MAHAMAYA TECHNICAL UNIVERSITY

NOIDA

Syllabus

for

MASTER OF COMPUTER APPLICATIONS

(Semester-I, Year-1)

(Effective from the Session: 2012-13)

Evaluation Scheme for Session: 2012-13

MCA –I Year (FIRST SEMESTER)

S N	Code	Subjects	Periods			Evaluation Scheme						Total	Credit
			L	T	P	Sessional				End Semester			
						CT	TA	TOT	P	Th	P		
1	CA-101	Problem Solving and Computer Programming with C	3	1	3	30	20	50	25	100	50	225	6
2	CA-102	Mathematical Foundation of Computer Science	3	1	0	30	20	50	-	100	-	150	4
3	CA-103	Principles of Management	3	1	0	30	20	50	-	100	-	150	4
4	CA-104	Computer System Design	3	1	3	30	20	50	25	100	50	225	6
5	CA-105	Energy, Environment and Ecology	3	1	0	30	20	50	-	100	-	150	4
6	CA-106	Professional Communication	0	1	2	15	10	25	-	-	25	50	2
7	CA-107	Seminar	0	0	2	15	10	25	-	-	25	50	1
Total Marks:			**15**	**6**	**10**							**1000**	**27**

Evaluation Scheme for Session: 2012-13

MCA –I Year (SECOND SEMESTER)

S N	Code	Subjects	Periods			Evaluation Scheme						Total	Credit
			L	T	P	Sessional				End Semester			
						CT	TA	TOT	P	Th	P		
1	CA-201	Computer Based Numerical & Statistical Techniques	3	1	2	30	20	50	25	100	25	200	5
2	CA-202	Computer networks	3	1	0	30	20	50	-	100	-	150	4
3	CA-203	Fundamentals of E-Commerce	3	1	0	30	20	50	-	100	-	150	4
4	CA-204	Data Structures and File Handling	3	1	3	30	20	50	25	100	50	225	6
5	CA-205	Object Oriented Systems and Programming with C++	3	1	3	30	20	50	25	100	50	225	6
6	CA-205	Technical Writing	0	2	0	15	10	25	-	-	25	50	2
Total Marks:			**15**	**7**	**8**							**1000**	**27**

MCA: CA-101: **Problem solving and Computer Programming with C**

Objective:

- Understand the significance of an implementation of a programming language in a *compiler*
- Increase the ability to learn new programming languages
- Increase the capacity to express programming concepts and choose among alternative ways to express things in a programming language

Evaluation Scheme :

Code	Subjects	Periods			Evaluation Scheme						Total	Credit
		L	T	P	Sessional				End Semester			
					CT	TA	TOT	P	Th	P		
	Problem solving and Computer Programming with C	3	1	3	30	20	50	25	100	50	225	6

UNIT 1:

Introduction to Computer System: Hardware, Software-system software & application software; Introduction to Computing Environment; Introduction to Problem solving and notion of algorithm: Flow charting, Pseudo code, corresponding sample C-program, Testing the code; Number Systems and their conversion: Decimal, Binary and Hexadecimal representations, bit, byte; Character representation: ASCII, sorting order; System software re-visited: machine language, symbolic language, higher level languages, what is a compiler, what is an operating system, what is a linker, what is an editor, error handling; Introduction to program development.

UNIT 2:

Structure of a C-program, comments, identifiers; Fundamental Data Types**:** Character types, Integer, short, long, unsigned, single and double-precision floating point, complex, boolean, constants; Basic Input/Output: printf, formatting, scanf, eof errors; Operators and Expressions: Using numeric and relational operators, mixed operands and type conversion, Logical operators, Bit operations, Operator precedence and associatively, Functions in C: standard function, defining a function, inter-function communication- passing arguments by value, scope rules and global variables; Top-down program development.

UNIT 3:

Conditional Program Execution: Applying if and switch statements, nesting if and else, restrictions on switch values, use of break and default with switch; Program Loops and Iteration: Uses of while-do and for loops, multiple loop variables, assignment operators, using break and continue; Arrays: Array notation and representation, manipulating array elements, using multidimensional arrays, arrays of unknown or varying size

UNIT 4:

Sequential search, Sorting arrays; Strings, Recursion; Text files**,** file Input/Output - fopen, fread, etc Structures: Purpose and usage of structures, declaring structures, assigning of structures, Pointers to Objects**:** Pointer and address arithmetic, pointer operations and declarations, using pointers as function arguments

UNIT 5:

Familiarization with Linux OS environment: basic OS commands, directory creation, editing, storing and protecting access to files; Text files in Indian languages: keyboarding, editing, searching; The Standard C Preprocessor: Defining and calling macros, utilizing conditional compilation, passing values to the compiler, string handling functions.

Lecture-wise Break-UP

Week	Lecture 1	Chapter	Lecture 2	Chapter	Lecture 3	Chapter	Lab Meeting
Week-1	Introduction to Computer System: Hardware, Software-system software, & application software; Introduction to Computing Environment;	Ch-1 TB1	Introduction to Problem solving and notion of algorithm: Flow charting, Pseudo code,	App C TB1	corresponding sample C-programme, Testing the code;	Ch-1 TB1	Get familiar with OS and C compiler Implement and Test Small Routine in C
Week-2	Number Systems and their conversion: Decimal, Binary and Hexadecimal representations, bit, byte;	App D TB1	Number Systems and their conversion: Decimal, Binary and Hexadecimal representations, bit, byte;	App D TB1	Character representation: ASCII, sorting order	App A TB1	Implement and Test Small Routine in C
Week-3	System software re-visited: machine language, symbolic language, higher lever languages, what is a compiler, what is an operating system, what is a linker, what is an editor, error handling	Ch-1 TB1	Introduction to programme development; Structure of a C-program, comments, identifiers	Ch-2 TB1	Fundamental Data Types: Character types, Integer, short, long, unsigned,	Ch-2 TB1	Implement and Test a moderate size Routine in C
Week-4	Data Types and Variable single and double-precision floating point, complex, boolean, constants;	Ch-2 TB1	Basic Input/Output: printf, formatting, scanf, eof errors;	Ch-2 TB1	Operators and Expressions: Using numeric and relational operators, mixed operands and type conversion,	Ch-3 TB1	Evaluation of Expression Basic I/O
Week-5	Logical operators, Bit operations, Operator precedence and associatively,.	Ch-3 TB1	Functions in C: standard function, defining a function,	Ch-3 TB1	Inter-function communication-passing arguments by value, scope rules and global	Ch-3 TB1	Evaluation of Expression Function

Week							
					variables; Top-down program development		
Week-6	if and switch statements,	Ch-5 TB1	nesting if and else, restrictions on switch values,	Ch-5 TB1	use of break and default with switch;	Ch-5 TB1	Iteration
Week-7	Repetition structure in C: while-do	Ch-6 TB1	Repetition structure in C: for loops	Ch-6 TB1	Repetition structure in C: multiple loop variables, assignment operators, using break and continue;	Ch-6 TB1	Iteration, Function
Week-8	Arrays: Array notation and representation, manipulating array elements,	Ch-8 TB1	using multidimensional arrays, arrays of unknown or varying size	Ch-8 TB1	Sequential search, Sorting arrays;	Ch-8 TB1	Arrays
Week-9	Sorting arrays	Ch-8 TB1	Strings,	Ch-11 TB1	recursion	Ch-8 TB1	Sorting & searching
Week-10	Recursion	Ch-6 TB1	Text files, file Input/Output - fopen, fread, etc	Ch-7 TB1	Structures: Purpose and usage of structures, declaring structures, assigning of structures,	Ch-12 TB1	Strings, Recursion
Week-11	Pointers to Objects: Pointer and address arithmetic,	Ch-9 TB1	pointer operations and declarations,	Ch-9 TB1	using pointers as function arguments	Ch-9 TB1	Pointers
Week-12	Linux OS environment: basic OS commands,	Ch-1 TB4 / Ch-2 TB3	directory creation, storing and protecting access to files	Ch-2 TB4 / Ch-5 TB3	editing,	Ch-3 TB4 / Ch-6 TB3	Use of Unix platform (making directory, cpy edit and store file, running a program already developed)
Week-13	Text files in Indian languages: keyboarding,		Text files in Indian languages: editing, searching		The Standard C Preprocessor: Defining and calling macros,	App G TB1	Hindi text document processing
Week-14	utilizing conditional compilation, passing values to the compiler, string handling functions,	App G TB1	Std C Library	App E TB1	Std C Library	App F TB1	Macros, Library

Text Books :

1. Computer Science- A Structured Programming Approach Using C, by Behrouz A. Forouzan, Richard F. Gilberg, Thomson, Third Edition [India Edition], 2007. **[TB1]**

For Linux:
2. UNIX Concepts and Applications, Das , TMH **[TB2]**
3.. LiNUX, unleashed , Techmedia **[TB3]**

 3. LINUX : LEARNING THE ESSENTIALS by   K. L. JAMES, published by PHI
4. Guide to UNIX and LINUX by Harley Hahn published by TMH

A few web-links for tutorials/resources:
http://www.cprogramming.com/tutorial.html
http://www.pixel2life.com/publish/tutorials/760/_c_beginner_examples_tutorial/
http://www.loirak.com/prog/ctutor.php
http://www.ee.surrey.ac.uk/Teaching/Unix/
http://fclose.com/b/linux/3423/tutorials-for-linux-beginners/
http://www.linux-tutorial.info/
http://www.roseindia.net/linux/tutorial/
http://www.tdil.mit.gov.in/

MCA: CA-102- MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

PREREQUISITES

There are no prerequisites in terms of courses to attend.
Students should be familiar with notions of mathematics

OBJECTIVES:

The objective of this course are :
- To Introduce Mathematical Logic, especially First Order Logic.
- To introduce proof techniques such as Mathematical Induction and Contradiction.
- Develop an understanding of counting, functions and relations.
- To introduce and study abstract, mathematical models of computation (such as Turing machines, formal grammars, recursive functions), and to use the abstract computation models to study the ability to solve computational problems.

LEARNING OUTCOME

Techniques introduced in this course will come in handy for courses such as Analysis of Algorithms, Compiler design and NLP

EVALUATION SCHEME

Code	Subjects	Periods			Evaluation Scheme						Total	Credit
		L	T	P	Sessional				End Semester			
					CT	TA	TOT	P	Th	P		
	Mathematical foundation of computer Science	3	1	0	30	20	50	-	100	-	150	4

UNIT-I: 8 Hrs

Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets

Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, equivalence relation, partial ordering relation.

Function: Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions.

Mathematical Induction: Piano's axioms, Mathematical Induction Discrete Numeric Functions and Generating functions Simple Recurrence relation with constant coefficients, Linear recurrence relation without constant coefficients.

(Text Book 1: Chapters 2, Pages 104 to 258)

UNIT-II: 8 Hrs

Algebraic Structures: Properties, Semi group, Monoid, Group, Abelian group, properties of group, Subgroup, Cyclic group, Cosets, Permutation groups, Homomorphism, Isomorphism and Automorphism of groups

(Text Book 1: Chapters 3 Pages: 270)

Propositional Logic: Preposition, First order logic, Basic logical operations, Tautologies, Contradictions, Algebra of Proposition, Logical implication, Logical equivalence, Normal forms, Inference Theory, Predicates and quantifiers,

(Text Book 1: Chapters 1, Pages 1 to 102)

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, and complemented lattices.

(Text Book 1: Chapters 4 , Page 278 to 390)

UNIT-III   8 Hrs

Graphs: Simple graph, multi graph, representation of graphs, Bipartite, Regular, Planar and connected graphs, Euler graphs, Hamiltonian path and circuits, Graph coloring, chromatic number, isomorphism and Homomorphism of graphs.

Tree: Definition, Rooted tree, properties of trees, binary search tree, tree traversal.

(Text Book 1: Chapters 5, Pages 468 to 509)

UNIT-IV   8 Hrs

Theory of computation: Introduction, Alphabets, Strings and Languages, Kleene Closure, NFA, DFA, , Conversion of NFA to DFA, Optimizing DFA FA with output: Moore machine, Mealy machine, Conversions. Regular expression (RE) , Definition, Regular expression to FA, Arden Theorem, DFA to Regular expression, Non Regular Languages, Pumping Lemma for regular Languages. Application of Pumping Lemma, Closure properties of Regular Languages.

(Text Book 2: Part II, All Chapters)

UNIT-V   8 Hrs

Chomsky Hierarchy of language, Context-free grammar (CFG) , Pushdown Automata (PDA), equivalence of PDA's and CFG's,   Introduction Turing Machine(TM), construction of TM for simple problems. TM as Computer of Integer functions, Universal TM, Recursive and recursively enumerable languages, Halting problem, Introduction to Undecidability, Undecidable problems about TMs.

(Text Book 2: Part III and Part IV)

Text Books:
1) John C Martin " Introduction to Languages and The Theory of Computation", Third edition,, TMH
2) Trembley, J.P & R. Manohar, "Discrete Mathematical Structure with Application to Computer Science", TMH

Reference Books :
3) Hopcroft, Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education
4) Chowdhary, K. R. " Fundamentals of discrete Mathematical Structures', Second Edition, PHI Learning

5) Liptschutz, Seymour, "Discrete Mathematics", TMH
6) Kenneth H. Rosen, " Discrete Mathematics and its applications", TMH
7) Peter Linz," An Introduction to Formal languages and Automata"," Jones & Bartlett Learning

Web-links for tutorials/resources: to be added
http://dipqa.com/view/dips/170/automata-theory-questions-turorials/
http://oqls10.typepad.com/blog/2011/12/automata_theory_tutorials-83399.html
http://math.about.com/od/discretemath/Discrete_Math.htm

Lecture-wise Break-UP

Week	Lecture 1	Lecture 2	Lecture 3	Assignments
Week-1	Definition of sets, countable and uncountable sets, Venn Diagrams	proofs of some general identities on sets ,	Definition, types of relation, composition of relations	Pictorial representation of relation
Week-2	equivalence relation, partial ordering relation.	Definition, type of functions, one to one, into and onto function, inverse function,	composition of functions, recursively defined functions	Piano's axioms, Mathematical Induction Discrete Numeric Functions
Week-3	Generating functions Simple Recurrence relation with constant coefficients	Properties, Semi group, Monoid, Group, Abelian group,	properties of group, Subgroup, Cyclic group, Cosets,	Permutation groups, Homomorphism, Isomorphism and Automorphism of groups
Week-4	Preposition, First order logic, Basic logical operations	Tautologies, Contradictions,	Algebra of Proposition	Logical implication, Logical equivalence, Normal form
Week-5	Inference Theory, Predicates and quantifiers	Lattices, and complemented lattices.	ordered set, Hasse diagram of partially, ordered set,	isomorphic ordered set, well ordered set
Week-6	properties of Lattices, and complemented lattices.	Simple graph, multi graph, representation of graphs	Regular, Planar and connected graphs	Euler graphs, Hamiltonian path and circuits
Week-7	Graph coloring, chromatic number,	isomorphism and Homomorphism of graphs.	Definition, Rooted tree, properties of trees	binary search tree, tree traversal
Week-8	Introduction, Alphabets, Strings	Introduction to Langauges	Kleene Closure,	NFA
Week-9	DFA	Conversion of NFA to DFA	Optimizing DFA	Mealy and More Machines
Week-10	Mealy to More Conversion	Moore machine to Mealy machine,	Regular expression	Regular expression to FA,

		Conversions		Arden Theorem
Week-11	DFA to Regular expression	Non Regular Languages	Pumping Lemma for regular Languages. Application of Pumping Lemma	Closure properties of Regular Languages
Week-12	Chomsky Hierarchy of language	Context-free grammar (CFG	Context-free grammar (CFG	Pushdown Automata (PDA
Week-13	Pushdown Automata (PDA	equivalence of PDA's and CFG's	Introduction Turing Machine(TM	construction of TM for simple problems
Week-14	TM as Computer of Integer functions, Universal TM	Recursive and recursively enumerable languages	Halting problem, Introduction to Undecidability	Undecidable problems about TMs

MCA: CA-103 PRINCIPLES OF MANAGEMENT

OBJECTIVE:

Knowledge on the principles of management is essential for all kinds of people in all kinds of organizations. After studying this course, students will be able to have a clear understanding of the managerial functions like planning, organizing, staffing, leading and controlling. Students will also gain some basic knowledge on international aspect of management.

Code	Subjects	Periods			Evaluation Scheme						Total	Credit
		L	T	P	Sessional				End Semester			
					CT	TA	TOT	P	Th	P		
	Principles of Management	3	1	0	30	20	50	-	100	-	150	4

UNIT 1. HISTORICAL DEVELOPMENT   8 Hours

Definition of Management – Science or Art – Management and Administration – Development of Management Thought – Contribution of Taylor and Fayol – Functions of Management – Types of Business Organization.

(Text Book 1: Chapters 1 and 2, Pages 3 to 24)

UNIT 2. PLANNING   8 Hours

Nature & Purpose – Steps involved in Planning – Objectives – Setting Objectives – Process of Managing by Objectives – Strategies, Policies & Planning Premises- Forecasting – Forecasting.

(Text Book 1: Chapters 3, 4 and 5, Pages 45 to 102)

UNIT 3. ORGANISING   8 Hours

Nature and Purpose – Formal and informal organization – Organization Chart – Structure and Process – Departmentation by difference strategies – Line and Staff authority – Benefits and Limitations – De-Centralization and Delegation of Authority – Staffing – Selection Process - Techniques – HRD – Managerial Effectiveness.

(Text Book 1: Chapters 7,8,9 and 11, Pages 133 to 190, 217 to 244)

UNIT 4. DIRECTING   8 Hours

Scope – Human Factors – Creativity and Innovation – Harmonizing Objectives – Leadership – Types of Leadership Motivation – Hierarchy of needs – Motivation theories – Motivational Techniques – Job Enrichment – Communication – Process of Communication – Barriers and Breakdown – Effective Communication – Electronic media in Communication.

(Text Book 1: Chapters 14, 15, 16 and 17, Pages 299 to 384)

UNIT 5. CONTROLLING   8 Hours

System and process of Controlling – Requirements for effective control – The Budget as Control Technique – Information Technology in Controlling – Use of computers in handling the information – Productivity – Problems and Management – Control of Overall Performance – Direct and Preventive Control – Reporting – The Global Environment – Globalization and Liberalization – International Management and Global theory of Management.

(Text Book 1: Chapters 18, 19, 20, 21 and 22, Pages 393 to 506)

TEXT BOOKS

1. Harold Koontz & Heinz Weihrich "Essentials of Management", Fifth edition, Tata McGraw-Hill, 1998

REFERENCES

1 Tripathy PC And Reddy PN, "Principles of Management", Tata McGraw-Hill, 1999.
2. Decenzo David, Robbin Stephen A, "Personnel and Human Reasons Management", Prentice Hall of India, 1996
3. JAF Stomer, Freeman R. E and Daniel R Gilbert, "Management", Pearson Education, Sixth Edition, 2004.
4. Fraidoon Mazda, "Engineering Management", Addison Wesley, 2000.

5. Joseph L Massie "Essentials of Management", Prentice Hall of India, (Pearson) Fourth Edition, 2003.

Web Links
http://www.wiziq.com/tutorials/principles-of-management
http://nova.campusguides.com/content.php?pid=132346&sid=1493625

Week wise Lecture Schedule

Week	Lecture 1	Lecture 2	Lecture 3	Assignment
Week-1	Definition of Management -Science or Art	Management and Administration	Development of Management Thought –	Development of Management Thought –
Week-2	Contribution of Taylor and Fayol	Functions of Management	Functions of Management	Types of Business Organization.
Week-3	Nature and Purpose of Planning	Steps involved in Planning	Objectives – Setting Objectives	Process of Managing by Objectives
Week-4	Strategies of Planning	Policies & Planning Premises	Forecasting	Forecasting
Week-5	Formal and informal organization	Organization Chart	Structure and Process – Departmentation by difference strategies	Line and Staff authority
Week-6	Benefits and Limitations	De-Centralization and Delegation of Authority	– Staffing – Selection Process - Techniques	HRD – Managerial Effectiveness.
Week-7	Human Factors – Creativity and Innovation	Harmonizing Objectives	Leadership – Types of Leadership Motivation	Hierarchy of needs
Week-8	Motivation theories – Motivational Techniques	Job Enrichment – Communication	Process of Communication – Barriers and Breakdown	Effective Communication – Electronic media in Communication.

Week 9	System and process of Controlling – Requirements for effective control	The Budget as Control Technique	Information Technology in Controlling	Use of computers in handling the information – Productivity
Week-10	Problems and Management	Control of Overall Performance – Direct and Preventive Control – Reporting	The Global Environment – Globalization and Liberalization	International Management and Global theory of Management.

MCA: CA-104-COMPUTER SYSTEM DESIGN

Learning Objective:

1. Students will learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design

2. Students will be able to identify where, when and how enhancements of computer performance can be accomplished.

3. Students will learn the sufficient background necessary to read more advance texts as well as journal articles on the field.

4. Student will see how to use concepts of computer organization in real-life settings using various PC performance improvements.

5. Students will also be introduced to more recent applications of computer organization in advanced digital systems.

Learning Outcome:

1. Student will learn the concepts of computer organization for several engineering applications.

2. Student will develop the ability and confidence to use the fundamentals of computer organization as a tool in the engineering of digital systems.

Evaluation scheme:

Code	Subjects	Periods			Evaluation Scheme						Total	Credit
		L	T	P	Sessional				End Semester			
					CT	TA	TOT	P	Th	P		
	Computer System Design	3	1	3	30	20	50	25	100	50	225	6

UNIT-1   9 Hrs

Data Representation in Computer Systems

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

(Textbook 1, Chapter 2, Page no 54 – 120)

Arithmetic:

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

(Textbook 2, Chapter 3, 61- 86)

Boolean algebra and Digital Logic:

Introduction, Boolean algebra, Boolean Expressions, Boolean Identities, Logic Gates, Digital Components, Combinational Circuits, Sequential Circuits, Karnaugh Maps

(Textbook 1, Chapter 3, Page no 121 – 192)

UNIT 2   9 Hrs

Register and Register transfer :

Part1- Registers, Micro-operations and Implementations, Part 2 - Counters, Register Cells, Buses, & Serial Operations, Part 3 - Control of Register Transfers

(Textbook 4, Chapter 7)

Processor Organization and Performance:

Introduction, Number of Addresses, Flow of Control, Instruction Set Design Issues, Micro-programmed Control, Performance

(Textbook 3, Chapter 6, Page no 197 - 247)

Computer Design Basics:

Part 1 – Data-paths, Part 2 – A Simple Computer

(Textbook 4, chapter 9)

UNIT-3

Memory: **7 Hrs**

Overview, The Memory Hierarchy, Random Access Memory, Memory Chip Organization, Case Study: Rambus Memory, Cache Memory, Virtual Memory, Advanced Topics, Case Study: The Intel Pentium 4 Memory System

(Textbook 2, Chapter 7, 249 - 302)

UNIT-4   **6 Hrs**

Buses and Peripherals

Parallel Bus Architectures, Bridge-Based Bus Architectures, Internal Communication Methodologies, Case Study: Communication on the Intel Pentium Architecture, Serial Bus Architectures, Mass Storage, RAID - Redundant Arrays of Inexpensive Disks, Input Devices, Output Devices, Case Study: Graphics Processing Unit, Case Study: How a Virus Infects a Machine

(Textbook 2, Chapter 8, 303 - 352)

UNIT- 5   **9 Hrs**

Languages and the Machine:

The Compilation Process, The Assembly Process, Linking and Loading, Macros, Quantitative Analyses of Program Execution, From CISC to RISC, Pipelining the Datapath, Overlapping Register Windows, Low Power Coding

(Textbook 2, Chapter 6, 197 - 248)

Performance Measurement and Analysis:

Introduction, Computer Performance Equations, Mathematical Preliminaries, Benchmarking, CPU Performance Optimization, Disk Performance

(Textbook 1, Chapter 11, Page no 585 – 620)

Text-Books:

1.   The Essentials of Computer Organization and Architecture,

       Linda Null and Julia Lobur,3rd Ed, Jones & Bartlett Learning

2.   **Computer Architecture and Organization: An Integrated Approach**

       Miles J. Murdocca and Vincent P. Heuring, John Wiley & Sons, 2007

3.   *Fundamentals of Computer Organization and Design,*

S. P. Dandamudi, Springer, New York, 2003.

4.   **Logic and Computer Design Fundamentals**

Morris mano and Kimi charels 4th Edition, Prentice Hall.

Reference Books:

1.   **Structured *Computer Organization*,**

Andrew S. *Tanenbaum* 5/E, Pearson

2.   **Digital Logic Design**

Brian Holdsworth and Clive Woods, 4th Ed, Newnes

Web-links
1. http://freevideolectures.com/Course/2315/Digital-Computer-Organization/
2. http://freevideolectures.com/Course/2277/Computer-Organization
3. http://www.mywbut.com/syllabus.php?mode=VT&paper_id=54&dept_id=6
4. http://www.jblearning.com/catalog/9781449600068/
5. http://writphotec.com/mano4/PowerPoint_Handouts/
6. http://www.scs.carleton.ca/sivarama/org_book/

Lecture-wise Break-UP

Ut	Wk	Lecture 1	Lecture 2	Lecture 3	Tutorial
1	1	Positional Numbering Systems, Converting Between Bases	Signed Integer Representation,	Floating-Point Representation,	**Data Representation in Computer Systems**
	2	Fixed Point Addition and Subtraction, Fixed Point Multiplication and Division,	Floating Point Arithmetic,	High Performance Arithmetic	**Arithmetic**
	3	Boolean algebra, Boolean Expressions, Boolean Identities, Logic Gates, Digital Components,	Combinational Circuits, Sequential Circuits,	Karnaugh Maps	**Boolean algebra and Digital Logic**

Ut	Wk	Lecture 1	Lecture 2	Lecture 3	Tutorial

2	4	Part 1 - Registers, Microoperations and Implementations,
		• Registers and load enable
		• Register transfer operations
		• Microoperations - arithmetic, logic, and shift
		• Microoperations on a single register
		    Multiplexer-based transfers
		    Shift registers
			Part 2 - Counters, Register Cells, Buses, & Serial Operations	Part 3 – Control of Register Transfers	**Register and Register transfer**

	5	Number of Addresses	Flow of Control	Microprogrammed	**Processor**

		3-Address Machines 2-Address Machines 1-Address Machines 0-Address Machines The Load/Store Architecture Processor Registers	Branching Procedure Calls Instruction Set Design - Issues Operand Types Addressing Modes Instruction Types Instruction Formats	Control H/w Implementation S/w Implementation Performance Performance Metrics Execution Time - Calculation Means of - Performance The SPEC Benchmarks	**Organization and Performance**
	6	Part 1 – Datapaths • Introduction • Datapath Example • Arithmetic Logic Unit (ALU) • Shifter • Datapath Representation and Control Word	Part 2 – A Simple Computer • Instruction Set Architecture (ISA) • Single-Cycle	Hardwired Control PC Function Instruction Decoder Example Instruction Execution	**Computer Design Basics**

Ut	Wk	**Lecture 1**	**Lecture 2**	**Lecture 3**	**Tutorial**
3	7	The Memory Hierarchy,	Random Access Memory	Memory Chip Organization	**Memory**
	8	Case Study: Rambus Memory,	Cache Memory,	Virtual Memory, Advanced Topics	
	9	Case Study: The Intel Pentium 4 Memory System			

Ut	Wk	**Lecture 1**	**Lecture 2**	**Lecture 3**	**Tutorial**
4	9		Parallel Bus Architectures Bridge-Based Bus Architectures,,	Internal Communication Methodologies,	**Buses and Peripherals**
	10	Case Study: Communication on the Intel Pentium Architecture,	Serial Bus Architectures, Mass Storage, RAID - Redundant Arrays of Inexpensive Disks,	Input Devices, Output Devices, Case Study: Graphics Processing Unit,	
	11	Case Study: How a Virus Infects a Machine			

Ut	Wk	**Lecture 1**	**Lecture 2**	**Lecture 3**	**Tutorial**
5	11		The Compilation Process,	The Assembly Process,	**Languages and the Machine**
	12	Quantitative Analyses of Program Execution,	Linking and Loading, Macros	From CISC to RISC, Pipelining the Datapath	
	13	Overlapping Register Windows, Low Power Coding			
	13		Computer Performance Equations,	Mathematical Preliminaries,	**Performance Measurement and Analysis**
	14	Benchmarking,	CPU Performance Optimization,	Disk Performance	

CA-104P: COMPUTER SYSTEM DESIGN LAB

Lecture/ Session -wise Lab Plan

Week	Lab Session (Duration: 3 Hours)
Week1	TTL Characteristics and TTL IC Gates
Week2	Multiplexers & Decoders
Week3	Flip-Flops: SR-ff, JK-ff, T-ff, D-ff
Week4	Counters
Week5	Shift Registers
Week6	Binary Adders & Subtractors
Week7	A L U
Week8 (8086 Assembly Language Programming(ALP))	Write an ALP to evaluate the expressions: (i) $a = b + c - d * e$ (ii) $z = x * y + w - v + u / k$ a. Considering 8-bit, 16 bit and 32 bit binary numbers as b, c, d, e. b. Considering 2 digit, 4digit and 8 digit BCD numbers. Take the input in consecutive memory locations and results also. Display the results by using "int xx" of 8086. Validate program for the boundary conditions.
Week9	Write an ALP of 8086 to add two exponential numbers which are in IEEE 754 notation. Display the results by using "int xx" of 8086. Validate program for the boundary conditions.
Week10	Write an ALP of 8086 to take N numbers as input. And do the following operations on them. a) Arrange in ascending and descending order. b) Find max and minimum c) Find average Consider 8-bit, 16 bit binary numbers and 2 digit, 4digit and 8 digit BCD numbers. Display the results by using "int xx" of 8086. Validate program for the boundary conditions.
Week11	Write an ALP of 8086 to take a string of as input (in 'C' format) and do the following Operations on it. a) Find the length b) Find it is Palindrome or not c) Find whether given string substring or not. d) Reverse a string e) Concatenate by taking another sting Display the results by using "int xx" of 8086.
Week 12	Write an ALP of 8086 to find the factorial of a given number as a Procedure and call from the main program which display the result Write a procedure to locate a character in a given string. When the first occurrence of the character is located, its position is returned to main. If no match is found, a negative value is returned. The main procedure requests a character string and a character to be located and displays the result.
Week13	Write an assembly language program to encrypt digits as shown below: Input digit: 0 1 2 3 4 5 6 7 8 9

	Encrypted digit: 4 6 9 5 0 3 1 8 7 2
	Your program should accept a string consisting of digits. The encrypted string should be displayed using "int xx" of 8086.

Week14	Write an assembly language program to read a string of characters from the user and that prints the vowel count . Display the results by using "int xx" of 8086.
	For example: Input: Advanced Programming in UNIX
	                      Out put:
	                      Vowel count
	                      a or A 3
	                      e or E 1
	                      i or I 3
	                      o or O 1
	                      u or U 1

REFERENCE BOOKS:

1. IBM PC Assembly Language and Programming, P. Abel, 5th Edition, PHI/Pearson Education.

2. Introduction To Assembly Language Programming, Sivarama P.Dandamudi, Springer Int. Edition,2003.

3. The 8088 and 8086 Microprocessors: Programming , Interfacing,Software,Hardware and Application,4th edition,W.A.Triebel,A.Singh,N.K.Srinath,Pearson Education

Web Resources :
1. http://etienne.ece.jhu.edu/etienne/teaching/ECE491/current/Lectures/chap5.pdf
2. http://www.eng.auburn.edu/~nelson/courses/elec3040_3050/ELEC3050%20HCS12%20Lab1.pdf

MCA: CA-105   ENERGY, ENVIRONMENT AND ECOLOGY

1. **Work load per week**

      a. Lecture (L): 3 hrs/week   **Total Lecture Hours per Semester**: 42

      b. Tutorials (T): 1   **Total Tutorial Hours per Semester**: 14

      c. Practicals (P): 0   **Total Lab Hours per Semester**: 0

      d. Total Credits: L+T+P   04

      e. One credit is defined as one lecture load per week and two hours of self-study to be connected with tutorial, practical work book and assignments.

2. **Prerequisites of the course**
    (a) Relation between human and nature
    (b) Effect of human activities on environment
    (c) Calculate the intensity of pollutants
    (d) Interaction between nature and human being
    (e) Chemistry of soil, air and water
    (f) Government legislation to control environmental pollution problem

3. **Prerequisites of which next course:** This course is prerequisite for :
    - Environment Engineering-I & II.
    - Environmental Management for Industries.
    - Environmental Geo-technology.
    - Industrial pollution control & Environmental Audit

4. **Objectives of the course**

    (a) Develop ability to understand interrelationship between human beings and nature.
    (b) Recognizing basic component of environment i.e. air, water and soil and ecology i.e. energy, producers and decomposers.
    (c) Identify problem of pollution along its solution
    (d) Evaluate quantity and quality of natured resources and how natural resource can be available for a long time.
    (e) Teach students how their activities support environment instead of degradation of environment by anthropogenic activities.
    (f) Introduce students to upcoming environmental pollution control techniques.

5. **Learning outcomes from this course**

    (a) To be able to plan and prepare suitable methods for the conservation of environmental segments.
    (b) To be able to plan importance of sustainable developments i.e. appropriate use of natural resources.
    (c) To be able to plan and prepare new techniques of development by reducing low rate consumption of natural resources through Environment Impact Assessment (EIA) process.

(d) To be able to understand role of individual NGO and Government for environment protection activities.

6. Details of the syllabi:

Unit	Topic	Text Book1 Page. No.	Lectures
I	**Introduction:** • Definition of environment. • Need of public awareness. • Segments of environment. • Importance of Environment. • Ecosystem- definition, classification and components. • Function of ecosystem. • Nitrogen and sulphur cycle.	(Text book-1 Chapter-1) (Text book-2, 1.3) (Text book-1,Chapter-2) (Text book-2, 1.4.4,1.4.5)	**6**
II	**Sustainable Development:** • Definition, principle, parameter and its challenges. • Biodiversity: classification, measurement and conservation. • Natural resources: availability & problems. • Minerals & Energy Resources • Seed suicide and sustainable agriculture.	Text book-1,chapter-5 (T.Book-2, Chapter-9) (T.Book-1,Chapter-7) (Text book-1,Chapter-8)	**6**
III	**Energy:** • Classification of energy resources. • Fossil fuels, nuclear and hydroelectric energy. • Solar, wind, biomass, biogas and hydrogen fuel energy.	Text book-1,chapter-8	**4**
IV	**Pollution:** • Environment pollution. • Water pollution, • Solid waste management & hazards waste management. • Current environmental issues • Problem with urbanization and automobile pollution and their control. • Adverse effects of Pollution: Climate change; Green house effect, Global warming, Acid rain and ozone layer depletion.	T.Book-1,Chapter-11 (T.Book-1,Chapter-12),T.Book-2,Ch.-7 T.book-1,Ch.-13 T.book-1,Ch.-18 T.BOOK-2,ch.-2	**8**

V	**Environmental protection & Control Measures:** • Government initiatives i.e. air, water and environmental protection act. • Role of NGOs. • Environment Impact Assessment (EIA): definition, methodology and process. • Environmental education: its principle and objectives. • Case Studies – Bhopal Gas Tragedy, London Smog. • Water Borne and water induce disease, arsenic problem in drinking water	T.book-1,Ch.-20	**6**

Text Books

1. Environment Studies - R Rajagopalan, Oxford Publications.
2. Environmental Chemistry – A K De, New Age Publications.

Reference Books

1. Environment and Ecology – Smriti Srivastava, S K Kataria & Sons.
2. Environmental Science – G T Miller, Publisher – Thomson Asia, Singapore.
3. Environmental Change and Globalization: Double Exposures – Robin Leichenko and Karen O'Brien, Oxford University Press.
4. Essential Environmental Studies – S P Mishra & S N Pandey, Ane Book Publications.
5. Principles of Environmental Science and Engineering by P Venugoplan Rao, Prentice Hall of India.
6. Environmental Science and Engineering by Meenakshi, Prentice Hall of India.
7. Introduction to Environmental Science – Y Anjaneyulu, B S Publication.
8. Environmental Science – D B Botkin, E A Keller, Wiley, India.
9. Fundamentals of Ecology – E P Odum, Publisher – Thomson Asia, Singapore.
10. Basics of Environment & Ecology – Anubhava Kushik, New Age International Publications.
11. Environmental Studies – Benny Joseph – Tata Mcgraw Hill.
12. Text book of Environment Science & Technology - M Anji Reddy, B S Publication.
13. Environmental Studies – S N Chary, Macmillan Publishers, India, Ltd.
14. Environmental Studies – B S Chauhan, University Science Press.

Internet Link:-   (i) www.epa.gov
               (ii) www.unfcce.int
               (iii) www.unep.org
               (iv) www.cpcb.nic.in
               (v) www.environmental.ksc.nasa.gov

MCA: CA-106   PROFESSIONAL COMMUNICATION

1. Title of the course: **PROFESSIONAL COMMUNICATION**

2. Work load per week
      a. Tutorial(T): 1 hrs/week   **Total Tutorial Hours per Semester**: 14

      b. Practicals (P): 2 hrs/week   **Total Lab Hours per Semester**: 28

      c. Total Credits: T+P   **2**

Objectives of the course: To impart basic Communication skills to the first year UG students in the English language through rigorous practice and use of various category of common words and how their application in sentences; to enable them to achieve effective language proficiency for their social, professional & inter personal communication both in speaking & writing.

Desired Outcome of the Course: The student must be able to:

    i) Understand and use about 1200 to 1500 General Purpose words of English language,
    ii) Express his /her ideas and thoughts in speech or writing,
    iii) Be able to comprehend, converse, interact and participate in any day-to-day events and situation
    iv) Write grammatically correct sentences for various forms of written communication to express oneself.

Key Concepts:

Context of Communication, as means of sharing, Speaker- Listener and Writer – Reader relationship, medium of communication, barriers to communication, accuracy, brevity, clarity and appropriateness in communication.

Writing Skills: Words for general purpose use. Sentence formation and using given set of words. Transforming word usage for different tenses, using words for narrative in first, second & third person. Semantics of connectives, modifiers and models, sentence variety and paragraphs, Cohesion and coupling, structure of basic letters, reports & document preparation – introduction to conclusion. Referencing & listing of references.

Speaking Skills: Speech and verbal communication, articulation, paralinguistic's, Pause and its use, formal and informal speaking, debate, extempore and discussion. Task oriented, personal and inter-personal communication.

Reading Comprehension: Kinds and types of texts, abstracting, précis writing and summarizing.

Listening Comprehension: Fluency & speed, impact of pronunciation on comprehension, Intelligent listening,

Teaching methodology:

1.The Professional Communication course needs to equip the student for oral & written communication in English language and meeting the requirements of situational communication ability.

2. The teacher must teach the course through examples, practice sessions and even the lectures must be conducted in the tutorial mode.

3. The teacher must function as a mentor, guide and facilitator for the student to understand the words that have been identified for practice and their use in different situations be given as the assignment for the student to write and speak with one another.

4. The course has to be taught in small batches of 20 to 25 and in the language lab so that continuous and intense practice is recorded, and the track of the student's progress is maintained on per lecture basis.

5. The Books suggested are as base texts and may be expanded upon for giving larger scope of practice to the students. It is important to promote self learning by asking the students to use the internet for finding language training material and content, which can then be used a classroom tasks.

Text Books & references:

1. Dorothy Adams, Michele Crawford, et et " Everyday English- A course on Communicative English" Level 1 & 2, Cengage India 2009. (with practice CD)
2. Bhaskar W. W. S. and Prabhu, N. S. "English Through Reading". Vol I & II MacMillan, 1978.
3. D'Souza Eunice and Shaham, G. "Communication Skills in English". Noble Publishing House 1977.
4. Fiske , John " Introduction to Communication Studies" Rotledge, London, 1990.

Performance Evaluation & Examination:

The student will have to perform on per lecture basis and the peer to peer learning and evaluation method is to be used. However, since the students will be given class tests and assignments hence these will have to be corrected and marked by the teachers and the marks made public with formative feedback to the student explaining where the mistake is and what the correct ways to answer the questions are.

Assignments are to be given to reinforce the concepts and extend the practice of words and their usage by the student in different situations, tenses and accounts in first, second or third person.

The Course examination will be practical based and the student will have to be proficient to demonstrate the language capability as will be tested on the basis of question paper sent from the university.