Loaders: Different Loading Schemes, General Loader Schemes, Linkers v/s Loaders. Language Processing: Programming Language Grammars, Classification of Grammar, Ambiguity in Grammar, Language Processor Development Tools, LEX, YACC - Compilers Causes of Large Semantic Gap, Binding and Binding Times, Data Structure used in Compiling, Scope Rules, Compilation of Expression, Compilation of Control Structure. Interpreters & Debuggers Benefits of Interpretation, Overview of Interpretation,

Unit III   **12**

Introduction to Compiling: Compilers – Analysis of the source program – The phase of a compiler – Cousins of the compiler – The grouping of phases – Compiler-Construction tools.

A Simple One-Pass Compiler: Overview – Syntax Definition – Syntax-directed Translation – Parsing – A translator for simple expressions – Lexical analysis – Incorporating a symbol table – Abstract stack machines.

Lexical Analysis: The role of the lexical analyzer – Input buffering – Specification of tokens – Recognition of tokens – A language of specifying lexical analyzers – Finite Automata – From regular expressions to an NFA – Design of a lexical analyzer generator – Optimization of DFA-based pattern matchers – Representation of Intermediate codes.

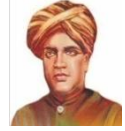**Unit IV**   **12**

Syntax Analysis: The role of the parser – Context-free grammars – Writing a grammar – Top-down Parsing – Bottom-up Parsing – Shift reduce parsing – Symbol Tables – Dynamic Storage allocation techniques - operator precedence parsing – LR parsers –Parser generators.

Unit V   **12**

Intermediate Code Generation**:** Intermediate languages – Declarations – Assignment statements – Boolean expressions – Procedure calls. Code Generation: Issues in the design of a code generators – Target machine – Run-time storage management – Basic blocks and flow graphs – Next-use information – A simple code generator – Register allocation and assignment – The DAG representation of basic blocks – Peephole Optimization – Generating code from DAGs - Code Optimization: Introduction – The principal sources of optimization – Optimization of basic blocks – Loops in flow graphs – Introduction to global data-flow analysis. A look at Some

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Compilers: EQN, a preprocessor for typesetting mathematics – Compilers of Pascal – The C compilers.

Outcomes:

At the end of the course the students will

- ➢ Be in a position to understand the preliminary concepts related to system programming.

- ➢ Be able to realize the importance of system programming concepts in other programming activities.

- ➢ Understand the fundamentals of compilers.
- ➢ Appreciate the role of compilers in syntax analysis
- ➢ Understand the role of compilers in code generation and optimization

Text and Reference books

1. System Programming by D M Dhamdhere McGraw Hill Publication
2. System Programming by Srimanta Pal OXFORD Publication
3. System Programming and Compiler Construction by R.K. Maurya & A. Godbole.
4. System Software – An Introduction to Systems Programming by Leland L. Beck, 3rd Edition, Pearson Education Asia, 2000
5. System Software by Santanu Chattopadhyay, Prentice-Hall India,2007
6. Compilers, Principles, Techniques and Tools - Alfred V. Aho, Ravi Sethi, Jeffrey D.Ullman , Pearson Education 2005.

**PRINCIPLES OF OPERATING SYSTEM   L T P C 4 0 0 4
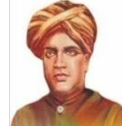(THROUGH E – LEARNING MODE)**

OBJECTIVES

- ➢ To enable the students to utilize the e – learning resources that are available in **e – PG Pathsala** portal
- ➢ To enable the students to understand the concepts behind the operating systems
- ➢ To make the students to realize the importance of the operating system in the computing domain.

Unit I   12
Operating Systems: - Introduction – Components of OS – System Calls and OS Structures – Process Concepts – Inter Process Communication - Communication in Client Server Systems – Threads

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Unit II   14

CPU Sheduling – I, II and III – Process Synchronisation – Solution I, II, and III – Semophores – Classic Problems -Deadlock – Introduction – Prevention – Avoidance – Detection and Recovery

Unit III   12

Memory Management – Paging I, II, III – Virtual Memory _ Page Replacment Algorithms I, II, III – Allocation of Frames – Thrashing – Virtual Memory – Windows NT, Solaris 2

Unit IV   12

File System Interface – I, II, III – Implementation of File Systems – File Allocation Methods – Disk Scheduling Algorithms

Unit V   10

Mass Storage Management – Process Management in Linux – Scheduling in Linux

Outcomes:

At the end of the course the students will be:

- ➢ In a position to know the importance of the operating system in the computing domain.
- ➢ Able to appreciate the e-learning process through e-PG pathsala
- ➢ Able to link the programming techniques with the OS concepts.
- ➢ Able to distinguish the features of various OS

Study Materials: e – PG Pathsala Portal
https://epgp.inflibnet.ac.in/view_f.php?category=1062
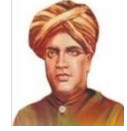
References:

1. William Stallings - Operating Systems: Internals and Design Principles, 6/E **-** Prentice Hall of India - Pvt. Ltd - 2009
2. Andrew S.Tanenbaum - Modern Operating Systems - Pearson Education Asia -2002
3. Achyut S.Godbole - Operating Systems - Tata McGraw Hill - 1998.
4. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Concepts", Ninth Edition, John Wiley & Sons Inc., 2012.
5.Thomas Anderson, Michael Dahlin, "Operating Systems: Principles   and Practice", Recursive Books, 2012

COMMUNICATION SKILL LABORATORY   L T P C 1 0 2 2

OBJECTIVES:

- • To provide opportunities to learners to practice their communicative skills to make them become proficient users of English.
- • To enable learners to fine-tune their linguistic skills (LSRW) with the help of technology to communicate globally.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

- To enhance the performance of learners at placement interviews and group discussions and other recruitment procedures.

LIST OF EXPERIMENTS:

1. **PC based session (Weightage 40%) A. English Language Lab   (15)**

1. Listening Comprehension:(5) Listening and typing – Listening and sequencing of sentences – Filling in the blanks - Listening and answering questions.

2. Reading Comprehension:(5) Filling in the blanks - Close exercises – Vocabulary building - Reading and answering questions.

Speaking: (5) Phonetics: Intonation – Ear training - Correct Pronunciation – Sound recognition exercises – Common Errors in English. Conversations: Face to Face Conversation – Telephone conversation– Role play activities

2. **B. Discussion of audio-visual materials (Samples to learn and practice)   (6)**

    1. Resume / Report Preparation / Letter Writing   (1)

    Structuring the resume / report - Letter writing / Email Communication - Samples.

    2. Presentation skills: (1)

    Elements of effective presentation – Structure of presentation - Presentation tools – Voice Modulation – Audience analysis - Body language – Video samples

    3. Soft Skills: (2)

    Time management – Articulateness – Assertiveness – Psychometrics – Innovation and Creativity - Stress Management & Poise - Video Samples

    4. Group Discussion: (1)

    Why is GD part of selection process? - Structure of GD – Moderator – led and other GDs Strategies in GD – Team work - Body Language - Mock GD –Video samples

    5. Interview Skills: (1)

    Kinds of interviews – Required Key Skills – Corporate culture – Mock interviews- Video samples.

3. **II. Practice Session (Weightage – 60%) Resume / Report Preparation / Letter writing**:   **(2)**

4. **SOFT SKILLS**   **(6)**

Hard skills & soft skills – soft skills: self-management skills & people skills - training in soft skills persuasive skills – sociability skills –interpersonal skills – team building skills – leadership skills – problem solving skills – adaptability - stress management – motivation techniques – life skills

5. **PRESENTATION SKILLS**   **(6)**

Preparing slides with animation related to the topic – organizing the material - Introducing oneself to the audience – introducing the topic – answering questions – individual presentation practice–– presenting the visuals effectively – 5 minute presentation

6. GROUP DISCUSSION SKILLS (5)

Participating in group discussions – understanding group dynamics - brainstorming the topic -– questioning and clarifying –GD strategies (expressing opinions, accepting or refusing others opinions, turn taking) – activities to improve GD skills – viewing recorded GD - mock GD.

7. INTERVIEW SKILLS (5)

Interview etiquette – dress code – body language – mock interview -–attending job interviews – answering questions confidently – technical interview – telephone/Skype interview - practice in different types of questions – one to one interview &panel interview – FAQs related to job interview- Emotional and cultural intelligence

TOTAL: 45 PERIODS

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

• Students will be able to make presentations and participate in group discussions with high level of self-confidence.
• Students will be able to perform well in the interviews
• They will have adequate reading and writing skills needed for workplace situations

Optimization Techniques   L T P C 3 1 0 4

Objectives:

To enable the students to learn the optimization techniques and to apply these techniques in providing the solutions to the computing problems.

Unit: I   12

Liner Programming formulation and Graphical Method. Simplex Method: Artificial Variable Techniques – Variants – Duality in LPP and Dual Simplex Method.

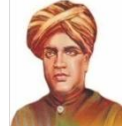**Unit: II   12**

Transportation Problem: Finding initial basic feasible solution – North West Corner Rule – Least Cost Method – Unit Cost Penalty Method – Degeneracy – unbalanced – Maximization case. Assignment Problem: Hungarian Method – Unbalanced Assignment Models – Maximization case – Restriction in Assignment – Travelling Salesman Problem.

Unit: III   12

Integer Programming: Gomory's Fractional cut algorithm method – Gomory's mixed integer method. Sequencing Problem: Johnson's method - Graphical Method. Seheduling by PERT and CPM: Network Computations – Floats – Programme Evaluation Review Technique – Cost consideration in PERT and CPM.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Unit: IV   **12**

Two Person Zero. Sum game – The maximin – minimax principle – Saddle point and value of the game – Games without saddle points, mixed strategies – matrix oddment method for nxn games – Dominance Property – Graphical method – Liner Programming method.

Unit: V   **12**

Queuing Theory: Natation and assumption – queing model with poisson input and exponential services. Birth ad Death model (M/M1:FCFS) Multi – Service Model (M/M/S/FCFS) – M/M/1 : /FCFS) – (M/M/S : /FCFS).

Outcomes:

➢ At the end of the course the student will be:

➢ Able to unsderstand the optimization techniques and to provide the solutions to the practical problems.

➢ Able to apply the concepts in the area of computer applications.

Text Books:

1. Operations Research – (Resource Management Techniques) V. Sundaresan, K.S.Ganapathy Subramaniam and K.Ganesan(June 2000)
2. Introduction to Operation Research – A Computer Oriented Algorithmic approach – Tata Mc - Graw Hill Publication – 1976.
   H.A.Taha – Operation Research – An introduction – Mac Millan Publication - 1982

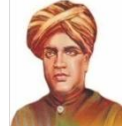**Java Programming**   **L T P C 3 1 0 4**

Objectives :

➢ To learn the a basic syntax and semantics of the java language and programming environment.
➢ To design webpage. To develop webpage using scripting.

Unit I   **9**

OOP and Java: Introduction – Objects & classes – Java Language – Creating and Executing a Java application.

The Primaries: Introduction – Character Set – Tokens- Constants – Variables – Operators & Expressions – Library Methods – Strings – I/O Statements – Simple Programs – Formatting the O/P values.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Control Statements: Introduction – if statement – switch – while- do while – for statements. Arrays and Methods: Introduction – One dimensional arrays – Two dimensional arrays – Methods – Method overloading – Recursion.

Classes & Objects : Introduction – General Form of a class – Creation of objects – Usage of Constructors –'this' keyword – Constructor overloading – Copy Constructors – Static Data Members – Static methods – Finalize( ) method – Inner Classes and Anonymous Inner Classes.

Unit II   **10**

Inheritance & Polymorphism: Inheritance: Introduction – Creating Subclasses – Calling Super classes – Calling Super class Constructors – Referring Super class Members – Referring Subclass objects with Super class Variables – Implementing Multi-level Inheritance - Method overriding – Dynamic method Dispatch..

 Polymorphism: Introduction – Polymorphism Examples – Demonstrating Polymorphic Behavior – Abstract Classes and Methods.

Interfaces & Packages: Interfaces: Defining and Implementing an Interface – Achieving Polymorphism by using Interface References – Implementing an Interface Partially – Implementing Multiple Interface Concept through Interfaces – The Final Keyword – Using Variables in Interfaces – The Finalize() method. Packages**:** Introduction to packages – Creating and using a package – Importing from Other packages – Access Protection in packages – Static Import.

Unit III   **15**

Applets: Introduction – Applet versus Application Programs – The Applet Class – Writing the First Applet – Life Cycle of an Applet – Applet Tag and Applet Parameters – Passing Parameter to Applet The paint, Update and Repaint Method – Getdocumentbase () and Getcodebase () methods – The Applet Context Interface – Working with Graphics Class – Working with Fonts – The Font Metric Class.

Exception Handling : Introduction – Basis for Exception Handling – Exception Handling Mechanism – Exception Classes in Java – Without Try-Catch – Exception Handling Using Try and Catch.

Unit IV   **14**

Multithreading & Abstract Windowing Toolkit- I: Multithreading – Introduction - Thread creation – Thread Priorities – Thread Synchronization – Producer-Consumer Problem and Wait() and notify Methods – Deadlocks - Suspending and Resuming Threads.

Abstract Windowing Toolkit-I: Introduction – Events – Listeners – Event Handling Methods – Inheritance Hierarchy of Control Classes – Labels – Button Control – Check Box – Radio Button, Choice, List, Scroll Bars Control – Flow Layout – Border Layout – Grid Layout – Card Layout – Gridbag Layout- Panels.

Unit V   **12**

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Abstract Windowing toolkit – II: Introduction – Windows and frames – Menus – Dialogs – Mouse events and their listeners – Adapter classes – Inner classes – Anonymous Inner classes.

Outcomes :

At the end of this course, the students will be able:

➢ To apply the java programming skills to solve the simple problems.

➢ To write the applets and application programs with exceptions

Reference Books:

1. Core Java – Mahesh P. Matha, PHI, 2011.
2. Programming with java – C.Muthu, Thomson Learning Series, 2010.
3. Java 2 – The Complete Reference , Herbert Schildt – Tata McGraw Hill , 2008.
4. JAVA HOW TO PROGRAM - H.M. Deitel & P.J. Deitel, PHI, 2010.
5. JAVA PROGRAMMING – Hari Mohan Pandey, Pearson Edition , 2012.
6. Programming with Java – E.Balagurusamy, Tata McGrawhill, 2012.
7. Programming in Java – Malhotra &Choudhary,Oxford University Press,2015.

Data Structures and Algorithms   L T P C   3 1 0 4

Objectives:

➢ To enable the students to understand the importance of Data Structures in the computer programming.

➢ To make the students to implement the data structures through the programming.

UNIT I: 12

Algorithm   efficiency   –Space   Complexity-Time   Complexity-Asymptotic Notations-   Multidimensional Arrays: Structure –Application-Sparse matrix-Representation-Transpose-Multiplication. Linked Lists: Singly Linked List –Structure-Operations-insert-delete- Application-Polynomial Manipulation.

UNIT II: 12

Stack : Structure-Array and Linked List-Operations-Applications of stacks-Reverse a List- Evaluation of Arithmetic Expression. Queues: Structure- Array and Linked List- Operations-Application-Round Robin Algorithm Circular Queue.

UNIT III: 12

Trees: Binary Trees –Structures-Properties-Traversal-Types of Binary Trees-Expression trees-Traversal Binary Search Trees-AVL tree-Operations.

UNIT IV: 12

Graphs: Graphs and its types - Structures- Operations- Applications- Shortest Path Problem- Minimum Cost Spanning Trees-Kruskal 's Algorithm- Prim's Algorithm,Connected components.

UNIT V: 12

Algorithm-Design Methods: The greedy Method –Knapsack Problem-Divide and conquer Method-Quick sort-Dynamics Programming- Travelling salesperson-Backtracking-The 8-Queens Problem.

Outcomes:

At the end of the course the students will be:

➢ Able to apply the concepts of data structures while writing the programs

➢ Able to measure the efficiency of the algorithm in terms of time and space complexity

➢ Able to identify the right data structures for right situation

Text and References:

1. Alfred V. Aho, John E. Hopcroft and Jeffry D. Ullman, Data Structures and Algorithms, Pearson Education, New Delhi, 2006.
2. Sahni, Data Structures, Algorithms and Applications in C++, McGraw Hill.
3. Data Structures, A Pseudo code Approach with C++-Gilberg, Ferouzan-Brooks/Cole-CENGAGE Learning, 2008.
4. Computer Algorithm/C++ -Ellis Horowitz Sartaj Sahni, S. Rajasekaran – University press, 2008.
5. Objected Oriented Data Structures using C++ -K.S.Easwarakumar5. Vikas Publishing House(P) Ltd.
6. Data Structures and Algorithm ,Concepts, Techniques and Application- G.A.V. Pai- The McGraw-Hill companies-2008.
7. Classic Data Structures- D.Samantha-Prentice Hall of India Pvt LTd, 2002.
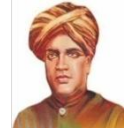
MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Computer System Architecture   L T P C 3 1 0 4

Objectives :

- To understand the basic structure and operation of digital computer.

- To understand the basic processing concepts and bus organization.

- To understand the two types of control unit techniques and the concept of pipelining.

- To understand the different ways of communicating with I/O devices and standard I/O interfaces

UNIT I   14

Digital Computers, Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Flip-Flops, Sequential Circuits, Integrated Circuits, Decoders, Multiplexers, Registers, Shift Registers, Binary Counters, Memory Unit.

UNIT II   12

Requester transfer and Micro- Operations: Register transfer language, Inter – Register transfer, Arithmetic, Logic and shift micro operations, Control functions. Computer Organization and Design: Instruction, codes computer instructions, Timing and, control Execution of instructions, Input-Output and interrupts, Design of computer.

UNIT III   12

Central Processor organization: Processor bus organization, ALU, Stack Organization, Instruction formats, Addressing modes, Data transfer and manipulation,   Program   control,   Parallel   processor.
Micro program control organization: Control memory, Address sequencing, Microprogram example, Microprogram sequencer, & Microinstruction formats.

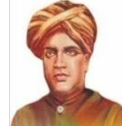**UNIT IV   12**

Arithmetic Processor Design: Comparison and subtraction, Algorithm for addition, Subtraction, Multiplication, division, Processor Configuration, Design of Control.
Arithmetic algorithms: Arithmetic with signed 2's complement numbers, Multiplication and Division, Floating point arithmetic operations, Decimal Arithmetic Unit and operations

UNIT V   10

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

I/O Organization: I/O interfaces, asynchronous data transfer, DMA, Priority interrupt, I/O processor, Multiprocessor system organization. Memory organization: Various memories – Auxiliary, Associative, Cache, Microcomputer, Virtual ones, and Memory Hierarchy, Memory Management hardware.

Computer software: Assembly language, Assembler, program loops, subroutines, system.

Outcomes :

At the end of the course the student will be in a position to :

➢ Understand the functional units of a computer, bus structures and addressing Analyze RAM, ROM, cache memory and virtual memory concepts.

➢ Evaluate the modes.

➢ Know about single bus, multiple bus organization.

➢ Design and analyze the pipelining concepts and various I/O interfaces.

Text Books:

1. Computer System Architecture by M.M. Mano
2. Computer Architecture and Organization, J.P. Hayes Int'1 student edition, McGraw – Hill.

Reference books:
1. Structured computer organization 3rd Edn by A. Stannabaum.
2. Computer Organization by V.C.Hamacher et al McGraw.
3. Introduction of Digital computer Design by V. Rajaraman & T.Radhakrishnman.
4. Analog computation and simulation by V. Rajaraman PHI

Supportive Course I - Office Automation   L T P C 3 0 0 3

Objectives: To enable the students to get familiarized with the computerized office environment by imparting preliminary working knowledge on Office Tools.

Unit I: MS Word   9

Exploring Word 2007: Working in the Word Environment – Opening, Moving Around in, and closing Document – Creating and Saving A Document – Previewing and Printing Document – Editing and Proofreading Documents: Making Changes to document – Inserting Saved Text – Finding the Most Appropriate Word – Reorganizing a Document Outline – Finding and Replacing Text – Correcting Spelling and Grammatical errors – Finalizing Document.

Unit II: MS Word   9

Changing the Look of Text: Quickly Formatting Text and Paragraphs – Manually changing the look of characters – Manually changing the look of paragraphs – Creating and modifying Lists-Presenting Information in Columns and Tables : Presenting Information in Columns – Creating Tabular List –Presenting Information in a Table – Formatting Table Information – Performing Calculations in a Table- Using a Table to control Page Layout.

Unit III: MS Excel   9

Setting Up a Workbook : Creating Workbooks – Modifying Workbooks - Modifying Worksheets – Working with Data and Data Tables : Entering and Revising Data –Moving Data within a Workbook- Finding and Replacing Data – Correcting and Expanding Upon Worksheet Data – Defining a Table – Performing Calculations on Data : Naming Groups of Data – Creating Formulas to Calculate Values – Summarizing Data that meets Specific Conditions –Finding and Correcting Errors in Calculations- Changing Document Appearance.

Unit IV – MS Access   9

Creating a Database –Creating a Database from a template, Manually - Simplifying Data Entry by Using Forms : Creating a form –changing the arrangements – Adding controls – Entering Data in a form –Adding Sub form to a form – Locating Specific Information : Sorting Information in a Table – Filtering Information – Locating Information that matches Multiple Criteria – Creating a Query – Performing Calculations.

Unit V: MS PowerPoint   9

Starting a New Presentation – Working with Slide Text : Entering Text – Editing Text – Adding and Manipulating Text Boxes –Correcting and Sizing text – Checking Spelling – Finding and replacing text and fonts – Changing the size, Alignment, Spacing – Adjusting the Slide Layout, Order and Look : Changing the Layout of a slide – Rearranging Slides in a Presentation – Applying a theme - Switching to a Different Color Scheme –Adding Shading and texture to the background of a slide – Delivering a Presentation Electronically.

Outcomes:

At the end of the course the students are expected to have:

✓ A strong fundamentals on office packages.

✓ Skill related to official communication.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Text Book:

Step by Step 2007 Microsoft Office System -Joyce Cox, Curtis Frye, M.Dow Lambert III , Steve Lambert ,Joan Preppernau and Katherine Murray

Internet Programming Essentials

Objectives :

- To understand the basic structure and operation of digital computer .
- To study the basic processing concepts and bus organization.
- To study the two types of control unit techniques and the concept of pipelining.
- To study the hierarchical memory system including cache memories and virtual memory.
- To study the different ways of communicating with I/O devices and standard I/O interfaces.

Unit I 12

Introduction to computers and the Internet: history of the World Wide Web – Hardware trends –software trends- Web Resources. Introduction to XHTML: Introduction – markup language – editing XHTML – common tags – headers – text styling – linking –images-special characters-tables-forms-CSS-inline styles-embedded style sheets-linking external style sheets-backgrounds-user style sheets.

Unit II 12

Java Script – Introduction to scripting-simple program-obtaining user input with prompt dialogs-decision making- Java script control structures: If, if / else selection structure while, for do/while repetition structure – Logical Operators-Java Script Functions: Introduction – Program Modules in Java Script – Functions –Scope Rules – Recursion – Recursion Vs Iteration – Java Script Global Functions.
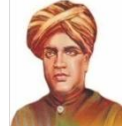
Unit III 12

Java Script Arrays: Introduction – Arrays – Declaring and Allocating Arrays – Reference Parameters – Passing Arrays to functions – Sorting Arrays – searching Arrays – Multiple Subscripted Arrays-Java Script Objects: Introduction – Math String, Data, Boolean and Number Objects-Javascript events:Registering event handlers-event onload-Event onmousemove,the event object and this-Form processing with onfocus and onblur-more events.

Unit IV 12

XML and RSS: Introduction-XML Basics-Structuring data-XML Namespaces-Document Type definitions-XML Schema documents-XML Vocabularies-MathML -Other markup Languages-Extensible style sheet Language and XSL Transformations-Document Object Model-RSS-Web Resources.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Unit V   **12**

Ajax Enabled Rich Internet Applications-Introduction-Traditional web applications vs Ajax applications-RIAs with Ajax-history of Ajax-Raw Ajax Example-Creating a full scale Ajax Enabled application- Active Server Pages (ASP): Introduction – How ASP Work – Client – Side Scripting Versus Server Side Scripting –Web Server–Activex Components – File System Objects Session Tracking and cookies –Accessing a Database form an ASP.

Outcome : At the end of the course the students will be in a position to:

- Understand the functional units of a computer, bus structures and addressing Analyze RAM, ROM, cache memory and virtual memory concepts.

- Evaluate the modes.Learn about single bus, multiple bus organization.

- Design and analyze the pipelining concepts.various I/O interfaces.

Books:

1 Deitel, Deitel, Nieto, "Internet and World Wide Web – How to program", Fourth Edition-Pearson Education Asia, 2011.

2 Thomas A. Powell, "The Complete Reference HTML and XHTML", fourth Edition, Tata McGraw Hill Pub. Company Ltd.

Computer Graphics & Visualization   L   T   P   C   4   0   0   4

Objectives :

> ➢ To introduce students with basic concepts on graphics and multimedia
> ➢ To make them to understand the various algorithms for drawing several shapes
> ➢ To provide the knowledge on the graphical transformation

Unit I   **10**

Overview of Graphics System – Video display devices – Raster Scan Systems - Random Scan Systems - Graphics Monitors and Workstations - Input devices - Graphics software – Points and Lines –Line Atrributes - Line Drawing Algorithms – Loading the frame buffer – Line function.
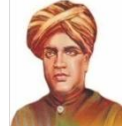
Unit II   **14**

Circle Generating algorithms – Ellipse generating Algorithms –Curve Attributes - Curve Functions – Pixel Addressing and Object Geometry – Filled area primitives – Fill Area functions – Color and gray scale levels – area fill attributes – character attributes – bundled attributes.

Unit III   **12**

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Two dimensional geometric transformations – basic transformations – matrix representations and homogenous coordinates – composite transformations – other transformations – two dimensional viewing - Viewing pipeline – Window to viewport coordinate transformation – Clipping operations - Line clipping - polygon clipping – curve clipping – text clipping.

Unit IV   **14**

Three dimensional Geometric and modeling transformations – translation – rotation – scaling – other transformations – composite transformations – three dimensional viewing – viewing pipeline-viewing coordinates – projections – clipping – Visible surface detection methods – back face detection – depth buffer method – Scan Line method – depth sorting method – Octree methods – Ray casting method.

Unit V   **10**

Unit 5: Types of visualization and design principles of visualization-Data Principles-Visual encoding principles-Perception and colors

Outcomes :

At the end of the course the students will be in a position to:

 ➢ appreciate the importance of graphics

 ➢ Understand the foundations of graphics and multimedia

 ➢ Apply the basic algorithms for developing graphical solutions

Reference Books:

 1) Donald Hearn, M. Pauline Baker – Computer Graphics C Version – Pearson Education, 2009.
 2) Tay Vaughan , Multimedia Making It Work – Tata McGraw Hill , Seventh Edition ,2008.

Web Resources: EG Padasala e – Learning materials

Relational Database Management Systems **L T P C 4 0 0 4**

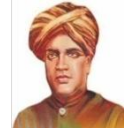**Objectives:**
 ➢ To enable the students to understand the concepts behind the relational database management system and its design.

Unit – I   **12**
Introduction to Database Management Systems : Introduction, Characteristics of Data – Database Management System – Types of Database Management Systems –Introduction to Relational Database Management Systems: The relational Data Structure – Relational Data Integrity – Relational Data Manipulation- Codd's Rules.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Unit – II   **12**

E-R modeling : Introduction-Components of E-R Model – E-R Modeling Symbols - Data Normalization : Introduction - first to fifth normal form –DKNF - Denormalization – Relational Algebra and Relational Calculus : Relational Algebra – Relational Calculus .

Unit – III   **12**

Introduction to SQL : Introduction- History of SQL – Characteristics of SQL – Advantages of SQL – SQL Data types and Literals – Types of SQL Commands – SQL Operators – Operator Precedence – Tables ,Views and Indexes : Creation , Modification and deletion of table , View and Indexes.

Unit – IV   **12**

Queries and Sub queries : Queries : Qualified Retrieval – Eliminating Duplicates – Select using In, Between and Like - Escape Clause – Selecting Computed Values – Grouping – Ordering - Sub-queries : Execution of Subquery – Nested Subquery – Parallel Subquery – Correlated Subquery – Aggregate Functions: General Rules – COUNT ,SUM,AVG,MAX and MIN – Insert, Update and Delete Operations – Single row and Bulk Insert -Update –Delete .

Unit – V   **12**

Cursors : Cursor Operations – Cursor Positions : Cursor Definition ,Opening the cursor – Fetch ,Update, Delete and Closing the Cursor – Joins and Unions : Aliases – Qualities of a Good Join – Equijoin , Non Equijoin and Theta Joins – Natural Join , Self Join – Joining more than 2 Tables – Joins Vs Subqueries –Outer Join- Unions –Triggers- Types of Triggers –Replace ,Dropping Triggers – Advantages and Limitations of Triggers.

Outcomes:

At the end of the course the students will be:

➢ In a position to understand the role of RDBMS in the real life.
➢ Able to apply the concepts for providing the database solutions.
➢ Able to design an efficient database system.
➢ Able to understand the database activities such as recovery, administration, backup, etc.

Text Book:

Database Management Systems – Alexis Leon , Mathews Leon

Reference:

Database Systems Using Oracle – Nilesh Shah
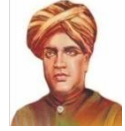

Computer Networks   **L T P C 4 0 0 4**

Objectives :

To make the students to understand the networking fundamentals and to apply the knowledge gained on the computer networks for the real time networking.

Unit I: **12**

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Data Communications – Networks – Internet – Protocols and standards, Network models – The Internet model. The physical Layer –Transmission media: Guided and Unguided Media (including Wireless, radio, microwave, infrared, millimeter waves and satellite communication). Circuit switching – Time division and Space division switches and their combinations – Telephone network –High speed digital access: DSL, Cable Modems and SONET.

Unit II: 12

Data Link Layer: Error Detection and Correction. Data Link Layer Protocols: Stop and wait ARQ, Go back N ARQ and Selective repeat ARQ, HDLC protocols.

LAN Medium Access Techniques: Multiple Access: ALOHA, CSMA and CSMA/CD technique, Controlled Access methods – Canalization. Ethernet LAN standard: Traditional Ethernet – Fast Ethernet and Gigabit Ethernet. Virtual Circuit Switching

Unit III: 12

Network Layer functions: Internetworking – Packet switched internet, Addressing – Classes of addresses – sub netting and super netting. Routing – types – classful and classless addressing. Network Layer Protocols: ARP, IPv4, ICMP, IPv6 and ICMPv6.

Unit IV: 12

Transport Layer Functions - Transport layer protocols: Process to Process delivery – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP): port numbers, services, segments, Connection establishment and termination, Flow and error Control.
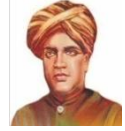
Unit V: 12

Network simulation Tools – (NS2 & Netsim) Introduction to Netsim – Basic Simulation Techniques – LAN – Slotted Aloha – (SMA/CD-IEEE802.11b Simulations – WAN – TCP – routing – GSM – CDMA – WSN. Introduction to NS2 – Basic simulation techniques.

Outcomes :

At the end of the course the students will:

- ✓ Know basic notation and terminology used in network science
- ✓ Relate and understand the basic protocols with the one that is used widely.
- ✓ Have through understanding on networking elements and equipments

Text Book:

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

1. Data Communication & Networking written by Behrouz A. Forouzan, Third Edition, Tata McGraw Hill Edition 2004

Reference Books:

1. Computer Networks, Tananbaum, Fifth Edition –Pearson /PHI. 2004.

2. Data & Computer Communications, William Stalling PHI/ Pearson Edition

   Asia, Sixth Edition, 2004

3. Computer Networking – Janes F. Kurose, Kerth W. Ross Second Edition. 2003.

4. Tetcos Netsim experiment Manual

5. www.isi.edu/nsnam/ns/doc/ns_doc.pdf.

Supportive Course II (Desk Top Publishing)   L T P C 3 0 0 3

Course Objectives: The objectives of this course is to:

1. Provide learners with a foundation of desktop publishing terms and concepts.

2. Provide learners with fundamental desktop publishing skills necessary to create effective business publications.

Unit – I   **9**

Photoshop – Working Environment: Using Toolbox – The History Palette. Opening and Saving a File: Opening images in Photoshop – TIFF Format – JPEG Format – saving files – creating a new file – closing files. Getting Started with Images: Rotating an image – Resizing without resampling – Resampling updown – Croping an image – Image modes.

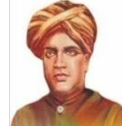**Unit – II**   **9**

Defining Colors: Foreground and Background colors – The Color Palette. The Painting Tools – The Editing Tools – Making Selections. Layers: Working with layers – Merging and Flattering layers – Moving layers between Images – Linking layers. Working with types. The Channel Palette – Layers Masks. Color Correction Techniques – Filters: Filter Control – Blur – Noise Filter – Mask and sharpen Filter.

Unit – III   **9**

PageMaker – Basic: Introduction – Floating Palettes – The Rulers. Working with Publications: New Publication – Inserting Pages – Removing Pages. Saving and

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Closing: Saving a document – closing a document. Drawing Tools: Lines – Boxes, ellipses, Polygon – Selecting, Deleting, moving, Resizing Elements – Grouping and Ungrouping – Using Fill and Line – Cut, copy, paste – The Rotation tool.

Unit – IV   **9**

CorelDraw: Basics: Creating a new file – Standard Toolbar – Property bar – Toolbox – Status Bar – Drawing Basic Geometric Figures: Drawing Bezier Line Drawing Ellipses and Circles – Drawing Rectangles and Squares – Saving a File – Closing a File – Views: Normal View – Full Screen Preview – Simple Wireframe View – Wireframe View - Draft View - Enhanced View – Page Sorter View – Zoom.

Unit V   **9**

Working with Text: The Text Tool – Formatting text – Text Editor. Working with images: Importing Images – Resizing, Rotating, Skewing Images. Page Layout and Background Changing the Page Size – Changing the Page Background – Inserting pages – Deleting pages – Rulers Getting Started with the Project: Resizing an Object – Changing the Shape of on Object – Combining Two Object – Welding the Objects – Blending two Objects – Rotating an Object – Grouping Objects – The Fill Tool Fly-out – The Fountain Fill Dialog Tool – Filling an Object with a single Color – The PostScript Fill Dialog Tool. Working with Objects shapes – Using the Transformations Docker – Adding Effects to Objects.

Out comes:

At the end of the course the students will be in a position to:

➢ Identify the suitable DTP tools and apply them for the day to day life needs.

➢ Design the documents and photographs.

Text Books

1. Photoshop CS, Robert Shufflebotham, dreamtech press.
2. Pagemaker, Scott Basham, Dreamtech press.
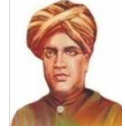3. CorelDRAW 12, Salini Gupta, Adity Gupta, dreamtech press.

References:

1. Photoshop CS3 in single steps, Kogent Solutions Inc., dreamtech press.
2. CorelDRAW X4, Kogent Solutions Inc., Dreamtech press.

SOFTWARE ENGINEERING (Through e – Learning) L   T P C   4 0 0 4

Objectives :

➢ To make the students to undergo the e – Learning process through e-PG Pathsala portal.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

➢ To make the students to understand several processes that are involved in the software development, the software engineering models, Cost estimation, etc and to apply the concepts in their project developments.

Unit I   **12**

Introduction – Characteristics of software – Evolution of software for Business – Software crisis and Emergence of software engineering – salient features of software Development – software Development process – software processes – Software Development Life cycle models, Agile Software Development

Unit II   **12**

Software Requirement Engineering – Requirement Engineering process – Requirement Elicitation- Requirement Elasoration – Negotiation- Requirement validation – structure of Sas – characristics of RE process. Software Design Approaches – Different approaches to SAD – Overview of the FO approach – overview of the OO Approach comparison of OOAD with S5AD.

Structured Analysis – Introduction to structured analysis – path flow Diagram – process specification- Data Dictionary – Entity relationship model – state transition diagrams. Structured design – structured Design methodologies – coupling and cohesion – structure chart – mapping DFD into a structured chart – Data design – detail design.

Unit III   **12**

Software testing – Testing fundamentals – Black box testing – white box testing – unite testing – Integration testing – System testing – Usability testing – software metrics – software metrics and its classification – software size metrics- Quality metrics – process metrics – design metrics.

Unit IV   **12**

Software project Estimation – Software project parameters – Approaches to software estimation – project estimation techniques – classification of software projects – constructive. Cost estimation model – cocomo –II – software project management – Introduction – project planning – work breakdown structure – project scheduling- Execution, monitoring and control – Risk management.

Unit V   **12**

Software quality management – Introduction – process quality models – Quality Assurance – process standard. ISO 9000 and ISO 12207 – capability

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

maturing model – web engineering – web engineering process – web design process – web metrics.

Outcomes :

At the end of the course the student will:

➢ Understand the importance of e-Learning Process through e-PG Pathsala portal
➢ Understand the process and model involved in the software development
➢ Be familiar with ISO 9000 and ISO 1220 standards on Software quality
➢ Be able to apply the software engineering models for the project development

Study Materials: e – PG Pathsala portal (Unit I to Unit IV)
https://epgp.inflibnet.ac.in/view_f.php?category=1067

TEXT BOOK

1. Software Engineering **Jibitesh Mishra**, Ashok Mohenty, Pearson publisher Publication 2011

REFERENCE BOOK

1. Software Engineering Sixth Edition, Pressman. Tata McGraw-Hill Edition 2010
2. Software Engineering Principles and Practices, Deepak Jain, OXFORD University 2009
3. Software Engineering Principles and Practices, Jawadekar Tata McGraw-Hill Edition 2005.

Advanced Concepts in Databases and Mining   L T P C 4 0 0 4

Objectives :

• To Understand Data mining principles and techniques and Introduce DM as a cutting edge business intelligence
• To expose the students to the concepts of Data warehousing Architecture and Implementation
• To study the overview of developing areas – Web mining, Text mining and ethical aspects of Data mining
• To identify Business applications and Trends of Data mining

UNIT I   15
        Algorithm for Query Processing and Query optimization, Transaction Concepts – ACID Properties – Schedules – Serializability – Concurrency Control – Need for Concurrency – Locking Protocols – Two Phase Locking – Deadlock – Transaction Recovery – Save Points – Object and Object Relational Databases – No SQL Database - Database Security and authorization.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

UNIT II   9

Data warehouse: Roles and Structures- Data stores- Data warehouse- Marts- Data warehouse characteristics-Three-tier Data warehouse Architecture-Metadata-Metadata extraction - Query tools and Applications- OnLine Analytical Processing(OLAP)- OnLine Transaction Processing(OLTP).

UNIT III   6

Data Mining:- Basic Tasks- Data Mining Functionalities- Data Mining Vs Knowledge Discovery and Databases-Data Processing- Data Cleaning- Data Integration and Transformation- Data Reduction- Data Discretization and Concept Hierarchy Generation.

UNIT IV   14

Classification and Prediction:- Issues Regarding Classification and Prediction-Classification by Decision Tree Introduction- Bayesian Classification- Rule Based Classification- Classification by Back Propagation- Support Vector Machines-

Cluster Analysis:- Types of Data in Cluster Analysis- K-means clustering- Partitioning Methods- Hierarchical Methods- Density-Based Methods- Grid-Based Methods-Outlier Analysis.

UNIT V   16

Association Rule Mining:- Introduction-Basic Algorithms-Apriori Algorithm-Efficient and Scalable Frequent Item Set Mining Methods- Mining Various Kinds of Association Rules- Association Mining to Correlation Analysis.

Spatial Data Mining: Spatial Data Overview-Spatial Data Mining Primitives-Generalization and Specialization –Temporal Mining: Introduction-Time series-Pattern detection
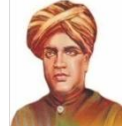
Outcomes :

At the end of this course, the students will be able to

- Evolve Multidimensional Intelligent model from typical system
- Discover the knowledge imbibed in the high dimensional system
- Evaluate various mining techniques on complex data objects

REFERENCES

1. Jiawei Han and Micheline Kamber "Data Mining Concepts and Techniques" Second Edition, Elsevier, Reprinted 2008.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

2. Alex Berson and Stephen J. Smith "Data Warehousing, Data Mining & OLAP", Tata McGraw-Hill Edition, Tenth Reprint 2007.

3. K.P. Soman, Shyam Diwakar and V. Ajay "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.

4. G.K. Gupta "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.

5. Pang-Ning Tan, Michael Steinbach and Vipin Kumar "Introduction to Data Mining", Pearson Education, 2007.

6. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, ―Database System Concepts‖, Sixth Edition, Tata McGraw Hill, 2011.

7. Ramez Elmasri, Shamkant B. Navathe, ―Fundamentals of Database Systems‖, Sixth Edition, Pearson Education, 2011.

Visual Programming   L T P C   4 0 0 4

Objectives:

➢ To provide the knowledge on the basics of visual programming
➢ To prepare the students to provide the computerised solution to the practical problems using Graphical User Interface
➢ To make the students familiar with the database connectivity

Unit – I   12

Introduction to VB: Event Driven programming-Example-memory concepts-Operators-Arithmetic-Comparison-Logical. Control structures part I: Introduction I –IF Then Else- Do While- Do Until. Control structures part II: For-For next- Select Case-Do Loop While- Do While Until- Variables- Data Types.

Unit – II   12

Introduction to .net framework - Features, Common Language Runtime (CLR) ,Framework Class Library(FCL).Visual Studio.Net – IDE, Languages Supported, Components - Visual Programming, VB.net- Features, IDE- Menu System, Toolbars, Code Designer, Solution Explorer, Object Browser, Toolbox, Class View Window, Properties Window, Server Explorer, Task List, Output Window, Command Window - Elements of Visual Basic .net - Properties, Events and Methods of Form, Label, TextBox, ListBox, Combo Box, RadioButton, Button, Check Box, Progress Bar, Date Time Picker, Calendar, Picture Box, HScrollbar, VScrollBar, Group Box, ToolTip, Timer.

Unit – III   12

Programming in Visual basic .net - Data Types, Keywords, Declaring Variables and Constants, Operators, Understanding Scope and accessibility of

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

variables, Conditional Statements- If- Then, If-Then-Else, Nested If, Select Case, Looping Statement- Do loop, For Loop, For Each-Next Loop, While Loop, Arrays-Static and Dynamic.

Unit – IV   **12**
Functions, Built-In Dialog Boxes, Menus and Toolbar - Menus and toolbars- Menu Strip, Tool Strip, Status Strip, Built-In Dialog Boxes –Open File Dialogs, Save File Dialogs, Font Dialogs, Color Dialogs, Print Dialogs, InputBox, Msg Box, Interfacing With End user- Creating MDI Parent and Child, Functionsand Procedures- Built-In Functions-Mathematical and String Functions, User DefinedFunctions and Procedures. (8 Hours)

Unit – V   **12**
Advanced Concepts in VB.Net - Object Oriented Programming- Creating Classes , Objects, Fields, Properties, Methods, Events , Constructors and destructors, Exception Handling- Models, Statements, File Handling- Using File Stream Class, File Mode, File Share, File Access Enumerations, Opening or Creating Files with File Stream Class, Reading and Writing Text using Stream Reader and Stream Writer Classes, Data Access withADO.Net – What are Databases?, Data Access with Server Explorer, Data Adapter and Data Sets, ADO.NET Objects and Basic SQL.

Outcomes:

At the end of the course the student will be:
  - ➢ Familiar with the graphical user interface and visual programming concepts
  - ➢ Able to design the GUI and provide GUI based solutions to the practical problems
  - ➢ Able to connect the database and provide databae solution using VB.

Books:

1. Visual Basic 6 How to Program – Deitel and Deitel, T.R.Nieto – Pearson Education Asia 2002.
2. Visual Basic 6 The Complete Reference – Noel Jerke – Tata Mc Graw Hill Edition 2005.
3. Visual Basic 6 Programming Black Book – Steven Holzner – Dreamtech Press, 2002.
4. Visual Basic 6 from the Ground Up – Gary Cornell – Tata McGraw Hill Edition 2002.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Mobile Computing   L T P C 4 0 0 4

Objectives :

To enable the students to describe the concepts related to mobile and pervasive computing and to apply these concepts on the web applications.

Unit I   **12**
Technologies:Past, Present, Future: The Vine and fig tree dream – Pervasive Computing – The pervasive computing market – m-Business.
Application Examples: Retail – Airline check-in and booking – Sales force automation – Healthcare – Tracking – Car Information systems – Email access via WAP and Voice.

Unit II   **12**
Device Technology: Hardware – Human-machine interfaces – Biometrics – Operating systems – Java for Pervasive devices – Outlook.

Unit III   **12**
Device Connectivity: Protocols – Security – Device management.
Web Application concepts: History of the World Wide Web – World Wide Web architecture – Protocols – Transcoding – Client authentication via the internet.

Unit IV   **12**
WAP and beyond: Introduction – Components of the WAP architecture – WAP infrastructure – WAP security issues – Wireless Markup Language – WAP push – Products – i-mode – Outlook.
Voice Technology: Basics of speech recognition – Voice standards – Speech applications – Speech and pervasive computing – Security.

Unit V   **12**
Pervasive Web application architecture: Background – Scalability and availability – Development of pervasive computing Web applications – Pervasive application architecture.

Outcomes :

At the end of the course the students will be able to:
  ➢ Describe the concepts like Mobile and pervasive computing, Pervasive web application architecture, etc
  ➢ Apply the above concepts to design a new applications
Book for Study:

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

1. Pervasive Computing, Technology & Architecture of Mobile Internet Applications – Jochen Burkhardt, Horst Henn et. al – Pearsan – 11th Edition 2012.
2. Mobile Computing – Raj Kamal – Oxford University Press – Second Edition 2012.
3. Mobile Computing – Asoke K Taluhdar, Roopa R Yavagal – Tata McGrawHill Publication – 2011

Advanced Java Programming   L T P C 3 1 0 4

Objectives :

To make the students to:

  ➢ To learn the a advanced concepts in the java language and java programming environment.
  ➢ To design webpage.
  ➢ To develop webpage using scripting.

Unit I: **12**

Swing: Introduction JApplet Class – Image Icon Class – Jlabel Class - JButton Class – JTextField Class - JCheckBox Class - JRadioButton Class – JComboBox Class – JTabbedPane Class – JScrollPane Class – JSplitPane Class – Dialogs – File Selection Dialog – JColor Chooser Class – JTable Class – JToolBar Class – JProgressBar Class – JSlider Class – JTree Class – Examples of Menus.

Multimedia: Applets and Applications: Introduction – Loading, Displaying and Scaling Images, Animating a Series of Images, Image Maps, Loading and Playing Audio Clips, Playing Video and other Media with Java Media Framework.

Unit II: 12

Networking: Introduction – Networking Basis – Java and the Net – InetAddress – TCP/IP Client Sockets – URL – URL Connection – TCP/IP Server Sockets – Proxy HTTP Server – Datagrams – Inet4Address and InetNe6Address – URL Class – UDP Approach – Accessing Resources on the Internet. Java .net Package – Internet Addressing with Java – Socket with Fundamentals – Sockets in Java – URL 680.

Unit III: **12**

Java Database Connectivity: Introduction – Establishing a connection – Creation of data tables – Entering data into the tables – Table updating – Use of Prepared statement – Obtaining Meta data – Using Transactions – Scrollable Result sets – Stored Procedures.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Servlets: Introduction – Servlets and Dynamic Web Pages – Life Cycle of a Servlet – Constituents of javax.servlet Package – Retrieving the values of parameters – Retrieving the values of Initialization parameters – The javax.servlet.http package – cookies – Creating a cookie and sending it to the client – Retrieving the stored cookies – Session Tracking.

Unit IV: **12**

Remote Method Invocation:- Introduction – Remote Interface – java.rmi.server package – The Naming class – RMI Security Manager Class – RMI exceptions – Steps involved in creating RMI client and server classes. A Simple Client/Server Application Using RMI.

Unit V: **12**

Java Beans: Introduction – Advantage of Java Beans – Application Builder Tools – Using the Bean Developer Kit (BDK) – JAR Files – Introspection – Developing a Simple Bean Using the BDK – Using Bound Properties – Using the Bean Info Interface – Constrained Properties – Persistence – Customizers – Java Beans API – Using Beans Builder - Procedure for running the Juggler Bean – Creating our own Bean – Concentric Circles Bean, Message Bean, Maths Bean.

Outcomes :

At the end of the course the students will:

➢ Know how to write the basic java programming
➢ Understand the importance of JDBC

➢ Apply the Java programming for providing the solution to the practical problems

Reference Books:

1.   Java 2 – The Complete Reference, Herbert Schildt, Tata McGraw Hill , 2010.
2.   Core Java – Mahesh P. Matha, PHI, 2012.
3.   Programming with java – C.Muthu, Thomson Learning Series, 2010.
4.   JAVA PROGRAMMING – Hari Mohan Pandey, Pearson Edition, 2012.
5.   JAVA HOW TO PROGRAM - H.M. Deitel & P.J. Deitel, PHI, 2010.
6.   Java Programming – D.S.Malik, Cengage Learning, 2010.
7.   Advanced Java Programming-Roy,Oxford University Press,2015.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

8.
Cloud Computing   L T P C 4 0 0 4

OBJECTIVES:

- To understand the current trend and basics of cloud computing.
- To learn cloud services from different providers.
- To understand the collaboration of cloud services.
- To expose various ways to collaborate the cloud service online.

Unit I   10

Distributed System Models and Enabling Technologies: Scalable Computing over the Internet, Technologies for Network-Based Systems, System Models for Distributed and Cloud Computing, Software Environments for Distributed Systems and Clouds, Performance, Security and Energy Efficiency

Computer Clusters for Scalable Parallel Computing: Clustering for Massive Parallelism, Computer Clusters and MPP Architectures, Design Principles of Computer Clusters, Cluster Job ad Resource Management

Unit II   10

Cloud Platform Architecture over Virtualized Data Centers: Cloud Computing and Service Models, Data-Center Design and Interconnection Networks, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms GAE, AWS, and Azure, Inter-cloud Resource Management, Cloud Security and Trust Management

Unit III   7

Service-Oriented Architectures for Distributed Computing: Services and Service-Oriented Architecture, Message-Oriented Middle-ware, Portals and Science Gateways, Discovery, Registries, Metadata and Databases, Work-flow in Service-Oriented Architectures.

Unit IV   10

Cloud Programming and Software Environments: Features of Cloud and Grid Platforms, Parallel and Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

Unit V   8

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Ubiquitous Clouds and the Internet of Things: Cloud Trends in Supporting Ubiquitous Computing, Performance of Distributed Systems and the Cloud, Enabling Technologies for the Internet of Things, Innovative Applications of the Internet of Things, On-line Social and Professional Networking.

OUTCOMES: Upon completion of the course the student will be:

- Able to collaborate the cloud services to any device.
- Exploring the online applications of cloud services.
- Able to implement cloud computing for the corporation.
- Able to design various applications by integrating the cloud services

References:

1. Distributed and Cloud Computing- Kai Hwang, Geoffrey C. Fox, Jack J. Dongarra –Elsevier-2012
2. Cloud Computing – A Hands-on Approach – Arshdeep Bahga, Vijay Madisetti – University Press2014
3. Enterprise Cloud Computing – Gautam Shroff – Cambridge University Press – 2014.

SOFTWARE TESTING AND QUALITY ASSURANCE   L T P C 4 0 0 4

OBJECTIVES:

- To understand the testing techniques and to design test cases to detect the errors in the software
- To get insight into the levels of testing in the user environment
- To understand standard principles to check the occurrence of defects and its removal.
- To learn the functionality of automated testing tools to apply in the specialized environment.
- To understand the models and metrics of software quality and reliability.

UNIT I   TESTING TECHNIQUES & TEST CASE DESIGN   12

Using White Box Approach to Test design - Test Adequacy Criteria – Static Testing Vs. Structural Testing – Code Functional Testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White box Based Test Design – Code Complexity Testing – Evaluating Test Adequacy Criteria. Test Case Design Strategies – Using Black Box Approach to Test Case Design – Random Testing – Requirements based testing – Boundary Value Analysis –Decision tables – Equivalence Class Partitioning – State-based testing – Cause-effect graphing – Error guessing – Compatibility testing – User documentation testing – Domain testing – Case study for Control Flow Graph and State-based Testing.

UNIT II   **LEVELS OF TESTING**   **12**

The Need for Levels of Testing- Unit Test Planning –Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording Results – Integration Tests – Designing Integration Tests – Integration Test Planning – Scenario Testing – Defect Bash Elimination. System Testing – Acceptance testing – Performance testing – Regression Testing - Internationalization testing - Ad-hoc testing – Alpha, Beta Tests- Testing OO systems – Usability and Accessibility Testing – Configuration Testing - Compatibility Testing – Testing the documentation – Website Testing - Case Study for Unit and Integration Testing.

UNIT III   TESTING FOR SPECIALIZED ENVIRONMENT   **12**
Testing Client / Server Systems – Testing in a Multiplatform Environment - Testing Object-Oriented Software – Object Oriented Testing – Testing Web based systems – Web based system – Web Technology Evolution – Traditional Software and Web based Software – Challenges in Testing for Web-based Software – Quality Aspects – Web Engineering – Testing of Web based Systems. Case Study for Web Application Testing

UNIT IV   **TEST AUTOMATION**   **12**
Selecting and Installing Software Testing Tools - Software Test Automation – Skills needed for Automation – Scope of Automation – Design and Architecture for Automation – Requirements for a Test Tool – Challenges in Automation – Tracking the Bug – Debugging – Case study using Bug Tracking Tool.

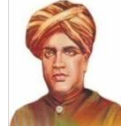**UNIT V   SOFTWARE TESTING AND QUALITY METRICS**   **12**
Six-Sigma – TQM - Complexity Metrics and Models – Quality Management Metrics - Availability Metrics - Defect Removal Effectiveness - FMEA - Quality Function Deployment – Taguchi Quality Loss Function – Cost of Quality. Case Study for Complexity and Object Oriented Metrics.

                                          TOTAL : 60   PERIODS
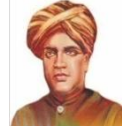**OUTCOMES:**

- Able to test the software by applying various testing techniques.
- Able to debug the project and to test the entire computer based systems at all levels.
- Able to test the applications in the specialized environment using various automation tools.
- Able to evaluate the web applications using bug tracking tools.
- Able to apply quality and reliability metrics to ensure the performance of the software

REFERENCES:

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

1. Adithya P. Mathur, " Foundations of Software Testing – Fundamentals algorithms and techniques", Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008

2. Boris Beizer, " Software Testing Techniques" , Dream Tech Press, 2009

3. Dale H. Besterfiled , "Total Quality Management", Pearson Education Asia, Third Edition, Indian Reprint (2011).

4. Edward Kit, " Software Testing in the Real World – Improving the Process", Pearson Education, 1995

5. Glenford J. Myers, Tom Badgett, Corey Sandler, "The Art of Software Testing", 3rd Edition, John Wiley & Sons Publication, 2012

6. Illene Burnstein, " Practical Software Testing", Springer International Edition, Chennai, 2003.

7. Naresh Chauhan , "Software Testing Principles and Practices " Oxford University Press , New Delhi ,2010

8. Ron Patton, "Software Testing", Second Edition, Pearson Education, 2009

Xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxx

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

ELECTIVE PAPERS

GROUP I

PROFESSIONAL ETHICS   L T P C 3 0 0 3

COURSE OBJECTIVE
- To enable the students to create an awareness on Professional Ethics and Human Values to in still Moral and Social Values and Loyalty and to appreciate the rights of others**.**

UNIT I HUMAN VALUES: 9
Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self-confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

UNIT II PROFESSIONAL ETHICS   9
Senses of Ethics – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg‟s theory – Gilligan‟s theory – Consensus and Controversy – Models of professional roles – Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT –III SOFTWARE ENGINEERING AS SOCIAL EXPERIMENTATION   9
Software Engineering as Experimentation – Software Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on IT Law.

UNIT-IV SAFETY, RESPONSIBILITIES AND RIGHTS   9
Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination.

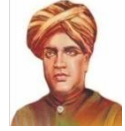### UNIT V GLOBAL ISSUES   9
Multinational Corporations – Business Ethics - Environmental Ethics – Computer Ethics - Role in Technological Development – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Honesty – Moral Leadership – Sample Code of Conduct.

TEXTBOOKS:

1. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2003.

2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

REFERENCES:

1. Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics – Concepts and Cases", Cengage Learning, 2009

3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003

4. Edmund G Seebauer and Robert L Barry, "Fundametals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001

5. Laura P. Hartman and Joe Desjardins, "Business Ethics: Decision Making for Personal Integrity and Social Responsibility" Mc Graw Hill education, India Pvt. Ltd.,New Delhi 2013.

6. World Community Service Centre, "Value Education", Vethathiri publications, Erode, 2011

Web sources:

1. www.onlineethics.org

2. www.nspe.org

3. www.globalethics.org

4. www.ethics.org

ENTREPRENEURSHIP DEVELOPMENT   L T P C 3 0 0 3

COURSE OBJECTIVE: To develop and strengthen entrepreneurial quality and motivation in students. To impart basic entrepreneurial skills and understandings to run a business efficiently and effectively.

COURSE OUTCOME: Students will gain knowledge and skills needed to run a business.

**UNIT I ENTREPRENEURAL COMPETENCE**   **9**

Entrepreneurship concept – Entrepreneurship as a Career – Entrepreneurial Personality - Characteristics of Successful, Entrepreneur – Knowledge and Skills of Entrepreneur.

UNIT II ENTREPRENEURAL ENVIRONMENT   **9**

Business Environment - Role of Family and Society - Entrepreneurship Development Training and Other Support Organisational Services - Central and State Government Industrial Policies and Regulations - International Business.

UNIT III BUSINESS PLAN PREPARATION   **9**

Sources of Product for Business - Prefeasibility Study - Criteria for Selection of Product - Ownership - Capital - Budgeting Project Profile Preparation - Matching
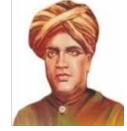
Entrepreneur with the Project - Feasibility Report Preparation and Evaluation Criteria.

UNIT IV LAUNCHING OF SMALL BUSINESS   9

Finance and Human Resource Mobilization Operations Planning - Market and Channel Selection - Growth Strategies - Product Launching – Incubation, Venture capital, IT startups.

UNIT V MANAGEMENT OF SMALL BUSINESS   9

Monitoring and Evaluation of Business - Preventing Sickness and Rehabilitation of Business Units- Effective Management of small Business.

TOTAL: 45 PERIODS

TEXTBOOKS

1. Hisrich, Entrepreneurship, Tata McGraw Hill, New Delhi, 2001.

2. S.S.Khanka, Entrepreneurial Development, S.Chand and Company Limited, New Delhi, 2001.

REFERENCES

1. Mathew Manimala, Entrepreneurship Theory at the Crossroads, Paradigms & Praxis, Biztrantra , 2nd Edition ,2005

 2. Prasanna Chandra, Projects – Planning, Analysis, Selection, Implementation and Reviews, Tata McGraw-Hill, 1996.

 3. P.Saravanavel, Entrepreneurial Development, Ess Pee kay Publishing House, Chennai -1997.

 4. Arya Kumar. Entrepreneurship. Pearson. 2012 5. Donald F Kuratko, T.V Rao. Entrepreneurship: A South Asian perspective. Cengage Learning. 2012

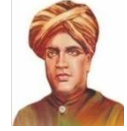## PRINCIPLES OF MANAGEMENT   L T P C 3 0 0 3

OBJECTIVES:
To enable the students to study the evolution of Management, to study the functions and principles of management and to learn the application of the principles in an organization .

UNIT I INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS   9
Definition of Management – Science or Art – Manager Vs Entrepreneur – types of managers – managerial roles and skills – Evolution of Management – Scientific, human relations , system and contingency approaches – Types of Business organization – Sole proprietorship, partnership, company-public and private sector enterprises – Organization culture and Environment – Current trends and issues in Management.

UNIT II PLANNING   9
Nature and purpose of planning – planning process – types of planning – objectives

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

– setting objectives – policies – Planning premises – Strategic Management – Planning Tools and Techniques – Decision making steps and process.

UNIT III ORGANISING   9

Nature and purpose – Formal and informal organization – organization chart – organization structure – types – Line and staff authority – departmentalization – delegation of authority – centralization and decentralization – Job Design – Human Resource Management – HR Planning, Recruitment, selection, Training and Development, Performance Management , Career planning and management.

UNIT IV DIRECTING   9

Foundations of individual and group behaviour – motivation – motivation theories – motivational techniques – job satisfaction – job enrichment – leadership – types and theories of leadership – communication – process of communication – barrier in communication – effective communication – communication and IT.

UNIT V CONTROLLING   9

System and process of controlling – budgetary and non-budgetary control techniques – use of computers and IT in Management control – Productivity problems and management – control and performance – direct and preventive control – reporting.

TOTAL: 45 PERIODS

OUTCOMES   **:**
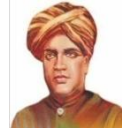Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
TEXTBOOKS:
1. Stephen P. Robbins & Mary Coulter, "Management", 10th Edition, Prentice Hall (India) Pvt. Ltd., 2009.

2. JAF Stoner, Freeman R.E and Daniel R Gilbert "Management", 6th Edition, Pearson Education, 2004.

REFERENCES:

1. Stephen A. Robbins & David A. Decenzo & Mary Coulter, "Fundamentals of Management" 7th Edition, Pearson Education, 2011.

2. Robert Kreitner & Mamata Mohapatra, "Management", Biztantra, 2008.

3. Harold Koontz & Heinz Weihrich "Essentials of management" Tata Mc Graw Hill, 1998.

4. Tripathy PC & Reddy PN, "Principles of Management", Tata McGraw Hill, 1999.

MANAGEMENT INFORMATION SYSTEM   L T P C 3 0 0 3

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

OBJECTIVES: To understand the fundamental concepts of system, information.

- To study the importance of decision making

- To impart the knowledge of development of MIS

- To know the security issues of MIS

UNIT I CONCEPTUAL FOUNDATIONS: 9

Introduction to Systems and Basic Systems Concepts, Elements of System, Characteristics of System, Types of Systems, System Approach to Problem Solving. Information Systems: Definition & Characteristics, Types of Information, Role of Information in Decision Making.

UNIT II MANAGEMENT DECISION MAKING: 9

Simon's Model of Decision Making. Concepts of Management Organization and Hierarchy of Management Activity, Structured Vs Unstructured Decisions, Formal Vs. Informal Systems, Levels of Management. Introduction to different kinds of Information Systems and Concept, Characteristics and Components: ESS, EIS, DSS, MIS, KWS, TPS, OAS and EDP- GDSS

UNIT III AN OVERVIEW OF MANAGEMENT INFORMATION SYSTEM: 9

Definition & Characteristics, History of MIS Components of MIS, Frame Work for Understanding MIS, Types of Computers Used by Organizations in Setting up MIS, Hardware support for MIS ,The Structure of Management Information System.

UNIT IV DEVELOPING INFORMATION SYSTEMS: 9

Analysis & Design of Information Systems: Implementation & Evaluation. Pitfalls in MIS Development. Functional MIS: A Study of Marketing, Personnel, Financial and Production MIS.

UNIT V SECURITY AND ETHICAL ISSUES: 9

Introduction, Control Issues in Management Information Systems, Security Hazards, Ethical Issues, Technical solutions for Privacy Protection TOTAL: 45 PERIODS OUTCOME : Students are expected to gain knowledge of fundamentals of system and information.•

TEXT BOOKS :

1. Management Information system, Bidgoli,Chattopadhyay, Cengage learning original edition 2012 reprint 2016.

2. "Management Information Systems", Davis, Gordan B. & Olson, M.H, Second Edition,2008

REFERENCES :
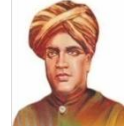
1. Management Information Systems: Managing the Digital Firm (14th Edition) by Kenneth C. Laudon and Jane P. Laudon 2015

2. Management Information Systems, Goyal, D.P., Fourth Edition, Macmillan. 2014

3. "Management Information Systems", Kanter, J.,Third Edition, PHI.

4. "Information Systems for Modern Management", Murdick, Robert G., & Ross, Joel E., & Claggett, James R., Third Edition, PHI. 1985

5. "Analysis, Design & Implementation of Information System", Lucas, Fourth Edition ,1992.

Electronic Commerce   L T P C 3 0 0 3

Objectives :

 ➢ To provide basic knowledge about the types of Electronic payment systems.
 ➢ To illustrate the concepts on mobile commerce, online marketing, e-customer relationship management, etc.

Unit I: **9**

History of E-Commerce: Advantages of E-Commerce – Disadvantages of E-Commerce – Transition to E-Commerce in India – The internet and India. Business Models for E-Commerce: E-Business Model Based on Relationship of Transaction Parties – E-business Model Based on the Relationship of Transaction Types.

Unit II: **9**

 E-marketing: Traditional Marketing – Identifying Web Presence Goals – The Browsing Behaviour Model – Online Marketing – E-Advertising –E-Branding– Target Markets – Marketing Strategies.
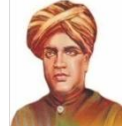
Unit III: **9**

E-Payment Systems: Digital Payment Requirements – Classification of New Payment Systems – Properties of Electronic Cash – Cheque Payment Systems on the Internet – Designing E-payment Systems – Digital Signature-Online financial services in India.

Unit IV: **9**

E-Customer   Relationship   Management: Customer   Relationship Management. E-Supply Chain Management: Supply Chain- Benefits, E-Supply Chain Components, E-Supply Chain Architecture, Major Trends in E-SCM

Unit V: **9**

Mobile Commerce: Growth of Mobile Commerce – Technologies for Mobile Commerce – Wireless Technologies – Mobile Commerce. Intelligent Web Design: Requirements of Intelligent Web Sites – Setting Web Sites Goals and Objectives – Strategies for website development.

Outcomes :

At the end of the course the student will be able to:

➢ Identify and analyze the construction and working principles of E-Commerce.
➢ Develop and implement the Electronic Payment Systems and EDI.

Reference Books:

1. E-Commerce – A Managerial Prespective – P.T. Joseph, Third edition, Prentice-Hall of India(P)Ltd, 2008.

Accounting and Financial Management   L T P C 3 0 0 3

Objectives:

To prepare the students:

1. To explain fundamental accounting concepts, the elements of financial statements, and basic accounting vocabulary.
2. To explain and use the accounting equation in basic financial analysis and explain how the equation is related to the financial statements.
3. To prepare basic entries for business transactions and present the data in an accurate and meaningful manner.
4. To prepare basic financial statements and explain the articulation between the basic statements.
5. Explain the basic features of accounting and reporting by organizations, including the principles underlying the design, integrity, and effectiveness of information systems

Unit I   15

Principles, Accounting concepts, Methods of recording the Journal, the ledger, Balancing the ledger, trial balance and preparation of Trial Balance. Final accounts - preparation of Trading, profit and loss account and Balance sheet of Sole trader concern with normal closing entries.Financial Management - Meaning - Objectives - Scope.

Unit II   9

Ratio Analysis - Meaning - classifications of ratios - Profitability .ratios - Turnover ratios- Financial ratios - Advantages - Limitations - Practical problems.   Fund Flow Analysis - Meaning of the term Fund, Fund flow, Working capital, statement of changes in working capital - preparation of fund Flow statement, practical problems.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Unit III   12

Cost Accounting - Meaning of Costing, Cost Accounting - Scope - importance, Cost classification - preparation of Cost sheet. Budget and Budgetary Control - Meaning, Budget, Budgetary, control- Advantages - Limitations - preparation of budgets - viz., production,budget, sales budget, purchase budget flexible budget, Cash budget.

Unit IV   10

Marginal Costing - Nature - Scope - importance - Break-even point - Break even chart - *PN* ratio - Marginal costing and Management decisions -\ viz. Make or buy, shut down or continue, expand or contract, Sales-mix decisions, Product replacement decisions, change, V. s. status quo, Capital Expenditure decisions - practical problems. Standard Costing and Variance analysis - nature, scope, uses, Computation and analysis of variances with reference to material - Cost and Labour cost.

Unit V: 14

Introduction to Computer Accounting - coding - Master Files - transaction files – documents used for data collection - processing of different files - outputs obtained.

Outcomes: At the end of the course the students will be in a position to :
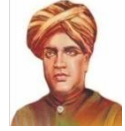
1. Explain the major concepts related to the financial accounting.

2. Perform the accounting analysis

3. Explain the basic features and issues in accounting.

4. Explain and use the computerized accounting methods.

5. Prepare the financial statements.

Text Books:

1. S.P. Jain and KL. Narang - Advanced Accounting, Kalyani publishers,New Delhi.
2. S.P. Iyengar 2. Advanced Accounting, Sultan Chand and sons, New Delhi.

3. Financial Management - S.N.Maheswari and C.B. Gupta, Sultan chand & sons,New Delhi.

4.Management Accounting - S.N. Maheswari and c.B. Gupta, Sultan chand and sons, New Delhi.

Reference Books:

1. RL. Gupta and M. Radhaswamy - Advanced Accounting, Sultan Chand and Sons, New Delhi.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

SOFTWARE PROJECT MANAGEMENT   L T P C 3 0 0 3

COURSE OBJECTIVES:

- ➢ To know of how to do project planning for the software process.

- ➢ To learn the cost estimation techniques during the analysis of the project.

- ➢ To understand the quality concepts for ensuring the functionality of the software

UNIT I SOFTWARE PROJECT MANAGEMENT CONCEPTS   9

Introduction to Software Project Management: An Overview of Project Planning: Select Project, Identifying Project scope and objectives, infrastructure, project products and Characteristics. Estimate efforts, Identify activity risks, and Allocate resources.

UNIT II SOFTWARE EVALUATION AND COSTING   9

Project Evaluation: Strategic Assessment, Technical Assessment, cost-benefit analysis, Cash flow forecasting, cost-benefit evaluation techniques, Risk Evaluation. Selection of Appropriate Project approach: Choosing technologies, choice of process models, Structured methods.

UNIT III SOFTWARE ESTIMATION TECHNIQUES   9

Software Effort Estimation: Problems with over and under estimations, Basis of software Estimation, Software estimation techniques, expert Judgment, Estimating by analogy. Activity Planning: Project schedules, projects and activities, sequencing and scheduling Activities, networks planning models, formulating a network model.

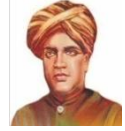### UNIT IV RISK MANAGEMENT   9

Risk Management: Nature of Risk, Managing Risk, Risk Identification and Analysis, Reducing the Risk. Resource Allocation: Scheduling resources, Critical Paths, Cost scheduling, Monitoring and Control: Creating Framework, cost monitoring, prioritizing monitoring.

UNIT V SOFTWARE QUALITY MANAGEMENT   9

TQM, Six Sigma, Software Quality: defining software quality, ISO9126, External Standards, Comparison of project management software's: dot Project, Launch pad, open Proj. Case study: PRINCE2

COURSE OUTCOMES:

- ➢ Understand the activities during the project scheduling of any software application.

- ➢ Learn the risk management activities and the resource allocation for the projects.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

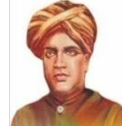**(With effect from the Academic year 2019-2020)**

- Can apply the software estimation and recent quality standards for evaluation of the software projects

- Acquire knowledge and skills needed for the construction of highly reliable software project

- Able to create reliable, replicable cost estimation that links to the requirements of project planning and managing

REFERENCES:

1. Bob Hughes & Mike Cotterell, "Software Project Management", Tata McGraw- Hill Publications, Fifth Edition 2012.

2. S. A. Kelkar," Software Project Management" PHI, New Delhi, Third Edition, 2013.

3. Richard H.Thayer " Project Management,": IEEE Computer Society

4. Futrell , "Quality Software Project Management", Pearson Education India, 2008

5. http://en.wikipedia.org/wiki/Comparison_of_project_management_software

6. http://www.ogc.gov.uk/methods_prince_2.asp

Xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxx

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

ELECTIVE PAPERS

GROUP II

Mobile Operating System   L T P C 3 0 0 3

Objectives :

To enable the students to learn the Android OS and to apply the android tools to solve the real life problems.

Unit –I   9

Role of Android OS – Android Execution Environment- Components-Activity Lifecycle- Service Lifecycle-Creating an Android Development Environment- starting a New Android Application – Writing –Running- Android Development Environment for Real Time Applications-Android and Social Networking –Downloading the MJ Android Code – A Brief Tour of the MJ Android Code- The Project Root folder – Source Folder-Resource Folder-Building and Running the Micro jobs Application – Android SDK/Eclipse IDE-Loading and Starting the application –Running an application on the T- Mobile phone.

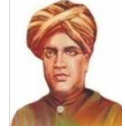### Unit –II   9

Debugging Android Applications – Tools-Eclipse Java Editor-Java Errors- Debugger-Logcat-Android Debug Bridge (adb)-Dalvis Debug Motor Service (DDMS)-Traceview-Signing and Publishing Your Application- Testing Application-Create and Attach an Icon and Label-Cleanup for Release-Version the Application-Obtaining and Signing the certificate and API key- Getting an Signing Certificate for an application- Getting an Signing Certificate while Debugging- Signing the Application-Retesting the Application –Publishing on Android Market - Signing Up as an android Developer.

Unit-III   9

Persistent Data Storage : SQLite Data bases and Content Providers-Databases-Basic Structure of the MicroJobs Databases Class- Reading Data from the Database-Modifying the Database-Content Providers-Introducing Notepad- Content Providers-Consuming a Content Provider-Location and Mapping-Location Based Services-Mapping-Google Maps activity-MapView and MapActivity-Working with MapViews-Pausing and Resuming a MapActivity-Controlling the Map with Menu Buttons- Controlling the Map with the KeyPad –Location without Maps- Manifest and Layout Files-Connecting to a Location Provider and Getting Location Updates-Updating the Emulated Location.

Unit-IV   9

Building a View- Android GUI Architecture-Model-View—Controller-Putting It Together-Assembling a Graphical Interface- Writing up the Controller-Listening to the Model-Listening for Touch Events-Listening for Key Events-Alternative Ways to Handle Events-Advanced Wiring: Focus and Threading-Android Views- Text View and Edit Text-Button and Image Button- Adapters and Adapter Views-Checkboxes, Radio buttons and Spinners- View Groups-Gallery and Grid View-List View and List Activity-Scroll View- Tab Host-Layouts-Frame Layout-Linear Layout-Table Layout-Absolute Layout-Relative Layout

Unit-V   9

Rolling your own Widgets-Layout-Canvas Drawing-Drawables- Bitmaps-Bling-Shadows, Gradients and Filters-Animation-OpenGL Graphics-Simple Phone Calls-Quick and Easy Phone Calls-Creating an Example Application to Run the call method-Embedding the code Snippet in a simple Application- Exploring the phone code through the Debugger-Creating an Instance of an Intent-Adding Data to an Instance of an Intent-Initiating a Phone call

Outcomes :

At the end of the course the students will:

   ➢ Be able to develop an android apps for the practical problems.

   ➢ Be able to debug the existing android apps.

Text Book

1. Android application Development-Rick Rogers, John Lombardo, Zigard Mednieks & Black Meiek O'Reilly 2009 Edition (Unit I- V).

OBJECT ORIENTED ANALYSIS AND DESIGN   L T P C 3 0 0 3

Objectives :

To enable the students:

   ➢ To understand objects, classes and inheritance
   ➢ To understand utilization of software objects to build software projects
   ➢ To use UML in requirements elicitation and designing
   ➢ To develop applications using UML

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Unit I: 9

Introduction: The System Development Life Cycle - System Development Methodologies – Project Team Roles and Skills. Unified Modeling Language: Basic Characteristics - Unified Modeling Language – Object Oriented Analysis and Design - A Sample approach.

Unit II: 9

Planning: Project Initiation- Project Identification- Feasibility Analysis- Project Selection. Project Management: Project Size Identification-Creating and Managing – Staffing the Project- Coordinating Project Activities

Unit III: 9

Analysis: Requirements Determination-Requirement Analysis Techniques-Requirements Gathering Techniques-Applying the Concepts. Functional Modeling: Activity Diagrams- Use Case Descriptions-Use Case Diagrams – Creation of use Case Diagrams & Descriptions – Refining the Project Size. Structural Modeling: Structural Models – CRC Cards - Class Diagrams -   Creation of Class Diagrams.

Unit IV: 9

Object Design: Evolving the analysis model to Design Models-Packages and Package Diagrams-Design Strategies- Design Strategies- Development of Actual Design. Class and Method Design: Basic Characteristics- Design Criteria – Object Design Activities-Constraints and Contracts-Method Specifications. Data Management Layer Design: Object-Persistence Formats-Mapping Problem Domain Objects to Object-Persistence Formats – Optimizing RDBMS Based Object Storage-Designing Data Access.

Unit V: 9

Human Computer Interaction Layer Design: Principles- User Interface Design Process –Navigation Design –Input Design-Output Design. Physical Architecture Layer Design : Elements- Infrastructure Design- Non Functional Requirements-Hardware and Software Specification. Implementation Phase : Managing Programming – Designing Tests   Developing Documentation.
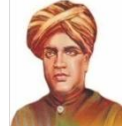
Outcomes:

At the end of the course the student will be in a position to:
  ➢ Analyze the Systems Development Life Cycle
  ➢ Identify the basic software requirements UML Modeling
  ➢ Apply software design with UML diagrams
  ➢ Develop applications using UML

Books:

1. Systems Analysis & Design with UML Version 2.0 An Object Oriented
   Approach– Alan Dennis,Barbara Haley Wixom,David Tegarden, Wiley India ,

Second Edition,2006.
2. Object Oriented Analysis & Design with the unified process – Satzinger, Jackson, Burd Course Technology Cengage learning 2005
3. Object-Oriented Modeling and Design – James Rumbaugh, Michael Blaha, William Premerlani, Frederick Eddy, William Lorensen – Prentice-Hall of India (P) Ltd, 2002.
4. Object Oriented Analysis & Design with Applications Grady Booch Second Edition – 2004.

Network Security   L T P C 3 0 0 3

Objectives :

To enable the students to understand the importance of network security in the current scenario and to apply the various security measures that are available. Further to make the students to design a new security measures by analyzing the existing works.

Unit I   9
Need for Network Security - Security Approaches – Principles of Security – Types of Attacks

Cryptography concepts & Techniques: Plain text & Cipher text – Substitution Techniques – Transposition Techniques – Encryption & Decryption – Symmetric & Asymmetric key cryptography – Steganography

Unit II   9

Symmetric key algorithms: Algorithm types & modes – Overview of Symmetric key cryptography – Data Encryption Standard

Unit III   9

IDEA – RC5 - Advanced Encryption Standard

Overview and History of Asymmetric key Cryptography – RSA algorithm – Digital Signatures – Knapsack Algorithm

Unit IV   9

Digital Certificates – Private Key management

Internet Security Protocols: Basic concepts - SSL – TLS

Unit V   9

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

TSP – SET – Electronic money – Email Security – WAP Security

User Authentication & Kerberos: Authentication basics - Passwords – Authentication Tokens – Certificate based authentication – Biometric authentication – Kerberos

Outcomes :

 At the end of the course the students will be able to:

 ➢ Understand the importance of network security
 ➢ Apply the various encryption scheme
 ➢ Analyse the efficiency of various authentication system

Text:

Cryptography & Network Security – Atul Kahate – TMH – 2008 Second Edition

References:

Cryptography & Network Security Principles of Practices – William Stallings – PHI – 4th Edition – 2006

Cryptography & Network Security – Forouzan – TMH – Special Indian Edition – 2007.

<div align="center">

EMBEDDED SYSTEMS   L T P C 3 0 0 3

</div>

Objectives :

 To enable the students to understand the basic concepts of embedded system and to apply the concepts to provide embedded solutions.

UNIT I : INTRODUCTION TO EMBEDDED SYSTEMS   9

 Definition and Classification – Overview of Processors and hardware units in an embedded system – Software embedded into the system – Exemplary Embedded Systems – Embedded Systems on a Chip (SoC) and the use of VLSI designed circuits.

UNIT II : DEVICES AND BUSES FOR DEVICES NETWORK   9

 I/O Devices - Device I/O Types and Examples – Synchronous - Iso-synchronous and Asynchronous Communications from Serial Devices - Examples of Internal Serial-Communication Devices - UART and HDLC - Parallel Port Devices - Sophisticated interfacing features in Devices/Ports- Timer and Counting Devices - '12C', 'USB', 'CAN' and advanced I/O Serial high speed buses- ISA, PCI, PCI-X, cPCI and advanced buses.

UNIT III : EMBEDDED PROGRAMMING INC& LabVIEW   **9**

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Programming in assembly language (ALP) vs. High Level Language - C Program Elements, Macros and functions -Use of Pointers - NULL Pointers - Use of Function Calls – Multiple function calls in a Cyclic Order in the Main Function Pointers – Function Queues and Interrupt Service Routines Queues Pointers – Concepts of EMBEDDED PROGRAMMING in C++ - Objected Oriented Programming – Embedded Programming in C++, 'C' Program compilers – Cross compiler – Optimization of memory codes.

Concepts of graphical programming – LabVIEW software – Concept of VIs and sub VI - Display types – Digital – Analog – Chart – Oscilloscopic types – Loops – Case and sequence structures - Types of data – Arrays – Formulae nodes –Local and global variables – String and file I/O.

UNIT IV: REAL TIME OPERATING SYSTEMS 9

Definitions of process, tasks and threads – Clear cut distinction between functions – ISRs and tasks by their characteristics – Operating System Services- Goals – Structures- Kernel - Process Management – Memory Management – Device Management – File System Organisation and Implementation – I/O Subsystems – Interrupt Routines Handling in RTOS, REAL TIME OPERATING SYSTEMS : RTOS Task scheduling models - Handling of task scheduling and latency and deadlines as performance metrics – Co-operative Round Robin Scheduling – Cyclic Scheduling with Time Slicing (Rate Monotonics Co-operative Scheduling) – Preemptive Scheduling Model strategy by a Scheduler – Critical Section Service by a Preemptive Scheduler – Fixed (Static) Real time scheduling of tasks - INTER PROCESS COMMUNICATION AND SYNCHRONISATION – Shared data problem – Use of Semaphore(s) – Priority Inversion Problem and Deadlock Situations – Inter Process Communications using Signals – Semaphore Flag or mutex as Resource key – Message Queues – Mailboxes – Pipes – Virtual (Logical) Sockets – Remote Procedure Calls (RPCs).

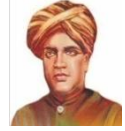## UNIT V : REAL TIME OPERATING SYSTEMS using LabVIEW – 9

Host & target application architecture – Multi threading – sleep mode – determinism – Timing control loops, software timing, hardware timing – Network communication & deployment platforms. Target – Real time module, FPGA, DSP, ARM, Blackfin processors

Outcomes :

At the end of the course the students will be able to:

➢ Describe the features of embedded systems and the related concepts.
➢ Apply the concepts to solve the real time problem.
➢ To deploy the RTOS in other domains.

TEXTBOOKS:

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct. 2003

REFERENCES:

1. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes, David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.
2. Wayne Wolf, Computers as Components; Principles of Embedded Computing System Design – Harcourt India, Morgan Kaufman Publishers, First Indian Reprint 2001
3. Frank Vahid and Tony Givargis, Embedded Systems Design – A unified Hardware / Software Introduction, John Wiley, 2002

Wireless Application Protocol   L T P C 3 0 0 3

Objectives :

To make the students to learn the WAP concepts and to apply it to the web problems.

Unit I   9

Overview of the Wireless Application Protocol – The origins of WAP, Overview of the WAP Architecture, Components of the WAP Structure, Network Infrastructures Service Supporting WAP, WAP Architecture Design Principles, Relationship to Other Standards.

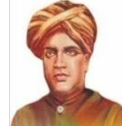**Unit II**   9

The Wireless Markup Language – Overview, The WML Document Model, WML Authoring URLs Identify Content, Markup Basics, WML Basics, Basic Content, Events, Tasks and Bindings, Variables, Other Content You Can Include, Controls, Miscellaneous Markup, Sending information.

Unit III   9

Application Security, Other Data: The meta Element, Document Type Declaration, Errors and Browser Limitations, Content Generation, WML Version Negotiation. Wireless Binary Extensible Markup Language – Overview, Content Structure, Document Structure, Content, The Encoding Process, Binary WML.

Unit IV   **9**

Enhanced WML: WML Script and WTAI – WML Script Overview, Language Basics, WML Script Standard Libraries, Other WML Script Libraries, WML Script Development, Binary WML Script.

Unit V   **9**

User Interface Design: Making Wireless Applications Easy to use – Web Site Design: Computer Terminals Versus Mobile Terminals, Designing a Usability Methods, User Interface Design Guidelines, Design Guidelines for Selected WML Elements.

Outcome :

At the end of the course the students will be able to:
- ➢ Describe the basic concepts related to WAP.
- ➢ Apply the concepts for the web related problems
- ➢ Design GUI for the mobile applications.

Text Book:

The Wireless Application Protocol – Writing Applications for the Mobile Internet, Authors: Sandeep Singhal, Jari Alvinen et al..Pearson Education Asia, 2006

Reference:

Programming WAP, WAP servelets with WML, WML scripts and 3G, V.K Jain, Dreamtech Press, 2005
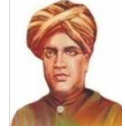
Open Source Technologies   **L T P C 3 0 0 3**

Objectives :

To make the students to learn the various open source technologies, their administration, open source databases and languages, etc.

UNIT I–Introduction   **9**

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Linux, GNU and Freedom, Brief history of GNU, Licensing free software – GPL and copy Left, trends and potential – global and Indian, overview and usage of various Linux Distributions – user friendliness perspective – scientific perspective. Linux for portable Devices, Creation of Bootable CD and USB from command line, Case Studies – Samba, Libreoffice, Assistive technology

UNIT II – System Administration   9

GNU and linux installation – Boot process, Commands Using bash features, The man pages, files and file systems, File security, Partitions, Processes, Managing processes, I/O redirection, Graphical environment, Installing software, Backup techniques.

PROGRAMMING TECHNIQUES Introduction: Application programming – Basics of X Windows server architecture – QT programming – GTK Programming-Python programming

UNIT III – Introduction to PHP   9

The problem with other Technologies, Downloading, installing, configuring PHP, Programming in a Web environment and The anatomy of a PHP Page.

Overview of PHP Data types and Concepts: Variables and data types, Operators, Expressions and Statements, Strings, Arrays and Functions.

Overview of Classes, Objects, and Interfaces: Creating instances using Constructors, Controlling access to class members, Extending classes, Abstract classes and methods, using interfaces, Using class destructors, File Handling and Using Exceptions.

UNIT IV- PHP Advanced Concepts   9

Cookies- HTTP Headers- Sessions- Authenticating users- Environment and Configuration variables- working with Date and Time.

Creating and Using Forms: Understanding Common Form Issues, GET vs. POST, Validating form input, Working with multiple forms, and Preventing Multiple Submissions of a form.

Reading Data in Web Pages - Embedding PHP within HTML.

Unit V – PHP and Database Access & Web Services   9

Basic Database Concepts, Connecting to a MYSQL database, Retrieving and Displaying results, Modifying, Updating and Deleting data. MVC architecture**.**

JAX-RPC-Concepts-Writing a Web Service-Writing a Web Service Client-Describing Web Services: WSDL- Representing Data Types: XML Schema-communicating Object Data: SOAP Related Technologies-Software Installation-Storing Objects as Files-Databases and Servelets.

Outcomes :

At the end of the course the students will be able to:

➢ Understand and appreciate the importance of open source technologies
➢ Describe the various features of open source softwares
➢ Identify the right open source software for the right use
➢ Use the open source technology on their day to day life

TEXT BOOKS

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.

2. PHP 5.1, I. Bayross and S.Shah, the X Team, SPD. 4. PHP and MySQL by Example, E.Quigley, Prentice Hall of India.

3. Jeffrey C. Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006.

4. Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, Linux in a nutshell, Sixth edition, OReilly media, September 2009

<div align="center">

CYBER FORENSICS   **L T P C 3 0 0 3**

</div>

Objectives :

To study the fundamentals of Computer Forensics, and also to learn, analyze and validate Forensics Data. Further to study the tools and tactics associated with Cyber Forensics

UNIT I - NETWORK LAYER SECURITY & TRANSPORT LAYER SECURITY   9

IPsec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPsec . Transport layer Security: SSL protocol, Cryptographic Computations – TLS Protocol.

UNIT II - E-MAIL SECURITY & FIREWALLS   9

PGP - S/MIME - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions.

UNIT III - INTRODUCTION TO COMPUTER FORENSICS   9

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition.

UNIT IV - EVIDENCE COLLECTION AND FORENSICS TOOLS   9

 Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools.

UNIT V - ANALYSIS AND VALIDATION   9

 Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics.

Outcomes :

 At the end of the course the student will be able to:

- Understand and appreciate the importance of cyber forensic in the day to day life.
- Collect, Process, Analyze, and present Computer Forensic Evidence.
- Apply Criminal Justice Methods to Cyber Security and Computer Forensic Investigations.
- Analyze and resolve Cyber Security issues.

TEXT BOOKS:

1. Man Young Rhee, "Internet Security: Cryptographic Principles", "Algorithms and Protocols", Wiley Publications, 2003. 2. Nelson, Phillips, Enfinger, Steuart, "Computer Forensics and Investigations", Cengage Learning, India Edition, 2008.

REFERENCES:

1. John R.Vacca, "Computer Forensics", Cengage Learning, 2005

2. Richard E.Smith, "Internet Cryptography", 3rd Edition Pearson Education, 2008.

3. Marjie T.Britz, "Computer Forensics and Cyber Crime": An Introduction", 3rd Edition, Prentice Hall, 2013.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

ELECTIVE PAPERS

GROUP III

Digital Image Processing   L T P C   3 0 0 3

Objectives :

To make the students:

- ➢ To understand basic concepts such as image processing activities such as acquisition, enhancements, compression, segmentation etc.
- ➢ To apply the above activities in the real life problems.

Unit I: **9**

Introduction: What is Digital Image Processing? – Fundamentals Steps in Digital Image Processing – Components of an Image Processing System.

Digital Image Fundamentals: Light and the Electromagnetic Spectrum – Image Sensing and Acquisition – Image Sampling and Quantization(Basic Concepts in Sampling and Quantization - Representing Digital Images - Spatial and Gray-level Resolution - Zooming and Shrinking Digital Images) – Some Basic Relationships between Pixels (Neighbors of a Pixel - Adjacency, Connectivity, Regions and Boundaries – Distance Measures).

Unit II: **9**

Image Enhancement in the Spatial Domain: Some Basic Gray level Transformations (Image Negative – Log Transformations – Power-law Transformations – Piecewise-Linear Transformation Functions)- Histogram Processing(Histogram Equalization- Histogram Matching)- Enhancement using Arithmetic/ Logic operations (Image subtraction – Image averaging) - Basics of Spatial Filtering – Smoothing Spatial Filters .
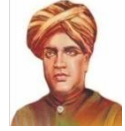
Unit III: **9**

Image enhancement in the frequency domain: Two Dimensional DFT and its inverse **–** Basics of filtering in the frequency domain **-** Lowpass filters(Ideal, Butterworth) – Sharpening frequency domain filters (Ideal, Butterworth).

Image Restoration: A model of the Image degradation / Restoration process – Spatial filtering (Mean filters – Order statistics filters – Adaptive filters).

Unit IV: **9**

Image Compression : Fundamentals (Coding Redundancy – Interpixel redundancy – Psychovisual redundancy – Fidelity criteria) - Image Compression

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Models (Source encoder and Decoder) – Error free compression (Variable length coding – LZW coding) –– Lossy Compression(Transform coding) - Image Compression Standards (Continuous tone still image , Video Compression Standards) .

Unit V: **9**

    Image Segmentation: Detection of discontinuities (Point, line, Edge detections) – Thresholding(Basic Global and Adaptive) - Region based segmentation (Basic formulations – Region growing – Region splitting and merging)

Outcome :

At the end of the course the students will be:

 ➢ Able to describe the concepts related to image processing.

 ➢ Able to describe the several image processing activities.

 ➢ Able to apply the above concepts to solve the real life problems.

Reference Books:

1. Digital Image Processing - Rafael C. Gonzalez and Richard E.Woods, Pearson Education Limited 2004
2. Digital Image Processing and Analysis – B. Chanda and D.Dutta Majunder PHI Limited, 2004
3. Image Processing Analysis and Machine Vision - Milan Sonka , Vaclav Hlavac and Roger Boyle, Vikas Publications 2005.
4. Digital Image Processing - Pratt – Wiley Publications , 2004.
5. Digital Image Processing for Medical Applications-Geoff Doucherty, Cambridge University Press,2015.

Internet of Things

Objectives:
    To explore the interconnection and integration of the physical world and the cyber space. Also to design & develop IOT Devices.

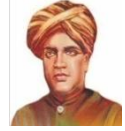**Unit I**   **9**

Introduction-Physical Design of IoT - Logical design of IoT- IoT enabling Technologies-IoT levels and Deployment Templates

Unit II   **9**

Domain Specific IoTs- Home Automation-Cities-Environment-Enegry-Retail-Logisties-Agriculture-Industry- Health and lifestyle

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Unit III 9

IoT and M2M- M2M- Difference between IoT and M2M- SDN and NFV for IoT-Need for IoT systems management-SNMP-Network operator Requirements-NETCONF-YANG

Unit IV 9

IoT Platforms design methodology-Introduction-IoT design methodology-What is an IOT device-Exemplary device: Raspberry Pi-About the board-Linux on Raspberry Pi-Raspberry Pi interfaces

Unit V 9

Introduction to cloud storage models and Communication APIS-WAMP-Xively Cloud for IoT-Python Web Application frame work-Django-Designing a RESTful Web API-Amazon Web Services for IoT.

Course Outcomes:

At the end of the course the student will be:

➢ able to understand the application areas of IOT
➢ able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
➢ able to understand building blocks of Internet of Things and characteristics

References

1) Internet of Things- A Hands on Approach- Arshdeep Bahga and Vijay Madisetti-Universities Press-2015
2) Internet of Things – Key applications and Protocols – Olivier Hersent, David Boswarthick, Omar Elloumi – Wiley India – 2015
3) Designing the Internet of Things – Adrian Mcewen, Hakin cassimally – Wiley India – 2015
4) The Internet of Things – Samuel Greengard – MIT Press - 2015

BLOCKCHAIN TECHNOLOGY   L T P C 3 0 0 3
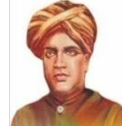
UNIT-I   INTRODUCTION 9

        Introduction to blockchain - Blockchain evolution- Blockchain Structures – Blockchain Characteristics - Decentralized computation platform-Decentralized storage platform-Decentralized messaging platform - Decentralised Applications (DApps) introduction -Trade-Creation and maintenance-Network and nodes-Immutability-Transparency-Design patterns.

UNIT-II   COMPONENTS , TOOLS AND PLATFORM 9

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Cryptocurrency - Distributed digital assets – Distributed ledger technologies – Go ethereum clients (Geth) – Python ethereum clients (pyethapp) – Solidity – Test RPC – Mist ethereum wallets – Metamask – Truffle Dapp framework – Smart contracts – Smart contract patterns –Mining.

UNIT-III   DATA STRUCTURE , ALGORITHM AND IMPLEMENTATION   9

Distributed algorithm – Advantages and disadvantages – Implementation - Consensus algorithm – Features - Secure Hasing algorithm – Implementing Dapp's – Crowd funding – Event registration – Document verification – Call option – Internet rate swap – Industrial IoT machine maintenance.

UNIT-IV   APPLICATIONS OF BLOCKCHAIN   9

Design methodology of applications – Blockchain application components – Blockchain application templates – Many to one – Many to one IoT applications – Many to Many or Peer to peer – One to one or Financial applications – Bitcoincore – Difference between bitcoin and blockchain –Dogecoin – Bitcoincash .

UNIT-V   SECURITY AND CHALLENGES   9
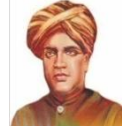
Peer to peer encryption – Stages of mining – Setting up mining node- Whisper protocol - Whisper routing approaches – Whisper API – Swarm nodes and layers – swarm setup - Double spending problem – Byzantine fault tolerance – Proof of work vs Proof of stake – Consistency availability and partition tolerance – Turing completeness - Greedy heaviest observed sub-tree – Sybil attack – Mining pools and centralization – Smart contacts vulnerabilities – Blockchain scalability.

Text books :

1. Blockchain Applications –A Hands on Approach - Arshdeep Bahga and Vijay Madisetti, 2017.

2. Blockchain Technology and Blueprint Ultimate Guide - Raymond kazuya, Kindle edition, 2018

Reference books :

3. Blockchain Blueprint: The Complete Guide to Blockchain Technology and How it is Creating a Revolution, Ray Toffler, Kindle Edition, 2017

4. Blockchain Technology – How to make money with ethereum, 20 alternatives to Bit Coin, David Blake, 2017.

5. Blockchain from Concepts to Execution - Debajani ,Mohanty, BPB Publications; 2nd revised and updated edition 2018.

Natural Language Processing   L T P C 3 0 0 3

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Objectives:

To make the students to be competent enough to apply the NLP techniques to provide the solutions.

Unit I Introduction to NLP. Language Structure and Language Analyzer.   (9)

Unit II Words and Their Analyzer. Local Word Grouping. Paninian Grammar. Paninian Parser.   (9)

Unit III Machine Translation.   Lexical Functional Grammar. LFG and Indian Languages.   (9)

Unit IV Tree Adjoining Grammar. Comparing TAG with PG.   (9)

Unit V Government and Binding. Comparing GB with PG.   (9)

Outcomes:

At the end of the course the students will be able to:

- Describe the various NLP techniques, Grammer, machine translation

- Apply the NLP concepts to provide the solutions.

Text Book:

1. Natural Language Processing: A Paninian Perspective - Akshar Bharati, Chaitanya & Sangal – PHI -2010

References:

1. Natural Language Processing and Text mining – Anne Kao –   Springer – 2011

2. Natural Language Processing – Semantic Aspects – CRC Press 2013

<div align="center">BIG DATA ANALYTICS   L T P C 3 0 0 3</div>

Objectives :

        To enable the students to understand the techniques available in handling the voluminous data and to apply the concepts of data analytics to the challenges and issues available on hand.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மனியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

UNIT I   **9**

INTRODUCTION TO DATA SCIENCE Introduction: Introduction of Data Science-Getting started with R- Exploratory Data Analysis- Review of probability and probability distributions- Bayes Rule Supervised Learning- Regression- polynomial regression- local regression- knearest neighbors.

UNIT II   **9**

UNSUPERVISED LEARNING Unsupervised Learning- Kernel density estimation- k-means- Naive Bayes- Data and Data Scraping Classification-ranking- logistic regression. Ethics- time seriesadvanced regression- Decision trees- Best practices-feature selection.

UNIT III   **9**

BIG DATA FROM DIFFERENT PERSPECTIVES Big data from business Perspective: Introduction of big data-Characteristics of big data-Data in the warehouse and data in Hadoop- Importance of Big data- Big data Use cases: Patterns for Big data deployment. Big data from Technology Perspective: History of Hadoop-Components of Hadoop-Application Development in Hadoop-Getting your data in Hadoop-other Hadoop Component.

UNIT IV   **9**

INFOSPHERE BIGINSIGHTS Infosphere Big Insights: Analytics for Big data at rest-A Hadoop-Ready Enterprise-Quality file system-Compression –Administrative tooling-SecurityEnterprise Integration –Improved workload scheduling-Adaptive map reduce-Data discovery and visualization-Machine Analytics

UNIT V   **9**
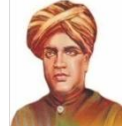
INFOSPHERE STREAMS Infosphere Streams: Analytics for Big data in motion-Infosphere Streams Basicsworking of Infosphere Streams-Stream processing language-Operators-Stream toolkits-Enterprise class

Outcomes :

At the end of the course the student will be able to:
  ➢ Understand the need for the big data analytics
  ➢ Appreciate the effectiveness of the techniques and algorithms that are available for handling big data
  ➢ Apply the data analytic techniques for their data analysis

REFERENCES

1. Noreen Burlingame and Lars Nielsen, "A Simple Introduction To Data Science", 2012.

2. "Understanding Big Data: Analytics for Enterprise Class Hadoop and streaming Data", The McGraw-Hill Companies, 2012.

SERVICE ORIENTED ARCHITECTURE   L T P C 3 0 0 3

COURSE OBJECTIVES:

➢ To provide fundamental concepts of Service Oriented Architecture..

➢ To gain knowledge about SOAP, UDDI and XML to create web services.

➢ To know about the Cloud Computing architecture and services.

UNIT I SOABASICS

Roots of SOA – Characteristics of SOA - Comparing SOA to client-server and distributed internet architectures – Anatomy of SOA- How components in an SOA interrelate - Principles of service orientation – Service Layers.

UNIT II XML AND WEB SERVICES

XML structure – Elements – Creating Well-formed XML - Name Spaces – Schema Elements, Types, Attributes – XSL Transformations – Parser –Web Services Overview – Architecture.

UNIT III WSDL, SOAP and UDDI

WSDL - Overview Of SOAP – HTTP – XML-RPC – SOAP: Protocol – Message Structure – Intermediaries – Actors – Design Patterns And Faults – SOAPWith Attachments – UDDI.
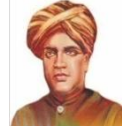
UNIT IV SOA in J2EE and .NET

SOA platform basics – SOA support in J2EE – Java API for XML-based web services (JAX-WS) - Java architecture for XML binding (JAXB) – Java API for XML Registries (JAXR) - Java API for XML based RPC (JAX-RPC) – JAX-RS SOA support in .NET – ASP.NET web services.

UNIT V CLOUD COMPUTING

Vision of Cloud computing – Cloud Definition – Characteristics and Benefits – Virtualization – Cloud computing Architecture – Cloud Reference Model, Types of Clouds – Cloud Platforms in Industry.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

➢ Known about the basic principles of service oriented architecture , its components and

➢ techniques

➢ Understand the architecture of web services

➢ Able to design and develop web services using protocol

➢ Understand technology underlying the service design

➢ Acquire the fundamental knowledge of cloud computing

REFERENCES:

1. Thomas Erl, "Service-Oriented Architecture: Concepts, Technology, and Design", Pearson Education, 2006.

2. HeatherWilliamson, "XML, The Complete Reference", McGraw Hill Education, 2012.

3. Frank. P. Coyle, "XML, Web Services And The Data Revolution", Pearson Education, 2002.

4. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services. An Architect's Guide", Pearson Education, 2005.

5. Newcomer, Lomow, "Understanding SOA with Web Services", Pearson Education, 2005.

6. Dan woods and Thomas Mattern, "Enterprise SOA designing IT for Business Innovation", O'REILLY, First Edition, 2006.

7. Rajkumar Buyya, Christian Vecchiola,

<div align="center">

Distributed Computing   **L T P C 3 0 0 3**
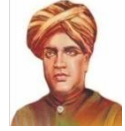
</div>

Objectives :

To enable the students to understand the processes and protocols involved in the distributed computing system and also to apply the concepts for the real life problems.

Unit 1:   **9**
Definition of a distributed system- goals- Connecting Users and Resources - Transparency - Openness - Scalability - hardware concepts - Multiprocessors- Homogeneous Multicomputer Systems   Heterogeneous Multicomputer Systems- software concepts - Distributed Operating Systems - Network Operating Systems - Middleware - the client - server model - Clients and Servers - Application Layering -

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

Client - Server Architectures

Unit II :   **9**

Communication Protocols: layered protocols- Lower - Level Protocols - Transport Protocols- Higher - Level Protocols - remote procedure call- Basic RPC Operation - Parameter Passing - Extended RPC Models - Example: DCE RPC , remote object invocation - Distributed Objects - Binding a Client to an Object - Static versus Dynamic Remote Method Invocations- Parameter Passing - Example : DCE Remote Objects and Java RMI- message - oriented communication - Persistence and Synchronicity in Communication- Message - Oriented Transient Communication - Message Oriented Persistent Communication,   Example: IBM MQSeries - stream - oriented communication .

Unit III: **9**

Processes-threads -Introduction to Threads -Threads in Distributed Systems - clients -User Interfaces- Client-Side Software for Distribution Transparency - SERVERS -General Design Issues - Object Servers -code migration - Approaches to Code Migration-Migration and Local Resources - Migration in Heterogeneous Systems- Example: D' Agents -software agents - Software Agents in Distributed Systems- Agent Technology

Unit IV: **9**

Naming-naming entities-Names, Identifiers, and Addresses-Name Resolution-The Implementation of a Name Space- Example: The Domain Name System-**Synchronization -** clock synchronization -Physical Clocks - Clock Synchronization Algorithms -Use of Synchronized Clocks -logical clocks -Lamport timestamps -Vector timestamps -global state -election algorithms - The Bully Algorithm- Ring Algorithm-mutual exclusion - Centralized Algorithm - Distributed Algorithm - Token Ring Algorithm - Comparison of the Three Algorithms

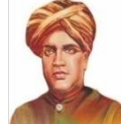**Unit V:**   **9**

Distributed Object-Based Systems-CORBA – Overview of CORBA – Communication- Processes -Naming – Synchronization- Caching and Replication - Fault Tolerance - Security -DISTRIBUTED COM -Overview of DCOM-Communication-Processes – Naming- Synchronization -Replication -Fault Tolerance - Security .

Outcomes :

After undergoing the course the students will:

 ➢ Be able to understand the protocols and processes involved in the distributed computing.
 ➢ Be able to appreciate the benefits of distributed computing.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic year 2019-2020)

➢ Be able to apply the concepts to provide distributed computing solutions to the real life problems.

Text Book:

1. Distributed Systems - - Tenanbaum – PHI/Pearson Education – 2003

Reference Book:

1. Distributed Systems Concepts and design   by   George Coulouris, Jean Dollimore, Tim Kindberg – Pearson Education Third edition 2003.
2. Distributed Computing Principles, Algorithms and Systems-Ajay &Muler Singha,   Cambridge University Press,2014.