WITH EFFECT FROM THE ACADEMIC YEAR 2015-2016

FIVE YEAR INTEGRATED MCA COURSE

SCHEME OF INSTRUCTION & EXAMINATION
M.C.A I\textsuperscript{st} Year
FACULTY OF INFORMATION TECHNOLOGY

SEMESTER - I

<table>
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<th>Scheme of Instruction</th>
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**PRACTICALS**

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**TOTAL** | 20 | 6 | - | 500 | 150 |
WITH EFFECT FROM THE ACADEMIC YEAR 2015-2016

SCHEME OF INSTRUCTION & EXAMINATION
M.C.A I\textsuperscript{st} Year
FACULTY OF INFORMATION TECHNOLOGY

SEMESTER - II

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TOTAL | | 20 | 6 | - | 500 | 150 |
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.
With effect from the academic year 2015 - 2016

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, Victor calculus matrices etc for application in solution of technical problems.

UNIT - I

UNIT-II

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

UNIT - V

Suggested Reading:
With effect from the academic year 2015 - 2016

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.

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

UNIT-V

Suggested Reading:
5 IMC 105  
BASICS ELECTRONICS

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

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 an 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:
With effect from the academic year 2015 - 2016

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:
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
   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:
8. Vikas Gupta, Comdex Information Technology Course Tool Kit, WILEY Dream tech.
With effect from the academic year 2015 – 2016

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.
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 polynomial’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

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 Pn(x)- Recurrence relations for Legendre's polynomials Pn(x) - Orthogonal and Orthogonal functions- Orthogonal property of Legendre's polynomials Pn(x).

UNIT - V
Chebyshev differential equation and Chebyshev Polynomials- Recurrence relation for Chebyshev Polynomials Tn(x) and Un(x)- Extreme points of Tn(x)- Leading Coefficient of Tn(x)- Generating function of Tn(x) and Un(x) Orthogonality of Chebyshev Polynomials Tn(x) and Un(x)- Relation between Tn(x) and Un(x)- Bessel's differential equation and Bessel functions-Derivatives and Integrals of Bessel functions Recurrence Relations for Jn(x)-Generating function for Jn(x).

Suggested Reading:
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.

UNIT-II
Arithmetic Circuits: Half adder, Full adder, Half sub tractors, Full Sub tractors.

UNIT-III

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:
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.

UNIT-V
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:
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.

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
Input and Output: Files, Streams, Standard library Input Output Functions, Character Input Output Functions.
Suggested Readings:
With effect from the academic year 2015 - 2016

### 5 IMC 251  
**SOFT SKILLS LAB- I**

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- 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.