

## SYLLABUS UNDER AUTONOMY

### B. Sc INFORMATION TECHNOLOGY

#### SEMESTER I COURSE : S.BIT.1.01

### PROFESSIONAL COMMUNICATION SKILLS

[Total Lectures 75]

#### LEARNING OBJECTIVE:

To equip the students with communication skills in the Information Technology Industry.

#### **Unit 1. The Seven Cs of Effective Communication** [13]

Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness

#### **Unit 2. Communication: Its interpretation** [13]

Basics, Nonverbal Communication, Barriers to Communication

#### **Unit 3. Business Communication at Work Place:** [13]

Letter Components and Layout, Planning a letter, Process of Letter writing, E-mail Communication, Memo and Memo reports, Employment Communication, Notice agenda and Minutes of meeting, Brochures

#### **Unit 4. Report Writing** [12]

Effective writing, types of business reports, structure of reports, gathering information, organization of the material, writing abstracts and summaries, writing definitions, visual aids, user instruction manual.

#### **Unit 5. Required Skills** [12]

Reading skills, listening skills, note-making, précis writing, audiovisual aids, oral communication

#### **Unit 6. Mechanics of Writing** [12]

Transitions, Spelling rules, hyphenation, transcribing numbers, Abbreviating technical and non-technical terms, Proof reading

#### **Continuous Internal Assessment**

Industrial visits, mock GD, mock presentations / seminars

Mid Term test.

#### **TEXT BOOKS:**

1. Professional Communication by Aruna Koneru, McGrawHill
2. Effective Business Communication by Herta A Murphy, Herbert W Hildebrandt, Jane P Thomas, McGrawHill

#### **REFERENCES:**

1. Business Communication, Lesikar and Petit, McGrawHill

2. Communication Skills Handbook, Summers, Wiley, India
3. Business Communication (Revised Edition), Rai and Rai, Himalaya Publishing House
4. Business Correspondence and Report Writing by R. C. Sharma and Krishna Mohan, TMH.

## **SEMESTER I      COURSE : S.BIT.1.02**

### **APPLIED MATHEMATICS I**

**[Total Lectures 75]**

#### **LEARNING OBJECTIVE:**

To study basic mathematics required for developing algorithms for system and application software.

#### **Unit 1. Matrices: [13]**

Minors and Cofactors, Adjoint of a square matrix, Inverse of a matrix. Rank of a matrix, Solution of Homogeneous and non homogeneous linear Equations using Matrix method.

#### **Unit 2. Eigen Values and Eigen Vectors: [13]**

Vectors, linear combination of vectors, Inner Product of two vectors, characteristic equation, Eigen Vector, Cayley- Hamilton Theorem, Similarity of Matrices, Derogatory and Non-derogatory matrices, Complex Matrices: Hermitian, skew-Hermitian and Unitary matrices and their properties

#### **Unit3. Vector Calculus: [13]**

Vector Differentiation: Vector Operator Del, Gradient, and Geometrical Meaning of gradient, Divergence and Curl.

#### **Unit 4. Differential Equations: [12]**

Differential Equations of 1<sup>st</sup> order and 1<sup>st</sup> degree and applications

#### **Unit 5. Linear Differential Equations: [12]**

Linear Differential equations with constant coefficient, Differential equations of higher order and applications.

#### **Unit 6. Successive differentiation, Mean Value theorems, Partial differentiation, Euler's Theorem, Approximation and errors, Maxima and Minima [12]**

### **Continuous Internal Assessment**

Assignments / Project

Mid Term test.

#### **TEXT BOOKS:**

1. Engineering Mathematics A tutorial approach by R. R. Singh and Mukul Bhatt, TMH 2010
2. Text Book of Applied Mathematics Vol I and Vol II. P.N. Wartikar & J.N. Wartikar, Pune

**REFERENCES:**

1. Higher Engineering Mathematics by B. V. Ramana, McGrawHill
2. Differential Calculus by Shanti Narayan. S. Chand.
3. Higher Engineering Mathematics by B.S. Grewal, Khanna Publications
4. Vector Analysis by Murray Spiegel, McGrawHill
5. Matrices by Vashistha, S. Chand

**SEMESTER I COURSE : S.BIT.1.03**

**FUNDAMENTALS OF DIGITAL COMPUTING**

**[Total Lectures and demonstrations 75]**

**LEARNING OBJECTIVE:**

To study the basic building blocks of any digital electronic machine, for example the hardware of a computer.

**Unit 1. Data and Information [10]**

Features of Digital Systems, Number Systems-Decimal, Binary, Octal, Hexadecimal and their inter conversions, Representation of Data: Signed Magnitude, one's complement and two's complement, Binary Arithmetic, Fixed point representation and Floating point representation of numbers.

**Codes**

BCD, XS-3, Gray code, hamming code, alphanumeric codes (ASCII, EBCDIC, UNICODE), Error detecting and error correcting codes

**Unit 2. Boolean Algebra: [10]**

Basic gates (AND, OR, NOT gates), Universal gates (NAND and NOR gates), other gates (XOR, XNOR gates). Boolean identities, De Morgan Laws.

**Karnaugh maps:**

SOP and POS forms, Quine McClusky method.

**Unit 3. Combinational Circuits: [10]**

Half adder, full adder, code converters, combinational circuit design, Multiplexers and demultiplexers, encoders, decoders, Combinational design using mux and demux.

**Unit 4. Sequential Circuit Design: [10]**

Flip flops (RS, Clocked RS, D, JK, JK Master Slave, T, Counters, Shift registers and their types, Counters: Synchronous and Asynchronous counters.

**Unit 5. Computers: [10]**

Basic Organisation, Memory: ROM, RAM, PROM, EPROM, EEPROM, Secondary Memory: Hard Disk and optical Disk, Cache Memory, I/O devices

### **Unit 6. Operating Systems:**

**[10]**

Types (real Time, Single User / Single Tasking, Single user / Multi tasking, Multi user / Multi tasking, GUI based OS. Overview of desktop operating systems-Windows and LINUX.

## **Continuous Internal Assessment**

Assignments / Project

Mid Term test.

### **TEXT BOOKS:**

1. Modern Digital Electronics by R. P. Jain, 3<sup>rd</sup> Edition, McGraw Hill
2. Digital Design and Computer Organisation by Dr. N. S. Gill and J. B. Dixit, University Science Press
3. Linux Commands by Bryan Pfaffaenberger BPB Publications
4. UNIX by Sumitabha Das, TMH

### **REFERENCES:**

1. Digital Principles and Applications by Malvino and Leach, McGrawHill
2. Introduction to Computers by Peter Norton, McGraw Hill

## **DEMONSTRATION/PRACTICAL**

**[15]**

**(Minimum 8 expts.)**

1. Study of logic gates (basic and universal)
2. Verify De Morgan's theorems
3. Design and implement Half adder and full adder using gates.
4. Design and implement binary to gray code converter and vice versa using XOR gates.
5. Design and implement multiplier for two 2-bit binary numbers using minimum number of gates.
6. Reduce the given numeric form using K-map and implement using gates.
7. Implement SOP /POS forms using logic gates.
8. Implement logic gates using multiplexers.
9. Implement expressions using multiplexers and demultiplexers
10. Implement 3-bit binary ripple counter using JK flip flops.

### **Linux**

1. Installation of Linux
2. Study of Linux Commands with all switches:  
ls, mkdir, cd, rmdir, wc, cat, mv, chmod, date, time, grep, tty, who, whoami, finger, pwd, man, cal, echo, ping, ifconfig, tar, telnet

## SEMESTER I COURSE : S.BIT.1.04

### ELECTRONICS AND COMMUNICATION TECHNOLOGY

[Total Lectures and Demonstrations 75]

#### LEARNING OBJECTIVE:

To Study electronic devices and circuits which are used in the communication technology and computer hardware.

#### Unit 1.

[10]

Concept of Conductor, Semiconductor, Insulator. Semiconductor Diode, Forward bias, Reverse Bias, Application of Diode as Rectifier, Zener diode and its applications, Introduction to Transistor (BJT, FET), PNP, NPN Transistors their Characteristic. Application of Transistor as amplifier and as a Switch.

#### Unit 2.

[10]

Concept of amplification, amplifier notations,  $A_v$ ,  $A_i$ ,  $A_p$ ,  $Z_i$ ,  $Z_o$ , Application of BJT as single stage Amplifier, Frequency response of single stage Amplifier. Multistage Amplifiers:- (Basics concepts) RC coupled, cascade, Darlington pair, DC amplifiers

#### Unit 3.

[10]

Concept of Feedback:- Negative Feedback and its advantage in Amplification, Positive Feedback :- Oscillators, RC Phase Shift Oscillator, LC Oscillator. Switching Circuits Multivibrators : - Monostable using IC 555 and Astable using IC 555 (including problems)

#### Unit 4.

[10]

Introduction:- Need for modulation system, Concept of Modulation. AM :- Definition of AM, Modulation index, Power relation in AM, Generation and Demodulation of AM. SSB:- Power requirement in comparison with AM, Advantages of SSB over AM, Concept of Balanced Modulator, Generation of SSB, Pilot Carrier System, Independent Side System, Vestigial Sideband Transmission.

#### Unit 5.

[10]

FM: - Definition of FM, Bandwidth, Noise triangle, Pre-emphasis and De-emphasis. PM: - Definition of PM. Difference between AM and FM. Radio receivers. Pulse Modulation:- Sampling Theorem, PAM, PTM, PWM, PPM, pulse code modulation, Quantization noise, companding, PCM system, differential PCM, Delta modulation. Multiplexing: - FDM/TDM. Television:- Scanning, Composite Video signal, Television Transmitter, television receiver.

#### Unit 6.

[10]

Introduction to Digital Communication: PSK, ASK, FSK. Introduction to fibre optics system:- Propagation of light in optical fibre; ray model. Types of fibre : Single mode, steps index. Graded index. Signal distortion: attenuation, dispersion. Optical sources: LED, LASERS. Optical Detectors and optics links. Link Budget.

### Continuous Internal Assessment

Assignments / Project  
Mid Term test.

### **REFERENCES:**

1. Allen Mottershead, "Electronic Devices and Circuits", PHI
2. Boylestad and Neshelsky, "Electronics Devices and Circuits", 4<sup>th</sup>, PHI, 1999.
3. Simon Haykin, "An Introduction to Analog and Digital communications", John Wiley and Sons, 1994.
4. R.B Carlson, "Communication Systems", MacGraw Hill.
5. George Kennedy, "Electrical Communication systems", Tata McGraw Hill 1993.
6. Roody Collin, "Electronics Communication", PHI
7. J. Millman and A Grabel, " Microelectronics" MacGraw Hill 1988.
8. Proakis J. J, "Digital Communications" Mc Graw Hill.
9. Digital Communications by TAUB Schilling
10. Electronic Communication Systems, Roy Blake Delmar, Thompson Learning
11. Introduction To telecommunications, Anu A Gokhale, Delmar Thompson Learning

### **DEMONSTRATION PRACTICAL:**

[15]

[Should contain 8 expts.]

1. Study of Zener diode characteristics
2. Study of Half wave and full wave rectifiers
3. Study of bridge rectifier.
4. Study of Transistor as a switch
5. Monostable multivibrator using IC 555 timer.
6. Astable multivibrator using IC 555 timer.
7. Study of Wien bridge oscillator
8. Frequency Response of single stage transistor amplifier
9. Study of Amplitude Modulation
10. Study of Frequency Modulation
11. Study of Fibre Optic transmission
12. Study of Pulse Amplitude Modulation
13. Study of transistor DC Amplifier

## **SEMESTER I COURSE : S.BIT.1.05**

### **INTRODUCTION TO C++ PROGRAMMING**

[Total Lectures 75]

#### **LEARNING OBJECTIVE:**

To learn a programming language and to learn structured and procedural programming concepts.

#### **Unit 1. Programming Logic and techniques**

[12]

Algorithms, Flow-charts, Program Design.

Introduction to C++: Origin of C++, A Sample C++ program, pitfall and programming tips. Testing and Debugging.

**Unit 2. C++ concepts** [12]

Variables and Assignments: variables, identifiers, variable declarations, Assignment Statements, reference variable, symbolic constant.

Input and Output: cin, cout, escape sequences, include directives and Namespaces, Indenting and Comments, Operator precedence.

Data types and expressions, Arithmetic operators, Type compatibilities

Continuous Internal Assessment

**Unit 3. Flow of Control** [13]

Compound statements

Loops: while, for, do while , nested loops.

Decision making: if – else, nested if else, switch , break and continue.

Manipulators: endl , setw, sizeof.

Increment and decrement operators.

Type Cast Operators, Scope resolution operators

**Unit 4. Functions** [13]

Function Prototypes , built in functions and user defined functions,

Function overloading, Call by reference, Call by value, const member functions. Inline

Functions and recursive functions, Math Library Functions

**Unit 5. Derived Data types ( Arrays , pointers , functions)** [13]

Introduction to arrays, arrays in functions, 2-D arrays , Multidimensional arrays.

Introduction to pointers, void pointers, pointers in function, pointer to constant and constant pointer, generic pointer.

**Unit 6. Strings, Vectors and Structures** [12]

String functions: strcmp, strcat, strlen, strcpy . Vector Basics. Introduction to structures.

**Continuous Internal Assessment**

Assignments / Project

Mid Term test.

**BOOKS:**

1. Problem Solving with C++ , Walter Savitch, Sixth Edition, Pearson Education.
2. J. R. Hubbard, Schaum's outlines "Programming with C++", Second Edition , Tata McGrawHill
3. Y.P.Kanetkar, "Let us C++" , seventh edition, BPB publication

**REFERENCES:**

1. Object Oriented programming with C++ , E Balagurusamy , Third Edition , Tata McGraw Hill.
2. Object oriented programming with C++ Poonamchandra Sarang, PHI Second Edition.
3. Pure C++ programming , Amir Afzal, Pearson Education.
4. Computer Science – A structured Approach using C++ bu B. Forouzan, R. F.

**SEMESTER I      COURSE : S.BIT.1.PR**

**PRACTICAL I & II**

**INTRODUCTION TO C++ PROGRAMMING**

**[Total Lectures 90]**

**LEARNING OBJECTIVE:**

To learn to design an algorithm and a program for a given problem and to actually execute it on a computer.

**Minimum 16 programs should be implemented:**

1. Write a program to Calculate simple and compound interest.
2. Write a program to Calculate sum of the digits of a number
3. Write a program to Find the reverse of a number.
4. Write a C++ program for Formatting the following statement using setw and endl:  
“ Nothing is difficult then beginning” “So Let’s start the voyage of technology
5. Write a C++ program for finding greatest of three number
6. Write a C++ program for solving the quadratic equation
7. Write a C++ program to print all the prime numbers in a given range
8. Write a C++ program for displaying the Fibonacci series.
9. Write a C++ program for converting number to words. (switch,break,continue)
10. Write a C++ function for swapping two numbers without using third variable.
11. Write a recursive function for factorial of given number
12. Write your own function for string reverse , string palindrome , string comparison
13. Write a program for sorting the number in ascending and descending order
14. Write a program for Matrix addition and Transpose.
15. Write a program for Matrix multiplication.
16. Write a program for implementing the concept of structures
17. Write a program for finding the greatest and smallest number using vector
18. Write a program for implementing the concept of call by value and call by reference.
19. Program for implementing Unions.
20. Programs on use of pointers
21. Write a program for generating the report card

**For a 3 credit course a minimum of 16 programs should be executed. A journal of the printouts of the programs and its output should be maintained. Certified journal will have to be presented at the time of practical exam.**

## **Continuous Internal Assessment**

MCQ / Viva test during practicals

Mid Term practical test.

### **SEMESTER II      COURSE : S.BIT.2.01**

## **WEB DESIGNING AND PROGRAMMING**

**[Total Lectures 75]**

### **LEARNING OBJECTIVE:**

To learn Web page designing and programming using java script, HTML, XML for the WWW.

### **UNIT 1. Internet and WWW**

**[13]**

What is Internet? Introduction to internet and its applications, E-mail, telnet, FTP, e-commerce, video conferencing, e-business. Internet service providers, domain name server, internet address

World Wide Web (WWW)

World Wide Web and its evolution, uniform resource locator (URL), browsers – internet explorer, netscape navigator, opera, firefox, chrome, mozilla. search engine, web saver – apache, IIS, proxy server, HTTP protocol

### **UNIT 2. HTML and Graphics**

**[13]**

HTML Tag Reference, Global Attributes, Event Handlers, Document Structure Tags, Formatting Tags, Text Level formatting, Block Level formatting, List Tags, Hyperlink tags, Image and Image maps, Table tags, Form Tags, Frame Tags, Executable content tags

#### **Imagemaps**

What are Imagemaps?, Client-side Imagemaps, Server-side Imagemaps, Using Server-side and Client-side Imagemaps together, Alternative text for Imagemaps,

#### **Tables**

Introduction to HTML tables and their structure, The table tags, Alignment, Aligning Entire Table, Alignment within a row, Alignment within a cell, Attributes, Content Summary, Background Color, Adding a Caption, Setting the width, Adding a border, Spacing within a cell, Spacing between the cells, Spanning multiple rows or columns, Elements that can be placed in a table, Table Sections and column properties, Tables as a design tool

#### **Frames**

Introduction to Frames, Applications, Frames document, The <FRAMESET> tag, Nesting<FRAMESET> tag, Placing content in frames with the <FRAME> tag, Targeting named frames, Creating floating frames, Using Hidden frames,

#### **Forms**

Creating Forms, The <FORM> tag, Named Input fields, The <INPUT> tag, Multiple lines text windows, Drop down and list boxes, Hidden, Text, Text Area, Password, File Upload, Button, Submit, Reset, Radio, Checkbox, Select, Option, Forms and

Scripting, Action Buttons, Labelling input files, Grouping related fields, Disabled and read-only fields, Form field event handlers, Passing form data

### **Style Sheets**

What are style sheets?, Why are style sheets valuable?, Different approaches to style sheets, Using Multiple approaches, Linking to style information in a separate file, ,Setting up style information, Using the <LINK> tag, Embedded style information, ,Using <STYLE> tag, Inline style information

## **UNIT 3. Java Script** **[13]**

Introduction, Client-Side JavaScript, Server-Side JavaScript, JavaScript Objects, JavaScript Security,

### **Operators**

Assignment Operators, Comparison Operators, Arithmetic Operators, % (Modulus), ++(Increment), --(Decrement), -(Unary Negation), Logical Operators, Short-Circuit Evaluation, String Operators, Special Operators, ?: (Conditional operator), , (Comma operator), delete, new, this, void

### **Statements**

Break, comment, continue, delete, do...while, export, for, for...in, function, if...else, import, labelled, return, switch, var, while, with,

### **Core JavaScript (Properties and Methods of Each)**

Array, Boolean, Date, Function, Math, Number, Object, String, RegExp

### **Document and its associated objects**

document, Link, Area, Anchor, Image, Applet, Layer

### **Events and Event Handlers**

General Information about Events, Defining Event Handlers, event, onAbort, onBlur, onChange, onClick, ondblclick, ondragdrop, onerror, onfocus, onkeydown, onkeypress, onkeyup, onload, onmousedown, onmousemove, onmouseout, onmouseover, onmouseup, onmove, onreset, onresize, onselect, onsubmit, onunload

## **UNIT 4. XML** **[12]**

Introduction to XML, Anatomy of an XML document, Creating XML Documents, Creating XML DTDs, XML Schemas, XSL

## **UNIT 5. PHP** **[12]**

Why PHP and MySQL?, Server-side web scripting, Installing PHP, Adding PHP to HTML, Syntax and Variables, Passing information between pages, Strings, Arrays and Array Functions, Numbers, Basic PHP errors/problems.

## **UNIT 6. Advanced PHP and MySQL** **[12]**

PHP/MySQL Functions, Displaying queries in tables, Building Forms from queries, PHP/MySQL Efficiency, PHP/MySQL Problems, Advanced Array Functions, String and Regular Expressions, File System and System Functions, Sessions, Cookies and HTTP, Type and Type Conversions, PHP Mathematics, E-Mail

## **Continuous Internal Assessment**

Assignments / Project

Mid Term test.

### **BOOKS:**

1. Web Design The Complete Reference by Thomas Powell, Tata McGraw Hill
2. HTML and XHTML The Complete Reference by Thomas Powell, Tata McGraw Hill
3. JavaScript: A Beginners guide by John Pullock, Tata McGraw Hill
4. XML: The Complete Reference by Williamson, Tata McGraw Hill
5. Beginning PHP and MySQL by W. J. Gilmore, Apress

### **REFERENCES:**

1. HTML for the WWW with XHTML and CSS: Visual Quickstart Guide 5<sup>th</sup> Edition, Pearson Education.
2. Programming the Web using HTML and JavaScript by Larry Randles Lagerstrom, Tata McGraw Hill
3. JavaScript Step by Step by Suehring, PHI
4. XML: A beginners guide by Steven Holzner Tata McGraw Hill
5. PHP: A beginners guide by Vikram Vaswani, Tata McGraw Hill
6. PHP: The Complete Reference by Steven Holzner, Tata McGraw Hill

## **SEMESTER II      COURSE : S.BIT.2.02**

**[Total Lectures 75]**

### **APPLIED MATHEMATICS II**

#### **LEARNING OBJECTIVE:**

To study advanced mathematical concepts used in software development of Computer Graphics, animation, image processing, cryptography, etc.

#### **UNIT 1. Complex Numbers: [13]**

Cartesian, Polar & Exponential form, De-Moivre's theorem, Hyperbolic functions, Logarithms of Complex numbers

#### **UNIT 2. Complex Variables : [13]**

Cauchy Riemann Equations, , Conformal Mapping and Bilinear Mapping, concept of Line Integral, Riemann Integral, Singularities –Poles, Evaluation of Residues theorem.

#### **UNIT 3. Laplace Transform: [13]**

Introduction, Definition, Properties of Laplace Transform, Laplace Transform of standard function.

**Inverse Laplace Transform:**

Inverse Laplace Transform , Methods of obtaining Inverse Laplace transform, Laplace transform of Periodic Functions, Heavyside Unit-step Function, Dirac-delta function (Unit Impulse Function), Application of Inverse Laplace transform to solve differential equations.

**UNIT 4. [12]**

Differentiation under Integral sign, Beta and Gamma Functions, Properties and Duplication Formula, Error Functions

**UNIT 5. Fourier Series: [12]**

Fourier Series, Change of Interval, Even and odd functions, Half range expansions.

**Fourier Transform and Inverse Fourier Transform:**

Fourier transform of Even and Odd functions, Fourier Transform of sine and cosine functions

**UNIT 6. Integral Calculus: [12]**

Double Integral, Area, Triple Integral, Volume

**Continuous Internal Assessment**

Assignments / Project

Mid Term test.

**REFERENCES:**

1. Engineering Mathematics A tutorial approach by R. R. Singh and Mukul Bhatt, TMH 2010
2. Differential Calculus by Shanti Narayan.
3. B. S. Grewal, "Higher Engineering Mathematics.
4. Advanced Engineering Mathematics: R.K.Jain, S.R.K. Iyengar, Narosa Publishing House.
5. Engineering Mathematics : T Veerajan, Tata McGraw-Hill
6. Integral Transforms: A. R. Vasishta, Dr. R.K. Gupta, Krishna Prakashan Mandir

**SEMESTER II COURSE : S.BIT.2.03****MICROPROCESSOR AND MICROCONTROLLERS****[Total Lectures 75]****LEARNING OBJECTIVE:**

To understand the architecture and functioning of a microprocessor and a microcontroller which are the prototypes of the modern large computers.

**UNIT 1. Logic devices: [13]**

Tristate devices, buffers, encoder, decoder, latches, Types of memories, memory organization, concept of control lines such as read/write chip enable

**UNIT 2. Introduction to 8085 microprocessor:** [13]

Organization of Microprocessor based system, 8085  $\mu$ p Architecture, Concept of Address line and Memory Interfacing, Address Decoding and Memory Interfacing,

**UNIT 3. 8085 Programming Model** [13]

Instruction Classification, Instruction Format, 8085 Instruction Set

**UNIT 4. Introduction to Modern day Computer Systems:** [12]

Organization and Architecture, Structure and function.

System Buses: - Computer Components, Computer function, PCI: - Features of PCI bus, Why PCI bus is needed? Concept of PCI Arbitration.

Internal Memory: - Concept of Cache Memory, Methods of Cache Mapping, Concept and need for Cache coherency. External Memory: - RAID.

**UNIT 5. The 8051 Microcontroller:** [12]

Introduction and overview of 8051 family, 8051 Assembly Language Programming, Jumps, Loops and call instructions.

**UNIT 6. Interfacing the 8051 Microcontroller:** [12]

8051 I/O port programming, Addressing Modes, Arithmetic and Logical instructions

**Continuous Internal Assessment**

Assignments / Project

Mid Term test.

**REFERENCES:**

1. William Stallings, "Computer Organisation and Architecture" (4<sup>th</sup> Edition)- PHI, 1998.
2. Andrew C. Tanenbaum, "Structured Computer Organisation" (3rd Edition) -, PHI.
3. Computer System Architecture - M. Morris Memo, PHI, 1998.
4. John P Hayes, "Computer Architecture and Organisation" - McGraw Hill, 1998.
5. Digital Computer Fundamentals, Malvino
6. Microprocessor Architecture and Programming and Applications with the 8085, R.S. Gaonkar, PRI (3<sup>rd</sup> Edition)
7. Digital Computer Fundamentals, Thomas C Bartee, TMG
8. The 8051 Microcontroller and Embedded systems by M. A. Mazidi, J. G. Mazidi and R. D. McKinlay, Pearson Education.

## **COURSE 4. SEMESTER II**

### **DATA BASE MANAGEMENT SYSTEMS (DBMS)**

**[Total Lectures 75]**

#### **LEARNING OBJECTIVE:**

To learn the concept of database systems and software techniques for manipulating and maintaining databases.

#### **UNIT 1. Introduction to Databases and Transactions [13]**

What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management

#### **UNIT 2. Data Models [13]**

The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction.

#### **UNIT 3. Database Design, ER-Diagram and Unified Modeling Language [13]**

Database design and ER Model: overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, weak entity sets, Codd's rules, Relational Schemas, Introduction to UML  
**Relational database model:** Logical view of data, keys, integrity rules.

Relational Database design: features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF)

#### **UNIT 4. Relational Algebra and Calculus [12]**

Relational algebra: introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison.

Calculus: Tuple relational calculus, Domain relational Calculus, calculus vs algebra, computational capabilities.

#### **UNIT 5. Constraints, Views and SQL [12]**

What is constraints, types of constrains, Integrity constraints,

Views: Introduction to views, data independence, security, updates on views, comparison between tables and views

SQL: data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers.

#### **UNIT 6. Transaction management and Concurrency control [12]**

Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, database recovery management

#### **Continuous Internal Assessment**

Assignments / Project

Mid Term test.



Continuous Internal Assessment  
Assignments / Project  
Mid Term test.

**BOOKS:**

1. Behrouz A Forouzan, “*Data communications and Networking*”, Fourth Edition, Mc-Graw Hill
2. Achyut Godbole, “Data communications and Networks, TMH
3. Dr.Sidnie Feit, “TCP/IP” ,Second Edition, TMH

**REFERENCE:**

W.Stallings,”Data and Computer Communications”,Eight Edition,Pearson Education

**SEMESTER II      COURSE : S.BIT.2.PR**

**PRACTICAL 1.**

**WEB TECHNOLOGY AND MICROPROCESSOR AND  
MICROCONTROLLERS**

**[Total Lectures 45]**

**LEARNING OBJECTIVE :**

To be able to design and develop a dynamic web site and to be able to develop and execute assembly language programs for microprocessors and microcontrollers.

**For a 1.5 credit course a minimum of 8 programs should be executed. A journal of the printouts of the programs and its output should be maintained. Certified journal will have to be presented at the time of practical exam.**

**Programs for Web Design**

1. Design a web page using different text formatting tags.
2. Design a web page with links to different pages and allow navigation between pages.
3. Design a web page with Imagemaps.
4. Design a web page with different tables. Design a webpage using table so that the content appears well placed.
5. Design a webpage using frames and/or Design a web page with a form that uses all types of controls.
6. Design a website using style sheets so that the pages have uniform style.
7. Using Java Script design a web page that prints factorial / Fibonacci series / any given series.
8. Design a form with a test box and a command button. Using Java Script write a program whether the number entered in the text box is a prime number or not.
9. Design a form and validate all the controls placed on the form using Java Script.

10. Design a DTD, corresponding XML document and display it in browser using CSS.
11. Design an XML document and display it in browser using XSL.
12. Design XML Schema and corresponding XML document.
13. Design a php page to process a form.
14. Design a php page for authenticating a user.
15. Design a complete dynamic website with all validations.

### **8085 programs:**

1. Simple 8-bit and 16-bit addition and subtraction
2. Transfer a block of data from one location to another.
3. Find the largest/smallest of the numbers stored at one location.
4. Addition of 10 numbers.
5. Multiplication of 8-bit and 16-bit numbers.
6. BCD addition

### **8051 programs:**

1. To search a number from a given set of numbers. The end of the data is indicated by 00.
2. Finding the average of signed numbers.
3. Multiplication of signed numbers.
4. Convert the BCD 0111 0101 number to two binary numbers and transfer this number to registers.

### **Continuous Internal Assessment**

MCQ / Viva test during practicals

Mid Term practical test.

## **PRACTICAL 2.**

### **DATA BASE MANAGEMENT SYSTEMS (DBMS)**

**[Total Lectures 75]**

#### **LEARNING OBJECTIVE :**

To be able to design and develop a dynamic database system and design queries to extract information and update and modify the data base.

**For a 1.5 credit course a minimum of 8 programs should be executed. A journal of the printouts of the programs and its output should be maintained. Certified journal will have to be presented at the time of practical exam.**

#### **DBMS Programs:**

- 1) Design a Database and create required tables. For e.g. Bank, College Database
- 2) Apply the constraints like Primary Key , Foreign key, NOT NULL to the tables.
- 3) Write a SQL statement for implementing ALTER,UPDATE and DELETE
- 4) Write the queries to implement the joins
- 5) Write the query for implementing the following functions:  
MAX(),MIN(),AVG(),COUNT()
- 6) Write the query to implement the concept of Intergrity constrains
- 7) Write the query to create the views
- 8) Perform the queries for triggers
- 9) Perform the following operation for demonstrating the insertion , updation and deletion using the referential integrity constraints
- 10) Write the query for creating the users and their role.

#### **Continuous Internal Assessment**

MCQ / Viva test during practicals

Mid Term practical test.