Faculty of Engineering & Technology

B.Tech(Computer Science)
(w.e.f. 2015-2016)

Scheme of Examination & Detailed Syllabi

University Campus

NH-12, Chaksu Bypass, Tonk Road, Jaipur-303901

Phone : 0141-3020500/555,Fax : 0141-3020538

Plot No.-IP-2 & 3, Phase-IV, Sitapura Industrial Area, Jaipur-202022

Phone : 0141-4071551/552, Fax : 0141-4071562

* Approved by AC vide resolution no. ……………… dated ……………

Course Structure (Computer Science and Engineering)

B.Tech. (CSE) Course Structure (2015-16)

Semester - I

BACHELOR OF TECHNOLOGY
COMMON TO ALL BRANCHES
FIRST SEMESTER

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BT 101	Engineering Physics-I	3	1	-	30	70	100	4
BT 102	Introduction to Computers Fundamental and IT*	3	-	-	30	70	100	3
BT 103	Applied Mathematics-I	3	1	-	30	70	100	4
BT 104	Introduction to Electrical & Electronic Engineering	3	-	-	30	70	100	3
BT 105	English & Communication Skills	3	-	-	30	70	100	3
BT 106	Engineering Chemistry	3	-	-	30	70	100	3

PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sessional	Practical	Total	Credits
BT 107	Electrical & Electronics Lab-I	-	-	2	30	20	50	1
BT 108	Engineering Physics Lab-I	-	-	2	30	20	50	1
BT 109	IT Fundamental Lab*	-	-	2	30	20	50	1
BT 110	Engineering Chemistry Lab	-	-	2	30	20	50	1
BT 111	Engineering Workshop	-	-	2	30	20	50	1
TOTAL		18	2	10	330	520	850	25

BACHELOR OF TECHNOLOGY

COMMON TO ALL BRANCHES

SECOND SEMESTER

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	**Subject/Paper**	**L**	**T**	**P**	**IA**	**EA**	**Total**	**Credits**
BT 201	Engineering Physics-II	3	1	-	30	70	100	4
BT 202	Introduction to Computer Programming *	3	-	-	30	70	100	3
BT 203	Engineering Mechanics*	3	1	-	30	70	100	4
BT 204	Digital Electronics	3	-	-	30	70	100	3
BT 205	Applied Mathematics-II	3	-	-	30	70	100	3
BT 206	Environmental Sciences	3	-	-	30	70	100	3
PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sessional	Practical	Total	Credits
BT 207	Electrical & Electronic Lab-II	-	-	2	30	20	50	1
BT 208	Engineering Physics-II	-	-	2	30	20	50	1
BT 209	Computer Programming Lab*	-	-	2	30	20	50	1
BT 210	Engineering Drawing	-	-	2	30	20	50	1
BT 211	Communication Skill Lab*	-	-	2	30	20	50	1
TOTAL		**18**	**2**	**10**	**330**	**520**	**850**	**25**

Semester - III

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 301	Applied Mathematics – III	3		-	30	70	100	3
BTCS 302	Foundation of Computer Science	3	1	-	30	70	100	4
BTCS 303	Electronic Devices and Circuit	3		-	30	70	100	3
BTCS 304	Object Oriented Programming	3		-	30	70	100	3
BTCS 305	Data Structure	3	1	-	30	70	100	4
BTCS 306	Computer Graphics and Multimedia	3		-	30	70	100	3
PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sessional	Practical	Total	Credits
BTCS 307	Electronic Devices and Circuit Lab		-	2	30	20	50	1
BTCS 308	Data Structure Lab		-	2	30	20	50	1
BTCS 309	Object Oriented Programming Lab		-	2	30	20	50	1
BTCS 310	Computer Graphics and Multimedia Lab		-	2	30	20	50	1
BTCS 311	GD and Soft Skills		-	2	30	20	50	1
TOTAL		18	**2**	**10**	**330**	**520**	**850**	25

Semester - IV

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 401	Micro Processors And Microcontrollers	3	1	-	30	70	100	4
BTCS 402	Computer Organization and Architecture	3		-	30	70	100	3
BTCS 403	Theory of Computation	3	1	-	30	70	100	4
BTCS 404	Database Management Systems	3		-	30	70	100	3
BTCS 405	Core PHP	3		-	30	70	100	3
BTCS 406	Java Programming	3		-	30	70	100	3
PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sessional	Practical	Total	Credits
BTCS 407	Micro Processor Lab	-	-	2	30	20	50	1
BTCS 408	Computer Organization and Architecture Lab	-	-	2	30	20	50	1
BTCS 409	Database Management Systems Lab	-	-	2	30	20	50	1
BTCS 410	PHP Lab	-	-	2	30	20	50	1
BTCS 411	Java Programming Lab	-	-	2	30	20	50	1
TOTAL		18	2	10	330	520	850	25

4-6 weeks training will be held after fourth semester, viva will be conducted in fifth sem.

Semester - V

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 501	Algorithms Design and Analysis	3	1	-	30	70	100	4
BTCS 502	Software Engineering	3		-	30	70	100	3
BTCS 503	Java 2 Enterprise Edition	3	1	-	30	70	100	4
BTCS 504	Random Variable and Stochastic Processes	3		-	30	70	100	3
BTCS 505	System Software	3		-	30	70	100	3
ELECTIVE (ANY ONE)								
BTCS 506A	Principles of Communication	3	-	-	30	70	100	3
BTCS506B	Information Theory and Coding	3	-	-	30	70	100	3
BTCS 506C	Telecommunication Networks	3	-	-	30	70	100	3
BTCS 506D	Simulation and Modelling	3	-	-	30	70	100	3
BTCS 506E	Analog and Digital Communication	3	-	-	30	70	100	3
PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sessional	Practical	Total	Credits
BTCS 507	Algorithms Design and Analysis Lab	-	-	2	30	20	50	1
BTCS 508	Software Engineering Lab	-	-	2	30	20	50	1
BTCS 509	Java 2 Enterprise Edition Lab	-	-	2	30	20	50	1
BTCS 510	System Software Lab	-	-	2	30	20	50	1
BTCS 511	Communication Lab	-	-	2	30	20	50	1
BTCS 512	Training Viva	-	-	0	30	20	50	2
TOTAL		**18**	**2**	**10**	**360**	**540**	**900**	**27**

Semester - VI

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 601	Operations Research	3	1	-	30	70	100	4
BTCS 602	Operating Systems	3		-	30	70	100	3
BTCS 603	Computer Networks	3	1	-	30	70	100	4
BTCS 604	Advanced Data structure	3	1	-	30	70	100	4
BTCS 605	Advanced Computer Architecture	3		-	30	70	100	3
Elective (any one)								
BTCS 606A	Artificial Intelligence	3	-	-	30	70	100	3
BTCS 606B	Advanced DBMS	3	-	-	30	70	100	3
BTCS 606C	Advanced PHP	3	-	-	30	70	100	3
BTCS 606D	Principles of Programming Languages	3	-	-	30	70	100	3
BTCS 606E	E-Commerce	3	-	-	30	70	100	3
PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sessional	Practical	Total	Credits
BTCS 607	Operating Systems (Linux Programming and Administration) Lab	-	-	2	30	20	50	1
BTCS 608	Computer Networks Lab	-	-	2	30	20	50	1
BTCS 609	Advanced Data Structure Lab	-	-	2	30	20	50	1
BTCS 610	Advance Computer Architecture Lab	-	-	2	30	20	50	1
BTCS 611	In house workshop	-	-	0	30	20	50	2
BTCS 612	Communication for professional lab	-	-	1	30	20	50	1
TOTAL		**18**	**3**	**9**	**360**	**540**	**900**	**28**
4 -6 weeks training will be held after sixth semester, viva will be conducted in seventh sem.								

Semester - VII

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 701	Training & Seminar				540	360	900	28

Semester - VIII

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 801	C# and .NET Programming	3	1	-	30	70	100	4
BTCS 802	Software Testing and Quality Assurance	3		-	30	70	100	3
BTCS 803	Compiler Design	3	1	-	30	70	100	4
BTCS 804	Information Security System	3		-	30	70	100	3
ELECTIVE(any one)								
BTCS 805A	Embedded Systems	3	-	-	30	70	100	3
BTCS 805B	Data Mining and Business Intelligence	3	-	-	30	70	100	3
BTCS 805C	Natural Language Processing	3	-	-	30	70	100	3
BTCS 805D	Web Intelligence and Big Data	3	-	-	30	70	100	3
BTCS 805E	Wireless Communication & Networks	3	-	-	30	70	100	3
ELECTIVE(any one)								
BTCS 806A	Parallel Computing	3	-	-	30	70	100	3
BTCS 806B	Advanced Computer Networks	3	-	-	30	70	100	3
BTCS 806C	Distributed Systems	3	-	-	30	70	100	3
BTCS 806D	Soft Computing	3	-	-	30	70	100	3
BTCS 806E	Data Compression Techniques	3	-	-	30	70	100	3
PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sessional	Practical	Total	Credits
BTCS 807	C# and .NET Programming Lab			2	30	20	50	1
BTCS 808	Compiler Design Lab			2	30	20	50	1
BTCS 809	Information Security System Lab			2	30	20	50	1
BTCS 810	Summer Training / Industrial Workshop/ Certification			0	30	20	50	2
BTCS 811	Project			4	60	40	100	2
TOTAL		18	2	10	360	540	900	27
Grand Total of Credits		126	15	69	2940	4060	7000	210

L=LECTURER, T= TUTORIAL, P=PRACTICAL, IA=INTERNAL ASSESSMENT, EA=EXTERNAL ASSESSMENT

The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format ,thereafter he/she will have to present the progress of the work through seminars and progress reports. Seminar related to the project should be delivered one after starting of semester .The progress will be monitored through seminars and progress reports.

Note;--
1. The total number of the credits of (Computer Science and Engineering))Programme are = 210.
2. Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn minimum of 200 credits .
For lateral entry students in Third SEMESTER ::--
1.The total number of credits of the B. Tech (Computer Science and Engineering)Programme = 160
2.Each student shall be required to appear for examination for all courses third semester onwards .However, for the award of the degree a student shall be required to earn the minimum of 150 credits .

Semester-I

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BT 101	Engineering Physics-I	3	1	-	30	70	100	4
BT 102	Introduction to Computers Fundamental and IT*	3	-	-	30	70	100	3
BT 103	Applied Mathematics-I	3	1	-	30	70	100	4
BT 104	Introduction to Electrical & Electronic Engineering	3	-	-	30	70	100	3
BT 105	English & Communication Skills	3	-	-	30	70	100	3
BT 106	Engineering Chemistry	3	-	-	30	70	100	3
PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sectionals	Practical	Total	Credits
BT 107	Electrical & Electronics Lab-I	-	-	2	30	20	50	1
BT 108	Engineering Physics Lab-I	-	-	2	30	20	50	1
BT 109	IT Fundamental Lab*	-	-	2	30	20	50	1
BT 110	Engineering Chemistry Lab	-	-	2	30	20	50	1
BT 111	Engineering Workshop	-	-	2	30	20	50	1
TOTAL		**18**	**2**	**10**	**330**	**520**	**850**	**25**

Note:

1. Semester I and II common for all Branches of Engineering.

2. Half the students will study Environmental Science in 1st Semester and rest will study Engineering Chemistry and Chemistry Lab. The students shall interchange the subjects and vice-versa In 2nd Semester.

UNIT-I

Atomic Structure and Solid State: Atomic energy levels and electronic configuration, Intermolecular forces and binding, phases of matter, crystal structure simple cubic , body centered cubic and face centered cubic structures, energy bands in solids , band structure of metals, semiconductors and insulators.

UNIT-II

Semiconductor Physics: Extrinsic and intrinsic semiconductors, Fermi levels of undoped and doped semiconductors, p-n junction, depletion region, forward and reverse biased p-n junction, volt-Ampere characteristics of a diode , effect of temperature on diode characteristics, Zener diode , tunnel diode, photodiode and LEDs , their structure and characteristics.

UNIT-III

Theory of Relativity : Absolute and relative frames of reference, Galilean transformations, importance of Michelson-Morley experiment, postulates of special theory of relativity, Lorentz transformations, time dilation and length contraction, velocity addition , mass-energy relationship, elementary ideas about general theory of relativity.

UNIT-IV

Elementary Quantum Mechanics: Wave particle duality, deBroglie waves, experimental evidence of wave nature of matter, Schrodinger wave equation in One dimension, eigen values and eigen functions, physical interpretation of wave function, Heisenberg uncertainty principle, tunneling phenomenon.

UNIT5-V

Oscillation & Waves : Simple harmonic oscillator with example, energy of oscillator, Damping oscillator,viscous & solid friction damping,Qualityfactor,Resonance standing waves,elastic waves,

Recommended reference books:

1.Conceptual Physics, P. Hewitt, Pearson, India

2. Physics for Scientists and Engineers, R. Serway

3. Fundamental University Physics, Alonso & Finn.

4. Physics Vol I and II, Resnick and Halliday

5. Berkley Physics Course Vol 1 & Vol. 3

6. Modern Physics , A . Beiser

BT102 - INTRODUCTION TO COMPUTER FUNDAMENTAL AND IT

UNIT-I

Computer System: Basics of computer systems, history, types and Generation of computer, capability and limitations of computer systems. Hardware organization: Anatomy of a digital computer, CPU.Internal architecture of CPU.Memory Units: Memory Hierarchy, Primary Memory, Secondary Memory, cache memory. Storage Devices,   Input and Output Devices.

UNIT-II

Operating Systems: DOS Internal, External commands, Windows (2000 and NT) , Overview of architecture of Windows, tools and system utilities including registry , partitioning of hard disk , Overview of Linux architecture , File system , file and permissions , concept of user and group , installation of rpm and deb based packages.

UNIT-III

Number system & Conversions: decimal, binary, octal and hexadecimal number systems and their inter conversions, 1's and 2's complement representation, negative numbers and their representation, BCD, EBCDIC , ASCII and Unicode. Binary Arithmetic operations: addition, subtraction, multiplication, division.

UNIT-IV

Networking Basics - Uses of a Network and Common types of Networks, Network topologies and protocols, Network media and hardware, Overview of Database Management System.

UNIT-IV

Data Processing: Introduction to MS office, MS-Power Point and MS-Excel, Introduction to Electronic Spreadsheets, Applications of Electronic

Spreadsheets, Types of Spreadsheets, Features of MS-Excel, Starting MS-Excel, Contents of the MS-Excel window, Cell Referencing, Ranges and Functions, Formatting Worksheets and Creating Charts, Data Forms and Printing

Introduction to MS-PowerPoint : Introduction to MS-PowerPoint, What is a Presentations?, Slides, Working with Slides, Slides Show and Printing Presentation

Text/Reference Books:

1. Peter Norton, Introduction to computers, Sixth Edition Tata McGraw Hill (2007).
2. Pradeep K. Sinha, PritiSinha, Computer Fundamentals, BPB Publications.
3. Andrews Jean, A+Guide to Managing & Maintaining Your PC, Cengage Publication 6/e
4. Anita Goel, Computer Fundamentals, Pearson Education.

<div align="center">

BT103- Applied Mathematics I

</div>

UNIT-I

Functions of variables: Geometric representation, limit, continuity and differentiability of functions of several variables , partial and full derivatives, derivatives of composite functions, Euler's theorem on homogeneous functions, harmonic functions, directional derivatives, Taylor's formula, maxima and minima of functions, Lagrange's multipliers.

UNIT-II

Asymptotes and curvature: Rolle's Theorem, Cauchy's mean value theorem, Taylor and Maclaurin theorems, concavity and convexity of a curve, points of inflexion, asymptotes and curvature.

UNIT-III

Analytical functions: Limit, continuity and differentiability of analytic functions, Cauchy-Reimann equations, complex functions, line integrals, Cauchy's integral theorem, Cauchy's integral formula, power series, zeroes and singularity, residue theorem.

UNIT-IV

Integral calculus: Definite integral as limit of sum, properties of definite integrals, mean value theorem, fundamental theorem, evaluation of definite integrals, reduction formula.

UNIT-V

Differential equations: Order and degree of a differential equation, general and particular solutions, solution of differential equations by separation of variables method, integrating factor method, homogeneous differential equations of first order and their solutions, solution of linear differential equation $dy/dx+f(x)y=Q(x)$ and their application in electrical, nuclear and mechanical systems.

Recommended reference books:

1. Kreszig, Advanced Engineering Mathematics, Wiley Eastern Ltd
2. Grewal B. S., Higher Engineering mathematics, Khanna Publishers
3. Sastri S S., Engineering Mathematics, Vol. 1 & 2, PHI
4. Gangadharan A, Engineering Mathematics Vol 1 & 2, PHI
5. Dass H.K., Advanced Engineering Mathematics, S. Chand, Delhi

BT104 : Introduction to Electrical and Electronic Engineering

UNIT-I

Basic Electrical Quantities: Electromotive force, Electric Power ,Charge, current, voltage, Energy,Electric potential and field, magnetic flux,resistance, capacitance and inductance. Ohm's law, Voltage and current sources.

UNIT-II

Network analysis: Circuit principles, Kirchoff's Laws, Node Voltage and Mesh Current Analysis;Delta-Star and Star-Delta Transformation, Source Conversion. Classification of Network Elements, Superposition Theorem, Thevenin's Theorem.Norton Theorem.,MaximumPower Transfer Theorems.

UNIT-III

AC circuits: Alternating Quanitities,Introduction, Generation of AC Voltages, Root Mean Square and Average Value of Alternating Currents and Voltages, Form Factor and Peak Factor, Phasor

Representation of Alternating Quantities, Single Phase RLC Circuits, Introduction to 3-Phase

AC System.Power in a circuit, reactive power, power factor, impedance in ac circuit, series and parallel resonance, Q factor, Introduction to 3-Phase

AC System.

UNIT-IV

Transformers: Faraday's Law of Electromagnetic Induction Basic principle of operation of transformer, construction, working, voltage and current relations, Phasor Diagram of Ideal Transformer.open circuit and short circuit test, transformer losses and efficiency, ferrite core transformers.**Electrical DC Machine:** Principle of DC Machines, Types, Different Parts ofDC Machines

UNIT-V

Power Supplies: Half wave, full wave and bridge rectifiers, ripple factor and reduction by use of inductor,capacitor, L and pie section filters, voltage regulation using Zener diode.

Recommended reference books:

1. Millman and Halkias; Integrated Electronics, Tata-McGraw Hill , New Delhi

2. E. Hughes; Electrical and Electronic Technology, Pearson Limited.

3. R.P. Punagin, Basic Electronics, Tata McGraw Hill.

4. J.Millman and C. Halkias: Electronic Devices and Circuits, Tata McGraw Hill Publishing Company Ltd., 2000.

5 .Donald A. Neamen, Semiconductor Physics and Devices, McGraw Hill, 1997.

6. Vicent Del Toro, Electrical Engineering Fundamentals, Prentice Hall India.

BT105- English and Communication Skills

UNIT –I

Grammar and Vocabulary: Basic sentence pattern, use of tense, modals, active and passive voice, Direct and Indirect Speech, One word substitution, Synonyms and Antonyms and Common Erros in English.

UNIT-II

 Phonetics: IPA symbols, Correct pronunciation of commonly used words, sounds (vowel and consonants)

UNIT-III

Literature : Poetry : where the mind is without fear – Rabindra Nath Tagore, Mending wall – Robert Frost, Night of Scorpion – Nissim Ezekiel

Essays: of studies: Francis Bascon, what is science? George Orwell.

UNIT-IV

Writing skills : Paragraph writing, Letter writing, covering letter and C.V., Writing E-mails.

UNIT-V

Fundamentals of Communication: (A) Communication: definition and meaning of communication, functions of communication, process of communication.

(B) Types of communication: Verbal and Non verbal communication, Formal and informal communication.

(C) Barriers to communication, qualities of good communication, the art of listening.

Recommended reference books:

1. English for competitive examinations, Prof. R. P. Bhatnagar, Macmillan Publications.

2. "Current English Grammar and usage with composition" by R. P. Sinha, Oxford University Press (New Delhi).

3. Effective Technical Communication by M. Ashraf Rizvi Tata Mcgraw-Hill Companies, New Delhi.

4. Communication skills by Sanjay Kumar & Pushp Lata. Oxford University Press (New Delhi)

UNIT -I

> <u>Water:</u>
>
> The sources of water, common Impurities, soft and hard water, Hardness of water, degrees of hardness and its effects, determination of hardness by various techniques, Municipal Water supply, requisites of drinking water, purification of water by sedimentation, filtration, reverse osmosis (RO), sterilization, chlorination. Water for boilers, corrosion, sludge and scale formation, caustic embitterment, treatment by preheating, lime-soda process, permutit de-ionizer or demineralization.

UNIT- II

> **Electrochemistry:** Redox reactions; conductance in electrolytic solutions, specific and molar conductivity variations of conductivity with concentration, Kohlrausch's Law, electrolysis and laws of electrolysis (elementary idea), dry cell – electrolytic cells and Galvanic cells; lead accumulator, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells. Relation between Gibbs energy change and EMF of a cell, fuel cells; corrosion.
>
> **Analysis:** Volumetric Analysis, Types of titrations, Theory of indicators.
>
> **Spectral Analysis:** Electromagnetic radiation, Lambert-Beer's Law, UV-VIS, IR, NMR instrumentation & applications.
>
> **Thermal Methods of Analysis:** principle, working and applications of Thermogravimetry, Differential thermal analysis and Differential scanning calorimetry.

UNIT- III

> <u>Fuels:</u> The need of fuel, origin and classification of fuels, Solid fuels, coal and its constituents, calorific value and its determination, coke: carbonization process, various types of coke ovens.
>
> <u>Liquid Fuels:</u> advantages, petroleum and its refining, synthetic petrol, reforming of gasoline, knocking, octane number and anti knocking agents, cracking. Gaseous Fuels advantages, composition and calorific value of coal gas and oil gas and its determination.

Lubricants: Need of Classification, types of lubricants, their properties and uses, lubricants, viscosity and viscosity index and flash points, cloud and pour point, emulsification

UNIT- IV

Phase Rule: Statement, definition of terms involved, application to one component system (water-sulphur system), two component systems (Ag-Pbsystems).

Polymers: Plastics, preparation, properties and uses of polyethylene, bakelite, terylene and nylon, Rubber; natural rubber, synthetic rubber such as butyl and neoprene rubbers, vulcanization process and its advantages.

Corrosion: its significance, theories of corrosion, Galvanic cell and concentration cell, pitting and stress corrosion, protection techniques.

UNIT-V

Explosives: Introduction, classification of explosives, preparation of commercially important explosives, blasting fuses, uses and abuses of explosives.

Cement: properties, Portland cement and its manufacture, chemistry of setting and hardening of cement, RCC structures.

Refractories: definition, classification, properties of silica and fireclay refractories, **Glass:** preparation, properties and uses.

Recommended reference books:

1. Morrison R.T & Boyn R. N ; Organic Chemistry; Prentice Hall of India 1999

2. Lee J. D. ; Inorganic Chemistry ;Blackwell Science

3. Gopalan R., Venkappayya D., Nagarajan S. "Engineering Chemistry" Vikas Publishing House Pvt Ltd 2000.

4. Jain & Jain " Engineering Chemistry" Dhanpat Rai publishing company

5. Dara S. S. , " A Text Book of Engineering Chemistry" S. Chand and Company Ltd, 2008

6. Keeler J and Wolhess P, Why Chemical Reaction Happen Oxford Press.

BT107- Electrical and Electronics Lab-I

List of Experiments

1. Identification, Study & Testing of various electronic components:

(a) Resistances-Various types, Colour coding (b) Capacitors-Various types, Coding, (c) Inductors

(d) Diodes (e) Transistors (f) SCRs (g) ICs (h) Photo diode (i) Photo transistor (j) LED (k) LDR

(l) Potentiometers.

2. Study of symbols for various Electrical & Electronic Components, Devices, Circuit functions etc.

3. Study of Analog & digital multi-meters.

4. Study of Function/ Signal generators.

5. Study of Regulated d. c. power supplies (constant voltage and constant current operations).

6. Study of analog CRO, measurement of time period, amplitude and frequency.

7. Perform half wave rectifier experiment and effect of filters on   output.

8. Perform bridge rectifier experiment and measure the effect of filter output.

9. Application of diode as clipper and clamper.

10. Soldering & desoldering practice.

BT108- Engineering Physics Lab-I

List of Experiments

1. To study the charging of a condenser to plot a graph of voltage (V) across it against time (T) and to determine the time constant from this graph

2. To study the discharging of a condenser to plot a graph of voltage (V) across it against time (T) and to determine the time constant from this graph.

3. To determine the specific resistance of a material and difference between two small resistances using "Carey Foster's Bridge ".

4. To determine band gap of a semiconductor- diode.

5. To study the Zener diode as a constant voltage regular.

6. To verify Malus Law (Cosine square law) for plane polarized light with the help of a Photo voltaic cell.

7. To determine the transmission coefficient by using Lummer Brodhum Photometer.

8. To determine minimum deviation angle for different light using prism and spectrometer.

9. To determine the profile of He -Ne Laser beam.

10. To study the variation of thermo e.m.f. of iron copper thermo couple with temperature.

11. To determine the wavelength of sodium light using Michelson Interferometer.

12. To determine the curie temperature of Monel metal

13. The determination of viscosity.

BT109 – IT FUNDAMENTAL LAB

LIST OF EXPERIMENTS

1. Dismantling a PC Part -1.
2. Dismantling a PC Part -2.
3. Internal and External commands of DOS.
4. System utilities of windows.
5. Understanding and Working knowledge of Linux/Unix OS.
6. Understanding of File system of Linux.
7. Creating user and group.
8. Understanding and Working knowledge of MS Office, Power Point and Excel: Editing and Reviewing, Drawing, Tables, Graphs, Templates.

BT110- Engineering Chemistry Lab

List of Experiments

1. To determine the strength of a given unknown copper sulphate solution (Iodometrically) with titrate Hypo (sodium thio sulphate) solution.

2. To determine the strength of a given unknown FAS solution with titrate potassium dichromate solution using N-phenyl anthranilic acid (internal indicator).

3. To determine the strength of a given unknown potassium dichromate solution (Iodometrically) with titrate Hypo (sodium thio sulphate) solution.

4. Determine the percentage of available chlorine in a given sample of bleaching powder.

5. Determine the amount of free chlorine in a given water sample.

6. To determine the viscosity and viscosity index of a given sample of lubricating oil using Redwood viscometer No.1

7. To determine the flash and fire point of a given sample of lubricating oil using Pensky Marten's apparatus.

8. Determine the cloud and pour point of a given sample of lubricating oil.

9. Determination of hardness of water by complexometric method (using EDTA).

10. Determine the pH of an acid (strength of an acid) pH – metrically.

11. Determine the strength of a given unknown HCl solution by titrating it against NaOH solution (Conductometric analysis).

12. To estimation the amount of sodium hydroxide and sodium carbonate in the given alkali mixture solution (or in water sample) by titrating against an intermediate hydrochloric acid using phenolphthalein and methyl orange indicator.

BT111- (Engineering workshop)

FITTING AND SHEET METAL   SHOP

  1. Finishing of two sides of a square piece by filing and to cut a Square notch using hacksaw.

  2. To drill three holes and   Tapping on the given specimen.

  3. Tin smithy for making mechanical joint and soldering of joint

WELDING SHOP

  4. To prepare Lap Joint with the help of Arc welding

  5. To prepare Butt Joint with the help of arc Welding

6. Gas welding practice by students on mild steel flat

MACHINE SHOP PRACTICE

7. Job on lathe M/C with centering and one step turning

8. Job on lathe M/C with grooving and chamfering operations

BACHELOR OF TECHNOLOGY
COMMON TO ALL BRANCHES
SECOND SEMESTER

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BT 201	Engineering Physics-II	3	1	-	30	70	100	4
BT 202	Introduction to Computer Programming *	3	-	-	30	70	100	3
BT 203	Engineering Mechanics*	3	1	-	30	70	100	4
BT 204	Digital Electronics	3	-	-	30	70	100	3
BT 205	Applied Mathematics-II	3	-	-	30	70	100	3
BT 206	Environmental Sciences	3	-	-	30	70	100	3
PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sessional	Practical	Total	Credits
BT 207	Electrical & Electronic Lab-II	-	-	2	30	20	50	1
BT 208	Engineering Physics-II	-	-	2	30	20	50	1
BT 209	Computer Programming Lab*	-	-	2	30	20	50	1
BT 210	Engineering Drawing	-	-	2	30	20	50	1
BT 211	Communication Skill Lab*	-	-	2	30	20	50	1
TOTAL		18	2	10	330	520	850	25

Note:

1. Semester I and II common for all Branches of Engineering.

2. Half the students will study Environmental Science in 1st Semester and rest will study Engineering Chemistry and Chemistry Lab. The students shall interchange the subjects and vice-versa In 2nd Semester.

Note:

3. Semester I and II common for all Branches of Engineering.

4. Half the students will study Environmental Science in 1st Semester and rest will study Engineering Chemistry and Chemistry Lab. The students shall interchange the subjects and vice-versa In 2nd Semester

UNIT-I

Electric and Magnetic Fields :Coulomb's law, Gauss's law, electrostatic potential and field due to discrete and continuous charge distributions, dipole and quadrupole moments, dielectric polarization, electrostatic energy, conductors and capacitors, Biot-Savart law, Ampere's law, magnetic induction due to current carrying conductors, force on a charged particle in electric and magnetic field, Faraday's law of electromagnetic induction.

UNIT-II

Thermodynamics: Work- Thermodynamic definition of work, examples, displacement work, path dependence of displacement work, thermal equilibrium, Zeroth law , definition of temperature, heat/work interaction systems , First law and its consequences, isothermal and adiabatic processes, reversible, irreversible and quasi-static processes. Second law and entropy. Carnot engine and cycle. Absolute temperature scale.

UNIT-III

Optical phenomena : Principle of superposition, coherent and incoherent sources, temporal and spatial coherence, interference phenomena(Newton's ring and Michelson interferometer), diffraction of waves, diffraction from single and diffraction grating, polarization : types of polarization , Malus law, quarter and half wave plates, optical activity, specific rotation.

UNIT-IV

Lasers and Holography : Spontaneous and stimulated emission (Einstein A and B coefficients), population inversion, basic principles of operation of He-Ne, Ruby and semiconductor lasers. **Optical Fibers** : Types of optical fibers and their characteristics, characteristics of step, graded , mono mode and multi mode fibers, numerical aperture and its measurement, fiber optical communication. Principles and applications of holography

UNIT-V

Magnetic Materials: Magnetization- origin of magnetic moment, classification of magnetic materials- die, Para and ferromagnetism, hysteresis curve, soft and hard magnetic materials. Superconductivity: General properties of superconductors, Meissonier effect, penetration depth, type I and Type II superconductors, flux quantization, magnetic levitation, high temperature superconductors, superconducting materials, Cooper pairs and postulates of BCS theory.

Recommended reference books:
1. Fundamental University Physics, Alonso & Finn.
2. Berkley Physics Course Vol 1 & Vol. 3
3. Thermodynamics and Statistical Physics by F. Reif.
4. Thermodynamics and Statistical Physics, S. Lokanathan and D.P. Khandelwal.
5. Optics by Ajoy Ghatak
6. Conceptual Physics, Paul Hewitt
7. Introduction to Electrodynamics, D.J.Griffiths
8. Modern Physics, A. Beiser
9. Physics for Scientists and Engineers, R. Serway

BT202- INTRODUCTION TO COMPUTER PROGRAMMING

UNIT I

Concept of algorithms, Flow Charts, Overview of the compiler (preferably GCC) , Assembler, linker and loader , Structure of a simple Hello World Program in C ,Overview of compilation and execution process in an IDE (preferably Code Block)

UNIT II

Programming using C: Preprocessor Directive, C primitive input output using get char and put char , simple I/O Function calls from library , data type in C including enumeration , arithmetic, relational and logical operations, conditional executing using if, else, switch and break .Concept of loops , for, while and do-while , Storage Classes: Auto, Register, Static and Extern

UNIT III

Arrays and Strings: Declaring an array, Initializing arrays, accessing the array elements, working with multidimensional arrays, declaring and initializing string variables, arithmetic operations on characters.

Pointers: Declaring and initializing pointers, pointer expressions, pointer increment and scale factor, pointers and arrays, pointers and strings.

UNIT IV

Functions: Defining functions, passing arguments to functions, returning values from functions, reference arguments, variables and storage classes, static functions, pointers and functions.

Structures: Declaring and initializing a structure, accessing the members of a structure, nested structures, array of structures, using structures in functions, pointers and structures.

UNIT V:

File Handling in C Using File Pointers, fopen( ), fclose( ), Input and Output using file pointers, Character Input and Output with Files , String Input / Output Functions , Formatted Input / Output Functions, Block Input / Output Functions, Sequential Vs Random Access Files , Positioning the File Pointer.

Text/ Reference Books:

1. Kernighan & Ritchie, "C Programming Language", The (Ansi C version), PHI, 2/e
2. Yashwant Kanetkar " Test your C Skills " , BPB Publications
3. Programming in ANSI C, E. Balagurusamy; Mc Graw Hill, 6th Edition.
4. Herbert Schildt, "C: The Complete Reference", OsbourneMcgraw Hill, 4th Edition, 2002.
5. Forouzan Behrouz A. "Computer Science: A Structured Programming Approach Using C, Cengage Learning 2/e
6. K.R Venugopal, "Mastering C ", TMH
7. R.S. Salaria "Application Programming in C " Khanna Publishers4/e

BT203- ENGINEERING MECHANICS

Unit I

Force System: Introduction, force, principle of transmissibility of force, resultant of a force system, resolution of a force, moment of force about a line. Varigon's theorem, couple, resolution of force into force and a couple, properties of couple and their application to engineering problems. Lami's theorem. Force body diagram.

Unit II

Centroid & Moment of Inertia: Location of centroid and center of gravity, Moment of inertia,
Parallel axis and perpendicular axis theorem, Radius of gyration, M.I of composite section, Polar
Moment of inertia, Lifting Machines: Mechanical advantage, Velocity Ratio, Efficiency of machine, Ideal machine, Ideal effort and ideal load, Reversibility of machine, Law of machine, Lifting machines; System of Pulleys, Wheel and differential axle, differential pulley Block,

Unit III

Friction: Types of Friction, Laws of friction, Angle of friction, Angle of repose, Ladder, Wedge,
Belt Friction. Belt Drive: Types of belts, Types of belt drives, Velocity ratio, Effect of slip on Velocity ratio, Length of belt, Ratio of tensions and power transmission by flat belt drives.

Unit IV

Kinematics of Particles and Rigid Bodies: Velocity, Acceleration, Types of Motion, Equations of

Motion, Rectangular components of velocity and acceleration, Angular velocity and Angular

Acceleration, Radial and transverse velocities and accelerations, Projectiles motion on plane and

Inclined Plane, Relative Motion. Newton's laws, Equation of motion in rectangular

Coordinate, radial and transverse components, Equation of motion in plane for a rigid body,

D'Alembert principle.

Unit V

Work, Energy and Power: Work of a force, weight, spring force and couple, Power, Efficiency,

Energy, Kinetic energy of rigid body, Principle of work and energy, Conservative and Nonconservative Force, Conservation of energy.

Impulse and Momentum: Linear and angular momentum, Linear and angular impulse, Principle

of momentum for a particle and rigid body, Principle of linear impulse and momentum for a

Particle and rigid body, Principle of angular momentum and Impulse, Conservation of angular

Suggested Readings

1. Vector Mechanics for Engineers, Beer and Johnston, Tata McGraw-Hill.
2. Engineering Mechanics, Hibbeler, Pearson Education.
3. Engineering Mechanics, Meriam and Kraige, John Wiley & Sons.
4. Engineering Mechanics, Timoshenko and Young, Tata McGraw-Hill.
5. Engineering Mechanics, Shames, Pearson Education.
6. Engineering Mechanics, Boresi and Schmidt, CL-Engineering.
7. Engineering Mechanics, Andrew Pytel & Kiusalas, Cengage Learning.

BT204- Digital Electronics

UNIT I

BASIC LOGIC GATES & BOOLEAN ALGEBRA: Features of logic algebra, postulates of Boolean algebra. Theorems of Boolean algebra. Boolean function. Derived logic gates: Exclusive-OR, NAND, NOR gates, their block

diagrams and truth tables. Logic diagrams from Boolean expressions and vice-versa. Converting logic diagrams to universal logic. Positive, negative and mixed logic. Logic gate conversion.

UNIT II

DIGITAL LOGIC GATE CHARACTERISTICS: TTL logic gate characteristics. Theory & operation of TTL NAND gate circuitry. Open collector TTL. Three state output logic. TTL subfamilies. MOS & CMOS logic families. Realization of logic gates in RTL, DTL, ECL, C-MOS & MOSFET. Interfacing logic families to one another.

UNIT III

MINIMIZATION TECHNIQUES: Minterm, Maxterm, Karnaugh Map, K map upto 4 variables. Simplification of logic functions with K-map, conversion of truth tables in POS and SOP form. Incomplete specified functions. Variable mapping. Quinn-Mc Klusky minimization techniques.

UNIT IV

COMBINATIONAL SYSTEMS: Combinational logic circuit design, half and full adder, subtractor. Binary serial and parallel adders. BCD adder. Binary multiplier. Decoder: Binary to Gray decoder, BCD to decimal, BCD to 7-segment decoder. Multiplexer, demultiplexer, encoder. Octal to binary, BCD to excess-3 encoder. Diode switching matrix. Design of logic circuits by multiplexers, encoders, decoders and demultiplexers.

UNIT V

SEQUENTIAL SYSTEMS: Latches, flip-flops, R-S, D, J-K, Master Slave flip flops. Conversions of flip-flops. Counters : Asynchronous (ripple), synchronous and synchronous decade counter, Modulus counter, skipping state counter, counter design. Ring counter. Counter applications, Registers: buffer register, shift register.

Recommended Reference Books:

1. M. Morris Mano: Digital Logic and Computer Design, PHI, India
1. Malvino and Leach: Digital Principles
2. Tocci R.J., Digital Systems- Principles & Applications, PHI 1997
3. loyd, Digital Fundamentals, PHI, 1997
4. Salivahanan A, Digital Circuit and Design, TMH

BT205- Applied Mathematics II

UNIT I

Vector spaces, linear dependence of vectors, basis and linear transformations, scalar and vector fields, level surfaces, directional derivatives, gradient, divergence and curl of fields, Green, Gauss and Stokes theorems.

UNIT II

Matrix algebra, rank of a matrix, adjoint and inverse of a matrix, Solution of algebraic equations using matrix algebra , consistency conditions, eigenvalues and eigenvectors , Hermitian matrices.

UNIT III

Numerical solution of matrix equations using Gauss, Gauss-Seidel, LU decomposition and other iterative methods.

UNIT IV

Convergence of improper integrals, tests of convergence, elementary properties of beta and gamma functions, differentiation under integral sign, Leibnitz rule, integrals dependent on a parameter, trapezoidal and Simpson's integration rules, applications in engineering.

UNIT V

Numerical methods; round off and truncation errors, approximations, order of convergence, Newton's forward and backward interpolation formula, central difference interpolation, solutions of polynomial equations using bisection, Newton-Raphson and Regula-falsi methods.

Recommended Books:

1. H. K. Dass: Advanced Engineering Mathematics; S. Chand, Delhi
2. P. C. Bishwal: Numerical Analysis; PHI, India

BT206- Environmental Sciences

UNIT I

Ecosystem and Biodiversity: Components and types of ecosystem, Structure and functions of Ecosystem, Values, Type and levels of Biodiversity, Causes of extension, and Conservation methods of biodiversity.

UNIT II

Air Pollution: Definition, different types of Sources, effects on biotic and abiotic components and Control methods of air pollution.

UNIT III

Water pollution: Definition, different types of Sources, effects on biotic and abiotic components and treatment technologies of water pollution.

UNIT IV

Noise Pollution: Introduction of noise pollution, different Sources, effects on abiotic and biotic environment and Control measures.

UNIT V

Non Conventional energy sources: Introduction, Renewable Sources of Energy: Solar energy, wind energy, Energy from ocean, energy from biomass, geothermal energy and Nuclear Energy.

Recommended Reference Books:

1. Brunner R.C., Hazardous Waste Incineration, McGraw Hill Inc. 1989.

2. Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)

3. Cunningham, W.P, Cooper, T.H. Gorhani, E & Hepworth, M.T. , Environmental Encycolopedia, Jaico Publishing House, Mubmbi, 2001.

4. De. A.K., Environmental Chemistry, Wiley Eastern Ltd.

5. Down to Earth, Centre for Science and Environment (R)

6. Gleick, H.P. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute. Oxford Univ. Press.

7. Gilpin, Alan. Environmental Impact Assessment (EIA), cutting egde for the 21th century. Cambridge university Press.

BT207- Electrical and Electronics Lab-II

List of Experiment:

1. To verify the truth tables of basic logic gates: AND, OR, NOR, NAND, NOR. Also to verify the truth table of Ex-OR, Ex-NOR.
2. To verify the truth table of OR, AND, NOR, Ex-OR, Ex-NOR realized using NAND & NOR gates.
3. To realize an SOP and POS expression.
4. To realize adder and Subtractor using universal gates.
5. To verify the truth table of Encoder and decoder.
6. To verify the truth table of multiplexer and demultiplexer.
7. To study and perform Various types of Flip-Flops.
8. To study and perform various types of counters.
9. To study and perform various types of shift registers.
10. To study and perform various types of Multivibrators.
11. To study and perform Schmitt Trigger.

BT208- Engineering Physics Lab-II

List of Experiments:

1. Conversion of a Galvanometer in to an ammeter and calibrate it.
2. Conversion of a Galvanometer in to voltmeter and calibrate it.
3. To determine the value of "g" by using compound pendulum.
4. To determine Plank's constant using LED.
5. To measure the Numerical Aperture (NA) of an optical fiber.
6. To determine the profile of He-Ne Laser beam.
7. To determine the wavelength of different lights using diffraction grating and spectrometer.
8. To determine the wavelength of sodium light by Newton's ring method.
9. To determine the specific rotation of glucose using Polarimeter.
10. To determine minimum deviation angle for different light using prism and spectrometer.
11. To study of detergent on surface tension of water by observing capillary rise
12. To determine the speed of sound in air at room temperature using a resonance tube by two resonance position.

LIST OF EXPERIMENTS

1   Write a program to calculate the area & perimeter of rectangle.

2   Write a program to calculate the area and circumference of a circle for a given radius.

3   Write a program to calculate simple interest for a given principal/amount.

4   Write a program to convert temperature given in ◦C to temperature in ◦F.

5   Write a program to find profit and loss (in percentage) of a given cost price and selling price.

6   Write a program to find out the maximum among the three given numbers.

7   Write a program to calculate the factorial of a given number.

8   Write a program to print the list of first 100 odd number.

9   Write a program to calculate the sum of the digits of a number and display it in reverse order.

10   Write a program to generate a Fibonacci series.

11   Write a program to generate the following series:

    1 2
    1 2 3
    1 2 3 4
    1 2 3 4 5

12   Write a program to generate the following series:

    0 1
    0 1 0
    0 1 0 1
    0 1 0 1 0

13   Write a program using a function to check whether the given number is prime or not.

14   Write a program to check whether the given string is a palindrome or not.

15   Write a program to find the length of a string, reverse the string and copy one string to another by using library function.

16   Write a program to swap two variables a & b using pointers.

17   Write a program to enter a line of text from keyboard and store it in the file. User should enter file name.

18   Write a recursive program for tower of Hanoi problem

19   Write a menu driven program for matrices to do the following operation depending on whether the operation requires one or two matrices
  • Addition of two matrices
  • Subtraction of two matrices
  • Finding upper and lower triangular matrices
  • Transpose of a matrix
  • Product of two matrices.

20   Write a program to copy one file to other, use command line arguments.

21   Write a program to perform the following operators an Strings without using String functions
  • To find the Length of String.
  • To concatenate two string.
  • To find Reverse of a string.
  • To Copy one sting to another string.

22   Write a Program to store records of an student in student file. The data must be stored using Binary File.Read the record stored in "Student.txt" file in Binary code.Edit the record stored in Binary File.Append a record in the Student file.

23   Write a programmed to count the no of Lowercase, Uppercase numbers and special Characters presents in the contents of File.

BT210- Engineering Drawing

Engineering Drawing

Sheet 1 Orthographic Projections (3 Problems)

Sheet 2   Riveted joints: Lap joints, butt joints, chain riveting, zig-zag riveting

Sheet 3   Screw fasteners, different threads, Nuts & bolts locking devices, set screws,

 Sheet 4   Scale, plain scales, diagonal scales, scale of chords

Sheet 5 Conic Sections: Construction of ellipse, parabola and hyperbola

 Sheet 6 Engineering Curves: Cycloid, Epicycloids, Hypo-cycloid, Involutes, Archemedian and logarithmic spirals

Sheet 7 Projection of points and lines, True inclinations and true length of straight lines, Traces of straight lines

Sheet 8 Projection of planes and solids: Projection of planes, Projection of polyhedra, Pyramids.

BT211- Communication Skills Lab

1. Introducing yourself.

2. Role Plays.

3. Word Formation.

4. Listening and Speaking Skills.

5. Words often mis-spelt and Mis- Pronounced.

6. One word for many.

7. Synonyms and Antonyms.

8. Seminar Presentation.

9. Group Discussion.

10. Job Interview.

BACHELOR OF TECHNOLOGY
COMPUTER SCIENCE AND ENGINEERING
Semester - III

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	**Subject/Paper**	**L**	**T**	**P**	**IA**	**EA**	**Total**	**Credits**
BTCS 301	Applied Mathematics – III	3		-	30	70	100	3
BTCS 302	Foundation of Computer Science	3	1	-	30	70	100	4
BTCS 303	Electronic Devices and Circuit	3		-	30	70	100	3
BTCS 304	Object Oriented Programming	3		-	30	70	100	3
BTCS 305	Data Structure	3	1	-	30	70	100	4
BTCS 306	Computer Graphics and Multimedia	3		-	30	70	100	3
PRACTICALS/VIVA-VOCE		**No. of Teaching Hours**			**Sessional**	**Practical**	**Total**	**Credits**
BTCS 307	Electronic Devices and Circuit Lab		-	2	30	20	50	1
BTCS 308	Data Structure Lab		-	2	30	20	50	1
BTCS 309	Object Oriented Programming Lab		-	2	30	20	50	1
BTCS 310	Computer Graphics and Multimedia Lab		-	2	30	20	50	1
BTCS 311	GD and Soft Skills		-	2	30	20	50	1
TOTAL		**18**	**2**	**10**	**330**	**520**	**850**	**25**

BTCS 301 Applied Mathematics – III

UNIT I:

DIFFERENTIAL EQUATIONS - Linear differential equations of higher order with constant coefficients. Second Order ODE with Variable Coefficients, Homogeneous

form, Exact Equations, Change of Dependent variable, Change of Independent Variable, Normal form, Variation of Parameters.

UNIT II:

SERIES SOLUTIONS - Solution in series of second order LDE with variable coefficients (CF only),

PARTIAL DIFFERENTIAL EQUATION- Partial differential equation of first order, Lagrange's form, standard forms, Charpit's method.

UNIT III:

LAPLACE TRANSFORM - Laplace transform with its simple properties, Laplace transform of unit step function and periodic function, Convolution Theorem, inverse Laplace transform, applications to the solution of ordinary and partial differential equations having constant coefficient with special reference to heat equation and wave equation.

UNIT IV:

STATISTICS- Standard deviation, moments, skewness, kurtosis, Curve fitting methods-method of least squares, fitting of a straight line, parabola. Correlation and regression, line of regression.

FOURIER SERIES - Expansion of simple functions in Fourier series. Half range series, Change of intervals, Harmonic analysis.

UNIT V:

FOURIER TRANSFORM - Complex form of Fourier Transform and its inverse, Fourier sine and cosine transform and their inversion. Applications of Fourier transform to solution of partial differential equations having constant co-efficient with special reference to heat equation and wave equation.

Recommended reference books:
(1) "Advanced Engineering Mathematics" by H. K. Dass, S.Chand and Sons.
(2) "Higher Engineering Mathematics" by B.S.Grewal, Khanna Publisher.
(3) "Engineering Mathematics,Vol. I & II" by S.S. Sastri,PHI.
(4) "Advanced Engineering Mathematics" by Kreszig, Wiley Eastern Lt.

BTCS 302 FOUNDATION OF COMPUTER SCIENCE

UNIT- I

Formal Logic**:** Preposition, Symbolic Representation and logical entailment theory of Inferences and tautologies, Predicates, Quantifiers, Theory of inferences for predicate

calculus, resolution. Techniques for theorem proving: Direct Proof, Proof by Contraposition, proof by contradiction.

UNIT- II

Overview of Sets and set operations, permutation and combination, principle of inclusion, exclusion (with proof) and pigeonhole principle (with proof), Relation, operation and representation of a relation, equivalence relation, POSET, Hasse Diagrams, extremal Elements, Lattices, composition of function, inverse, binary and n-ary operations.

UNIT- III

Principle of mathematical induction, principle of complete induction, solution methods for linear and non-linear first-order recurrence relations with constant coefficients, Counting: Basics of Counting, Equivalence Relations and Counting

UNIT-IV

Groups, Symmetry, subgroups, normal subgroups, cyclic group, permutation group and cayles's theorem (without proof), cosets lagrange's theorem (with proof) homomorphism, isomorphism, automorphism, rings, Boolean function, Boolean expression, representation & minimization of Boolean function**.**

UNIT V

Graph Theory: Terminology, Directed and Undirected Graph, isomorphic graphs, Euler's formula (proof), chromatic number of a graph, five color theorem (with proof), Euler &Hamiltonian paths.

Text / Reference Books:

1. Norman L. Biggs**, "**Discrete Mathematics", Oxford, second edition.
2. Keneth H. Rosen, "Discrete Mathematics and Its Applications", TMH, seventh edition.
3. Kolman, Busby & Ross, "Discrete Mathematical Structures", PHI, 1996.
4. C.L. Liu, "Elements of Discrete Mathematics", TMH, 2000.
5. J. P. Trembly& P. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill, 1997.

BTCS 303 Electronic Devices and Circuits

Unit I

SEMICONDUCTOR PHYSICS - Mobility and conductivity, Charge densities in

a

semiconductor, Fermi Dirac distribution, Fermi-Dirac statistics and Boltzmann approximation to the Fermi-Dirac statistics, Carrier concentrations and Fermi levels

in semiconductor, Generation and recombination of charges, Diffusion and continuity equation, Transport equations, Mass action Law, Hall effect.

Unit II

JUNCTION DIODES - Formation of homogenous and hetrojuntion diodes and their energy band diagrams, Calculation of contact potential and depletion width, VI

characteristics, Small signal models of diode, Diode as a circuit element, Diode parameters and load line concept, C-V characteristics and dopant profile. Applications of diodes in rectifier, Clipping, Clamping circuits and voltage multipliers, Transient behavior of PN diode, Breakdown diodes, Schottky diodes, and Zener diode as voltage regulator, Construction, Characteristics and operating principle of UJT.

Unit III

TRANSISTORS - Characteristics, Current components, Current gains: alpha and beta. Variation of transistor parameter with temperature and current level, Operating point, Hybrid model, DC model of transistor, h-parameter equivalent circuits.   CE, CB and CC configuration. DC and AC analysis of single stage CE, CC (Emitter follower) and CB amplifiers AC & DC load line, Ebers-Moll model. Biasing & stabilization techniques. Thermal runaway, Thermal stability.

Unit IV

JFET & MOSFET - Construction and operation, Noise performances of FET, Parasitic of MOSFET, Small signal models of JFET & MOSFET, Biasing of JFET's

& MOSFET's, Low frequency single stage CS and CD (source follower) JFET amplifiers, FET as voltage variable resistor and FET as active load.

Unit V

SMALL SIGNAL AMPLIFIERS AT LOW FREQUENCY - Analysis of BJT and FET multistage amplifier, DC and RC coupled amplifiers. Frequency response of single and multistage amplifier, mid-band gain, gains at low and high

frequency.Analysis of DC and differential amplifiers, Miller's Theorem, use of Miller and bootstrap configuration. Cascade and cascode configuration of multistage amplifiers (CE-CE, CE-CB, CS-CS and CS-CD), Darlington pair.

Reference Books:

1. Electronic devices & circuits theory By R.L. Boylestad, Louis Nashelsky ,Pearson education
2. Integrated Electronics By Millman Halkias, T.M.H
3. Electronic devices & circuits By David Bell, Oxford Publications
4. Grob's Basic Electronics By Schultz, T.M.H.

BTCS 304 Object Oriented Programming using C++

Unit I:

Evolution of Programming Paradigms; Structured versus Object-Oriented Development; Elements of Object Oriented Programming – encapsulation, data hiding, data abstraction, inheritance, polymorphism, message communication; Popular OOP Languages, Merits and Demerits of Object Oriented Methodology.

Unit II:

Overview of C++; Class specification, class objects; Inline functions; Nesting of member functions, function overloading; Arrays within a class, arrays of objects, returning objects; Static data members, static member functions; Friend functions and friend classes; Constructors and Destructors – order of construction and destruction, parameterized constructors, constructor overloading, constructors with default arguments, copy constructor, dynamic initialization of objects

Unit III:

Operator Overloading – rules for overloading, overloading unary & binary operators, overloading binary operators using friends; Type Conversions – basic to class type, class to basic type, class to class type; Inheritance – forms of inheritance, inheritance and member accessibility, constructors and destructors in derived classes, constructor invocation and data members initialization, virtual base classes, nested and inner classes.

Unit IV:

Concept of dynamic binding; Pointers to objects; this pointer; Pointers to derived classes; Virtual functions, pure virtual functions; Object Slicing; Abstract classes, Smart pointers; Managing Console I/O Operations – C++ stream classes, unformatted I/O operations, formatted console I/O operations, managing output with manipulators; File handling – classes for file stream operations, file modes, file pointers and their manipulations, sequential and random access to a file, saving and retrieving of objects.

Unit V:

Generic programming with templates - function templates, class templates; Exception handling model and constructs; Standard Template Library(STL) overview, container classes; Namespace; Runtime typecasting.

Text/ Reference Books:

1. E. Balagurusamy, Object Oriented programming, Tata McGraw Hill.

2. K R Venugopal, Rajkumar, T Ravishankar, Mastering C++, Tata McGraw Hill.

3. C. Thomas Wu, An Introduction to OOP with Java, McGraw Hill.

4. Timothy Wood, An Introduction to Object Oriented Programming, Addison Wesley.

5. John R. Hubbard, Programming with C++, McGraw Hill International.

BTCS 305 Data Structure & Algorithms

UNIT – I

Introduction: Data Structures, data structure operations, complexity, Asymptotic Notation, Time/Space trade-off.

Linear Lists:

Arrays, address calculation in single and multidimensional arrays, operations on array, sequential search, Binary Search and their complexity analysis.

UNIT – II

Linked lists and its operations: linked list, representation of link list in memory, traversing a link list, insertion into a link list, deletion from a link list, header link list, two way link lists.

UNIT – III

Trees: Definition of tree, Binary tree and related terms, Application of binary tree, Tree Traversals, Threaded tree, Binary Search Tree, heap , heap sort, General trees.

UNIT – IV

Graph: introduction, sequentional representation of Graphs, adjacency matrix, path matrix, operations on graphs ,traversing a Graph, Warshall's algorithm.

UNIT – V

Sorting Techniques : Selection, Insertion, Bubble, Merge, Quick, Radix sort, searching and hashing.

TEXT/ Reference BOOKS:

1. Schaum Series, "Introduction *to Data Structures*", TMH.
2. R.B. Patel, "*Expert Data Structures with C*", Second Edition, Khanna Book publishing Co (P) Ltd.
3. Tenenbaum, "*Data Structure using C++*", PHI.
4. Chattopadhyay S., Dastidar d G.and Chattopadhyay Matangini., "*Data Structure through C language*", BPB publications.

BTCS 306 Computer Graphics and Multimedia

UNIT I:

Introduction to Raster scan displays, Storage tube displays, refreshing, flicking, interlacing, color monitors, display processors resolution, , positioning techniques ,rubber band techniques, dragging.

Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Beizier Method, B-sp-line Method.

UNIT II:

2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite, transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen.

UNIT III:

Algorithms: Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.

UNIT IV:

MEDIA AND DATA STREAMS :Medium, Properties of Multimedia, Data stream characteristics of continuous media, Information units.

MUSIC AND GRAPHICS: Audio formats, MIDI, Speech, Image formal, Graphics format, computer Image Processing.

UNIT V:

VIDEO AND ANIMATION :Basic concepts, Computer-based Animation, JPEG, MPEG, H 261, DVI, CD - ROM Technology, Compact disk digital audio

Books Recommended:

1. Foley et.al, Computer Graphics Principles & Practice, Addision , 1999

2. David F.Rogers, Procedural Elements for Computer Graphics, McGraw Hill Book Company

3. D.Heam and P.Baker, Computer Graphics, Prentice Hall 1986

4. R.Plastock and G.Kalley, Theory and Problems of Computer Graphics, Schaum's Series., McGraw Hill.

5. Ralf Steinmetz & Klara Nahrstedt - Multimedia : computing, Communication & Applications, Pearson Education Asia.

6. Prabhat K.Andleigh-Multimedia System Design, Prentice Hall,Kiran Thaukrar.

BTCS 307 Electronic Devices and Circuits Lab

1. Plot V-I characteristic of P-N junction diode & calculate cut-in voltage, reverse Saturation current and static & dynamic resistances.

2. Plot V-I characteristic of zener diode and study of zener diode as voltage regulator. Observe the effect of load changes and determine load limits of the voltage regulator.

3. Plot frequency response curve for single stage amplifier and to determine gain bandwidth product.

4. Plot drain current - drain voltage and drain current – gate bias characteristics of field effect transistor and measure of Idss & Vp

5. Application of Diode as clipper & clamper

6. Plot gain- frequency characteristic of two stages RC coupled amplifier & calculate its bandwidth and compare it with theoretical value.

7. Plot gain- frequency characteristic of emitter follower & find out its input and output resistances.

8. Plot input and output characteristics of BJT in CB, CC and CE configurations. Find their h-parameters.

9. Plot gain-frequency characteristics of BJT amplifier with and without negative feedback in the emitter circuit and determine bandwidths, gain bandwidth products and gains at 1kHz with and without negative feedback.

10. Plot and study the characteristics of small signal amplifier using FET.

11. Study Wein bridge oscillator and observe the effect of variation in R & C on oscillator frequency

12. Study transistor phase shift oscillator and observe the effect of variation in R & C on oscillator frequency and compare with theoretical value.

13. To plot the characteristics of UJT and UJT as relaxation.

14. To plot the characteristics of MOSFET and CMOS.

BTCS 308 DATA STRUCTURES LAB

S.No.	List of Exercises
1	Write a program to insert an element at desire position in the array.
2	Write a program to delete an element at desire position from the array.
3	Write a program to replace an element at desire position in the array.
4	Write a program to search (linear search) an element in the array.
5	Write a program to search (binary search) an element in the array.
6	Write a program to addition and multiply of two matrices.
7	Write a program to implementation of stack using array.
8	Write a program to implementation of queue using array.
9	Write a program to implementation link list.
10	Write a program that sorts the array through Bubble sort.
11	Write a program that sorts the array through Quick sort.
12	Write a program that sorts the array through Merge sort.
13	Write a program that sorts the array through Insertion sort.
14	Write a program to BST (binary search tree) addition, deletion and searching.

LIST OF EXPERIMENTS

1. Define a class to represent a bank account. Include the following members:

a. Data members: Name of the depositor, Account number, Type of account, Balance amount in the account.

b. Member functions: To assign initial values, To deposit an amount, To withdraw an amount after checking the balance, To display name and balance.

c. Write a main program to check the working.

2. Create two classes DM and DB which store the values of distances. DM stores distances in metres and centimetres and DB in feet and inches. Write a program that can read values for the class objects and add one object of DM with another object of DB.

a. Use a friend function to carry out the addition operation. The object that stores the results may be a DM object or DB object, depending on the units in which the results are required. The display should be in the format of feet and inches or metres and centimetres depending on the object of display.

3. Write a function power() to raise a number m to a power n. The function takes a int value for m and int value for n, and returns the result correctly. Use a default value of 2 for n to make the function to calculate squares when this argument is omitted. Write a main() the gets the values of m and n from the user to test the function. Write another function that takes a double value for m. Both the functions should have the same name. Use the concept of function overloading.

4. Define a class String that could work as a user-defined string type. Include constructors that will enable to create an uninitialized string

a. String s1; // string with length 0

b. And also to initialize an object with a string constant at the time of creation like

c. String s2("Well done!");

d. Include a function that adds two strings to make a third string. Note that the statement

s2 = s1; will be perfectly reasonable expression to copy one string to another.

5. Write a program to implement stack operations using OOP concepts.

6. Create a class FloatObj that contains one float data member. Overload all the four arithmetic operators so that they operate on the objects of FloatObj.

7. Write a program to implement operator overloading for complex number operations.

8. Write a program for matrix multiplication using the concept of friend operator overloading.

9. Write a program to implement the inheritance property by using the example of bank, where Bank is a base class and Saving and Current are two classes derived from bank. Member functions like deposit( ), withdraw( ), and display( ) should be implemented.

10. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data( ) to initialize base class data members and another member function display_area( ) to compute and display the area of figures. Make display_area( ) as a virtual function and redefine this function in the derived classes to suit their requirements. Using these three classes design a program that will accept dimensions of a triangle or rectangle interactively and display the area.

1. Write a program to draw a line using following algorithms:

a) Bresenham's Algorithm

b) DDA Algorithm

c) Mid Point Algorithm

2. Write a program to draw a circle using following algorithms:

a) Midpoint circle algorithm.

b) Bresenham's Algorithm

3. Write a program to draw an ellipse using "Midpoint" algorithm.

4. Write a program to fill a circle with any color using "Boundary Fill" algorithm.

5. Write a program to fill a square with multiple color edges using "Flood Fill" algorithm.

6. Write a menu driven program to scale, rotate and translate the line, circle, triangle and rectangle about the origin.

7. Write a menu driven program to scale, rotate and translate the line, circle, triangle and rectangle about an arbitrary point.

8. Write a program to perform line clipping.

9. Write a program to implement reflection of a line along X-axis or Y-axis.

10. Write a program to implement mirror reflection of a polygon.

11. Write a program to implement curve generation using interpolation methods.

12. Write a program to make a "Moving Ball".

13. Write a program to make a "smiling face".

BACHELOR OF TECHNOLOGY
COMPUTER SCIENCE AND ENGINEERING

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 401	Micro Processors And Microcontrollers	3	1	-	30	70	100	4
BTCS 402	Computer Organization and Architecture	3		-	30	70	100	3
BTCS 403	Theory of Computation	3	1	-	30	70	100	4
BTCS 404	Database Management Systems	3		-	30	70	100	3
BTCS 405	Core PHP	3		-	30	70	100	3
BTCS 406	Java Programming	3		-	30	70	100	3
PRACTICALS/VIVA-VOCE		No. of Teaching Hours			Sessional	Practical	Total	Credits
BTCS 407	Micro Processor Lab	-	-	2	30	20	50	1
BTCS 408	Computer Organization and Architecture Lab	-	-	2	30	20	50	1
BTCS 409	Database Management Systems Lab	-	-	2	30	20	50	1
BTCS 410	PHP Lab	-	-	2	30	20	50	1
BTCS 411	Java Programming Lab	-	-	2	30	20	50	1
	TOTAL	18	2	10	330	520	850	25

4-6 weeks training will be held after fourth semester, viva will be conducted in fifth sem.

BTCS 401: MICROPROCESSORS AND MICROCONTROLLERS

UNIT I:

INTRODUCTION: Overview of Microprocessor Structure and its operation.CPU, address bus, data bus and control bus. Input/ Output devices, buffers, encoders, latches and memories. Demultiplexing of address/data bus and memory/IO read/write control signals

UNIT II:

8085 MICROPROCESSOR ARCHITECTURE: Internal data operations and registers, pins and signals, peripheral devices and memory organization, Memory Interfacing, Memory mapped I/O and peripheral mapped I/O.

UNIT III:

8085 MICROPROCESSOR INSTRUCTIONS: Classification, format and timing. Instruction set,8085 Microprocessor Programming model, stack and subroutines, interrupts of 8085

UNIT IV:

8085 MICROPROCESSOR INTERFACING: 8259, 8257, 8255, 8253, 8155 chips and their applications. A/D conversion, memory, keyboard and display interface (8279).

UNIT V:

INTRODUCTION TO 8051 MICROCONTROLLER: General features & architecture of 8051. Memory, timers and interrupts. Pin details. Interfacing and applications.

Text/ReferenceBooks Recommended:

1. Ramesh.S.Gaonkar "Microprocessor architecture, programming & applications with 8085.

2.Kenneth J.Ayala "The 8051 Microcontroller Architecture, Programming & Applications"-Penram International publishing.

3.D.V.Hall "Microprocessor and Digital system"-McGraw Hill Publishing Company.

4 .Ajit Pal "Microprocessor Principles and Applications"-Tata McGraw Hill.

5.Kenneth "Microprocessor and programmed logic" PHI.

UNIT I:

REGISTER TRANSFER LANGUAGE: Data movement around registers. Data movement from/to memory. Concept of bus and timing in register transfer. Arithmetic and logic micro operations.

UNIT II:

CPU ORGANISATION: CPU organization with large registers, Addressing Modes, Instruction Format. Stacks and handling of interrupts & subroutines Instruction pipelining

UNIT III:

ARITHMETIC ALGORITHM: Array multiplier, Booth's algorithm. Addition subtraction for signed unsigned numbers and 2's complement numbers.

UNIT IV:

MICROPROGRAMMED CONTROL UNIT: Basic organization of micro-programmed controller, Address sequencer, Horizontal & Vertical formats,

UNIT V:

MEMORY ORGANISATION: Concept of RAM/ROM, basic cell of RAM, Associative memory, Cache memory organization, virtual memory organization. I/O ORGANISATION: Introduction to Peripherals & their interfacing.Strobe based and handshake-based communication, DMA based data transfer, I/O processor.

Text & References books:

1. Computer Organization and Architecture - William Stallings (Pearson Education Asia)

2. Computer Organization and Architecture -John P. Hayes (McGraw-Hill)

3. Computer Organization -V. Carl. Hamsacher (McGraw-Hill)

4. Computer System Architecture-M. Morris Mano (PHI)

BTCS 403: Theory of Computation

UNIT- I

Automata Theory: Basic Concepts of finite state system, Deterministic finite Automata (DFA) & Nondeterministic finite Automata (NDFA), Equivalence of NDFA and DFA, Minimization of Finite Automata, Moore and Mealy machine and their equivalence.

Formal Languages Overview: Definition of a Grammar, Derivations and the Language Generated by a Grammar, Chomsky Classification of Languages.

UNIT-II

Finite Automata & Regular Grammars: Regular Expressions, Kleen's Theorem, Arden,s Theorem, NDFA and Regular Expressions-Construction of FA equivalent to a Regular Expression, Application of Pumping Lemma for Regular Language, Closure properties of Regular Languages, Construction of a Regular Grammar for a given DFA and vice versa.

UNIT-III

PDA and Context Free Grammar: Context free grammar, Derivation trees, Ambiguity in grammar and its removal, Simplification of Context Free grammar, Normal forms for CFGs: Chomsky Normal Form &Greibach Normal Form, Pumping Lemma for Context Free languages, Push Down Automata (PDA)-Basic Definitions, PDA and Context-free Languages.

UNIT-IV

Turing Machines and Recursively Enumerable Languages: Turing Machine Model, Representation of Turing Machines, Design of Turing Machines, Multiple Track and Multitape Turing Machine, Turing Church's Thesis, Recursive and recursively enumerable languages-Decidability- Undecidable problems.

UNIT-V

Linear bounded Automata and Context Sensitive Language: Basic Definition, Descriptions of LBA, Context-Sensitive Languages, Properties of context-sensitive languages, Relation between LBA and context-sensitive languages

Text/Reference Books:
1. K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science, PHI
2. Martin J. C., "Introduction to Languages and Theory of Computations", TMH
3. Hopcroft, Ullman, "Introduction to Automata Theory, Language and Computation", Nerosa Publishing House, 3rd Edition.

BTCS 404: DATABASE MANAGEMENT SYSTEMS

UNIT I

INTRODUCTION TO DBMS: Overview and History of DBMS. File System vs. DBMS .Advantage of DBMS Describing and Storing Data in a DBMS. Queries in DBMS. Transaction management and Structure of a DBMS.

UNIT II

ENTITY RELATIONSHIP MODEL: Overview of Data Design Entities, Attributes and Entity Sets, Relationship and Relationship Sets. Features of the ER Model-Key Constraints, Participation Constraints, Weak Entities, Class Hierarchies, Aggregation, Conceptual Data Base, and Design with ER Model-Entity vs Attribute, Entity vs Relationship Binary vs. Ternary Relationship and Aggregation vs ternary Relationship Conceptual Design for a Large Enterprise.

UNIT III

RELATIONAL MODEL: Relationship Algebra Selection and Projection, Set Operations, Renaming, Joints, Division, Relation Calculus, Expressive Power of Algebra and Calculus.

UNIT IV

SQL AND TRIGGERS: The Forms of a Basic SQL Query, Union, Intersection and Except, Nested Queries, Correlated Nested Queries, Set-Comparison Operations, Aggregate Operators, Null Values, Triggers and Active Databases.

UNIT V

NORMAL FORMS AND CONCURRENCY CONTROL: Normalization using Functional Dependency, Multivalued dependency and Join dependency. Concurrency Control: Lock Based Protocols; Time Stamped Based Protocols, Deadlock Handling.

Recommended Reference Books:

1 Date C J, "An Introduction to Database System", Addision Wesley.

2 Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill

3 Elmasri, Navathe, "Fundamentals of Database Systems", Addision Wesley

4 Leon & Leon, "Database Management System", Vikas Publishing House.

5 Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication

6 Ramakrishnan, Gehrke, "Database Management System", McGraw Hill

7 Kroenke, "Database Processing: Fundamentals, Design and Implementation", Pearson.

BTCS 405: CORE PHP

UNIT I

Introduction of web applications. Introduction to web designing with HTML and Cascaded Style Sheets. Concept of Client Side Scripting and Server Side Scripting. Static website vs Dynamic website development. Web Servers: Local Servers and Remote Servers.

UNIT II

Introduction to PHP, Installing Web servers, PHP configuration in IIS &Apache Web server. Data types in PHP, Variables, Constants, operators and Expressions. PHP Operator: Conditional Structure - if, switch case & Looping Structure - for, while, do while, foreach

UNIT III

Introduction to Arrays: Initialization of an array, Iterating through an array, Sorting arrays, Array Functions, Functions: Defining and Calling Functions, Passing by Value and passing By references, Inbuilt Functions: String Function, Math Function, Date Function and Miscellaneous Function.

UNIT IV

Working with Forms: Get and Post Methods, Query strings, HTML form controls and PHP, Maintaining User State: Cookies, Sessions and Application State. Working with Files: Opening and Closing Files, Reading and Writing to Files, Getting Information on Files

UNIT V

PHP Database Connectivity: Introduction to MYSQL, Creating database and other operations on database, connecting to a database, Use a particular database, Sending query to database, Parsing of the query results, Checking data errors.

Text/ Reference Books:

1. Steven Holzner " PHP: The Complete Reference"
2. Tim Converse, Joyce Park "PHP Bible", 2nd Edition
3. Dave W. Mercer, Allan Kent, Steven D. Nowicki, David Mercer, Dan Squier, Wankyu Choi with Heow Eide-Goodman, Ed Lecky-Thompson, Clark Morgan "Beginning PHP5"

BTCS 406: JAVA PROGRAMMING

UNIT I

The Genesis of Java: The importance of Java to Internet, Java's magic-the byte code, introduction to JDK and JVM, the Java libraries. Data Types, Variables and Arrays: Java Programming: Data types, acces specifiers, operators, control statements, arrays; Classes: Fundamentals, objects, methods, constructors.

UNIT II

Usage of this keyword, garbage collection, the finalize() method, overloading methods, using objects as parameters, argument passing, returning objects, recursion, introducing access control, understanding static, introducing final, arrays revisited, nested and inner classes, exploring string class, using command-line arguments.

Inheritance: Inheritance basics, using super, creating a multilevel hierarchy, when constructors are called, method overriding, dynamic method dispatch, using abstract, using final with inheritance, the object class.

UNIT III

Package, Interfaces: Packages, access protection, importing packages, interfaces. Java Library: String handling (only main functions), String Buffer class. Elementary concepts of Input/Output: byte and character streams, System.in and Sysem.out, print and println, reading from a file and writing in a file.

UNIT IV

Exception Handling: exception-handling fundamentals, exception types, uncaught exceptions, using try and catch, multiple catch clauses, nested try statements, throw, throws, finally, Java's built-in exceptions, creating your own exception subclasses, using exceptions.

Multithreaded Programming: The Java thread model, the main thread, creating a thread, creating multiple threads, using Alive() and join(), thread priorities, synchronization, inter thread Communication, suspending, resuming, and stopping threads, using multithreading

UNIT V

Applets: Introduction, Life cycle, creation and implementation, AWT controls: Button, Label, TextField, TextArea, Choice lists, list, scrollbars, check boxes, Layout managers, Elementary concepts of Event Handling: Delegation Event

Model, Event classes and listeners, Adapter classes, Inner classes. Swings: Introduction and comparison with AWT controls.

Recommended reference books:

1. E. Balagurusamy, *Programming with Java*, TMH

2. Herbert Schieldt, *The Complete Reference:Java*, TMH

3. Horstmann, *Core Java*, Addison Wesley.

4. Rich raposa, *Learning Java*, Wiley.

BTCS407 Micro-Processors Lab

List of Experiments:

1 Study the hardware, functions, memory structure and operation of 8085-Microprocessor kit.

2 Add the contents of memory locations XX00 &XX01 & place the result in memory location XX02.

3 Program to perform integer division of two 8 bit numbers.

4 Write a program to find the square of a number.

5 Transfer of a block of data in memory to another place in memory

6 Transfer of block to another location in reverse order.

7 Searching a number in an array.

8 Sorting of array in: (1) Ascending order (2) Descending order.

9 Finding parity of a 32-bit number.

10 Program to multiply two 8–bit numbers.

11 Write a program to perform traffic light control operation.

12 Write a program to control the speed of a motor.

BTCS408 Computer Organization and Architecture Lab

List of Experiments:

1. To recognize the various components of a personal computer.

2. To understand how the different components of PC are connected to work properly.

3. Simulation of fundamental unit in XILINX ISE 9.1i

(i) Half Adder.

(ii) Full Adder

(iii) Multiplexer

4. Exploring Instruction Set Architecture (ISA) of x86 Machines.

5. Learning to program in Assembly Language of x86 Machines

6. Implementing Branching in x86 Assembly Language.

7. Array Processing in x86 Assembly Language.

8. Learning Address Translation in Virtual Memory System using MOSS Simulator

9. Implementing vector operations in MIPS Assembly and exploring Loop Unrolling

10. Simulating Cache Read/Write using MIPS Pipes Simulator

(These experiments can be implemented in Integrated Development Environment (IDE) i.e. Microsoft Visual Studio 2008 or simulator.)

BTCS 409 Database Management Systems Lab

List of Experiments

1. a) Define DBMS.

   b) Key Component- Entity , Attributes

   c) SQL

      1) DDL

      2) DML

   d) Relational data model-

      1) Relation

      2) Tuple

      3) Domain

      4) Degree

2. Create the student/employee Table and construct the following requires for the database…

   1. Create the table for student/employee.

   2. Find out name of all students.

   3. Retrieve the list of name and the city of all students.

   4. List of all students/employee who stay in city "BOMBAY" or city DELHI".

   5. List of all students /employee who are located in "MADRAS".

3. (1) Apply these Operations on employee relation

   1. Insert

   2. Select

   3. Update

   4. Drop

5. Delete

6. Alter

4. Create table with attributes emp. No., emp. Name, designation salary, and department no. Construct for following queries…..

1. Display complete information of all the employees working as a manager.

2. Display name of all the employees working as a clerk.

3. Suppose DA for manager is 75% of salary then display name of all managers.

4. Select names and designation whose salary is greater then 15000.

5. Between operation- list of all Employee Name & DOJ(date of joining) to join the Company in 2010

6.   Join operation- list of all the employees along with their department information by using join operation.

7.   AND/OR operation- make a table that have an employee Perform AND/OR operation.

8.   Group by function

   a) create the table for facilities having faculty-id, dept. no., designation name and group by similar dept.no. facilities by using count function.

9. Order by ACS function-

   a) Create a table for emp. Using following data:- emp. name, emp age, emp salary,emp city & display the emp salary in assending order.

10. Max-Min function- create a table for student having similar attributes s-name, s-marks, s-id, s-sec, & remark.

   i.   Find the maximum marks obtained by student.

   ii. Find the minimum marks obtained by student.

   iii. Sum of all students marks using sum function.

   iv. Find the average of marks using avg function.

11. Drop operation- perform drop operation.

BTCS 410 PHP Lab

List of Experiments

Experiment 1: Design the following static web pages required for online book store.

a) **Home page: -** the static home page must contains three pages

b) **Top: -** logo and college name and links to homepage, login page, registration Page, catalogue page and cart page

c) **Left: -** at least four links for navigation which will display the catalogue of Respective links

d) **Right: -** the pages to links in the left frame must be loaded here initially it Contains the description of the website

Experiment 2: Create registration and cart page in the previous created web site.

Experiment 3: Write a java script to validate the following fields in a registration page

a) userName (should contains alphabets and the length should not be less than 6 characters)

b) userPassword (should not be less than 6 characters)

c) userEmail (should not contain invalid addresses)

d) userCity (should select city from drop down)

e) userGender (Should select gender)

Experiment 4: Implement CSS on the above create WebPages.

Experiment 5: Write an XML file which displays the book details that includes the following:

1) Title of book 2) Author name 3) Edition 4) Price Write a DTD to validate the above XML file and display the details in a table.

Experiment 6: Create a php program to demonstrate the different file handling methods.

Experiment 7: Create a php program to demonstrate the different loops in php.

Experiment 8: Create a php program to demonstrate the different predefined function in array, Math.

Experiment 9: Create a php program to demonstrate the different predefined function in Data & Regular Expression, date.

Experiment 10: Create a HTML form and process the HTML form in PHP.

Experiment 11: Create a php program to connect to MySQL Server.

Experiment 12: Create a php program to execute more SQL queries.

List of Experiments

Practical 1: Write a program to compute the sum of the digits of a given integer number.

Practical 2: Given a number, write a programming using (while/ do..while/for) loop to reverse the digits of the number. For example, the number 12345 should be written as 54321.

Practical 3: Write a program (making use of class and methods), which will read a string and rewrite it in the alphabetical order. For example, the word JAIPUR should be written as AIJPRU.

Practical 4: Write a program that accepts a shopping list of five items from the command line and stores them in a vector.

Practical 5: Write a program to show the application of interface and abstract class.

Practical 6: Define an exception called "NoMatchException" that is thrown when a string is not equal to "India". Write a program that uses this exception.

Practical 7: Write a program to implement multithreading making use of **Thread** class and/or **Runnable** interface.

Practical 8: Write a program to implement the concept of packages.

Practical 9: Develop an applet that receives three numeric values as input from the user and then displays the largest of the three on the screen. Write a HTML page and test the applet.

Practical 10: Develop an applet which runs a banner with text "Welcome to Jagan Nath University" making use of multithreading.

BACHELOR OF TECHNOLOGY
COMPUTER SCIENCE AND ENGINEERING
Semester - V

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 501	Algorithms Design and Analysis	3	1	-	30	70	100	4
BTCS 502	Software Engineering	3		-	30	70	100	3
BTCS 503	Java 2 Enterprise Edition	3	1	-	30	70	100	4
BTCS 504	Random Variable and Stochastic Processes	3		-	30	70	100	3
BTCS 505	System Software	3		-	30	70	100	3
ELECTIVE (ANY ONE)								
BTCS 506A	Principles of Communication	3	-	-	30	70	100	3
BTCS506B	Information Theory and Coding	3	-	-	30	70	100	3
BTCS 506C	Telecommunication Networks	3	-	-	30	70	100	3
BTCS 506D	Simulation and Modelling	3	-	-	30	70	100	3
BTCS 506E	Analog and Digital Communication	3	-	-	30	70	100	3
PRACTICALS/VIVA-VOCE					Sessional	Practical	Total	Credits
BTCS 507	Algorithms Design and Analysis Lab	-	-	2	30	20	50	1
BTCS 508	Software Engineering Lab	-	-	2	30	20	50	1
BTCS 509	Java 2 Enterprise Edition Lab	-	-	2	30	20	50	1
BTCS 510	System Software Lab	-	-	2	30	20	50	1
BTCS 511	Communication Lab	-	-	2	30	20	50	1
BTCS 512	Training Viva	-	-	0	30	20	50	2
TOTAL		**18**	**2**	**10**	**360**	**540**	**900**	**27**

BTCS 501 Algorithms : Designs and Analysis

UNIT I:

> **BACKGROUND**: Review of Algorithm Complexity and Order Notations and Sorting Methods.

> **DIVIDE AND CONQUER METHOD**: Binary Search, Merge Sort, Quick sort and Stassen's matrix multiplication Algorithms.

> **GREEDY METHOD**: Knapsack Problem, Job Sequencing, Optimal Merge Patterns and Minimal Spanning Trees.

UNIT II:

> **DYNAMIC PROGRAMMING**: Matrix Chain Multiplication. Longest Common Subsequence and 0/1 Knapsack Problem.

> **BRANCH AND BOUND**: Traveling Salesman Problem and Lower Bound Theory. Backtracking Algorithms and queens problem.

UNIT III:

> **PATTERN MATCHING ALGORITHMS**: Naïve and Rabin Karp string matching algorithms, KMP Matcher and Boyer Moore Algorithms.

> **ASSIGNMENT PROBLEMS**: Formulation of Assignment and Quadratic Assignment Problem.

UNIT IV:

> **RANDOMIZED ALGORITHMS**. Las Vegas algorithms, Monte Carlo algorithms, randomized algorithm for Min-Cut, Randomized algorithm for 2-SAT. Problem definition of Multicommodity flow, Flow shop scheduling and Network capacity assignment problems.

UNIT V:

> **PROBLEM CLASSES** NP, NP-HARD AND NP-COMPLETE: Definitions of P, NP-Hard and NP-Complete Problems. Decision Problems. Cook's Theorem. Proving NP-Complete Problems - Satisfiability problem and Vertex Cover Problem. Approximation Algorithms for Vertex Cover and Set Cover Problem.

Recommended Reference Books:

1. ' Design and Analysis of Algorithm'; Horowitz and Sahani

2. ' Introduction to Algorithm Design' ; Corman

3. ' Design and Analysis of Computer Algorithms"; Aho, Pearson

BTCS 502 SOFTWARE ENGINEERING

UNIT – I

System Analysis: Definition of System, Sub-System, Component of System with examples. Characteristics of System, Different types of system. Problems in system Development, System Development Life cycle (SDLC), System Analysis and System Level project Planning.

UNIT – II

Software Engineering: Introduction and Definition of Software Engineering. Software Crisis, Software Processes & Characteristics.

Software Process Models: Software development life cycle (SWDLC), Software development life cycle models:-Waterfall, Prototype, Evolutionary, RAD, V and Spiral Models.

UNIT – III

Software Requirements analysis & specifications: Requirement engineering, Requirement analysis tasks, Analysis principles. Requirement elicitation techniques like FAST, QFD, Requirements analysis using DFD(with case studies), Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.

UNIT – IV

Software Project Management Concepts: The Management spectrum, The People, The Problem, The Process, The Project.

Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Analysis.

UNIT – V

Software Design: Design fundamentals, Effective modular design: Data architectural and procedural design, Design documentation. Function Oriented Design, Object Oriented Design.

Cohesion & Coupling: Cohesion & Coupling, Classification of Cohesiveness & Coupling.

Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering.

Text/ Reference Books:

1. R. S. Pressman, "Software Engineering – A practitioner's approach", McGraw Hill Int. Ed.

2. I. Sommerville, "Software Engineering", Addison Wesley, 2004

3. Rajib Mall, "Fundamental of Software Engineering", 3rd Edition, PHI Learning Private Limited

4. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers

5. K. K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International, 2005.

6. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach", John Wiley & Sons.

7. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa, 3rd Ed., 2005.

BTCS 503 Java 2 Enterprise Edition

UNIT I

Java Beans: Introduction to Java Beans, Advantage, Properties, BDK, Introduction to EJB, Java Beans API. Fundamental of Servlets**:** Advantages of Servlets over CGI, Servlet API, life cycle of servlet. Creating simple Servlet, installing and configuring Apache Tomcat 4 as a standalone servlet , Servlet Packages: HTTP package, Working with Http request and response, Security Issues. Handling cookies, session tracking.

UNIT II

JSP: Introduction to JSP, JSP processing, JSP Application Design, Tomcat Server, Implicit JSP objects, Conditional Processing, Declaring variables and methods, Error Handling and Debugging, Sharing data between JSP pages- Sharing Session and Application Data.

UNIT III

Database Connectivity: Database Programming using JDBC, Studying Javax.sql.package, accessing a database from a JSP page, Application-specific Database Action, Developing Java Beans in a JSP page, introduction to Struts framework.

UNIT IV

Distributed Computing: Overview of current technologies (J2EE, RMI, CORBA, and DCOM), RMI and ORBs, patterns for distributed components, defining interfaces to active objects, remote RMI interfaces, RMI, clients, server, and registry. Creating simple RMI application.

UNIT V

EJB Fundamentals: Introduction to J2EE architecture, EJB – introduction, understanding stateful and stateless session beans life cycle, writing stateless session bean, introduction to entity beans, writing first entity bean.

Text book/R*eference books:*

[1]. Joe, "The Complete Reference: J2EE", TMH.

[2]. Hans Bergsten, "Java Server Pages", SPD O'Reilly

[3]. Bryan Basham, "Head first servlet and JSP", O'Reilly

[4]. Marty Hall, "Core Servlets and JSP", Sun Micro Systems

BTCS 504   Random Variables and Stochastic Processes

UNIT I:

PROBABILITY**:** Introduction to theory of probability, Definitions, sample, space & events, Self, joint & conditional probabilities, statistically dependent & independent events.

UNIT II:

RANDOM VARIABLES**:** Introduction, distribution & density functions, discrete & continuous random variables, special distributions: binominal, Poisson, uniform, exponential, normal, Rayleighs. Conditional distribution & density functions.

UNIT III:

MULTIPLE RANDOM VARIABLES :Vector random variable, joint distribution functions, joint probability density function(PDF), Statistical independence, distribution & density function of sum of random variable, one function of one random variable ,one function of two random variable, two function of two random variable.

UNIT IV:

OPERATION ON SINGLE & MULTIPLE RANDOM VARIABLES**:** Mean & variance, moments, chebyshev's inequality, Central limit theorem, characteristic functions &moment generating function, covariance & correlation coefficient of multiple random variables.

UNIT V:

STOCHASTIC PROCESSES**:** Introduction, random process concept, stationary & independence, ergodicity, correlation, functions. Gaussion Random Process, Transmission of Random process through linear systems. Power spectral Density (PSD), Cross Spectral density, white Gaussion Random process.

References books Recommended:

1. B.P. Lathi- Modern Digital & Analog Communication system.

2. A.B. Carlson- Communication systems.

3. A. Populis- Random Variables & Stochastic processes.

4. Peebles, P. Probability, random variables and random signal principles. McGraw Hill, 2001.

5. Papoulis, A. Probability, random variables and stochastic processes. Mc Graw Hill (international Students' edition), Singapore.

6. Childers, D. G. Probability and random processes using MATLAB.Mc Graw Hill 1997.

UNIT I

System software introduction, Evolution of Components of a Programming System, General Machine Structure - Memory, Registers, Data and Instructions. Machine Language - No Looping, Address modification using instruction as Data and Index registers, Looping. Assembly Language Program using Literals and pseudo -ops.

UNIT II

Introduction to Assemblers - General design procedure, Design of Assembler-Statement of Problem, Data Structures, Format of Databases, Algorithm (2-pass assembler) in brief with flowchart

UNIT III

Macro Language and the Macro Processor: Macro instructions, Features of Macro facility - Macro instruction argument, Conditional Macro expansions, Macro call within Macros and Implementation- Two-Pass macro processor with flowchart

UNIT IV

Loaders and Linkers: - Loader Schemes, Compile and Go Loader, General Loader scheme, Absolute Loaders, Subroutine Linkages, Relocating Loaders, Direct-Linking Loaders, Binders, Linking loaders, Overlays, Dynamic Binders. Design of an Absolute Loader

UNIT V

Introduction to Compilers: Different phases- Lexical Phase, Syntax Phase, Interpretation Phase, Optimization Phase, Storage Assignment Phase, Code Generation Phase and Assembly phase.

Text/ Reference Books:

1. D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 1999

2. Leland L. Beck, "System Software – An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2000.

3. M. Joseph "System Software", Laxmi Publications First edition, 2007

BTCS 506A PRINCIPLES OF COMMUNICATION

UNIT-I

ANALOG MODULATION: Concept of frequency translation. Amplitude Modulation: Description of full AM, DSBSC, SSB and VSB in time and frequency domains, methods of generation & demodulation, frequency division multiplexing (FDM). Angle Modulation: Phase and frequency modulation. Descriptions of FM signal in time and frequency domains, methods of generation & demodulation, pre- emphasis &deemphasis, PLL

UNIT-II

PULSE ANALOG MODULATION: Ideal sampling, Sampling theorem, aliasing, interpolation, natural and flat top sampling in time and frequency domains. Introduction to PAM, PWM, PPM modulation schemes. Time division multiplexing (TDM).

UNIT-III

PCM & DELTA MODULATION SYSTEMS: Uniform and Non-uniform quantization. PCM and delta modulation, Signal to quantization noise ratio in PCM and delta modulation.DPCM, ADM, T1 Carrier System, Matched filter detection. Error probability in PCM system.

UNIT-IV

DIGITAL MODULATION: Baseband transmission: Line coding (RZ, NRZ), inter symbol interference (ISI), pulse shaping, Nyquist criterion for distortion free base band transmission, raised cosine spectrum. Pass band transmission: Geometric interpretation of signals, orthogonalization. ASK, PSK, FSK, QPSK and MSK modulation techniques, coherent detection and calculation of error probabilities.

UNIT-V

SPREAD-SPECTRUM MODULATION: Introduction, Pseudo-Noise sequences, directsequence spread spectrum (DSSS) with coherent BPSK, processing gain, probability of error, frequency-hop spread spectrum (FHSS). Application of spread spectrum: CDMA.

Text/Reference Books:
1. Principles of communication systems by Taub Schilling, T.M.H.
2. Fundamentals of communication systems by Proakis&Salehi, Pearson Education.
3. Communication Systems by Simon Haykin, Johan Wiley

BTCS506B Information Theory And Coding

UNIT 1:

Elements Of Information Theory: Measure of information, average information, entropy, information rate. Communication channel, discrete and continuous channel

UNIT 2:

Shannon-Hartley theorem and its implications. Channel capacity, Gaussian channel and bandwidth-S/N tradeoff

UNIT 3:

Introduction of Coding: types of efforts, types of codes, error control coding, methods of controlling errors

UNIT 4:

Linear Block and Binary Cyclic Codes: matrix decryption of linear block codes, error detection and error correction. Capabilities of linear block codes. Hamming codes, structure of cyclic codes, encoding using an (n-k) bit shift register syndrome calculation, its error detection & correction, special classes of cyclic codes bch.

UNIT 5:

Burst and Convolution Codes: burst and random error correcting codes, encoders for convolution codes.   Decoders for convolution codes.

Recommended Reference Books:

1. K. Sam Shanmugam-"Digital and Analog Communication System", John Wiley Sons.
2. Herbor Taub Donald Schilling- "Principal of Communication System". Tata Mc-Graw Hill.

BTCS506C Tele Communication Networks

UNIT 1:

Telecommunication Need and Applications: Information Explosion in industry, government and military applications estimated bandwidth need and electromagnetic spectrum of telecommunication. **Communication Model:** Transmission system in communication introduction to WAN, MAN and LANs. Broadband and narrowband ISDN Protocols and protocol architectures. Layered Architecture. Introduction to TCP/IP protocol Architecture.

UNIT 2:

Data Transmission: Concepts and terminology, Frequency spectrum and bandwidth. Time domain and frequency domain analysis/and digital data transmission. Audio and video signals. Transmission impairments Guided transmission media, audio and video signals. Transmission impairments. Guided transmission media, twisted pair, UTP cables. Coaxial and optical fiber cables, wireless microwave and satellite transmission.

UNIT 3:

Data Encoding : Amplitude, frequency and phase modulation techniques, NRZ-I, Bipolar AMI, Manchester and differential Manchester encoding techniques. Scrambling techniques. ASK, FSK and PSK techniques. Pulse code and pulse Amplitude Modulations. Delta Modulations.

UNIT 4:

Multiplexing: Frequency Division Multiplexing, Synchronous Time Division Multiplexing, Statistical Time Division Multiplexing. **Switching Networks:** Circuit switching Networks, space and time division switching, routing in circuit switched networks. Control signaling Packet Switching principles. Fixed, flopping and adaptive routing strategies-X.25 interface packet format and X.28 protocol.

UNIT 5:

Frame Relay: Frame Relay protocol Architecture-Frame Relay Call control and congestion control. **MAC Sub layer:** Channel allocation problem, pure and slotted ALOHA protocols, persisted and Non-persisted CSMA, Collision free protocols, Digital cellular adio, CDMA.

Recommended reference books:

1. William Stallings: Data and Computer Communications (PHI, 5th Ed.)
2. James Martin: Telecommunication and the Computer (PHI,3rd Ed.)
3. A.S. Tanenbaum: Computer Networks (PHI,3rd Ed.)

BTCS 506D Simulations and Modeling

UNIT 1:

Introduction: System definition and components, stochastic activities, continuous and discrete System, system modeling, types of models, static and dynamic physical models, Static and dynamic mathematical models, full corporate models, types of system.

UNIT 2:

System simulation: Why to simulate and when to simulate, basic nature of simulation, technique of simulation ,comparison of simulation and analytical methods, types of system simulation , real time simulation, hybrid simulation, simulation of pure pursuit problem single server queuing system and an inventory problem, Monte Carlo simulation, Distributed Lag methods.

UNIT 3:

Simulation of continuous Systems: Analog vs. Digital simulation, simulation of water reservoir system, simulation of a servo system, simulation of an autopilot. Discrete system simulation**,** fixed time-step vs event-to event model, generation of random numbers, test for randomness, Generalization of non –uniformly distributed random numbers, Monte-Carlo computation vs stochastic simulation.

UNIT 4:

System dynamics: Exponential growth models, exponential decay models, modified exponential growth models, logistic curves, generalization of growth models, System dynamics diagrams, feedback in socio-Economic systems, world model.

UNIT 5:

Simulation of PERT networks: Critical path computation, uncertainties in Activity duration, Resource allocation and consideration.

Simulation Software & Simulation language: Continuous and discrete simulation languages, expression based languages, object-oriented simulation, general –purpose vs application –oriented simulation packages, CSMP-III, MODSIM-III

Recommended Books:

1. Geofrey Gordon, System Simulation, PHI

2. Narsingh Deo, System Simulation with Digital Computer, PHI

3. Averill M. Law, W. David Kelton, Simulation Modeling and Analysis.

UNIT I

ANALOG COMMUNICATION

Noise: Source of Noise - External Noise- Internal Noise- Noise Calculation. Introduction to **Communication Systems**: Modulation – Types - Need for Modulation. Theory of Amplitude Modulation - Evolution and Description of SSB Techniques - Theory of Frequency and Phase Modulation – Comparison of various Analog Communication System (AM – FM – PM).

UNIT II

DIGITAL COMMUNICATION

Amplitude Shift Keying (ASK) – Frequency Shift Keying (FSK) Minimum Shift Keying (MSK) –Phase Shift Keying (PSK) – BPSK – QPSK – 8 PSK – 16 PSK – Quadrature Amplitude Modulation (QAM) – 8 QAM – 16 QAM – Bandwidth Efficiency– Comparison of various Digital Communication System (ASK – FSK – PSK – QAM).

UNIT III

DATA AND PULSE COMMUNICATION

Data Communication: History of Data Communication - Standards Organizations for Data Communication- Data Communication Circuits - Data Communication Codes -Error Detection and Correction Techniques - Data communication Hardware - serial and Parallel interfaces.

Pulse Communication: Pulse Amplitude Modulation (PAM) – Pulse Time Modulation (PTM) – Pulse code Modulation (PCM) - Comparison of various Pulse Communication System (PAM – PTM – PCM).

UNIT IV

SOURCE AND ERROR CONTROL CODING

Entropy, Source encoding theorem, Shannon fano coding, Huffman coding, mutual Information, channel capacity, channel coding theorem, Error Control Coding, linear Block codes, cyclic codes, convolution codes, viterbi decoding algorithm.

UNIT V

MULTI-USER RADIO COMMUNICATION

Advanced Mobile Phone System (AMPS) - Global System for Mobile Communications (GSM) – Code division multiple access (CDMA) – Cellular Concept and Frequency Reuse - Channel Assignment and Hand - Overview of Multiple Access Schemes -Satellite Communication - Bluetooth.

TEXT BOOK:

1. Wayne Tomasi, "Advanced Electronic Communication Systems", 6th Edition, Pearson Education, 2009.

REFERENCES:

1. Simon Haykin, "Communication Systems", 4th Edition, John Wiley & Sons, 2004

2. Rappaport T.S, "Wireless Communications: Principles and Practice", 2nd Edition, Pearson Education, 2007

3. H.Taub, D L Schilling and G Saha, "Principles of Communication", 3rd Edition, Pearson Education, 2007.

4. B. P.Lathi, "Modern Analog and Digital Communication Systems", 3rd Edition, Oxford University Press, 2007.

BTCS 507 ALGORITHMS ANALYSIS AND DESIGN LAB

List of Experiments:

1. To implement following algorithm using array as a data structure and analyse its time complexity.

   a. Merge sort

   b. Quick sort

   c. Bubble sort

   d. Bucket sort

   e. Radix sort

   f. Shell sort

   g. Selection sort

   h. Heap sort

2. To implement Linear search and Binary search and analyse its time complexity.

3. To implement Matrix Multiplication and analyse its time complexity.

4. To implement Longest Common Subsequence problem and analyse its time complexity.

5. To implement Optimal Binary Search Tree problem and analyse its time complexity.

6. To implement Huffman Coding and analyse its time complexity.

7. To implement Dijkstra's algorithm and analyse its time complexity.

8. To implement Bellman Ford algorithm and analyse its time complexity.

9. To implement naïve String Matching algorithm, Rabin Karp algorithm and Knuth Morris Pratt algorithm and analyse its time complexity.

Tool Required: Rational Rose Enterprise Edition

List of Experiments:

1. Write down the problem statement for a suggested system of relevance.

2. Do requirement analysis and develop Software Requirement Specification Sheet (SRS) for suggested system.

3. To perform the function oriented diagram: Data Flow Diagram (DFD) and Structured chart.

4. To perform the user's view analysis for the suggested system: Use case diagram.

5. To draw the structural view diagram for the system: Class diagram, object diagram.

6. To draw the behavioral view diagram : State-chart diagram, Activity diagram

7. To perform the behavioral view diagram for the suggested system : Sequence diagram,

   Collaboration diagram

8. To perform the implementation view diagram: Component diagram for the system.

9. To perform the environmental view diagram: Deployment diagram for the system.

10. To perform various testing using the testing tool unit testing, integration testing for a sample code of the suggested system.

11. 10 Perform Estimation of effort using FP Estimation for chosen system.

12. 11 To Prepare time line chart/Gantt Chart/PERT Chart for selected software project.

Text Books:

1. K.K. Aggarwal & Yogesh Singh, "Software Engineering", New Age International, 2005

2. Pankaj Jalote, "An Integrated Approach to Software Engineering", Second Edition, Springer.

NOTE:- At least 8 Experiments out of the list must be done in the semester.

List of Experiments

1. (a) Demonstrate the installation of Tomcat for servlet development.

  (b) Write a program to create a simple servlet that sends the output of the servlet to the browser display Area.

2. Write a program to create a servlet that displays basic information about a client's session (basic info. Includes session id, creation time, last access time, and number of previous accesses) in form of a HTML table. In case of first access, it should display the message – "A warm welcome to the new Visitor" and on consequent accesses the message should be "I recognize you! You are visiting once Again".

3. Write a program to create two servlets, ServletCreatesCookies and ServletDisplaysCookies. ServletCreatesCookies sets 3 cookies, one of which has default expiration date. The other two cookies Use setMaxAge ( ) and have a lifetime of 2 hours. The servlet ServletDisplaysCookies should display The active cookies.

4. Write a program to create a simple bean (using swings) making use of Net Beans environment.

5. Write a program to define an HTML form in a JSP source file, using JSP tags to pass data between the Form and some type of server-side object.

6. Write a program using JSP and making good use of script lets and expressions, implement the number Guess game.

7. Write a program using JSP to set up a simple counter and demonstrate declarations, script lets, and Expressing working together.

8. Write a program to access an ODBC compliant database and

(i)   show the records in the standard output device

(ii)   Demonstrate the use of SQL queries through the program.

9   Build a Web interface that will allow users to retrieve a listing of J2EE books from a computer books' Database. Users will be able to query the database on one or more of the following criteria: title, Author, publisher, and publishing year. Create the database using Microsoft Access.

10. Write a program to develop a Java Bean in a JSP page. You are required to develop the colorful Alphabet list such that the presentation of the letters remains the responsibility of the JSP page, but The color mapping will be the bean's job.

11. Write a program to create a client/server application for summing up 5 numbers using Remote Method Invocation (RMI) technique.

12. Write a program to create a simple Enterprise Java Bean (EJB) that encapsulates the data and behavior Associated with a real world Hotel room booking business

List of Experiments:

In this lab we will practice how source code is processed by compiler/ assembler/ pre-processor.

All programs have to be written in C++

1. Write a class for file handling, having functions to open/ read/ write/ close/ reset.

(2-5) develop a program which take input a file of C language

2. Print Lines of Codes and print signature of all function (including main)

3. Print number of variables in every function (with type)

4. Generate a new file without the comments. (/ / and //).

5. Process all #define (i.e. #define MAX 100, than replace every occurrence of MAX with 100).

   (Macro value 100 can be an expression also.)

6. Write a program to create a symbol table.

7. Write a program which can parse a given C file and store all variables and functions in symbol table.

List of Experiments

1. Harmonic analysis of a square wave of modulated waveform Observe the amplitude modulated waveform and measures modulation index. Demodulation of the AM signal

2. To modulate a high frequency carrier with sinusoidal signal to obtain FM signal. Demodulation of the FM signal.

3. To observe the following in a transmission line demonstrator kit :

    i. The propagation of pulse in non-reflecting Transmission line.

    ii. The effect of losses in Transmission line.

    iii. The resonance characteristics of al half wavelength long x-mission line.

4. To study and observe the operation of a super heterodyne receiver

5. To modulate a pulse carrier with sinusoidal signal to obtain PWM signal and demodulate it.

6. To modulate a pulse carrier with sinusoidal signal to obtain PPM signal and demodulate it.

7. To observe pulse amplitude modulated waveform and its demodulation.

8. To observe the operation of a PCM encoder and decoder. To consider reason for using digital signal x-missions of analog signals.

9. Produce ASK signals, with and without carrier suppression. Examine the different processes required for demodulation in the two cases

10. To observe the FSK wave forms and demodulate the FSK signals based on the properties

    of (a) tuned circuits (b) on PI.L.

11. To study & observe the amplitude response of automatic gain controller (AGC).

Semester - VI

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 601	Operations Research	3	1	-	30	70	100	4
BTCS 602	Operating Systems	3		-	30	70	100	3
BTCS 603	Computer Networks	3	1	-	30	70	100	4
BTCS 604	Advanced Data structure	3	1	-	30	70	100	4
BTCS 605	Advanced Computer Architecture	3		-	30	70	100	3
Elective (any one)								
BTCS 606A	Artificial Intelligence	3	-	-	30	70	100	3
BTCS 606B	Advanced DBMS	3	-	-	30	70	100	3
BTCS 606C	Advanced PHP	3	-	-	30	70	100	3
BTCS 606D	Principles of Programming Languages	3	-	-	30	70	100	3
BTCS 606E	E-Commerce	3	-	-	30	70	100	3
PRACTICALS/VIVA-VOCE					Sessional	Practical	Total	Credits
BTCS 607	Operating Systems (Linux Programming and Administration) Lab	-	-	2	30	20	50	1
BTCS 608	Computer Networks Lab	-	-	2	30	20	50	1
BTCS 609	Advanced Data Structure Lab	-	-	2	30	20	50	1
BTCS 610	Advance Computer Architecture Lab	-	-	2	30	20	50	1
BTCS 611	In house workshop	-	-	0	30	20	50	2
BTCS 612	Communication for professional lab	-	-	1	30	20	50	1
TOTAL		**18**	**3**	**9**	**360**	**540**	**900**	**28**
4 -6 weeks training will be held after sixth semester, viva will be conducted in seventh sem.								

BTCS 601 Operations Research

Unit I

Overview of Operation Research History of Operation Research, Linear optimization models, simplex algorithms, duality; dual linear programming, Sensitivity; Integer programming

Unit II

Transportation Transportation, Transshipment & Assignment problems

Unit III

Project Scheduling by CPM/PERT: Designing an activity network, Critical path calculations, Determination of floats, Program Evaluation and Review Technique (PERT). Cost-Time analysis of projects : crashing activities in a project.

Unit IV

Deterministic and Stochastic inventory models- Single & multi period models with continuous & discrete demands, Service level & reorder policy

Unit V

Simulations-Simulation V/S mathematical modeling, Monte Carlo simulation, simulation language ARENA.

TEXT BOOKS:

1. H. Taha, "Operations Research: An Introduction", PHI, 8th Ed., 2009.

2. Hilier and Liebermann, "Introduction to Operations Research", McGraw-Hill, 8th Ed., 2009.

3. Wayne Winston, "Operations Research: Applications and Algorithms", Cengage, 4th Ed., 2009.

REFERENCES:

1. J. K. Sharma, "Operation Research Theory and Applications", 3rd Edition, Macmillan, India
2. *S*.D.Sharma, "Operations Research", Kedar Nath Ram Nath
3. Paul A. Jensen, "Operations Research Models and Methods", John Wiley, 2003.
4. G. Srinivasan, "Operational Research Principles and Applications", PHI, 2nd Ed., 2008.
5. A.M. Natarajan, P. Balasubramani, A. Tamilarasi, "Operational Research", Pearson, 4th Ed., 2009.

UNIT 1:

Introduction to Operating Systems, Operating system services, Role of Operating System as resource manager, multiprogramming, time-sharing system, storage structures, system calls, multiprocessor system. Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling I/0 devices Organization, I/0 devices organization, I/0 devices organization, I/0 buffering.

UNIT2:

Process concept, process scheduling, operations on processes, Threads:overview,benefitsofthreads,userandkernelthreads, inter-process communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization. Deadlock Problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from Deadlock, Methods for deadlock handling.

UNIT 3:

Concepts of memory management, logical and physical address space, swapping, contiguous and non-contiguous allocation, paging, segmentation, and paging combined with segmentation. Concepts of virtual memory, demand paging, page replacement algorithms, allocation of frames, thrashing, Demand segmentation. Security threads protection intruders-Viruses-trusted system.

UNIT 4:

Disk scheduling, file concepts, file access methods, allocation methods, directory systems, file protection, Introduction to distributed systems and parallel processing case study.

UNIT 5:

UNIX Administration: Introduction to networking concept, Network basics, Sharing information, Topology, Protocols, Types of network, Networking devices, Internetworking: concept, Architecture and protocols. Using the VI Editor, Defining Shell Scripting Concepts, Using the tr Command to Translate Letters, Using the case Statement, Creating a Custom Function, Using the sed and awk Commands Controlling the UNIX System, Becoming the Root User

Controlling Multiple Processes. Relocating Files and Directories, Archiving Files and Directories, Restoring Files and Directories

Recommended reference books:

1. A.S.Tanenbaum-Modern Operating Systems, Pearson Education Asia.
2. D.M.Dhamdhere-Operating Systems-A Concept based approach, Tata Mc-Graw Hills.
3. Achyut godble -Operating Systems, Tata Mc-Graw Hills.
4. Stallings-Operating System, Pearson.
5. UNIX Network programming by W. Richard Stevens, Prentice Hall India, 2000

BTCS 603 Computer Network

UNIT 1:

Network: Network Protocols, Edge, Access Networks and Physical Media, Protocol Layers and their services models, Internet Backbones, NAP's and ISPs.

UNIT II

Application Layer: Protocol and Service provided by application layer, transport protocols. The World Wide Web. HTTP, Message formats, User Server Interaction and Web caches. FTP commands and replies. Electronic Mail, SMTP, Mail Message Formats and MIME and Mail Access Protocols DNS The internet's directory service DNS records and Message.

UNIT III

Transport Layer: Transport Layer Service and Principles, Multiplexing and Demultiplexing applications, Connectionless Transport. UDP Segment structure and UDP Checksum. Principles of Reliable Data Transfer-Go back to N and Selective Repeat. Connection Oriented Transport TCP Connection and Segment Structure, Sequence Numbers and acknowledgement numbers, Telnet, Round trip time and timeout. TCP connection management.

UNIT IV

Network Layer and Routing: Network service model, routing principles. Link State routing Algorithm, A distant Vector routing & OSPF algorithm. Router Components; Input Prot, Switching fabric and output port. IPV6 Packet Format. Point To Point Protocol (PPP), transition States, PPP Layers-Physical Layer and Data Link Layer, Link Control Protocols. LCP Packets and options. Authentication PAP and CHAP,

UNIT V

Sonet/SDH Synchronous Transport Signals. Physical configuration-SONET Devices, Sections, Lines and Paths. SONET Layers-Photonic Layer, section layer, line layer, path layer and device layer relationship. Sonnet Frame Format. Network Control Protocol (NCP). Introduction to Cell Switched Networks e.g Asynchronous Transfer Mode (ATM) and Packet Switched Networks.

Text book/ Reference Books:

[1]   'Computer Networking";   J. F. Kurose   and K.W.Ross, Pearson education

[2].   ' Data Communications and Networking"; B.A. Forouzon, Tata-McGraw-Hill

[3].   ' Computer Networks'; A.S. Tannenbaum

[4].   ' Communication Networks'; Garcia and Widija, Tata-McGraw-Hill.

BTCS 604 Advanced Data Structures

UNIT I:

ADVANCED TREES: Definitions Operations on Weight Balanced Trees (Huffman Trees),2-3 Trees and Red-Black Trees. Augmenting Red-Black Trees to Dynamic Order Statics and Interval Tree Applications. Operations on Disjoint sets and its union-find problem Implementing Sets. Dictionaries, Priority Queues and Concatenable Queues using 2-3 Trees.

UNIT II:

MERGEABLE HEAPS : Mergeble Heap Operations, Binomial Trees Implementing Binomial Heaps and its Operations, 2-3-4. Trees and 2-3-4 Heaps. Structure and Potential Function of Fibonacci Heap Implementing Fibonacci Heap.

UNIT III:

GRAPH THEORY DEFINITIONS : Definitions of Isomorphism Components. Circuits, Fundamental Circuits, Cut-sets. Cut-Vertices Planer and Dual graphs, Spanning Trees, Kuratovski's two Graphs.

UNIT IV:

GRAPH THEORY ALGORITHMS : Algorithms for Connectness, Finding all Spanning Trees in a Weighted Graph and Planarity Testing Breadth First and Depth First Search, Topological Sort, Strongly Connected Components and Articulation Point. Single source shortest path and all pair shortest path algorithms. Min-Cut Max-Flow theorem of Network Flows. Ford-Fulkerson Max Flow Algorithms.

UNIT V:

NUMBER THEORITIC ALGORITHM: Number theoretic notation, Division theorem, GCD recursion, Modular arithmetic, Solving Linear equation, Chinese remainder theorem, power of an element, RSA public key Crypto system, primality Testing and Integer Factorization.

Recommended Books:

1. Narsingh Deo-Graph Theory with Application to Engineering and Computer Science, Prentice Hall of India.
2. Baase-Computer Algorithms,pearson Education.
3. Cormen-Introduction to Algorithms,Prentice Hall of India.
4. Aho A.V.,Hopcrptt J.E. and Ullman J.D.-The Design and Analysis of Computer Algorithms, Pearson Education.
5. Horowitz and Sawhni-Fundamentals of Data Structures Galgotia Book Source.

BTCS 605 Advance Computer Architecture

UNIT I

Fundamentals: Computational models, concept of computer architecture, Von Newmann architecture. Harvard Computer Architecture, Von newmann vs Harvard computational Model

UNIT II

Linear pipeline processor, nonlinear pipeline processor, Instruction pipeline Design, Mechanisms for instruction Pipelining, Dynamic instruction scheduling, Branch Handling techniques, branch prediction, Arithmetic Pipeline Design, Computer arithmetic principles, Static Arithmetic pipeline, Multifunctional arithmetic pipelines Throughput improvement, VLIW architectures.

UNIT III

RISC and CISC architectures: **Arithmetic for Computers:** RISC design versus CISC design.

Instruction level data-parallel architectures: Conditions of parallelism, Data and resource Dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain Size and latency, Program flow mechanisms, Control flow versus data flow, SIMD, vector architectures.

UNIT IV

Interconnection networks: Network topology, Static NW, Interconnection design decisions. Multiprocessors and multicomputer, various classifications & Architecture of Multiprocessor and Multicomputer Common interconnection Structures,

UNIT V

Data Flow computers: Introduction, Data flow Architecture, Demand driven mechanisms, Comparisons of flow mechanisms Data Flow Program Graph, Activity Template, Scheme, Implementation, Pipelining in Data Flow Programs, Basic Mechanism, Data Flow Multiprocessor, Token labeling, MIT architecture.

Text book/ Reference books:

[1]. Advanced Computer Architectures, Sima and Fountain, Pearson Education.

[2]. Computer Architectures single and parallel systems, Mehdi R.Zargham, PHI.

[3]. Advanced Computer Architectures, Hwang, Tata McGraw Hill.

[4]. Kai Hwang, "Advanced computer architecture"; TMH. 2000

BTCS 606A Artificial Intelligence

UNIT I

Introduction to AI, Various types of production systems, Characteristics of production systems, Study and comparison of breadth first search and depth first search. Techniques, Other Search Techniques like hill Climbing, Best first Search. A algorithm, AO algorithms etc, and various types of control strategies.

UNIT II

Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and nonmonotonic reasoning.

UNIT III

Probabilistic reasoning, Baye's theorem, semantic networks scripts schemas, frames, conceptual dependency and fuzzy logic, forward and backward reasoning.

UNIT IV

Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and Natural Languages Processing.

UNIT V

Introduction to learning, Various techniques used in learning, introduction to Neural Networks, applications of Neural Networks, common sense reasoning, some example of Expert systems.

Text/ Reference Books:

1. E.Rich,K Knight-Artificial Intelligence,Tata McGraw Hills.

2. S.Russell,P.Norving-Artificial Intelligence-A Modern Approach,Pearson Education,Asia.

3. Thomas Dean-Artificial Intelligence-Theory & Practice,Pearson Education,Asia.

4. Alison Caursey - The Essence of Artificial Intelligence, Pearson Education, Asia.

BTCS 606B Advanced DBMS

Unit I

Introduction, Parallel database architecture, speedup, scale-up I/O parallelism, Inter-query and Intra-query parallelism, Inter-operational and Intra-operational parallelism, parallel query evaluation, Design of parallel systems, Implementation issues of Parallel query evaluation, Design of parallel systems, Comparison of Inter-query and Intra-query parallelism.

Unit II

Distributed Databases, Study of DDBMS architectures, Comparison of Homogeneous and Heterogeneous Databases, Analysis of Concurrency control in distributed databases, Implementation of Distributed query processing. Distributed data storage, Distributed transactions, Commit protocols, Availability, Distributed query processing, Directory systems-l dap, Distributed data storage and transactions.

Unit III

Overview of client server architecture, Databases and web architecture, N-tier architecture, XML, Introduction, Structure of XML Data, XML Document Schema, DTD, Querying and Transformation: XQuery, FLOWR, XPath, XML validation, Web server, API to XML, Storage of XML Data, XML Applications: web services, Web based system, Implementation of XML validations, Use of web servers. XML and DTD implementation, Use of Web service like Amazon web service or Microsoft Azure.

Unit IV

Information retrieval - overview, Relevance ranking using terms and hyperlinks, synonyms, homonyms, ontologies, Indexing of documents, measuring retrieval effectiveness, web search engines, Information retrieval and structured data. Information Retrieval, Study and Comparison of Synonyms, Homonyms, Ontologies. Implementation issues of Relevance ranking Algorithm.

Unit V

Database security - Security and integrity threats, Defence mechanisms, Statistical database auditing & control. Security issue based on granting/revoking of privileges, Introduction to statistical database security. PL/SQL Security – Locks – Implicit locking, types and levels of locks, explicit locking, Oracles' named Exception Handlers.

Text/ Reference Books:

1. Avi Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, McGraw-Hill, USA.
2. C. J. Date, An Introduction to Database Systems, Addison-Wesley Longman Publishing Co., USA.
3. Stefano Ceri, Giuseppe Pelagatti, Distributed Databases: Principles and Systems, McGraw-Hill, USA.

BTCS 606C Advanced PHP

UNIT I

Introduction to PHP, Data types in PHP, Variables, Constants, operators and Expressions. PHP Operator, Arrays, User defined functions and inbuilt functions, String Function, Math Function, Date Function and Miscellaneous Function. Working with Forms: Get and Post Methods, Query strings, HTML form controls and PHP, Maintaining User State: Cookies, Sessions.

UNIT II

PHP Database Connectivity: Introduction to MYSQL, Creating database and other operations on database, connecting to a database, Use a particular database, Sending query to database, Parsing of the query results, Checking data errors.

UNIT III

PHP Advanced Data Validation, Error Handling, PHP AJAX - XML, PHP PEAR Mail, PHP Zip, Handling CSV data, PHP XML Handling

UNIT IV

Introduction to Object Oriented Programming in PHP, Classes and Objects, Abstraction, Encapsulation, Inheritance and Polymorphism , Constructors and Destructors, Overloading, Overriding of functions, Exception Handling, Regular Expressions, Session Handling ,Using Cookies.

UNIT V

Introduction to PHP frameworks. Introduction to cakePHP and Code Igniter. Introduction to Content Management System, how to configure the CMS, Working with the CMS, Sample Web Application Development using Word press.

Text/ Reference Books:

1. Steven Holzner " PHP: The Complete Reference"
2. Tim Converse, Joyce Park "PHP Bible", 2nd Edition
3. Dave W. Mercer, Allan Kent, Steven D. Nowicki, David Mercer, Dan Squier, Wankyu Choi with Heow Eide-Goodman, Ed Lecky-Thompson, Clark Morgan "Beginning PHP5"

BTCS 606D Principles of Programming Languages

UNIT I:

Programming Language: Definition, History, Features. Issues in Language Design: Structure and Operation of computer, Programming Paradigms. Efficiency, Regularity. Issues in Language Translation: Syntax and Semantics.

UNIT II:

Specifications and Implementation of Elementary and Structured Data Types. Type equivalence, checking and conversion. Vectors and Arrays, Lists, Structures, Sets, Files.

UNIT III:

Sequence control with Expressions, Conditional Statements, Loops, Exception handling. Subprogram definition and activation, simple and recursive subprogram, subprogram environment.

UNIT IV:

Scope – Static and Dynamic, Block structures, Local Data and Shared Data, Parameters and Parameter Transmission. Local and Common Environments, Tasks and Shared Data.

UNIT V:

Abstract Data type, information hiding, encapsulation, type definition. Static and Stack-Based Storage management. Fixed and Variable size heap storage management, Garbage Collection.

Text/ Reference Books:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education,2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.
3. Programming Languages, 2nd Edition, A.B. Tucker, R.E. Noonan, TMH.

4. Programming Languages, K. C.Louden, 2nd Edition, Thomson,2003.

BTCS 606E E- Commerce

UNIT I:

Overview: Definition, scope of electronic commerce, trade cycle, electronic markets, electronic data interchange, Internet commerce and e-commerce perspectives.

Business Strategy and B to B e-commerce: Porter value chain model, inter organizational value chains, Porter model for competitive forces, e-commerce implementation and evaluation, inter organizational transactions, transaction types, credit transaction trade cycle, case study of airline booking system.

UNIT II:

Electronic Data Interchange: definition and benefits, technology, standards, communications, implementations, agreements and securities, trading patterns and transactions. E-commerce Framework: Framework, e-commerce media convergence, anatomy of e-commerce, consumer applications.

UNIT III:

E-commerce and World Wide Web: Architectural Framework for e-commerce, World Wide Web as the architecture, web background-hypertext publishing, technology behind the web, securities and the web, E-commerce Website development.

Electronic Payment Systems: Types of payment systems based on-electronic, digital token, smart cards and credit card, risk in electronic payment systems, desiging of electronic payment systems.

UNIT IV:

ERP: Needs and Evolution of ERP Systems, Benefits of ERP, ERP and Related Technologies: Data Warehousing, Data Mining, On-line Analytical Processing (OLAP), Supply Chain Management. ERP Domain, ERP Modules, ERP Market, identification of suitable platforms, Present global and Indian market scenario, ERP implementation life cycle, Evolution, Maintenance and Retirement phases Framework for evaluating ERP acquisition, Role of consultants, vendors and users in ERP implementation, Implementation vendors evaluation criterion, ERP Implementation approaches and methodology, ERP Implementation strategies, ERP Customization, ERP-A manufacturing Perspective.

UNIT V:

ERP & E-Commerce: Future Directives- in ERP, ERP and Internet, Integrating ERP into organizational culture, guidelines for ERP Implementations.

Recommended Books:

1. A. Lexis Leon, "Enterprise Resource Planning", TMH

2. Brady, Manu, Wegner, "Enterprise Resource Planning", TMH

BTCS 607 Operating Systems (Linux Programming and Administration) Lab

Q1. Study and practice the following-

1.	cal	2.	date
3.	echo	4.	passwd
5.	who	6.	tty
7.	pwd	8.	cd
9.	mkdir	10.	rmdir
11.	ls	12.	cat
13.	cp	14.	rm
15.	mv	16.	more
17.	wc	18.	Cmp

Q2. Study and practice the following-

1. chmod
2. head
3. tail
4. cut
5. paste
6. sort
7. uniq

Q3. Study the grep, sed and awk.

Q4. Study the vi Editor.

Q5. Write a shell script to generate different types of star/text pattern-

```
   **
  ****
 ******
********
********
 ******
  ****
   **
```

Q6. Write a shell script to swap values of two variables x and y.

Q7. Write a shell script to generate the table for a given number.

Q8. Write a shell script to simulate a simple calculator.

Q9. Write a shell script to read three numbers and find the greatest among them.

Q10. Write a shell script to verify whether the given number is Armstrong or not.

Q11. Write a shell script to generate a pyramid of numbers.

Q12. Write a shell script to generate Fibonacci series.

1. To Prepare Network cable for connecting two devices.

- Striate cable

- Cross cable

2. How to configure VLAN.

3. Design Various topology (Ring , Star & Mesh) and ping the network using networking H/W devices

4. What is Socket? Make a TCP client socket to communicate with the server

5. What is server socket? Make a TCP server socket to communicate with the Client

6. Write a program to UDP client.

7. Write a program to UDP server. And establish the connection between them.

8. How to configure the switches.

9. How to configure the firewalls.

10. What is NIC.? How we can set the NIC in your computer

11. How we can use the following command

- telnet

- ping

- sub netting

- Allotment of IP addresses

- How we can measure the network performance.

12. Design Wireless topology on virtual simulation S/W and ping the network

Objectives:

- To make the student learn a object oriented way of solving problems.
- To make the student write ADTS for all data structures.
- To make the student learn different algorithm design techniques.

Week1- C programs to implement the following using an array.

a) Stack ADT b) Queue ADT

Week2- Write C programs to implement the following using a singly linked list.

a) Stack ADT b) Queue ADT

Week3- Write C programs to implement the deque (double ended queue) ADT using

a doubly linked list and an array.

Week 4-Write a C program to perform the following operations:

a) Insert an element into a binary search tree.

b) Delete an element from a binary search tree.

c) Search for a key element in a binary search tree.

Week5-.Write C programs that use non-recursive functions to traverse the given

binary tree in

a) Preorder b) inorder and c) postorder.

Week6-.Write C programs for the implementation of bfs and dfs for a given graph.

Week7- Write C programs for implementing the following sorting methods:

a) Merge sort b) Heap sort

Week8-.Write a C program to perform the following operations

a) Insertion into a B-tree b) Deletion from a B-tree

Week9-.Write a C program to perform the following operations

a) Insertion into an AVL-tree b) Deletion from an AVL-tree

Week10-Write a C program to implement Kruskal's algorithm to generate a   minimum cost spanning tree.

Week11-Write a C program to implement Prim's algorithm to generate a minimum cost spanning tree.

BTCS 610   Advance Computer Architecture Lab

List of Experiments:

1. Write a program to execute three POSIX threads (P threads) simultaneously for Updating a text file.

2. Write a program for synchronizing POSIX threads (P threads) using

- Semaphore
- Mutex

3. Write a program to create child process & Parent Process

4. Write a program to find child process Id & Parent Process ID

5. Write a program to implement Pipelining

6. Write an algorithm and program to perform matrix multiplication of two n * n matrices On the 2-D mesh SIMD model.

7. Write an algorithm and program to perform matrix multiplication of two n * n matrices On Hypercube SIMD Model

8. Write an algorithm and program for Block oriented Matrix Multiplication on Multiprocessor system.

9. Configure a serial interface on each of two routers so that they can communicate.

10. Configure an Ethernet interface on the router with an IP address and a subnet

Semester - VII

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 701	Training & Seminar				540	360	900	28

94

Semester – VIII

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTCS 801	C# and .NET Programming	3	1	-	30	70	100	4
BTCS 802	Software Testing and Quality Assurance	3		-	30	70	100	3
BTCS 803	Compiler Design	3	1	-	30	70	100	4
BTCS 804	Information Security System	3		-	30	70	100	3
ELECTIVE(any one)								
BTCS 805A	Embedded Systems	3	-	-	30	70	100	3
BTCS 805B	Data Mining and Business Intelligence	3	-	-	30	70	100	3
BTCS 805C	Natural Language Processing	3	-	-	30	70	100	3
BTCS 805D	Web Intelligence and Big Data	3	-	-	30	70	100	3
BTCS 805E	Wireless Communication & Networks	3	-	-	30	70	100	3
ELECTIVE(any one)								
BTCS 806A	Parallel Computing	3	-	-	30	70	100	3
BTCS 806B	Advanced Computer Networks	3	-	-	30	70	100	3
BTCS 806C	Distributed Systems	3	-	-	30	70	100	3
BTCS 806D	Soft Computing	3	-	-	30	70	100	3
BTCS 806E	Data Compression Techniques	3	-	-	30	70	100	3
PRACTICALS/VIVA-VOCE					Sessional	Practical	Total	Credits
BTCS 807	C# and .NET Programming Lab			2	30	20	50	1
BTCS 808	Compiler Design Lab			2	30	20	50	1
BTCS 809	Information Security System Lab			2	30	20	50	1
BTCS 810	Summer Training / Industrial Workshop/ Certification			0	30	20	50	2
BTCS 811	Project			4	60	40	100	2
TOTAL		18	2	10	360	540	900	27
Grand Total of Credits		126	15	69	2940	4060	7000	210

BTCS 801 C# and .NET Programming

UNIT 1:

Intorduction to .NET framework, the technologies that constitute the framework., components of .net framework, ,.Net Framework Architecture: Common Language Infrastructure (CLI). Know the role of the Common Type System (CTS), the Common Language Specification (CLS) and the Common Language Runtime (CLR), Understand the assembly, namespace, type distinction, Contrast single-file and multi-file assemblies, Know the role of the Common Intermediate Language (CIL), Platform independent .NET(Mono / Portable .NET distributions).

UNIT 2:

Introduction to C#: Introducing C#, **:** Language Fundamentals Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

UNIT 3:

Object Oriented Aspects of C#: Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions. Application Development on .NET: Building Windows Applications, Accessing Data with ADO.NET.

UNIT 4:

Web Based Application Development on .NET: Programming Web Applications with Web Forms, ASP.NET Architecture, Control based Programming, User Interface Elements, Web Services.

UNIT 5:

The CLR and the .NET Framework: Assemblies, Versioning, Attributes, Reflection, Viewing MetaData, Type Discovery, Reflecting on a Type, Marshaling, Remoting, Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using SingleCall, Threads.

Recommended Books:

1. J. Liberty, "Programming C#", 2nd ed., O'Reilly, 2002.

2. Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2004.

3. Robinson et al, "Professional C#", 2nd ed., Wrox Press, 2002.

4. Andrew Troelsen, "C# and the .NET Platform", A! Press, 2003.

5. Thamarai Selvi, R. Murugesan, "A Textbook on C#", Pearson Education, 2003.

6. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004.

BTCS 802 SOFTWARE TESTING & QUALITY ASSURANCE

UNIT I

Software Configuration Management: SCM Process, Objects in Software configuration, Version Control, Change control, Configuration audit, Status reporting, SCM standards.

Software Quality Assurance: Software Quality Concept, Software Control, Quality Assurance, Quality Assurance Analyst, Quality Factor, Quality Management, Methods of Quality Management, Core components of Quality, Cost Aspect of Quality.

UNIT II

Testing Fundamental: Testing as an Engineering Activity, Role of Process in Software Quality, Testing as a Process, Software Testing Principles, Tester Role in Software Development, Artifacts of testing (Faults, Errors, and Failures), Characteristics of Testable Software , Test Characteristics, Limitations of Testing, Challenges in Software Testing, Testing and debugging, Verification, Validation, Test levels.

UNIT III

Testing Techniques: White Box and Black Box Testing: Different Testing Techniques, Differences between testing techniques

Black Box Testing: Equivalence partitioning, Boundary value analysis, Input domain & Output domain, Special Value, Error based Cause-effect Graph, Comparison Testing.

White Box Testing: Basis Path Testing, Cyclomatic Complexity, Control Structure Testing - Conditions Testing, Data Flow Testing, Loop Testing.

UNIT IV

Testing Strategies: unit test, Integration testing approaches, System testing, Validation Testing

Some Other Strategies: Performance Testing, Load Testing, Stress Testing, Security Testing, User Acceptance Testing, Alpha Testing, Beta Testing, Regression Testing,

UNIT V

Test Planning: Introduction of Test Plan, Need of test plan, The Level of Test Plan, Test Plan Document: Plan Identifier, Test Items, Software Risk Issues, Features to be Tested, Features not to be Tested, Features not to be Tested, Test Pass/Fail Criteria, Test Pass/Fail Criteria, Test Deliverables, Environmental Requirements, Staffing/Training Needs, Schedule of Test, Planning for Risks and Contingencies, Approvals,

Quality Standards: Quality Models/Standards, Standards and guidelines, Types of Models, ISO Standards, CMM and CMMI, Six Sigma concepts, Quality Challenge, National Quality Awards.

Text Books/Reference Book:

1. Paul C. Jorgensen, "Software Testing: A Craftsman's Approach", Auerbach Publications, 2008

2. Yogesh Singh,"Software Testing", Cambridge University Press, 2011

3. Sagar Naik, Piyu Tripathy," Software Testing and Quality Assurance", Wiley

4. Effective methods for Software Testing William Perry, Wiley

5. Aditya P. Mathur, "Foundation of Software Testing", Pearson Education.

6. Milind Limaye,"Software Quality Assurance, McGraw-Hill publication

BTCS 803   Compiler Design

UNIT I:

Brief overview of the compilation process, structure of compiler &its different phases, introduction to one pass, Multi-pass, andCross compiler, Bootstrapping, Review of Finite automata lexical analyzer, buffering, Recognition of tokens, Idea about LEX: A lexical analyzer generator, Error handling.

UNIT II:

Review of CFG Ambiguity of grammars, Introduction to parsing. Bottom up parsing Top down parsing techniques, Shift reduce parsing, Operator precedence parsing, Recursive descent parsing,Predictive parsers. LL grammars &passers,Error handling of LL parser. LR parsers, Construction of SLR, Conical LR & LALR parsing tables, Parsing With ambiguous grammar. Introduction of automatic parser generator, YACC error handling in LR parsers.

UNIT III:

Syntax directed definitions; Construction of syntax trees, L-attributed definitions, Top down translation. Specification of a type checker, Intermediate code forms using postfix notation and three address code, Representing TAC using triples and quadruples, Translation of assignment statement.Boolean expression and Control structures.

UNIT IV:

Storage organization, Storage allocation, Strategies, Activation records, Accessing local and nonlocal names in a block structured language, Parameters passing, Symbol table organization, Data structures used in symbol tables.

UNIT V:

Definition of basic block control flow graphs, DAG representation of basic block, Advantages of DAG, Sources of Optimization, Loop optimization, Idea about global data flow analysis, Loop invariant computation, Peephole Optimization, Issues in design of code generator, A simple code generator, Code generation from DAG.

Text/Reference Books:

1. 'Compilers Principles, Techniques and Tools',Aho, Pearson Education.

2. 'Modern Compiler Design', Galles, Pearson Education.

3. 'The Essence of Compilers', Hunter, Pearson Education.

Unit I:

Multi level model of security, Cryptography, Secret Key Cryptography, Modes of Operation, Hashes and Message Digest, Public Key Algorithm, Security Handshake Pitfall, Strong Password Protocol; Case study of real time communication security;

Unit II:

Introduction to the Concepts of Security, Security Approaches, Principles of security, Types of attacks; Cryptographic Techniques: Plain text and Cipher text, Substitution Techniques, Transposition Techniques Encryption and Decryption, Symmetric and Asymmetric Key Cryptography. Computer-based symmetric Key Cryptographic;

Unit III:

Algorithms: Algorithm Types and Modes, An Overview of Symmetric Key Cryptography, Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), Advanced Encryption Standard (AES);
Computer-based Asymmetric Key Cryptographic Algorithms; Cryptography, An Overview of Asymmetric Key Cryptography, The RSA algorithm, Symmetric and Asymmetric Key Cryptography Together, Digital Signatures, Knapsack Algorithm;

Unit IV:

Public Key Infrastructure (PKI) Digital Certificates, Private Key Management , The PKI Model, Public Key Cryptography Standards (PKCS); Internet Security Protocols Secure Socket Layer (SSL) , Secure Hyper Text Transfer Protocol (SHTTP) , Time Stamping Protocol (TSP), Secure Electronic Transaction (SET), SSL versus SET, 3-D Secure Protocol , Electronic Money , Email Security;

Unit V:

User Authentication Mechanisms : Authentication Basics, Passwords, Authentication Tokens, Certificate-based Authentication; Practical Implementations of Cryptography/Security: Cryptographic Solutions Using Java, Cryptographic Solutions Using Microsoft, Cryptographic Toolkits, Security and Operating Systems; Network Security: Brief Introduction to TCP/IP, Firewalls, IP

Security, Virtual Private Networks (VPN); Case Studies on Cryptography and Security:

Reference Books:

1. Atul Kahate "Cryptography and Network Security" Tata McGraw-Hill

2. Charlie Kaufman,Radia Perlman,Mike Speciner" Network Securities" Pearson,

3. J. A. Coopeer "Computer Communication Securities"TMH,

4. D.W. Davies W. L. Price "securities For computer Networks"

5. John Wiley Sons, L.Stein "Web Securities A step by step Guide " Addison Wesley.

BTCS 805A Embedded Systems

UNIT 1:

Introduction: Review of embedded hardware, Terminology- Gates, Timing Diagram, Memory, Microprocessor Buses, Direct Memory Access, Interrupts, Built ins on the Microprocessor. Conventions used on Schematic, Microprocessor Architecture – Interrupt Basic – Shared Data Problems – Interrupt Latency.

UNIT 2:

PIC Micro controller & Interfacing: Introduction, CPU Architecture, Registers, Instruction Sets, Addressing Modes, Programs, Interfacing Methods, Parallel I/O Interface, Parallel Port Interface, Memory Interfacing, High Speed I/O Interfacing, Interrupts – Interrupt Service Routine – features of Interrupts – Interrupt vector & Priority, Timing Generation & Measurements, Input Capture, Output Compare, Frequency Measurement, Serial I/O Device RS232, RS845, Analog Interfacing, Applications.

UNIT 3:

Embedded Microcomputers Systems: Architecture Registers, Addressing Modes, Programs Interfacing Methods, Parallel I/O interface, Parallel Port Interface, Memory Interfacing, High Speed I/O Interfacing, Interrupts, Timing Generation and measurement, Input Capture Output Compare, Frequency Measurement, Serial I/O device RS232, RS485, Analog Interfacing, Applications.

UNIT 4:

Software Development & Tools: Embedded System Evolution Trends, Round – Robin, Robin with Interrupts, Function – one – Scheduling architecture, Algorithms, Introduction to assembler – Compiler –n Cross compilers and Integrated Development Environment IDE, Object Oriented Interfacing, Recursion, Debugging Strategies, Simulators.

UNIT 5:

Real Time Operating Systems: Task And Task States, Tasks And Data, Semaphores and shared data operating System, Services, Message queues, Timer Function, Events, Memory Management, Interrupt Routines in an RTOS Environment, Basic Design Using RTOS.

Recommended Books:

1. D. D. Gajski, F. Vahid, S. Narayan, J. Gong, *Specification and Design of Embedded Systems,* Prentice Hall.

2. Steve Heath, Embedded systems design, Newnes, 1997.

3. Hardware Software Co-design of Embedded Systems, F. Balarin, Chiodo, et al., Kluwer Academic Publishers,

BTCS 805B Data Mining & Business Intelligence

UNIT I

Introduction to Data Mining, Importance of Data Mining, Data Mining functionalities, Classification of Data mining systems, Data mining architecture, Major Issues in Data Mining, Applications of Data Mining, Social impacts of data mining. Data Preprocessing, Data cleaning, Data Integration and Transformation, Data reduction, Discretization and Concept Hierarchy Generation.

UNIT II

The Compelling Need for data warehousing: Escalating Need for strategic information, failures of Past decision-support systems, operational versus decision-support systems, Introduction to Data Warehouse and OLAP Technology for Data Mining, Multidimensional data Model, Data warehouse Data Model, Data warehouse Architecture, Data warehouse Implementation, Development of Data Cube Technology, From Data warehousing to Data Mining.

UNIT III

Data Mining primitives, Languages and System Architectures, Concept description: Characterization and Comparison, Analytical Characterization, Mining Class Comparison.

Association Rule Mining, Mining of Single dimensional Boolean association rules, Multilevel association rules and Multidimensional association rules.

UNIT IV

Classification and Predication: Basic issues regarding classification and predication, Classification by Decision Tree, Bayesian classification, and classification by back propagation, Associative classification, Prediction, Classifier accuracy.

Cluster Analysis, basic issues, clustering using partitioning methods, Hierarchical methods, Density based methods, Grid based methods and model based methods, Algorithms for outlier analysis.

UNIT V

Mining complex Types of data: Multidimensional analysis and descriptive mining of complex data objects, Introduction to spatial mining, multimedia mining, temporal mining, text mining and web mining with related algorithms.

Reference Books:

1. Data Mining concepts and Techniques by Jiawei Han, Micheline Kamber –Elsevier.
2. Data Mining by Arun K. Pujari – University Press.
3. Mordern Data Warehousing, Data Mining and Visualization by George M. Marakas–Pearson.
4. Data Mining by Vikram Puri And P.RadhaKrishana –Oxfrod Press.
5. Data Warehousing by Reema Theraja –Oxford Press

BTCS 805C NATURAL LANGUAGE PROCESSING

UNIT-I

Introduction to NLP

Achievement and brief history, open problems, major goal, characteristic of Language, Language structure, Language analyzer

UNIT-II

Study of Grammar and Semantics

Morphology, word formation, theory of semantics, componential theory of meaning, truth conditional theory of meaning, pragmatics and discourse

UNIT-III

Machine Translation

Introduction, problems of machine translation. Approaches, language Accesor, Structure of Anusaraka system.

UNIT-IV

Lexical: Functional Grammar (LFG) Overview of LGF, LFG formalism, well formedness conditions, computational aspects.

UNIT V

CFG and Indian languages, functional specification, tree adjoining grammar.

Text Books:

1. Natural language processing by Akshar Bhartati, Sangal and Chaitanya, Eastern Economy Edition
2. An introduction to Linguistics, language grammar and semantics by P.Syal and D.V.Jindal, Eastern Economy Edition
3. Natural Language Processing with Python 1st Edition, Steven Bird
4. Foundations of Statistical Natural Language Processing, Christopher Manning

UNIT-I

Introduction: Web Scale AI and Big Data, Web Intelligence, Big Data Look**:** Indexing- Index creation, Ranking, Page Rank Searching- Enterprise search, Searching structured data, Object Search, Locality Sensitive Hashing and Memory.

UNIT-II

Listen: Streams, Information and Language, Analyzing Sentiment and Intent Load**:** Databases and their Evolution, Big data Technology and Trends.

UNIT III

Programming: Map-Reduce, Map-Reduce applications and its efficiency, Big-Table and HBase

UNIT-IV

Learn: Classification, Clustering, and Mining, Information Extraction
Connect: Reasoning: Logic and its Limits, Dealing with Uncertainty.

UNIT-V

Predict: Forecasting, Neural Models, Deep Learning, and Research Topics.
Data Analysis: Regression and Feature Selection

Text Book:

- The Intelligent Web: Search, Smart Algorithms and Big Data published by Oxford University Press, UK, in November 2013, authored by Dr. Gautam Shroff.

- Mining Massive Datasets by J.D. Ullman and A. Rajaraman (Cambridge University Press, UK 2012)

- Introduction to Information Retrieval by Christopher Manning, Prabhakar Raghavan and Hinrich Schutze (Cambridge University Press, UK 2008).

BTCS 805E Wireless Communication & Networks

UNIT I:

DIGITAL COMMUNICATION THROUGH FADING MULTIPATH CHANNELS: Fundamentals of fading, Multipath channels, Fading channel and their characteristics, Channel modeling, Digital signaling over a frequency non selective slowly fading channel, frequency selective slowly fading channel, Spread Spectrum signals: Direct-sequence spread spectrum signals, p-n sequences, Frequency-hopped spread spectrum signals, Code-division multiplexing.

UNIT II:

MULTIPLE ACCESS TECHNIQUES: Introduction, Frequency Division Multiple Access, Time Division Multiple Access TDMA based networks, CDMA with reference to mobile radio and satellite systems. CDMA based networks Spread Spectrum Multiple Access, Space Division Multiple Access, Packet Radio Protocols, pure ALOHA, Slotted ALOHA Cellular Systems

UNIT III:

CELLULAR WIRELESS NETWORKS: GSM: Introduction, overview of the GSM systems, GSM codec, channel coding and interleaving, radio like control. Cordless systems and WLL, Mobile IP, Wireless access protocol. Wireless LAN's: Technology, IEEE 802.11 standards and Blue tooth. Broadband Wireless 802.16, Wi-Fi technology

UNIT IV:

WIRELESS NETWORKING: Introduction, Difference between Wireless & Fixed Telephone Networks, Development of Wireless Networks, Traffic Routing in Wireless Networks, Wireless Data Services, Common Channel signaling, broad band ISDN & ATM, Signaling System No. 7(SS-7), Personal Communication Services/ Networks, Protocols for Network Access, Network Databases.

UNIT V:

SATELLITE COMMUNICATION: Elements of satellite communication: Frequency bands, Transmission and multiplexing. Modulation, Multiple access. Satellite orbit and description- orbital period and velocity, effects of orbital

inclination, Azimuth and elevation, Coverage angle and slant range, Geostationary orbit, Satellite description. Earth Station antenna, high-power amplifier, low-noise amplifier, up converter, down converter, monitoring and control, reliability. Satellite Link: basic link analysis.

References books Recommended:

1   William   Stallings,   Wireless   Communications   &   Networks,   Pearson publication,2005

2. Dr. RajKamal, Mobile Computing,TMH publications

3. Theodore S.Rappaport, "Wireless communications: Principles and practice", third Indian reprint Pearson Education Asia 2003.

4. Schiller, Mobile Communication, Pearson Education India.

BTCS 806A PARALLEL COMPUTING

UNIT I

Theory of Parallelism: Parallelism, Reason of parallel processing, Concepts and challenges, applications of parallel processing.

Parallel computer models: The state of computing, Classification of parallel computers, Flynn and Feng's classification, SIMD and MIMD operations, Shared Memory vs. message passing multiprocessors, Distributed shared memory, Hybrid multiprocessors, multiprocessors and multicomputers, Multivector and SIMD computers, PRAM and VLSI Models.

Program and Network Properties: Conditions of parallelism, program partitioning and scheduling, program flow mechanism, system interconnection architecture.

UNIT II

Memory Hierarchy Design: Memory technologies and optimization, inclusion, coherence and locality, cache memory organization and cache performance optimization, shared memory organization, memory protection, virtual memory technology and introduction to buses, crossbar and multi-stage switches.

UNIT III

Pipelining and ILP: Instruction level parallelism and its exploitation- concepts and challenges, overcoming data hazards with dynamic scheduling. Pipelining, instruction and arithmetic pipelining designs, branch handling techniques, linear and non-linear pipeline processors, superscalar and super pipeline design.

UNIT IV

Parallel architectures: multi-processor system interconnects, cache coherence and synchronization mechanism, message passing mechanism, vector processing principles, multivector multiprocessors, compound vector processing, principles of multithreading, latency hiding techniques- shared virtual memory, prefetching techniques, distributed coherent cache, scalable and multithread architectures, dataflow and hybrid architecture.

UNIT V

Parallel Programming Platforms: Implicit Parallelism: Trends in Microprocessor Architectures, limitations of Memory System Performance, Dichotomy of Parallel Computing Platforms, Physical Organization of Parallel Platforms, Communication Costs in Parallel Machines, Routing Mechanisms for

Interconnection   Networks.
Parallel Programming Models: Shared variable models, message passing models, parallel languages and complier, code optimization and scheduling, Introduction of shared-memory MIMD machines and message-passing MIMD machines.

Text Books:

- Introduction to Parallel Computing by Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar in Pearson Publication.
- Advance computer Architecture by Kai Hwang under Tata McGraw Hill publications.
- Introduction to Parallel Processing: Algorithms & Architectures, Behrooz Parhami in Springer Shop.
- Introduction to Parallel Processing by P. Ravi Prakash, M. Sasikumar, Dinesh Shikhare By PHI   Publications.
- Fundamentals of Parallel Processing by Jordan Harry, Alaghband Gita, PHI Publication
- Introduction to Parallel Programming by Steven Brawer.
- Parallel Computers – Architecture and Programming by V. Rajaraman And C. Siva Ram Murthy.

BTCS 806B ADVANCED COMPUTER NETWORKS

UNIT-I

Network Layer ARP, RARP, ICMP, IPv4 Routing Principles, Routing and overview, DVR and LSR, the IGRP and EIGRP, BGP, Routing Information Protocol (RIP), OSPF (IPv4 / IPv6). Multicasting in IP Environments-Broadcasting, Multicasting, IGMP and Multicast Listener Discovery (MLD). The Distance Vector Multicast Routing Protocol (DVMRP), Multicast OSPF (MOSPF), Protocol Independent Multicast (PIM).

UNIT-II

Transport Layer: Transport layer overview, UDP, TCP (Flow Control, Error Control, and Connection Establishment), TCP Protocol: TCP Tahoe, TCP Reno.

UNIT-III

Optical Networking: Introduction to Optical networking, its benefits and drawbacks, SONET layered architecture, frame format, SONET network configuration, its advantages and benefits.

UNIT-IV

Quality of Service: Introducing QoS, Queue Analysis, QoS Mechanisms, Queue Management algorithms, Resource Reservation,

UNIT-V

Overview of latest concepts: TCP/IP Applications: VoIP, NFS, Telnet, FTP, SMTP, SNMP, Finger, Whois and WWW, IP v6 and Next Generation Networks, xAAS(PAAS,SAAS,HAAS) and Cloud Computing, Big data, Elements of Social Network.

Text Books:

[T1] Douglas E. Comer, "Internet networking with TCP/IP", Pearson. TCP/IP, Vol. 2

[T2] B. A. Forouzan, "TCP/IP Protocol Suite", TMH, 2nd Ed., 2004.

Reference Books:

[R1] TCP/IP Illustrated, Volume 1 (The Protocols) by W. Richard Stevens, Pearson Education.

[R2] U. Black, "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.

[R3] W. Stallings, "Computer Communication Networks", PHI, 1999.

BTCS 806C Distributed Systems

UNIT I

Architectural models for distributed and mobile computing systems. Basic concepts in distributed computing such as clocks, message ordering, consistent global states, and consensus.

Basic Algorithms in Message: Passing Systems, Leader Election in Rings, and Mutual Exclusion in Shared Memory, Fault-Tolerant Consensus, Causality and Time. Message Passing: PVM and MPI.

UNIT II

Distributed Operating Systems:OS and network operating systems, Distributed File systems. Middleware, client/server model for computing, common layer application protocols (RPC, RMI, streams), distributed processes, network naming, distributed synchronization and distributed object-based systems.

UNIT III

Simulation:A Formal Model for Simulations, Broadcast and Multicast, Distributed Shared Memory, Fault-Tolerant Simulations of Read/Write Objects Simulating Synchrony, Improving the Fault Tolerance of Algorithms, Fault-Tolerant Clock Synchronization.

UNIT IV

Distributed Environments: Current systems and developments (DCE, CORBA, JAVA). Advanced Topics: Randomization, Wait-Free Simulations of Arbitrary Objects, Problems Solvable in Asynchronous Systems, Solving Consensus in Eventually Stable Systems, High Performance Computing-HPF, Distributed and mobile multimedia systems. Adaptability in Mobile Computing. Grid Computing and applications. Fault tolerant Computing Systems.

UNIT V

Parallel Processing:Basic Concepts: Introduction to parallel processing, parallel processing terminology, Parallel & Distributed Programming: Parallel Programming environments

Text Books:

1. Tannenbaum, A, Van Steen. Distributed Systems, Principles and Paradigm, Prentice Hall India, 2002

2. Tannenbaum, A. Distributed Operating Systems, Pearson Education. 2006

3. Attiya, Welch, "Distributed Computing", Wiley India, 2006

Reference Books:

1. Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar, "Introduction to parallel computing", 2nd Edition, Pearson Education, 2007

2. Cameron Hughes, Tracey Hughes, "Parallel and distributed programming using C++", Pearson Education, 2005

3. Tanenbaum, A, "Modern Operating Systems", 2nd Edition, Prentice Hall India, 2001.

4. Singhal and Shivaratri, "Advanced Concepts in Operating Systems", McGraw Hill, 1994

5. Michael J. Quinn, "Parallel Computing – Theory and Practice, 2nd Edition, McGraw Hill, 1994

BTCS 806D SOFT COMPUTING

UNIT-I:

Neural Networks: History, overview of biological Neuro-system, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, unsupervised and reinforcement Learning, ANN training Algorithms-perceptions, Training rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks.

UNIT-II:

Fuzzy Logic: Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation. Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation, Operations.

UNIT-III:

Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations. Fuzzy Logic: Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers,

Uncertainty based Information: Information & Uncertainty, Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets.

UNIT-IV:

Introduction of Neuro-Fuzzy Systems: Architecture of Neuro Fuzzy Networks.

Application of Fuzzy Logic: Medicine, Economics etc.

UNIT V:

Algorithm: An Overview of Genetic Algorithm, Artificial Bee Colony Algorithm, Ant Colony Algorithm etc. Applications and implementation of these algorithms.

Text Books:

- Hertz J. Krogh, R.G. Palmer, "Introduction to the Theory of Neural Computation", Addison-Wesley, California, 1991.

- G.J. Klir & B. Yuan, "Fuzzy Sets & Fuzzy Logic", PHI, 1995.

- Melanie Mitchell, "An Introduction to Genetic Algorithm", PHI, 1998.

- F. O. Karray and C. de Silva, "Soft computing and Intelligent System Design", Pearson, 2009.

- "Neural Networks-A Comprehensive Foundations", Prentice-Hall International, New Jersey, 1999.

- Freeman J.A. & D.M. Skapura, "Neural Networks: Algorithms, Applications and Programming Techniques", Addison Wesley, Reading, Mass, (1992).

BTCS 806E Data Compression Techniques

Unit I:

Compression Techniques: Lossless, lossy, measure of Compression Techniques: performance, modeling & coding. Lossless compression: Derivation of average informa Lossless compression: tion, data models, uniquely decodable codes with tests, prefix codes, Kraft-Mc Millan inequality. Huffman coding: Algorithms, minimum variance Huffman codes, optimality, length extended codes, adaptive coding, Rice codes, using Huffman codes for lossless image compression.

Unit II

Arithmetic coding with application to lossless compression. Dictionary Techniques: LZ77, LZ78, LZW Dictionary Techniques: Predictive coding: Burrows-Wheeler Transform and mo Predictive coding: ve-to-front coding, JPEG-LS Facsimile Encoding: Run length, T.4 and T.6 Facsimile Encoding:

Unit: III

Lossy coding- Mathematical preliminaries: Distortio Lossy coding n criteria, conditional entropy, average mutual information, differential entropy, rate distortion theory, probability and linear system models. Scalar quantization: The quantization problem, unif Scalar quantization: orm quantizer, Forward adaptive quantization, non-uniform quantization-Formal adopting quantization, companded Quantization Vector quantization: Vector quantization: ntization: Introduction, advantages, The Linde-Ruzo-Grey algorithm, lattice vector quantization.

Unit IV Differential encoding – Introduction, Basic algorit Differential encoding hm, Adaptive DPCM, Delta modulation, speech and image coding using delta modulation. Sampling in frequency and time domain, z-transform, DCT, DST, DWHT, quantization and coding of transform coefficient.

Unit V

Sub band coding: Introduction, Filters, Basic algor Sub band coding: ithm, Design of Filter banks, G.722, MPEG. Wavelet based compression: Introduction, wavelets m Wavelet based compression: ulti-resolution analysis and the scaling function implementation using filters.

1. Visual Studio DOT NET Installation with various facilities.

2. Write a program in C# which include these following topics:-
    1. Data Types
    2. Operators & Expressions
    3. Branching ,Looping ,Methods
    4. Array, String

3. Write a program in C# which include all OOP features like:-
    1. Class ,Object ,
    2. Inheritance,
    3. Polymorphism ,
    4. Exception Handling etc.

4. Write a program make clone of a given array.

5. Write a program to make property as read-only and write only.

6. Write an application to print the rank of an array of integers.

7. Write an application that will store 10 string values into hash table and print the contents of this hash table.

8. Write an application that will use Hash table to store 10 elements. Also write a code that will search for a specific element.

9 .write a program in C# Language to demonstrate the usage of Delegates.

10. To write a program in C# Language to demonstrate the Mouse Events.

11. Write a program to connect to the master database in SQL Server, in the Page_Load event. When the connection is established, the message "Connection has been established" should be displayed in a label in the form.

12. Write an application that contains a list of following technologies:

• ASP.NET

• ADO.NET

• C#

It also contains a textbox in which the user has to enter a name and a textarea in which the user has to enter his comments. When the Submit is clicked, the output should display the name entered in the textbox and the user-selection from the listbox. All the above should be displayed with the tracing for the page being enabled.

13. Write a Web application that generates the "IndexOutOfRange" exception when a button is clicked. Instead of displaying the above exception, it redirects the user to a custom error page. All the above should be done with the trace for the page being enabled.

14. Create a component that contains an array of 100 integers and a corresponding indexer. From a Web page, assign values to some of its elements. Then the Web Form should display the first 10 elements of the indexer.

1. Develop an in depth understanding of system programming concept.Lexical analysis, syntax analysis, semantics analysis, code optimization, code generation. Language specification and processing

2. Develop an Understanding of Scanning by using concept of Finite state automaton. Parse tree and syntax tree, Top down parsing (recursive decent parsing, LL (1) parser) Bottom up parsing (operator precedence parsing) .Managing symbol table, opcode table, literal table, pool table

3. Develop an Understanding of Intermediate code form: Three address code, Polish notation (Postfix strings)

4. Develop an Understanding of Allocation data structure. Heaps

5. Develop an Understanding about Language processor development tools: LEX, YACC. Language processing activities (Program generation and execution) It is expected that each laboratory assignments to given to the students with an aim to In order to achieve the above objectives

Indicative List of exercises:

1. Write grammar for a fictitious language and create a lexical analyzer for the same.

2. Develop a lexical analyzer to recognize a few patterns in PASCAL and C (ex: identifiers, constants, comments, operators etc.)

3. Write a program to parse using Brute force technique of Top down parsing

4. Develop on LL (1) parser (Construct parse table also).

5. Develop an operator precedence parser (Construct parse table also)

6. Develop a recursive descent parser

7. Write a program for generating for various intermediate code forms i) Three address code ii) Polish notation

8. Write a program to simulate Heap storage allocation strategy

9. Generate Lexical analyzer using LEX

10. Generate YACC specification for a few syntactic categories

11. Given any intermediate code form implement code optimization techniques

Reference

V.V Das, Compiler Design using FLEX and YACC, PHI

BTCS 809 Information Security System Lab

List of Projects are as follows (Implement any one with specific reference to Information System Security)

1. Shopping cart project using ADO.NET: This sample project has all basic features required for a shopping cart web site

including Login, Registration, Add to Cart, Checkout etc. A good ASP.NET learning project using C#, ASP.NET, SQL Server.

2. Personal Assistant: This is a small project for managing personal details. Current version of this project support Address Book feature - Add, Edit and Manage contacts and addresses using VB.NET.

3. Address Book: This is a small project for managing contact details. This is a C# version of the 'Personal Assistant' project.

4. School Management System: This is a project for managing education institutes using C#.

5. Library Management System: This is an academic project for students using Java.

6. spider Alerts & Web services: This project communicates with web services and downloads Alerts from the web server using Java & XML.

7. Patient Information System: This software can be used to keep track of the patients' information and treatment details in a hospital or clinic. Some of the advanced features include patient consulting, lab information, billing etc using JSP, Servlet & JDBC.

8. Web based Address Book: This application can be used to keep track of your contacts/addresses. N Tier architecture is used to separate data layer, business layer and UI layers.

BTCS 810 : Summer Training / Industrial Workshop/ Certification

BTCS 811 :Project

****