

Integral University
STUDY & EVALUATION SCHEME
B.Tech. CSE/IT

Year 2nd, Semester III

S. No	Course Code	Subject	Periods			Evaluation Scheme				Subject Total
						SESSIONALS			Exam	
			L	T	P	CT	TA	Total	ESE	
Theory Subjects										
1.	IHU 302/ HU-501	Principles of Management & Engineering Economics	3	1	0	30	20	50	100	150
2.	ICS 301	Data Structure using 'C'	3	1	-	30	20	50	100	150
3.	ICS 302	Discrete Structure	3	1	-	30	20	50	100	150
4.	ICS 303	Advanced Computer Programming	3	1	-	30	20	50	100	150
5.	IEC305/ IEC401	Digital Electronics	3	1	-	30	20	50	100	150
6.	IHU-301 /ICS-305	Disaster Management/ Cyber law & Information Security	2	1	-	15	10	25	75	100
7.	IHU-303	* Human Values & Professional Ethics	3	0	-	-	-	-	50	50
Practicals/Training/Project										
8.	ICS-351	Data Structure Lab	-	-	3	10	10	20	30	50
9.	ICS-352	Programming Lab using VB	-	-	3	10	10	20	30	50
10.	IEC-355/IEC451	Digital Electronics Lab	-	-	3	10	10	20	30	50
11.	ICS-353	Advanced Computer Programming Lab	-	-	3	10	10	20	30	50
12.	GP-301	General Proficiency	-	-	-	-	-	50	-	50
Total			20	6	12	-	-	405	695	1100

- This subject is offered as compulsory audit course for which passing marks is 50% in ESE and the marks will not be added. It has to be cleared till final year.

PRINCIPLE OF MANAGEMENT AND ENGINEERING ECONOMICS
IHU-302/HU – 501

L T P
3 1 0

UNIT 1

Introduction:

Nature and Significance of Economics. Meaning of Science. Engineering and Technology and their Relationship with Economic Development. **4**

UNIT 2

Basic Concepts:

The Concept of Demand and Supply. Elasticity of Demand and Supply, Indifference Curve Analysis, Price Effect. Income Effect and Substitution Effect. **6**

UNIT 3

Money and Banking:

Functions of Money, Value of Money, Inflation and Measures to Control it, Brief Idea of Functions of Banking System viz Commercial and Central Banking, Business Fluctuations. **8**

Management

UNIT 4

Introduction:

Definition, Nature and Significance of Management, Evaluation of Management Thought, Contributions of Max Weber. Taylor and Fayol. **10**

UNIT 5

Human Behaviour:

Factors of Individual Behaviour, Perception. Learning and Personality Development Interpersonal Relationship and Group Behaviour.

REFERENCES

1. Modern Economic Theory: Dewett, K.K., S. Chand and Co.
2. Organizaional Behaviour, Luthers Fred
3. Principles of Management: Prasd L.M.
4. A textbook of Economics Theory: A. W. Stonier & D. C. Horgne, Oxford Publishing House Pvt. Ltd.

DATA STRUCTURE USING 'C'

ICS-301

L T P
3 1 0

UNIT 1

Introduction to Data Structures: Basic Terminology, Elementary Data Organization, Data Structure Operations. Algorithms, Analysis of Algorithms, Complexity of Algorithms, Time-Space Tradeoff.

Arrays: Array Definition, Representation and Analysis, Single and Multi Dimensional Arrays, Address Calculation, Application of Arrays, Character String Representation, Character String Operation, Sparse Matrices & Vectors.

Linked List: Representation and Implementation of Singly Linked List, Traversing, Searching of Linked List, Insertion & Deletion to/from Linked List, Underflow & Overflow. Circular Linked List, Doubly Linked List, Two-way Header List, Polynomial Representation & Addition, Generalized Linked List, Garbage Collection and Compaction. **C program based on above concept.** [10]

UNIT 2

Stacks: Array Representation and Implementation of Stack, Operations on Stacks: Push & Pop, Linked Representation of Stack, Application of Stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of Postfix Expression using Stack.

Recursion: Recursive Definition and Processes, Recursion in C, Example of Recursion, Tower of Hanoi Problem.

Queues: Array and Linked Representation and Implementation of Queues, Operations on Queue: Create, Add, Delete, Full and Empty; Circular Queues, D-queues and Priority Queues. **C program based on above concept.** [9]

UNIT 3

Trees: Basic Terminology, Binary Trees, Binary Tree Representation, Algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary Trees, Traversing Binary Trees, Threaded Binary Trees, Traversing Threaded Binary Trees, Huffman Algorithm, Binary Search Tree (BST), Insertion and Deletion in BST, Path Length, AVL Trees, B-trees. **C program based on above concept** . [8]

UNIT 4

Searching and Hashing: Sequential Search, Binary Search, Comparison and Analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.

Sorting: Insertion Sort, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort. **C program based on above concept.** [7]

UNIT 5

Graphs: Terminology & Representations, Graphs & Multi-Graphs, Directed Graphs,

Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees, **C program based on above concept.**

File Handling:

Physical Storage Media File Organization, Organization of Records into Blocks, Sequential Files, Indexing and Hashing, Primary Indices, Secondary Indices [7]

REFERENCES

1. A. M. Tannenbaum. "Data Structure Using C/C+"
2. Horowitz And Sahani "Fundamental of Data Structure", Galgotia Publication
3. Lipschutz "Data Structure", Schaum series.

DISCRETE STRUCTURE
ICS – 302

L T P
3 1 0

UNIT 1

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, of Functions, Recursively Defined Functions.

Theorem Proving Techniques: Mathematical Induction (Simple and Strong), Pigeonhole Principle, Prove by Contradiction. [9]

UNIT 2

Algebraic Structures: Definition, Properties, Types: Semi Groups, Monoid, Groups, Abelian Group, Properties of Groups, Subgroup, Cyclic Groups, Cosets, Factor Group, Permutation Groups, Normal Subgroup, Homomorphism and Isomorphism of Groups, Example and Standard Results, Rings and Fields: Definition and Standard Results.

[8]

UNIT 3

Posets, Hasse Diagram and Lattices: Introduction, Ordered Set, Hasse Diagram of Partially, Ordered Set, Isomorphic Ordered Set, Well Ordered Set, Properties of Lattices, Bounded I and Complemented Lattices.

Boolean Algebra: Basic Definitions, Sum of Products and Product of Sums, Form in Boolean Algebra, Logic Gates and Karnaugh Maps.

Tree: Definition, Rooted Tree, Properties of Trees, Binary Search Tree, Tree Traversal. [9]

UNIT 4

Propositional Logic: Proposition, First Order Logic, Basic Logical Operation, Truth Tables, Tautologies, Contradictions, Algebra of Proposition, Logical Implications, Logical Equivalence, Predicates, Universal And Existential Quantifiers. [7]

UNIT 5

Combinatorics & Graphs: Recurrence Relation, Generating Function, Simple Graph, Multi Graph, Graph Terminology, Representation of Graphs, Bipartite, Regular, Planar and Connected Graphs, Connected Components in a Graph, Euler Graphs, Hamiltonian Path and Circuits, Graph Coloring, Chromatic Number, Isomorphism and Homomorphism of Graphs. [8]

REFERENCES

1. Liptschutz, Seymour, "Discrete Mathematics", McGraw Hill.
2. Trembley, J.P & R. Manohar, "Discrete Mathematical Structure with Application to Computer Science", McGraw Hill.
3. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill.
4. Deo, Narsingh, "Graph Theory With application to Engineering and Computer.Science.", PHI.
5. Krishnamurthy, V., "Combinatorics Theory & Application", East-West Press Pvt. Ltd., New Delhi.

ADVANCED COMPUTER PROGRAMMING
ICS-303

L T P
3 1 0

Unit-1

Dynamic memory allocation: The process of Dynamic memory allocation, DMA functions: Malloc(),calloc(),realloc(), Sizeof(),free(),creating singly linked list by DMA
Pointers: Function returning pointers, pointers to functions, typedef with function pointers. Parameter passing mechanism using Call by –(value, reference, name ,copy restore, need), **C program based on above concept.** [08]

Unit-2

Introduction to File handling,:-File structure, File handling function, File types, Streams, Text, Binary, File system basics, The file pointer, Opening a file, Closing a file, Writing reading character, words, line Using fopen(), getc(), putc(), and fclose(), Using feof().
Working with string fputs() and fgets(), Standard streams in C, Flushing a stream, Using fread() and fwrite(), Direct access file, fseek() and random access I/O, fprintf() and fscanf(),**C program based on above concept.** [08]

Unit-3

The C preprocessor, # define, defining functions like macros, # error, #include, creating header files, include user defined header files. Conditional compilation directives i.e. # if, # else, # elif and #ifdef &undef, using defined, #line, #pragma, the #&## preprocessor
Error handling in C: types of errors, handling errors, debugging tools, **C program based on above concept.** [08]

Unit-4

Graphics on your PC: Graphics and Text mode, Video Adapter, Initialize Graphics Mode and resolution, header file graphics.h. Functions used In Graphics - Drawing a Point on Screen, Drawing – lines, rectangle, circles, arcs, polygon. Functions to fill colors. Display Text in Graphics mode, outtext(), outtextxy(), justifying text, **C program based on above concept.** [10]

Unit-5

Singly Linked list and its operations (insert, delete, search and traverse)
Standard C libraries- Header files, library function, Operations on bits- One's complement operator, right shift operator, left shift operator, bitwise AND, OR, XOR operator, show bits() operator, hexadecimal numbering system. C under Windows, and Linux, Internet Programming, **C programs based on above concepts.** [10]

References:

1. Expert C prog..by Peter Van Der Linden PHI,
2. Programming in 'C' by 'E Balagurusamy'.-TMH Publication.
3. Pointers in 'C' by 'Yashwant Kanitkar'-BPB Publication.
4. The C Programming Essentials by Dey- Pearson Publication.
5. Pointers on C by Reek Kenneth PHI

DIGITAL ELECTRONICS
IEC-305/IEC-401

L T P
3 1 0

Unit 1

Boolean algebra and number system

Digital system and binary numbers: Signed binary numbers, fixed and floating point numbers, binary codes, cyclic codes, gray codes, error detecting and correcting codes, parity check codes and hamming codes.

Boolean algebra and logic gates: basic definition, axiomatic definition of Boolean algebra, basic theorem and properties of Boolean algebra, Boolean function, canonical and standard forms, other logic operations

(10)

Unit 2

Combinational Logic

Gate-level minimization : K-map, don't care conditions, NAND and NOR implementation, Quine Mc-Clusky method (Tabular method).

Combinational Logic: Combinational circuits, analysis procedure, design procedure, binary addersubtractor, decimal adder, binary multiplier, magnitude comparator, decoders, encoders, multiplexers, three state devices.

(8)

Unit 3

Sequential Circuits: Latches, Flip Flops, Shift Registers, Counters; Synchronous and asynchronous sequential circuits.

(8)

Unit 4

Asynchronous sequential logic: Analysis procedure, circuit with latches, design procedure, reduction of state and flow table, race Free State assignment, hazards.

(8)

Unit 5

Memory:

ROM : PROM, EPROM & EEPROM,

RAM : SRAM & DRAM,

PLD : PLA, PAL & FPGA

(6)

Text Books:

1. Mano M Morris / Digital Design/ Pearson Education India
2. Mano M Morris / Digital Logic and Computer Design / Pearson Education India

3. G.K.Kharate/Digital Electronics/Oxford University Press India

Reference Books:

1. Gopalan , K. Gopal/Introduction to Digital Microelectronics Circuits/ McGraw-Hill Education India
2. Jacob Millmam and Herbert Taub / Pulse, Digital & switching wave forms/ McGraw-Hill Education India
3. Bignell James/Digital Electronics: Logic and Systems/Cengage Learning

DISASTER MANAGEMENT
HU-301/HU-401

L T P
2 1 0

Objective: The objective of this course is to familiarize the students with basic management principles relating to disaster management and mitigation techniques.

Unit-I

- Concept of Disaster Management
- Types of disaster and their impact: Natural and Man made like- Earthquakes, Floods, Droughts, Cyclones, Avalanches, Forest Fires, Terrorism related disaster etc.
- Assessment of Human and Economic Losses. 6

Unit-II

- Impact of Extensive Industrialization
- Impact of Global Warming and Environmental degradation
- National and Global Disaster. 6

Unit-III

- National Policy for Disaster Management, Elementary knowledge of the disaster management Act 2005
- Types of Responses: Central, State, District level, People's community participation in Disaster management.
- Post Disaster management and Rehabilitation measures. 6

Unit-IV

- Capacity building for meeting disasters.
- Long- term measures for prevention of Disasters.
- Mitigation techniques/ Strategies: Early Warning Systems, Data sharing at National and International Levels. 6

CYBER LAW AND INFORMATION SECURITY
ICS-305

L T P
2 1 0

Unit 1

Fundamentals of Cyber Law: Jurisprudence of Cyber Law, Object and Scope of the IT Act 2000, Introduction to Indian Cyber Law, Unicitral Model Law, ISP Guideline. Intellectual property issues and cyber space, Indian perspective, Overview of Intellectual property related legislation in India, Patent, Copy Right, Trademark law, Law related to semiconductor layout & design. [7]

Unit 2

E - Commerce: Security Threats to E - Commerce, Virtual Organization, Business Transactions on Web, E-Governance and EDI, Concepts in Electronics payment systems, E-Cash, Credit/Debit Cards, E- Agreement, Legal recognition of electronic and digital records, E-Commerce Issues of privacy, Wireless Computing- Security challenges in Mobile devices. Digital Signatures - Technical issues, legal issues, Electronic Records, Digital Contracts, Requirements of Digital Signature System. [8]

Unit 3

Investigation and Ethics: Cyber Crime, Cyber jurisdiction, Cyber crime and evidence act, Treatment of different countries of cyber crime, Ethical issues in data and software privacy, Plagiarism, Pornography, Tampering computer documents, Data privacy and protection, Domain Name System, Software piracy, Issues in ethical hacking.

Internet security treats: Hacking, Cracking, Sneaking, Viruses, Trojan horse, Malicious Code & logic bombs.

Introduction to biometric security and its challenges, Finger prints.

Cyber crime forensic: CASE STUDY in Cyber Crime. [8]

Unit 4

Information security- Information Systems and its Importance, Role of Security in Internet and Web Services, Principles of Information Security, Classification of Threats and attacks, Security Challenges, Security Implication for organizations, Security services - Authentication, Confidentiality, Integrity, Availability and other terms in Information Security, Information Classification and their Roles. Introduction to Cryptography, Issues in Documents Security, Keys: Public Key, Private Key, Firewalls, Basic Concepts of Network Security, Perimeters of Network protection & Network attack, Need of Intrusion Monitoring and Detection. [8]

References:

1. Harish Chander “Cyber Law and IT Protection” , PHI Publication, New Delhi

2. Merkov, Breithaupt, “ Information Security”, Pearson Education
3. “Cyber Law in India” - Farooq Ahmad-Pioneer books.
4. K. K. Singh, Akansha Singh “Information Security and Cyber law”, Umesh Publication, Delhi

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B.Tech (3rd & 4th Semester) Common to all branches

IHU-3/3/403

Human Values & Professional Ethics

owais Iqbal

Maximum Marks:50

L T P: 3 0 0

Unit-1

Human Value Education: Understanding the need, basic guidelines, content and process for value education, self exploration – Its content and process; Natural acceptance' and Experiential Validation- as the mechanism for self exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations, Right understanding, Relationship and Physical Facilities- the basic requirement for fulfillment of aspirations of every human being with their correct priority, Understanding Happiness and Prosperity correctly

6

Unit-2

Introduction to Ethical Concept: Definition of industrial ethics and values, Ethical rules of industrial worker. Values and Value Judgments. Moral Rights and Moral Rules, Moral character and responsibilities. Privacy, Confidentiality, Intellectual Property and the Law. Ethics as Law.

6

Unit-3

Professional Responsibility: The basis and scope of Professional Responsibility, Profession and Norms of Professional Conduct, Ethical Standards versus Profession, Culpable mistakes, the autonomy of professions and codes of ethics. Employee status and Professionalism. Central Professional Responsibilities of Engineers: The emerging consensus on the Responsibility for safety among engineers, hazards and risks.

6

Unit-4

Engineers Ethics: senses of Engineering Ethics'-variety of moral issues-types of enquiry - moral dilemmas - moral autonomy – Kohlberg's theory – Gilligan's theory – consensus and controversy – Models of Professional Roles – theories about right action – Self-interest – customs and religion – uses of ethical theories. Valuing Time – Co-operation – Commitment.

6

Unit-5

Global Issues: A Glimpse of Life Stories: Life story of Prophet Mohammad, Mahatma Gandhi, Swami Vivekanand, Marie Curie and Steve Jobs. Multinational corporations – Environmental ethics – computer ethics – weapons development – engineers as managers – consulting engineers – engineers as expert witnesses and advisors- moral leadership.

6

Text Books:

1. R.P Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Value Education.
2. Mike Martin and Ronald Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996
3. Govindarajan M, Natrajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India. New Delhi, 2004

Relevant CDs, Movies, Documentaries & Other Literature:

1. Value Education Website, <http://www.uptu.ac.in>
2. Story of Stuff, <http://www.storyofstuff.com>
3. Al Gore. An Inconvenient Truth, Paramount Classics, USA
4. Charlie Chaplin, Modern Times, United States, USA
5. IIT Delhi, Modern Technology- The Untold Story

DATA STRUCTURE LAB
ICS-351

L T P
0 0 3

Write Programs for the Following:-

1. To implement traversing, insertion and deletion in arrays.
2. To implement, addition, Multiplication of Two sparse Matrices.
3. To implement insertion, deletion and pattern matching of a substring in a given string using linked list.
4. To implement Insertion and deletion in Singly Linked List at Given Location as well as for a Given Item in sorted List.
5. To Implement Insertion and deletion in Circular Linked List.
6. To implement insertion and Deletion in Stack and Queue using arrays and pointer.
7. To implement Fibonacci Series and Tower of Hanoi Using Recursion.
8. Creation of Trees and Tree Traversal Algorithms: Recursive and Non-Recursive.
9. Creation of Graphs and Graph Traversal Algorithms.
10. Sorting:
 - a. Insertion Sort
 - b. Quick Sort
 - c. Merge Sort
 - d. Bubble Sort
 - e. Heap Sort
11. Implementation of Sparse Matrix and Polynomial using Linklist.

**PROGRAMMING LAB USING VB
ICS-352**

**L T P
0 0 3**

- I Introduction to Visual Basic
 - Using Project Explorer, Properties Window.
 - Working with Forms.
- II Working with the Project
 - Working with Multiple forms.
 - Saving and running an .exe application.
- III Adding Code and Events
 - Using code window.
 - Naming and declaring variables and their scope.
 - Array and String Manipulation.
- IV Subroutines and Functions
 - Private and Public.
 - Call by values and Call by reference.
- V Decision Making
 - Decision Structure
 - If Else
 - Select... Case
 - Loop Structure
 - Do ... Loop
 - For ... Next
- VI Using Visual Basic Controls
 - Label, Text Box, Command Button.
 - Frame, Check Box, Option Button.
 - List Box, Combo Box, etc.
- VII Use of Dialog Box
 - MsgBox () function.
 - Inputbox() function.
 - Common Dialog Control.
- VIII Working with Menus
 - Creation of Menus.
 - Adding code to Menus.
- IX Debugging & Handling Error
 - Stepping through code.
 - Dealing with errors.
- X Create an Application using Visual Basic concepts.

DIGITAL ELECTRONIC LAB

IEC-451

1. Realize OR, NOR, XOR, XNOR gates using NAND gate and verify its truth table
2. Design and study of 1-bit Magnitude Comparator
3. Design of Shift Registers
4. (a) Design and test a CODE CONVERTER from decimal number to binary number.
Use diode and LED's.
(b) Measure voltage drop across the diodes, LED's and resistor R. Find the current flowing through LED.
5. (a) Assemble the Half Adder circuit using X-OR and AND gates. Verify the truth table for Half Adder.
(b) Using two Half Adder and an OR gate, assemble Full Adder circuit, verify truth table.
(c) Express sum and carry with all the minterms in minimization possible?
6. Display of decimal digits using 7 segments LED display and a suitable decoder.
(a) Use a BCD to 7 segment decoder 0-9 digits.
(b) Study the 7 segment LED display. Is it common anode or common cathode type? What is a suitable value of R for bright display of digit?
(c) Design a BCD to 7-segment decoder using NAND gates. Use K-maps and don't care terms to implement the design with minimum number of gates.
7. STUDY OF FLIP-FLOPS
(a) Design and test J-K, F/F using NAND gates.
(b) Study J-K Master- Slave F/F IC 74LS76. Make special observations of edge triggering, preset and clear.
(c) Make and test D-F/F and T-F/F and verify its truth table
8. STUDY OF COUNTER
Design MOD-10 Counter using Master - Slave F/F (7476) and logic gates. (7400 & 7408)
Verify its truth table.
9. Study and verify 4-bit adder/subtractor circuit using IC7483 and IC7486.
10. STUDY THE X-OR GATE IV MODULE (7486)
(a) Verify the truth table and record the voltage levels.
(b) Design a 3-input X-OR gate using 2-input X-OR gate. Obtain its truth table
 $F_1 = A + B + C$
(c) Design a 3-input X-NOR gate using 7486 & 7402. Obtain its truth table.
 $F_2 = A \oplus B \oplus C$
(d) Find the expression of F_1 and F_2 as sum of product (SOP) and compare F_1 and F_2 .

**ADVANCED COMPUTER PROGRAMMING LAB
ICS-353**

**L T P
0 0 3**

1. Write a program to allocate memory using malloc(), calloc(), and realloc(), after using it release the memory using free() function.
2. Write a program Insert, Delete, and Search element in Single link List.
3. Write a program to open a file and store/append the student data.
4. Write a program to count the number of character in a file.
5. Write a program to search the character in a file.
6. Write a program to copy content to one file to another file.
7. Write a program to use exception handling for divide by zero.
8. Write a program to print a message in Graphics mode with sound.
9. Write a program to draw different basic shapes Line, Circle, Rectangle, Ellipse, Arc.
10. Write a program to print a message in different font size, style and color.
11. Write a program to print a message using different functions outtext(), outtextxy().
12. Write a program to use different types of preprocessor #define, #if, #else, #elif, and #ifdef
13. Write a program to multiply two given numbers using bitwise operators.
14. Write a program to create a function that returns the value of the integer x rotated to the right by n positions.
15. Write a program using macro swap(t,x,y) that interchanges two arguments of type t.

*Mini Projects based on Advance Computer Programming.