UNIVERSITY OF MUMBAI

Syllabus for the F.Y.B.Sc.
Program: B.Sc.
Course : Information Technology

(Credit Based Semester and Grading System with effect from the academic year 2011–2012)

Courses	Theory Code	Practical Code
Professional Communication skills	USIT101	USIT1P1
Applied Mathematics – I	USIT102	USIT1P2
Fundamentals of Information Technology	USIT103	USIT1P3
Electronics and Communication technology	USIT104	USIT1P4
Introduction to C++ programming	USIT105	USIT1P5

CLASS: B. Sc (Information technology)		Semester - I
SUBJECT: Professional Communication skills (USIT101)		
Periods per week	Lectures - 5	3 Credits

Unit – I	**The Seven Cs of Effective Communication** Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness	**8 Lectures**
Unit- II	**Communication: Its interpretation** Basics, Nonverbal Communication, Barriers to Communication	**8 Lectures**
Unit-III	**Business Communication at Work Place:** 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	**8 Lectures**
Unit-IV	**Report Writing** 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.	**8 Lectures**
Unit -V	**Required Skills** Reading skills, listening skills, note-making, précis writing, audiovisual aids, oral communication	**8 Lectures**
Unit-VI	**Mechanics of Writing** Transitions, Spelling rules, hyphenation, transcribing numbers, Abbreviating technical and non-technical terms, Proof reading.	**8 Lectures**

Books:
Professional Communication by Aruna Koneru, McGrawHill
Effective Business Communication by Herta A Murphy, Herbert W Hildebrandt, Jane P Thomas, McGrawHill

References:
Business Communication, Lesikar and Petit, McGrawHill
Communication Skills Handbook, Summers, Wiley, India
Business Communication (Revised Edition), Rai and Rai, Himalaya Publishing House
Business Correspondence and Report Writing by R. C. Sharma and Krishna Mohan, TMH.

Term Work of USIT101: (For Internal Assessment)

    i)   Assignments: Should contain at least 2 assignments covering the Syllabus.

    ii)   Class Tests: One. Also Known as Unit Test or In-Semester Examinations

    iii)   Tutorial : Minimum Three tutorials covering the syllabus

Practical USIT1P1:

Case Studies	3 Lectures per week (1 Credit)
List of Practical:	

List of Practical:

    i)   Case study on the 7 Cs of effective communication.

    ii)   Case study on the body language.

    iii)   Case study on different types of letters like Job application, Appointment letter, Memos, formal and informal letters, minutes of the meeting, emails.

    iv)   Case study on reports.

    v)   Case study on oral communication.

    vi)   Case study on technical writing.

CLASS: B. Sc (Information technology)		Semester – I
SUBJECT: Applied Mathematics I (USIT102)		
Periods per week	Lectures - 5	3 Credits

Unit – I	**Matrices**: 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.	**8 Lectures**
Unit- II	**Eigen Values and Eigen Vectors:** 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.	**8 Lectures**
Unit -III	**Vector Calculus:** Vector Differentiation: Vector Operator Del, Gradient, and Geometrical Meaning of gradient, Divergence and Curl.	**8 Lectures**
Unit - IV	**Differential Equations:** Differential Equations of 1st order and 1st degree and applications	**8 Lectures**
Unit - V	**Linear Differential Equations:** Linear Differential equations with constant coefficient, Differential equations of higher order and applications.	**8 Lectures**
Unit -VI	Successive differentiation, Mean Value theorems, Partial differentiation, Euler's Theorem, Approximation and errors, Maxima and Minima	**8 Lectures**

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

References:
Higher Engineering Mathematics by B. V. Ramana, McGrawHill
Differential Calculus by Shanti Narayan. S. Chand.
Higher Engineering Mathematics by B.S. Grewal, Khanna Publications
Vector Analysis by Murray Spiegel, McGrawHill
Matrices by Vashistha, S. Chand

Term Work for USIT102
   i)   Assignments: Should contain at least 2 assignments covering the Syllabus.
   ii)   Class Tests: One. Also Known as Unit Test or In-Semester Examinations
   iii)   Tutorial : Minimum Three tutorials covering the syllabus

Practical USIT1P2

Problem Solving	3 Lectures per week(1 Credit)
List of Problems	

List of Problems
  i)   Problem solving based on matrices
  ii) Problem solving based on Eigen Values and Eigen Vectors
  iii) Problem solving based on Vector Analysis
  iv) Problem solving based on Differential Equations
  v)   Problem solving based on Linear Differential Equations
  vi) Problem solving based on Successive Differentiation
  vii)   Problem solving based on Mean Value theorems
  viii)   Problem solving based on Partial differentiation
  ix) Problem solving based on Euler's Theorem
  x)   Problem solving based on Approximation and errors
  xi) Problem solving based on Maxima and Minima

CLASS: B. Sc (Information technology)		Semester – I
SUBJECT: Fundamentals of Digital Computing (USIT103)		
Periods per week	**Lectures - 5**	**3 Credits**

Unit – I	**Data and Information:** Features of Digital Systems, Number Systems: Decimal, Binary, Octal, Hexadecimal & their inter conversions, Representation of Data: Signed Magnitude, one's complement & 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.	**8 Lect.**
Unit- II	**Boolean Algebra:** 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.	**8 Lect.**
Unit -III	**Combinational Circuits:** Half adder, full adder, code converters, combinational circuit design, Multiplexers and demultiplexers, encoders, decoders, Combinational design using mux and demux.	**8 Lect.**
Unit - IV	**Sequential Circuit Design:** Flip flops (RS, Clocked RS, D, JK, JK Master Slave, T, Counters, Shift registers and their types, Counters: Synchronous and Asynchronous counters.	**8 Lect.**
Unit- V	**Computers:** Basic Organization, Memory: ROM, RAM, PROM, EPROM, EEPROM, Secondary Memory: Hard Disk & optical Disk, Cache Memory, I/O devices	**8 Lect.**
Unit -VI	**Operating Systems:** 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.	**8 Lect.**

Text Books: Modern Digital Electronics by R. P. Jain, 3rd Edition, McGraw Hill
           Digital Design and Computer Organisation by Dr. N. S. Gill and J. B. Dixit, University Science Press
           Linux Commands by Bryan Pfaffaenberger BPB Publications
           UNIX by Sumitabha Das, TMH
References: Digital Principles and Applications by Malvino and Leach, McGrawHill
           Introduction to Computers by Peter Norton, McGraw Hill

Term Work for USIT103

i) Assignments: Should contain at least 2 assignments covering the Syllabus.
ii) Class Tests: One. Also Known as Unit Test or In-Semester Examinations
iii) Tutorial : Minimum Three tutorials covering the syllabus

Practical USIT1P3:

Journal Practical	3 Lectures per week (1 Credit)
List of Practical 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 & 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	

CLASS: B. Sc (Information technology)		Semester – I
SUBJECT: Electronics and Communication Technology (USIT104)		
Periods per week	Lectures - 5	3 Credits

Unit – I	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.	**8 Lect.**
Unit- II	Concept of amplification, amplifier notations, Av, Ai, Ap Zi, Zo), Application of BJT as single stage Amplifier, Frequency response of single stage Amplifier. Multistage Amplifiers:- (Basics concepts) RC coupled, cascade, Darlington pair, DC amplifiers.	**8 Lect.**
Unit-III	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)	**8 Lect.**
Unit- IV	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.	**8 Lect.**
Unit- V	FM: - Definition of FM, Bandwidth, Noise triangle, Per-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.	**8 Lect.**
Unit-VI	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.	**8 Lect.**

References

Allen Mottershead, "Electronic Devices and Circuits", PHI
Boylstead and Neshelesky , "Electronics Devices and Circuits", 4th , PHI, 1999.
Simon Haykin, "An Introduction to Analog and Digital communications", John Wiley and Sons, 1994.
R.B Carlson, "Communication Systems", MacGraw Hill.
George Kennedy, "Electrical Communication systems", Tata McGraw Hill 1993.
Roody Collin, "Electronics Communication", PHI
J. Millman and A Grabel, " Microelectronics" MacGraw Hill 1988.
Proakis J. J, "Digital Communications" Mc Graw Hill.
Digital Communications by TAUB Schilling

Electronic Communication Systems, Roy Blake Delmar, Thompson Learning
Introduction To telecommunications, Anu A Gokhale, Delmar Thompson Learning

Term Work for USIT104

    i)   Assignments: Should contain at least 2 assignments covering the Syllabus.
    ii)   Class Tests: One. Also Known as Unit Test or In-Semester Examinations
    iii)   Tutorial : Minimum Three tutorials covering the syllabus

Practical (USIT1P4):

Journal Practical	3 Lectures per Week (1 Credit)
List of Practical 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	

CLASS: B. Sc (Information technology)		Semester – I
SUBJECT: Introduction to C++ programming (USIT105)		
Periods per week	Lectures – 5	3 Credits

Unit – I	**Programming Logic and techniques :** Algorithms, Flow-charts, Program Design, Introduction to C++: Origin of C++, A Sample C++ program, pitfall and programming tips. Testing and Debugging.	**8 Lect.**
Unit-II	**C++ concepts :** 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.	**8 Lect.**
Unit-III	**Flow of Control :** 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	**8 Lect.**
Unit-IV	**Functions:** 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.	**8 Lect.**
Unit-V	**Derived Data types (Arrays , pointers , functions) :** 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.	**8 Lect.**
Unit-VI	**Strings, Vectors and Structures :** String functions: strcmp, strcat, strlen, strcpy . Vector Basics. Introduction to Structures.	**8 Lect.**

Books: Problem Solving with C++ , Walter Savitch, Sixth Edition, Pearson Education.
J.R.Hubbard, Schaum's outlines "Programming with C++", Second Edition, Tata McGrawHill
Y.P.Kanetkar, "Let us C++" , seventh edition, BPB publication
Reference Books: Object Oriented programming with C++ , E Balagurusamy , Third Edition , Tata McGraw Hill.
Pure C++ programming , Amir Afzal, Pearson Education.
Computer Science – A structured Approach using C++ by B. Forouzan, R. F. Gilberg, Cengage Publication.

Term Work for USIT105

   i)   Assignments: Should contain at least 2 assignments covering the Syllabus.
   ii)   Class Tests: One. Also Known as Unit Test or In-Semester Examinations
   iii)   Tutorial : Minimum Three tutorials covering the syllabus

Practical (USIT1P5):

Journal Practical	3 Lectures per Week (1 Credit)
List of Practical 1) Write a C++ program for finding greatest of three number. 2) Write a C++ program for solving the quadratic equation. 3) Write a C++ program to print all the prime numbers in a given range. 4) Write a C++ program for displaying the Fibonacci series. 5) Write a C++ program for converting number to words. (switch,break,continue) 6) Write a C++ function for swapping two numbers without using third variable. 8) Write a recursive function for factorial of given number. 9) Write your own function for string reverse , string palindrome , string comparision 10) Write a program for sorting the number in ascending and descending order 11) Write a program for Matrix addition and multiplication. 12) Write a program for implementing the concept of structures. 13) Write a program for finding the greatest and smallest number using vector. 14) Write a program for implementing the concept of call by value and call by reference. 15) Write a program for generating the report card.	

Courses	Theory Code	Practical Code
Web Designing and Programming	**USIT201**	**USIT2P1**
Applied Mathematics – II	**USIT202**	**USIT2P2**
Microprocessor and microcontrollers	**USIT203**	**USIT2P3**
Database Management Systems	**USIT204**	**USIT2P4**
Data Communication and Networking Standards	**USIT205**	**USIT2P5**

CLASS: B. Sc (Information technology)		Semester – II
SUBJECT: Web Designing and Programming (USIT201)		
Periods per week	**Lectures – 5**	**3 Credits**

Unit – I	**Internet and WWW :** 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	**8 lectures**
Unit- II	**HTML and Graphics :** 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?,	**8 lectures**

	Different approaches to style sheets, Using Multiple approaches, Linking to style information in s separate file, ,Setting up style information, Using the <LINK> tag, Embedded style information, Using <STYLE> tag, Inline style information	
Unit- III	**Java Script :** 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	**8 lectures**
Unit – IV	**XML :** Introduction to XML, Anatomy of an XML document, Creating XML Documents, Creating XML DTDs, XML Schemas, XSL	**8 lectures**
Unit – V	**PHP :** 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.	**8 lectures**
Unit – VI	**Advanced PHP and MySQL :** PHP/MySQL Functions, Displaying queries in tables, Building Forms from queries, String and Regular Expressions, Sessions, Cookies and HTTP, Type and Type Conversions, E-Mail	**8 lectures**

References :
1. Web Design The Complete Reference, Thomas Powell, Tata McGrawHill
2. HTML and XHTML The Complete Reference, Thomas Powell, Tata McGrawHill
3. JavaScript 2.0: The Complete Reference, Second Edition by Thomas Powell and Fritz Schneider
4. PHP: The Complete Reference By Steven Holzner, Tata McGrawHill

Term Work for USIT201

   i)   Assignments: Should contain at least 2 assignments covering the Syllabus.
   ii)   Class Tests: One. Also Known as Unit Test or In-Semester Examinations
   iii) Tutorial : Minimum Three tutorials covering the syllabus

Practicals (USIT2P1):

Journal Practical	3 Lectures per Week (1 Credit)
List of Practical 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 suing table so that the content appears well placed. 5. Design a webpage using frames. 6. Design a web page with a form that uses all types of controls. 7. Design a website using style sheets so that the pages have uniform style. 8. Using Java Script design a web page that prints factorial / Fibonacci series / any given series. 9. 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. 10. Design a form and validate all the controls placed on the form using Java Script. 11. Design a DTD, corresponding XML document and display it in browser using CSS. 12. Design an XML document and display it in browser using XSL. 13. Design XML Schema and corresponding XML document.	

CLASS: B. Sc (Information technology)	Semester – II
SUBJECT: Applied Mathematics – II (USIT202)	

Periods per week		
	Lectures – 5	3 Credits

Unit – I	**Complex Numbers:** Cartesian, Polar & Exponential form, De-Moivre's theorem, Hyperbolic functions, Logarithms of Complex numbers	**8 Lect.**
Unit-II	**Complex Variables :** Cauchy Riemann Equations, , Conformal Mapping and Bilinear Mapping, concept of Line Integral, Riemann Integral, Singularities –Poles, Evaluation of Residues theorem.	**8 Lect.**
Unit – III	**Laplace Transform**: 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.	**8 Lect.**
Unit – IV	Differentiation under Integral sign, Beta and Gamma Functions, Properties and Duplication Formula, Error Functions	**8 Lect.**
Unit – V	**Fourier Series:** 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	**8 Lect.**
Unit – VI	**Integral Calculus:** Double Integral, Area, Triple Integral, Volume	**8 Lect.**

References:
Differential Calculus by Shanti Narayan.
B. S. Grewal, "Higher Engineering Mathematics.
Advanced Engineering Mathematics: R.K.Jain, S.R.K. Iyengar, Narosa Publishing House.
Engineering Mathematics : T Veerajan, Tata McGraw-Hill
Integral Transforms: A. R. Vasishta, Dr. R.K. Gupta, Krishna Prakashan Mandir.

Term Work for USIT202

i) Assignments: Should contain at least 2 assignments covering the Syllabus.
ii) Class Tests: One. Also Known as Unit Test or In-Semester Examinations
iii) Tutorial : Minimum Three tutorials covering the syllabus

Practicals (USIT2P2):

Problem Solving	3 Lectures per Week (1 Credit)

List of Problems
 	
    i)   Problem solving based on Complex Numbers
    ii) Problem solving based on Complex Variables
    iii) Problem solving based on Laplace Transforms
    iv) Problem solving based on Inverse Laplace Transforms
    v) Problem solving based on Differentiation under the integral sign
    vi) Problem solving based on Beta and gamma functions
    vii) Problem solving based on error functions
    viii) Problem solving based on Fourier series
    ix) Problem solving based on Fourier transforms
    x) Problem solving based on double integrals and area
    xi) Problem solving based on triple integrals	

CLASS: B. Sc (Information technology)		Semester – II
SUBJECT: Microprocessor and microcontrollers (USIT203)		
Periods per week	Lectures – 5	3 Credits

Unit – I	Logic Devices: Tristate devices, buffers, encoder, decoder, latches. Types of memories, memory organization, concept of control lines such as read/write, chip enable.	8 Lect.
Unit-II	Introduction to 8085 microprocessor: - Organization of Microprocessor based system, 8085 µp Architecture, Concept of Address line and Memory interfacing, Address Decoding and Memory Interfacing,	8 Lect.
Unit-III	8085 Programming Model, Instruction Classification, Instruction Format, 8085 Instruction Set	8 Lect.
Unit-IV	Introduction to Modern day Computer Systems: - 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.	8 Lect.
Unit-V	The 8051 Microcontroller: Introduction and overview of 8051 family, 8051 Assembly Language Programming, Jumps, Loops and call instructions.	8 Lect.
Unit-VI	8051 I/O port programming, Addressing Modes, Arithmetic and Logical instructions.	8 Lect.

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

Term Work for USIT203

     i)   Assignments: Should contain at least 2 assignments covering the Syllabus.
     ii)   Class Tests: One. Also Known as Unit Test or In-Semester Examinations
     iii)   Tutorial : Minimum Three tutorials covering the syllabus

Practicals (USIT2P3):

Journal Practical	3 Lectures per Week (1 Credit)
8085 programs for 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. Sorting of numbers. 7. BCD addition 8. Division 9. Find GCD and LCM of two numbers 10. Swapping a block of data	
8051 programs for: 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. 5. To find y where $y = x^2 + 2x + 5$ and x is between 0 and 9. 6. Write a program to show the use of the BIT directive. 7. Write a program to find the number of zeros in register R2 8. Write a program to check if the accumulator is divisible by 8. 9. To check whether a character string is a palindrome or not. 10. To check the number is prime or not.	

CLASS: B. Sc (Information technology)		Semester – II	
SUBJECT: DBMS (USIT204)			
Periods per week		Lectures – 5	3 Credits

Unit – I	**Introduction to Databases and Transactions :** What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management,	**8 Lect**
Unit-II	**Data Models :** The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction.	**8 Lect**
Unit-III	**Database Design, ER-Diagram and Unified Modeling Language:** 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).	**8 Lect**
Unit-IV	**Relational Algebra and Calculus:** 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.	**8 Lect**
Unit-V	**Constraints, Views and SQL:** 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.	**8 Lect**
Unit-VI	**Transaction management and Concurrency control:** Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks),Time stamping methods, optimistic methods, database recovery management.	**8 Lect**

Books:

A Silberschatz, H Korth, S Sudarshan, "*Database System and Concepts*", *fifth Edition* McGraw-Hill ,

Rob, Coronel, "*Database Systems*", *Seventh Edition*, Cengage Learning

Term Work for USIT204

   i)   Assignments: Should contain at least 2 assignments covering the Syllabus.
   ii)   Class Tests: One. Also Known as Unit Test or In-Semester Examinations
   iii) Tutorial : Minimum Three tutorials covering the syllabus

Practicals (USIT2P4):

Journal Practical	3 Lectures per Week (1 Credit)

List of Practical:

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.

CLASS: B. Sc (Information technology)		Semester - II
SUBJECT: - Data Communication and Networking Standards (USIT2P5)		
Periods per week	Lectures - 5	(3 Credits)

Unit-I	**Introduction to data communications and networking** Introduction, Fundamental concepts, Data communications, Protocol, standards, standard organizations, signal propagation, analog and digital signals, bandwidth of signal and a medium, Fourier analysis and the concept of bandwidth of a signal, The data transmission rate and bandwidth.	**8 Lect**
Unit-II	**Network Models** Layered Tasks, The OSI reference model , Layers in the OSI reference model , TCP/IP protocol suite , Addressing IPv4	**8 Lect**
Unit-III	**Information Encoding , Errors Detection and Correction** Introduction, Representing different symbols, Minimizing errors , Multimedia , Multimedia and Data compression. Error classification, types of errors, redundancy, detection versus correction , hamming distance , cyclic redundancy check.	**8 Lect**
Unit-IV	**Media and Transmission modes** Data and signals, Periodic analog signals, Digital signals, Transmission impairment, Data rate limits, Performance, Digital to digital, Analog to digital conversion , Transmission modes, Digital to analog conversion , Analog to analog conversion, Guided media and Unguided media	**8 Lect**
Unit-V	**Network topologies ,Switching and routing algorithms** Mesh, star, tree, ring, bus, hybrid, switching basics , circuit switching, packet switching and Message switching , routing algorithms	**8 Lect**
Unit-VI	**IP version 6** Overview , Terminology, IPv6 addresses , Special addresses , IP v 6 header formats, IPv6 extension headers , IPv6 autoconfiguration , configuration via DHCP v6 , IPv6 transition	**8 Lect**

Books:

Behrouz A Forouzan, *"Data communications and Networking"*, Fourth Edition , Mc-Graw Hill

Achyut Godbole, "Data communications and Networks, TMH

Dr.Sidnie Feit, "TCP/IP" ,Second Edition, TMH

Reference:

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

Term Work for USIT205

    i)   Assignments: Should contain at least 2 assignments covering the Syllabus.

    ii)   Class Tests: One. Also Known as Unit Test or In-Semester Examinations

    iii)   Tutorial : Minimum Three tutorials covering the syllabus

Practical (USIT2P5):

Case Studies	3 Lectures Per Week (1 Credit)

List of Cases
 	
  i) Case study on implementation of TCP/IP model in different OS
  ii) Case study on errors in data transmission
  iii) Case study on transmission media
  iv) Case study on static IP addressing
  v) Case study on dynamic IP addressing
  vi) Case study on network devices: Routers, Switches, Bridges
  vii) Case study on IPv6	

Issues related to Term Work, tutorial, assignments and Practicals
Following is the marks distribution for Theory and Practical. Minimum 16 marks out of 40 and 24 marks out of 60 for passing in Theory and 8 marks out of 20 and 12 marks out of 30 for passing in Practical.
Credit of 3 of Theory and 1 of Practical for any course is to be awarded only if students clear both.

Semester I

Theory

Course	Internal Assessment (40 Marks)			External Assessment (60 Marks)	Total(100 Marks)
	Assignment	Tutorial	Class Test	Theory Exam	
USIT101	10	10	20	60	100
USIT102	10	10	20	60	100
USIT103	10	10	20	60	100
USIT104	10	10	20	60	100
USIT105	10	10	20	60	100

Practical

Course	Internal Assessment (20 Marks)	External Assessment (30 Marks)	Total (50 Marks)
USIT1P1	Case Study	Case Study	50
USIT1P2	Problem Solving	Problem Solving	50
USIT1P3	Lab and Journal	Practical Exam	50
USIT1P4	Lab and Journal	Practical Exam	50
USIT1P5	Lab and Journal	Practical Exam	50

Semester II

Theory

Course	Internal Assessment (40 Marks)			External Assessment (60 Marks)	Total(100 Marks)
	Assignment	Tutorial	Class Test	Theory Exam	
USIT201	10	10	20	60	100
USIT202	10	10	20	60	100
USIT203	10	10	20	60	100
USIT204	10	10	20	60	100
USIT205	10	10	20	60	100

Practical

Course	Internal Assessment (20 Marks)	External Assessment (30 Marks)	Total (50 Marks)
USIT2P1	Lab and Journal	Practical Exam	50
USIT2P2	Problem Solving	Problem Solving	50
USIT2P3	Lab and Journal	Practical Exam	50
USIT2P4	Lab and Journal	Practical Exam	50
USIT2P5	Case Study	Case Study	50

- Tutorials are theory /problems to be solved by the students in the class room at the end of practical / theory session
- Assignments are theory / problems to be solved by the students at home.
- Class Test is to be conducted in the class room with due notice. Test could be out of any sum total but is to be converted out of 20 for class test.

- Semester I,II,III,IV are college examinations. Question papers will be set by examiners appointed by Principals of the affiliated colleges.

Suggested Question Paper Format for END Semester Examination

Duration : 2 hrs.   Total Marks : 60

All Questions Compulsory:

Q. 1	From Unit I Attempt any two of following i. …….. 5 marks ii. …….. 5 marks iii. …….. 5 marks	10 marks
Q. 2	From Unit II Attempt any two of following i. …….. 5 marks ii. …….. 5 marks iii. …….. 5 marks	10 marks
Q. 3	From Unit III Attempt any two of following i. …….. 5 marks ii. …….. 5 marks iii. …….. 5 marks	10 marks
Q. 4	From Unit IV Attempt any two of following i. …….. 5 marks ii. …….. 5 marks ii. …….. 5 marks	10 marks
Q. 5	From Unit II Attempt any two of following i. …….. 5 marks ii. …….. 5 marks iii. …….. 5 marks	10 marks
Q. 6	From Unit II Attempt any two of following i. …….. 5 marks ii. …….. 5 marks iii. …….. 5 marks	10 marks

Note: Internal choice should be given.