

**FIVE YEAR INTEGRATED MCA COURSE**

**SCHEME OF INSTRUCTION & EXAMINATION**

**M.C.A I<sup>st</sup> Year**

**FACULTY OF INFORMATION TECHNOLOGY**

**SEMESTER - I**

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessionals
1	5 IMC 101	<b>THEORY</b> English-I	4	-	3	80	20
2	5 IMC 102	Mathematics - I	4	-	3	80	20
3	5 IMC 103	Elements of Information Technology	4	-	3	80	20
4	5 IMC 104	Principles of Economics	4	-	3	80	20
5	5 IMC 105	Basic Electronics	4	-	3	80	20
		<b>PRACTICALS</b>					
1	5 IMC 151	English Lab	-	3	3	50	25
2	5 IMC 152	IT workshop Lab	-	3	3	50	25
		<b>TOTAL</b>	<b>20</b>	<b>6</b>	<b>-</b>	<b>500</b>	<b>150</b>

**SCHEME OF INSTRUCTION & EXAMINATION  
M.C.A I<sup>st</sup> Year  
FACULTY OF INFORMATION TECHNOLOGY**

**SEMESTER - II**

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessionals
1	5 IMC 201	<b>THEORY</b> English - II	4	-	3	80	20
2	5 IMC 202	Mathematics - II	4	-	3	80	20
3	5 IMC 203	Digital Logic Design	4	-	3	80	20
4	5 IMC 204	Environmental Studies	4	-	3	80	20
5	5 IMC 205	Computer Programming and Problem Solving	4	-	3	80	20
		<b>PRACTICALS</b>					
1	5 IMC 251	Soft Skills Lab - I	-	3	3	50	25
2	5 IMC 252	Programming in C	-	3	3	50	25
							-
		<b>TOTAL</b>	<b>20</b>	<b>6</b>	<b>-</b>	<b>500</b>	<b>150</b>

## 5 IMC 101

## ENGLISH - I

Instruction	4 Periods per week
Duration	3 Hours
University Examination	80 Marks
Sessional	20 Marks

### Objectives:

To enable the students to

- Communicate clearly, accurately and appropriately
- Understand the importance of listening skill
- Know and use verbal and non verbal communication appropriately
- Infer information from texts
- Learn basic grammar of English language
- Use appropriate idiomatic expressions, one word substitutes etc.

### UNIT - I

**Effective communication:** Role and importance of communication; Process of communication; Language as a tool of communication; Importance of listening and speaking; Importance of reading and writing.

### UNIT-II

**Communication in English:** Verbal and Non-verbal communication; Formal and informal communication; Barriers to communication.

### UNIT – III

**Remedial English:** Common errors, words often confused, tense and aspect, articles, prepositions, connectives and correlative conjuncts, voice, concord, direct and indirect speech, question tags, punctuation.

### UNIT - IV

Homonyms, homophones, synonyms, antonyms, one-word substitutes, idiomatic usage.

### UNIT - V

Reading comprehension and reading strategies.

The following two lessons are prescribed:

1. Barack Obama: A Trendsetter
2. Rendezvous with Indra Nooyi

**Note:** Units I and V are from the book 'Essential English', Unit - III is from 'Communication Skills & Soft Skills' and Units - II and IV are from both 'Essential English' and 'Communication Skills & Soft Skills'.

### Suggested Reading:

1. E. Suresh Kumar et al., Essential English, Orient Black Swan, 2011.
2. E. Suresh Kumar et al., Communication Skills and Soft Skills, Pearson, 2011.
3. Meenakshi Raman et al., Technical Communication, Oxford University Press, 2009.
4. K K Ramachandran et al, Business Communication, Macmillan, 2009.
5. Sunita Mishra, C. Murali Krishna, Communication Skills for Engineers, Pearson, 2004.

## 5 IMC 102

## MATHEMATICS - I

Instruction	4 periods per week
Duration of university Examination	3 hours
University Examination	80 Marks
Sessional	20 Marks

### Objectives :

- To make students to understand calculus, Vector calculus matrices etc for application in solution of technical problems.

### UNIT - I

**Differential Calculus:** Roll's Theorem - Lagrange's and Cauchy's Mean Value Theorems - Taylor's Series - Curvature - Circle of Curvature - Radius of Curvature - Centre of Circle of Curvature - Envelope of a Family of Curves - Asymptotes of a Curve - Curve Sketching.

### UNIT-II

**Functions of Several Real Variables:** Functions of two Variables - Limits and Continuity- Partial Derivatives - Total Differential and Differentiability-Derivatives of Composite and implicit functions (Chain rule)- Change of Variables- Jacobean -Higher order Partial Derivatives - Taylor's series of functions of two variables-Maximum and Minimum Values of functions two variables-Lagrange's method of multipliers.

### UNIT - III

**Multiple integrals and Vector Calculus:** Multiple integrals- Double integrals- Triple integrals- Change of Variables in integrals. Gradient of a Scalar field and Directional Derivative - Divergence and Curl of a Vector field-Line Integrals - Green's Theorem - Surface area and surface integrals - Divergence theorem of Gauss and Stokes Theorem (With Proof) and their applications.

### UNIT - IV

**Infinite Series:** Sequences- Series- General properties of Series- Series of positive terms-Comparison tests - D'Alemberts Ratio Test - Rabies's Test -Cauchy's root test-Alternating Series -Series of positive and negative terms-Power series-convergence of exponential series.

### UNIT - V

**Matrices:** Rank of Matrix -Elementary transformations of a matrix-Linear transformations-Orthogonal transformations, Vectors- Linear independence and dependence of Vectors- Eigen values and eigenvectors Properties of Eigen values – Cayley - Hamilton Theorem -Reduction of Quadratic form to canonical form by Orthogonal transformation- Nature of a Quadratic form.

### Suggested Reading:

1. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publishing House.
2. B.S. Grewal, Higher Engineering Mathematics, 40th Edition, Khanna Publishers.
3. N. Bali, M. Goyal, C. Watkins, Advanced Engineering Mathematics 7th Edition, Firewall Media.
4. Shanti Narayan, Differential Calculus, S. Chand & Co.
5. G.B. Thomas & Finney, Addison Wesley, Calculus and Analytic Geometry, Peterson, India.
6. H.C. Taneja, Advanced Engineering Mathematics Vol.-I, I.K International, Publishing House Pvt. Ltd, New Delhi.

## 5 IMC 103

## ELEMENTS OF INFORMATION TECHNOLOGY

Instruction	4 periods per week
Duration of university Examination	3 hours
University Examination	80 Marks
Sessional	20 Marks

### Objectives:

- To understand the basic components and peripherals of computers
- To acquaint with Information Technology fundamentals
- To familiarize with basic fundamentals of operating systems and communications
- Acquire knowledge on Databases and cyber hygiene
- Get knowledge on the impact of information technology in real time.

### UNIT-I

**Introduction to Information Technology:** Information concepts & Processing: Basic concepts of IT, data Processing, data and information

**Elements of Computer System:** Classification, history and types of computers.

**Hardware:** CPU, Memory unit, I/O devices, auxiliary storage devices, data representation

**Software:** System and Application s/w and utility packages.

**Programming Languages:** classification, Machine code, Assembly Language, higher level languages, fourth generation languages.

**Translators:** Assembler, Compiler and Interpreter.

### UNIT –II

**Operating Systems:** Concept as resource manager and coordinator of processor, devices and memory. Concept of priorities, protection and parallelism. Command interpreter, Typical commands of Linux/MS Windows

**Communications:** Client server systems, Computer networks, network protocols, LAN, WAN, Internet facilities through WWW, Mosaic, Gopher, html, scripting languages, communication channels, factors affecting communication among devices.

### UNIT-III

**Files & Databases:** Data Storage hierarchy, File management systems, database management systems, types of data base organizations, features of database management systems.

**Information Integrity & Computer Security:** Perverse software, concepts and components of security, Preventive measures and treatment.

### UNIT-IV

**Information System Analysis & Design:** system study review, problem definition, system analysis, system design.

**Management Information Systems:** information need of managers, developing a management information system, planning & decision making practices supported by an MIS.

### UNIT-V

**Computers Impact on Society & Range of applications:** scientific, educational, industrial, business, multilingual applications.

**Suggested Reading:**

1. Sanders, D.H. "Computers Today" McGraw Hill. 1988.
2. Prof. Vikram Singh, "Impact of Information & Communication Technology on public life" (1<sup>st</sup> Edition)  
Lakshmi Publications, 2009
3. Trainer T., et , "Computers" (4th Edition) McGraw Hill, 1994

**5 IMC 104**

**PRINCIPLES OF ECONOMICS**

Instruction	4 periods per week
Duration of university Examination	3 hours
University Examination	80 Marks
Sessional	20 Marks

**Objectives:**

- To learn managerial skills which helps to solve managerial problems in any organization.
- To understand how demand, supply and elasticity's plays role in the working of economic system.
- To make aware and familiarize with the macro economic concepts and financial institutions of India.

**UNIT-I**

The nature and scope of Managerial Economics, Fundamental concepts of managerial economics.

**UNIT-II**

Demand Analysis, concepts of demand, demand elasticity's.

**UNIT-III**

**Production and cost analysis and principles:** Production function, single output isoquantum, average cost curve-Laws of returns – Laws of supply, Price determination under different competitive situations.

**UNIT-IV**

**National Income:** Concepts, measurement and determinants.

**Planning :** The machinery for planning in India, Salient features of India's Five, Year plans.

**UNIT-V**

Indian Financial Systems, Function and role of Reserve Bank of India. Conventional Banks and Industrial Finance. Term "Lending Financial Institutions – role and functions.

**Suggested Reading:**

1. Dhiraj Bhattacharya & Pranab Chakraborti, "Fundamentals of Business Economics", A.H.Wheeler & Co. (P) Ltd., 1986.
2. Barry Keating & J.Holton Wilson, "Managerial Economics", Biztantra, Second Edition, 2003.
3. Dominick Salvatore, "Managerial Economics", Thomson, Fourth Edition, 2001.

## 5 IMC 105

## BASICS ELECTRONICS

Instruction	4 periods per week
Duration of university Examination	3 hours
University Examination	80 Marks
Sessional	20 Marks

### Objectives:

- To understand the behavior of semiconductor diodes, Bipolar Junction Transistors and Field Effect Transistors.
- To familiarize with operational amplifiers.
- To acquaint with Digital logic fundamentals.

### UNIT-I

**Semiconductor Diodes:** Intrinsic semiconductor, drift current, diffusion current, mobility and conductivity, extrinsic semiconductors, donor and acceptor impurities, p-n junction diode: p-n junction as a diode, band structure of an open circuited p-n junction, current components in a p-n diode, V-I characteristics, applications of diode: half wave and full wave rectifier, capacitor filters, zener diode: zener breakdown, avalanche breakdown, comparison of zener and p-n junction diode.

### UNIT-II

**Bipolar Junction Transistor:** junction transistor, current components, transistor as an amplifier, transistor as a switch, transistor configurations: CE, CB and CC. Transistor biasing: operating point, bias stability, collector to base bias, emitter feedback bias, collector emitter feedback bias, self-bias, small signal low frequency transistor model: transistor hybrid model, analysis of transistor amplifier circuit using h-parameters.

### UNIT-III

**Field Effect Transistor:** the junction field effect transistor, pinch off voltage, volt ampere characteristics, CS, CG, CD Amplifiers, FET small-signal model, Metal Oxide- semiconductor FET (MOSFET). Small-signal analysis of CS, CG, CD Amplifiers.

### UNIT-IV

**Operational Amplifiers:** The basic operational amplifier, practical op-amp circuits, inverting and non-inverting configurations, the differential amplifier, emitter coupled differential amplifier, op-amp applications: differential dc amplifier, stable AC coupled amplifier, analog integration and differentiation, electronic analog computation.

### UNIT-V

**Digital Electronics:** Binary operation of a system, OR gate, AND gate, and NOT gate. INHIBIT Operation, exclusive OR circuit, De Morgan's laws, universal gates, logic families: DCTL, RTL, diode logic, TTL.

### Suggested Reading:

1. J Millman, CC Halkias and JIT Satyabrata, "Millman's Electronic Devices and Circuits," 2nd Edition, Tata McGraw Hill, 2008.
2. S Salivahanan, N Suresh kumar and A Vallavaraj, "Electronic Devices and Circuits," 1st Edition, Tata McGraw Hill, 2002.
3. Robert Boylestad and L Nashelsky, "Electronic Devices and Circuit Theory," 8th Edition, Pearson Publishers, 2002.
4. AP Godse and UA Bakshi, "Electronic Devices and Circuits," 1st Edition, Technical Publications, 2005.



## 5 IMC 151

## ENGLISH LAB

Instruction	3 Periods per week
Duration	3 Hours
University Examination	50 Marks
Sessional	25 Marks

### Objectives:

- Learn IPA so as to overcome MTI
- Learn minimal pairs and types of syllables
- Overcome the difficulties with sounds of English
- Learn better pronunciation through the practice of phonemic sounds
- Use proper body language, expressions in their presentations and speeches
- Learn how to use a dictionary and thesaurus effectively

**Note:** While teaching the following items, emphasis may be laid on intensive practice in the language lab. Lecturing may be avoided as far as possible.

1. **Introduction to English Phonetics:** Organs of Speech: the respiratory, articulatory and phonatory systems.
2. **Sounds of English:** Phonemic sounds, introduction to International Phonetic Alphabet, minimal pairs; The syllable: types of syllables; Difficulties of Indian speakers with sounds of English.
3. **Use of dictionary and thesaurus:** Advantages of using a dictionary and thesaurus; improving vocabulary using a dictionary and thesaurus.
4. **Presentation Skills:** Making effective presentations, expressions which can be used in presentations, use of non-verbal communication, coping with stage fright, handling question and answer session; Use of audio-visual aids, PowerPoint presentations.
5. **Role play:** Use of dialogues in a variety of situations and settings.
6. **Public Speaking:** Advantages of public speaking, essentials of an effective speech, rehearsal techniques, planning and delivering a speech.

### Suggested Reading:

1. E. Suresh Kumar et al. English for Success (with CD), Cambridge University Press India Pvt. Ltd. 2010.
2. T. Balasubramanian, A Textbook of English Phonetics for Indian Students, Macmillan, 2008.
3. Kavita Tyagi and Padma Misra. Professional Communication, PHI Learning Pvt. Ltd, 2011.
4. J. Sethi et al. A Practical Course in English Pronunciation (with CD), Prentice Hall India, 2005.
5. Meenakshi Raman and Sangeeta Sharma. Technical Communication, Oxford University Press, 2009.

## 5 IMC 152

## IT WORKSHOP LAB

Instruction	3 Periods per week
Duration	3 Hours
University Examination	50 Marks
Sessional	25 Marks

### Objectives:

- Understand the basic components and peripherals of a computer.
- To become familiar in configuring a system.
- Learn the usage of productivity tools.
- Acquire knowledge about the netiquette and cyber hygiene.
- Get hands on experience in trouble shooting a system.

### Syllabus:

1. System Assembling, Disassembling and identification of Parts / Peripherals
2. Operating System Installation – Install Operating Systems like Windows, Linux along with necessary Device Drivers.
3. MS-Office / Open Office
  - a. Word – Formatting Page Borders, Reviewing Equations, symbols.
  - b. Spread Sheet – Organize data, Usage of formula, graphs charts.
  - c. Power Point – Features of Power Point, Guidelines for Preparing an effective presentation.
  - d. Access – Creation of database, validate data.
4. Network Configuration & Software Installation – Configuring TCP/IP, proxy and firewall settings, Installing application software, system software & tools.
5. Internet and World Wide Web – Search Engines, Types of search engines, netiquette, cyber hygiene.
6. Trouble Shooting – Hardware trouble shooting, Software trouble shooting.
7. SCI LAB – basic commands, subroutines, graph plotting.
8. LATEX – basic formatting, handling equations and images.

### Suggested Reading:

1. K.L.James, Computer Hardware, Installation, Interfacing, Troubleshooting and Maintenance, Eastern Economy Edition.
2. Gary B. Shelly, Misty E, Vermaat and Thomas J. Cashman, Microsoft Office – 2007: Introductory Concepts and Techniques, Windows XP Edition, (2007, Paperback)
3. Leslie Lam Port, LATEX-User's Guide and Reference Manual, Pearson, LPE, 2<sup>nd</sup> Edition.
4. <http://www.ieor.iitb.ac.in/resource/latex>
5. [http://www.cse.iitb.ac.in/~sohoni/TD604/sundry/Scilab\\_Tutorial.pdf](http://www.cse.iitb.ac.in/~sohoni/TD604/sundry/Scilab_Tutorial.pdf)
6. Scott Mueller's, Upgrading and Repairing PCs, 18<sup>th</sup> Edition, Scott. Mueller, QUE, Pearson, 2008.
7. Cheryl A Schmidt, The Complete Computer Upgrade and Repair Book, 3<sup>rd</sup> Edition, Dream tech.
8. Vikas Gupta, Comdex Information Technology Course Tool Kit, WILEY Dream tech.
9. ITL Education Solutions Limited, Introduction to Information Technology, Pearson Education.

## 5 IMC 201

## ENGLISH - II

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

### Objectives:

- Communicate clearly, accurately and appropriately
- Learn different models of interpersonal communication
- Participate in group discussions and work in teams effectively
- Understand various strategies of speaking.
- Comprehend the difference between technical and general writing
- Write reports, scientific papers, letters, Statement of Purpose, Resume

### UNIT - I

**Interpersonal communication:** Models of interpersonal communication: Johari Window; Styles of communication; Situational dialogues; Information transfer using charts, figures, tables, bar graphs, pie charts

### UNIT-II

**Group communication:** Organizational group discussions, Team work; Speaking strategies; Persuasion techniques.

### UNIT - III

**Technical communication:** Difference between technical writing and general writing; Writing general reports; Writing technical reports and scientific paper

### UNIT - IV

**Communication through letters:** official and personal letters, letters of complaint, letters of enquiry and responses, Résumé writing; cover letters, writing a Statement of Purpose, e-mail etiquette.

### UNIT - V

Reading comprehension and reading strategies.

### The following two lessons are prescribed:

1. Muthyala Raju Revu: An Engineer Turned IAS Officer
2. R. Madhavan: Engineering to Farming

**Note:** Units I and V are from the book 'Essential English', Unit - III is from 'Communication Skills & Soft Skills' and Units - II and IV are from both 'Essential English' and 'Communication Skills & Soft Skills'.

### Suggested Reading:

1. E. Suresh Kumar et al., Essential English, Orient Black Swan, 2011.
2. E. Suresh Kumar et al., Communication Skills and Soft Skills, Pearson, 2011.
3. Meenakshi Raman et al., Technical Communication, Oxford University Press, 2009.
4. K K Ramachandran et al, Business Communication, Macmillan, 2009.
5. Sunita Mishra, C. Murali Krishna, Communication Skills for Engineers, Pearson, 2004.

**5 IMC 202****MATHEMATICS - II**

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

**Objectives:**

- To understand differential equations, Beta and Gamma functions and poly nominal's and to apply in engineering field.

**UNIT - I**

Ordinary Differential Equations of first order: Exact first order differential equations-Integrating factors-Linear first order equations-Some special first order equations- Orthogonal trajectories of a given family of curves-applications of First Order Differential Equations- Rate of Growth or Decay-Newton's Law of cooling.

**UNIT - II**

Linear Differential equations: Solutions of linear differential equations-Linear Independence and Dependence Methods of solutions of linear Second Order Equations-Solutions of second order linear homogeneous equations with constants coefficients- Method of reduction of Order for the linear homogenous second order differential equations with variable coefficients-Solutions of higher order homogeneous linear Equations with constants coefficients-Solutions of Non-homogeneous linear Equations-Method of Variation of Parameters- Solution of Euler- Cauchy Equation- Simultaneous linear Equations.

**UNIT - III**

Series Solution of differential equations: Ordinary and Singular points of an equation-Power series solution-Series solution about a Regular Singular point - Frobenis Method.

**UNIT - IV**

Beta and Gamma Functions- Error Function-Legendre's differential equation and Legendre's polynomials - Rodriguez formula-Generating function for Legendre's polynomials  $P_n(x)$ - Recurrence relations for Legendre's polynomials  $P_n(x)$  - Orthogonal and Orthogonal functions- Orthogonal property of Legendre's polynomials  $P_n(x)$ .

**UNIT - V**

Chebyshev differential equation and Chebyshev Polynomials- Recurrence relation for Chebyshev Polynomials  $T_n(x)$  and  $U_n(x)$ - Extreme points of  $T_n(x)$ - Leading Coefficient of  $T_n(x)$ - Generating function of  $T_n(x)$  and  $U_n(x)$  Orthogonality of Chebyshev Polynomials  $T_n(x)$  and  $U_n(x)$ - Relation between  $T_n(x)$  and  $U_n(x)$ - Bessel's differential equation and Bessel functions-Derivatives and Integrals of Bessel functions Recurrence Relations for  $J_n(x)$ -Generating function for  $J_n(x)$ .

**Suggested Reading:**

1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, 3rd Edition, Narosa Publishing House.
2. Dr. B.S. Grewal, Higher Engineering Mathematics, 40th Edition, Khanna Publishers.
3. M.D. Raisinghania, "Ordinary and Partial Differential equations" , S. Chand & Company Ltd., 1997.
4. N. Bali, M. Goyal, C. Watkins, Advanced Engineering Mathematics, Firewall, New Delhi.
5. G.B. Thomas & Finney, Addison Wesley, Calculus and Analytic Geometry, Peterson, India.
6. H.C. Taneja, Advanced Engineering Mathematics Vol.-I, I.K International, Publishing House Pvt. Ltd, New Delhi.

## 5 IMC 203

## DIGITAL LOGIC DESIGN

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

### Objectives:

- To understand the number systems and conversions between them.
- To study the properties for Boolean algebra and simplification of Boolean equations using K-maps.
- To study the digital circuits, classifications and their applications.
- To learn about different types of memories and how they are programmed.
- To study the basic applications of digital electronics like digital clock, frequency counter etc.

### UNIT-I

**Number systems:** Binary, Octal and Hexadecimal number systems. Conversion from one system to another.

**Codes:** BCD, ASCII code, Excess-3 code, Gray code. Error detecting and error correcting codes.

**Combinational Logic Design:** Boolean laws & theorems. Karnaugh Map-simplification of Boolean expressions-Sum of Products (SOP) form, Product of Sums (POS) form. Realization of Boolean Expressions using universal gates.

### UNIT-II

**Data processing circuits:** Multiplexers, De-Multiplexers, Code-converters, Encoders, Decoders.

**Arithmetic Circuits:** Half adder, Full adder, Half sub tractors, Full Sub tractors.

**Digital Circuit Testing tools:** Logic Pulsar, Logic probe, Current Tracer.

### UNIT-III

**Sequential circuits:** Flip-flops-RS, D, JK and JK Master slave. De bounce circuits.

**Registers:** Serial-in Parallel-out, Serial-in Serial-out, Parallel-in Serial-out, Parallel-in Parallel-out.

**Counters:** Asynchronous and synchronous counters, decade counters, ring counters. Design of synchronous counters using excitation tables.

### UNIT-IV

**Basic computer Organization:** Instruction codes, Computer registers, Timing and control, Instruction cycle, Input-output Configuration, Interrupt cycle, Introduction to microprocessors and microcontrollers.

### UNIT-V

**Memories:** Types of memories, Memory Addressing, ROM, PROM, EPROM, SRAM, DRAM, DDRAM, NVRAM, Flash memory.

**Programmable Logic Devices:** PLAs, PALs, PLLs.

**Applications:** Digital Clock, Frequency counter, Time measurement, Displays.

### Suggested Reading:

1. Donald P. Leach & Albert Paul Malvino “Digital Principles and Applications” 5<sup>th</sup> Edition, Tata McGraw Hill, 2003
2. R. P. Jain, “Modern Digital Electronics”, 3<sup>rd</sup> Edition, Tata McGraw Hill, 2003
3. Morris Mano M., “Digital Logic and Computer Design”, 3<sup>rd</sup> Edition, Prentice Hall of India, 2004.

## 5 IMC 204

## ENVIRONMENTAL STUDIES

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

### Objectives:

- To study the basic concepts, sources of water, floods and their impact on environment
- To know the ecosystems and energy resources systems
- To understand the Biodiversity concepts and their advantages
- To study the different pollutions and their impact on environment
- To know the social and environment related issues and their preventive measures

### UNIT- I

**Environmental Studies:** Definition, scope and importance, need for public awareness.

**Natural resources:** Water resources; use and over-utilization of surface and ground water, floods, drought, conflicts over water

**Dams:** benefits and problems. Effects of modern agriculture, fertilizer- pesticide problems, water logging and salinity.

### UNIT-II

**Ecosystems:** Concept of an ecosystem, structure and function of an ecosystem, producers, consumers and decomposers, energy flow in ecosystem, food chains, ecological pyramids, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries).

**Energy resources:** Growing energy needs, renewable and non-renewable energy sources. Land Resources, land as a resource, land degradation, soil erosion and desertification.

### UNIT-III

**Biodiversity:** Genetic species and ecosystem diversity, bio-geographical classification of India. Value of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity.

### UNIT-IV

**Environmental Pollution:** Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution; solid and liquid waste management.

**Environment Protection Act:** Air, water, forest and wild life Acts, enforcement of environmental legislation.

### UNIT-V

**Social Issues and the Environment:** Water conservation, watershed management, and environmental ethics. Climate change, global warming, acid rain, ozone layer depletion.

**Environmental Disaster Management:** Types of disasters, impact of disasters on environment, infrastructure, and development. Basic principles of disaster mitigation, disaster management, and methodology. Disaster management cycle, and disaster management in India.

### Suggested Reading:

1. A.K. De "Environmental Chemistry", Wiley Eastern Ltd.
2. E.P. Odum "Fundamentals of Ecology", W.B. Saunders Co., USA.
3. M.N. Rao and A.K. Datta "Waste Water Treatment", Oxford and IBK Publications.
4. Benny Joseph "Environmental Studies", Tata McGraw Hill, 2005.
5. V.K. Sharma "Disaster Management", National Centre for Disaster Management, IPE, Delhi, 1999.
6. Teri Document, "Green Building Council of India"

## 5 IMC 205

## COMPUTER PROGRAMMING AND PROBLEM SOLVING

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

### Objectives:

- To acquire problem solving skills
- To understand basic programming concepts
- To be able to develop flowcharts
- To be able to write programs in C

### UNIT – I

**Introduction to Computer Programming:** Computing Environments, Computer Languages, Creating and Running Programs, Number Systems (Binary, Octal, Decimal, Hex), Representation of numbers (fixed and floating point)

**Algorithms and Flow charts :** Definition of Algorithms, examples, Symbols used in Flow chart, examples.

**Introduction to C Language -** Background, C Identifiers, Data Types, Operators, Variables, Constants, Input / Output, Expressions, C Programs, Precedence and Associativity, Evaluating Expressions, Type Conversion, Statements, Bitwise Operators.

### UNIT-II

**Selection:** Logical Data and Operators, if-else, switch Statements, Standard Functions.

**Repetition:** loops, while, for, do-while statements, Loop examples, break, continue, go to.

**Arrays -** Concepts, Using Arrays in C, Inter-Function Communication, Array Applications, Two-Dimensional Arrays, Multidimensional Arrays, Linear and Binary Search, Selection, Bubble, Insertion Sorts.

### UNIT – III

**Functions:** Designing Structured Programs, Functions Basics, User Defined Functions, Inter Function Communication, Standard Functions, Scope, Storage Classes-auto, Register, Static, Extern, Scope Rules, and Type Qualifiers.

**Recursion-** Recursive Functions, Terminating Condition, Quick & Merge Sort Techniques, Preprocessor Commands.

### UNIT - IV

**Pointers -** Introduction, Pointers to Pointers, Compatibility, L value and R value, Arrays and Pointers, Pointer Arithmetic and Arrays

**Call-by-reference:** Pointers for Inter-Function Communication, Passing Arrays to a Function,

**Dynamic Memory Allocation:** Memory Allocation Functions, Array of Pointers, Programming Applications, Pointers to void, Pointers to Functions, Command-line Arguments.

**Strings -** Concepts, C Strings, String Input / Output Functions, Arrays of Strings, String Manipulation Functions.

### UNIT - V

The Type Definition (type def), Enumerated Types

**Structure:** Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Self Referential Structures. Unions.

**Input and Output:** Files, Streams, Standard library Input Output Functions, Character Input Output Functions.

**Suggested Readings:**

1. Rajaraman V, The Fundamentals of Computer, 4th Edition, Prentice-Hall of India, 2006
2. Kernighan BW and Ritchie DM, The C Programming Language, 2nd Edition, Prentice Hall of India, 2006.
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With effect from the academic year 2015 - 2016

**5 IMC 251**

**SOFT SKILLS LAB- I**

Instruction

3 Periods per week

Duration

3 Hours

University Examination

50 Marks

Sessional

25 Marks

Language Skills  
Communication Skills  
Learning Skills  
Inter Personal Skills  
Presentation Skills  
Letter Writing  
Stress Management  
Planning  
Leadership  
Facilitation  
Decision Making

**5 IMC 252**

**PROGRAMMING IN C**

Instruction	3 Periods per week
Duration	3 Hours
University Examination	50 Marks
Sessional	25 Marks

1. Finding the maximum and minimum of given set of numbers
2. Finding Roots of a Quadratic Equation
3. Sin x and Cos x values using series expansion
4. Conversion of Binary to Decimal, Octal, Hex-Decimal and vice versa
5. Generating a Pascal triangle
6. Program using Recursion - Factorial, Fibonacci, GCD, Quick Sort and Merge Sort
7. Matrix addition and multiplication using arrays
8. Programs for Bubble Sort, Selection Sort, Insertion Sort
9. Programs on Linear Search and Binary Search
10. Functions for string manipulations
11. Finding the No. of characters, words and lines from a given text file
12. Program to open a file and copy the contents of it into another file.