YBN UNIVERSITY,RANCHI

School Of Engineering and Technology

B.Tech. Semester-I **Common to all Branches**

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted						Credits Allotted Subject wise			Total Credits	Remark
			Theory Slot			Practical Slot							
			End Sem.	Mid Sem. MST(Two tests average)	Quiz, Assig-nment	End Sem	Term work						
							Lab work & sessional	Assignment / quiz	L	T	P		
1	YBE101	Engineering Chemistry	70	20	10	30	10	10	3	1	2	06	: One credit refers to one hour teaching in theory, Tutorial and in practical. :32 hour workload per week corresponding to LTP
2	YBE102	Engineering Mathematics -I	70	20	10				3	1		04	
3	YBE 103	Communication Skills	70	20	10	30	10	10	3	1	2	06	
4	YBE 104	Basic Electricals & Electronics Engg.	70	20	10	30	10	10	3	1	2	06	
5	YBE 105	Engineering Graphics	70	20	10	30	10	10	3	1	2	06	
6	YBE 106	Work Shop Practice	-	-	-	30	10	10	-	-	2	02	Total Mark
		Total	350	100	50	150	50	50	15	05	10	30	750

MST: Mid Semester Tests Taken at Least twice Per Semester **L:Lecture- T:Tutorial - P: Practical**

YBN UNIVERSITY,RANCHI

School Of Engineering and Technology

B.Tech. Semester-II **Common to all Branches**

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted						Credits Allotted Subject wise			Total Credits	Remark
			Theory Slot			Practical Slot							
			End Sem.	Mid Sem. MST	Quiz, Assign-ment	End Sem.	Term work						
							Lab work sessional	Assignment / quiz	L	T	P		
1	YBE201	Engineering Physics	70	20	10	30	10	10	3	1	2	06	: One credit refers to one hour teaching in theory, Tutorial and in practical. :32 hour workload per week corresponding to LTP
2	YBE202	Energy, Environment, Ecology & Society	70	20	10				3	1		04	
3	YBE203	Basic Mechanical Engg.	70	20	10	30	10	10	3	1	2	06	
4	YBE204	Basic Civil Engg. &Engg. Mechanics	70	20	10	30	10	10	3	1	2	06	
5	YBE205	Basic Computer Engg.	70	20	10	30	10	10	3	1	2	06	
6	YBE206	Language Lab. & Seminars	-	-	-	30	10	10	-	-	2	02	Total Mark
		Total	350	100	50	150	50	50	15	05	10	30	750

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Engineering Chemistry	YBE 101	Theory	Practical	
			Min.“D”	Min.“D”	5.0

Unit I

WATER AND ITS INDUSTRIAL APPLICATIONS :

Sources, Impurities, Hardness & its units, Industrial water characteristics, softening of water by various methods (External & Internal treatment), Boiler trouble causes, effect & remedies, Characteristics of municipal water &its treatment, Numerical problems based on softening methods.

Unit II

FUELS & COMBUSTION:

Fossil fuels & classification, Calorific value, Determination of calorific value by Bomb calorimeter Proximate and Ultimate analysis of coal and their significance, calorific value Computation based on ultimate analysis data, Carbonization, Manufacturing of coke & recovery of by products. Knocking, relationship between' knocking & structure of hydrocarbon, improvement of anti knocking characteristics of IC engine fuels, Diesel engine fuels, Cetane number, combustion and it related numericalproblems.

Unit III

A. LUBRICANTS:

Introduction, Mechanism of lubrication, Classification of lubricants, Properties and Testing of lubricating oils, Numerical problems based on testing methods.

B. CEMENT &REFRACTORIES:

Manufacture , IS-code, Setting and hardening of cement, Refractory : Introduction, classification and properties of refractories .

Unit IV

HIGH-POLYMER :

Introduction, types and classification of polymerization, Reaction. Mechanism, Natural &Synthetic Rubber; Vulcanization of Rubber, Preparation, Properties &uses of the following- Polythene, PVC, PMMA, Teflon, Poly acrylonitrile, PVA, Nylon 6, Nylon 6:6, Terylene, Phenol formaldehyde, Urea - Formaldehyde Resin, Glyptal, Silicone Resin, Polyurethanes; Butyl Rubber, Neoprene, Buna N, Buna S.

Unit V

A. INSTRUMENTAL TECHNIQUES IN CHEMICAL ANALYSIS:

Introduction, Principle, Instrumentation and applications of IR, NMR, UV, Visible, Gas Chromatography, Lambert's and Beer's Law

B. WATER ANALYSIS TECHNIQUES:

Alkalinity, hardness (Complexo-metric), Chloride, Free chlorine, DO, BOD and COD, Numerical problems based on above techniques.

Reference Books:

1. Chemistry for Environmental Engineering &Science- Sawyer, McCarty and Parkin – McGraw Hill, Education Pvt. Ltd., NewDelhi
2. Engineering Chemistry - B.K. Sharma, Krishna Prakashan Media (P) Ltd.,Meerut.
3. Basics of Engineering Chemistry - S. S. Dara& A.K. Singh, S. Chand & Company Ltd.,Delhi
4. Applied Chemistry - Theory and Practice, O.P. Viramani, A.K. Narula, New Age International Pvt. Ltd. Publishers, NewDelhi
5. Polymer Science – Ghosh, Tata McGrawHill.
6. Engg. Chemistry –ShashiChawla, DhanpatRai& company pvt. Ltd,Delhi.
7. Engg. Chemistry –Jain & Jain, DhanpatRai& company pvt. Ltd, NewDelhi
8. A Text book of Engg. Chemistry- Agrawal, C.V, Murthy C.P, Naidu, A, BSPublication, Hyderabad.

Engineering Chemistry Practical

NOTE: At least 10 of the following core experiments must be performed during the session.

1. WaterTesting

(i) Determination of Totalhardness by Complexometric titration method.
(ii) Determination of mixedalkalinity
(a) OH^- &$C0_3^{--}$
(b) CO_3^{--} &HCO_3^-
(iii) Chloride ion estimation by Argentometric method.

2. Fuels &lubricant testing:

(i) Flash &fire points determination by
a) Pensky MartinApparatus,
b) Abel'sApparatus,
c) Cleveland's open cupApparatus.
d) Calorific value by bombcalorimeter

(ii) Viscosity and Viscosity index determination by
a) Redwood viscometerNo.1
b) Redwood viscometer No.2

(iii) Proximate analysis of coal
a) Moisture content
b) Ashcontent
c) Volatile matter content
c) Carbon residue

(iv) Steam emulsification No &Anline point determination

(v) Cloud and Pour point determination of lubricating oil

3. AlloyAnalysis

(i) DeterminationofpercentageofFeinanironalloybyredoxtitrationusingN-Phenyl anthranilic acid as internalindicator.
(ii) Determination of Cu and or Cr in alloys by IodometricTitration.
(iii) Determination of % purity of Ferrous Ammonium Sulphate & Copper Sulphate.

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Engineering Mathematics - I	YBE102	Theory	Practical	
			Min."D"	-	5.0

Unit I

DIFFERENTIAL CALCULUS :

Expansion of functions by Maclaurin's and Taylor's theorem. Partial differentiation, Euler's theorem and its application in approximation and errors, Maxima and Minima of function of two variables, Curvature : Radius of curvature, centre of curvature.

Unit II

INTEGRAL CALCULUS :

Definite Integrals : Definite Integrals as a limit of a sum , its application in Summation of series, Beta and Gamma Functions , Double and Triple Integrals, Change of Order of Integration, Area,Volume and Surfaces using double and triple Integral.

Unit III

DIFFERENTIAL EQUATIONS :

Solution of Ordinary Differential Equation of first order and first degree for Exact differential Equations, Solution of Ordinary Differential Equation of first order and higher degree (solvable for p, x and y, Clairauts Equation), Linear Differential Equations with Constant Coefficients, Cauchy's Homogeneous differential Equation, Simultaneous differential Equations, Method of Variation ofParameters

Unit IV

MATRICES :

Rank, Solution of Simultaneous equation by elementary transformation, Consistency of System of Simultaneous Linear Equation, Eigen Values and Eigen Vectors, Cayley-Hamilton Theorem and its Application to find the inverse

Unit V

Algebra of Logic, Boolean Algebra, Principle of Duality, Basic Theorems, Boolean Expressions and Functions. Elementary Concept of Fuzzy Logic

Graph Theory : Graphs, Subgraphs, Degree and Distance, Tree, cycles and Network,

References:

(i) Advance Engg. Mathematics. By Ramana, Tata McGraw hill.
(ii) Higher Engineering Mathematics by BS Grewal, KhannaPublication
(iii) Advance Engineering Mathematics byD.G.Guffy
(iv) Engineering Mathematics by S SSastri.P.H.I.

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Communication Skills	YBE103	Theory	Practical	
			Min.“D”	Min.“D”	5.0

Unit I - Languages and skills of communication

Linguistic techniques, Modern usages, Reading comprehension, English phonetic symbols/sings, Oral presentation, Audition Communication, Processes of Communication, Verbal and Non Verbal Communication, Barriers to Communication.

Unit II - Application of linguistic ability

Writing of definitions of Engineering terms, Objects, Processes and Principles (Listening) Topics of General Interest, Reproduction from business, daily life, travel, health, buying and selling, company structure, systems etc.

Unit III - Letter Writing:

Applications, Enquiry, Calling quotations, Tenders, Order and Complaint.

Unit IV

Precise Writing, Noting and drafting, Technical Description of simple engineering objects andprocesses (writing), Report writing, precise writing, Note writing, Slogan writing comment, Speechadvertising.

Unit V

Writing Technical reports of the type of observation report, Survey report, Report of trouble, Laboratory Report and ProjectReport on the subjects of engineering. (Speaking)Vocabulary, Presentations, Demonstrations, Conversation – Telephone media, socializing, cultural events, debates,speech.

Communicative Language Lab.

Course objective: The language lab focuses on the production and practice of sounds of English through audio – visual aids and Computer software. It intends to enable the students to speak English correctly with confidence and intends to help them to overcome their inhibitions and self – consciousness while speaking in English.

Topics to be covered in the Language laboratory sessions :

1. Basic Grammar & Vocabulary (Synonyms /Antonyms, Analogies, sentence completion, correctly spelt words, idioms, proverbs, common errors).
2. phonetic symbols and pronunciation.
3. Listening skills (Including Listening Comprehension)3
4. Reading Skills (Including Reading Comprehension)
5. Writing Skills (Including structuring resume and cover letter)
6. Speaking Skills
7. Body Language
8. Oral Presentation : Preparation and delivery using audio – visual aids with stress n body language and voice modulation (Topic to be selected by the teacher.)

Final Assessment Should be based on Assignment, presentation and interview.

Reference Books :-

1. Business Correspondence and Report Writing - By Sharma; TMH.
2. Living English Structure – By W.S. Allen; Longmans.
3. English Grammar – Ehrlich, Schaum Series; TMH.
4. Spoken Englishfor India – By R.K. Bansal and IB Harrison Orient Longman.
5. New International Business English – by Joans and Alexander; OUP.
6. Effective Technical Communication – Rizvi; TMH.

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Electrical & Electronics Engineering	YBE104	Theory	Practical	
			Min."D"	Min."D"	5.0

Unit I

Electrical circuit analysis- Voltage and current sources, dependent and independent sources, source conversion, DC circuits analysis using mesh & nodal method, Thevenin's& superposition theorem, star-delta transformation.
1-phase AC circuits under sinusoidal steady state, active, reactive and apparent power, physical meaning of reactive power, power factor, 3-phase balanced and unbalanced supply, star and delta connections.

Unit II

Transformers-Review of laws of electromagnetism, mmf, flux, andtheir relation, analysis of magnetic circuits. Single-phase transformer, basic concepts and construction features, voltage, current and impedance transformation, equivalent circuits, phasordiagram, voltage regulation, losses and efficiency, OC and SCtest.

Unit III

Rotating Electric machines- Constructional details of DCmachine, induction machine and synchronous machine, Working principle of 3-Phase induction motor, Emfequation of 3-Phase induction motor, Concept of slip in 3- Phase induction motor, Explanation of Torque-slip characteristics of 3-Phase induction motor, Classification of self excited DC motor andgenerator.

Unit IV

Digital Electronics-Number systems used in digital electronics, decimal, binary, octal, hexadecimal, their complements, operation and conversion, floating point and signed numbers, Demorgan's theorem, AND, OR, NOT, NOR, NAND, EX-NOR, EX-OR gates and their representation, truth table, half and full adder circuits, R-S flip flop, J-K flipflop.

Unit V

ELECTRONIC COMPONENTS AND CIRCUITS- Introduction to Semiconductors, Diodes, V-I characteristics, Bipolar junction transistors (BJT) and their working, introduction to CC, CB & CE transistor configurations, different configurations and modes of operation of BJT, DC biasing of BJT.

References:

1. Vincent Del Toro, Electrical Engineering Fundamentals, PHI Learning, IIEdition
2. S.Ghosh,FundamentalsofElectricalandElectronicsEngineering,PHI,IIEdition.
3. Millman, Halkias& Parikh, Integrated Electronics, McGrawHill, IIEdition
4. Nagrath& Kothari, Basic Electrical Engineering, III EditionTMH.
5. J.S. Katre, Basic Electronics Engg, Max Pub.Pune.
6. Hughes, Electrical and Electronic Technology, Pearson Education IXEdition

List Of Experiments

1. Verificatiionsof Thevenin's Superpositiontheorem.
2. Study of Transformer, name plate rating, determination of rayioandpolarity.
3. Determination of equivalent circuit parameters of a single phase transformer by O.C. and S.C. tests and estimation of voltage regulation and efficiency at various loading conditions and verification by loadtest.
4. Seperationof resistance and inductance of chokecoil.
5. Measurement of various line & phase quantities for a 3-phasecircuit.
6. Identification of different Electronicscomponents.
7. Observing input and output waveforms ofrectifiers.
8. Transistor application as amplifier andswitch.
9. Verification of truth table for variousgates.

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the endof every even semester
B.Tech. Common	Engineering Graphics	YBE105	Theory	Practical	
			Min.“D”	Min.“D”	5.0

Unit I

Scales: Representative factor, plain scales, diagonal scales, scale of chords.

Conic sections: Construction of ellipse, parabola, hyperbola by different methods; Normal and Tangent.

Special Curves: Cycloid, Epi-cycloid, Hypo-cycloid, Involutes, Archimedean and logarithmic spirals.

Unit II

Projection: Types of projection, orthographic projection, first and third angle projection, **Projection of points and lines**, Line inclined to one plane, inclined with both the plane, True Length and True Inclination, Traces of straight lines.

Unit III

Projection of planes and solids: Projection of Planes like circle and polygons in different positions; Projection of polyhedrons like prisms, pyramids and solids of revolutions like cylinder, cones in different positions.

Unit IV

Section of Solids: Section of right solids by normal and inclined planes; Intersection of cylinders.

Development of Surfaces: Parallel line and radial - line method for right solids.

Unit V

Isometric Projections: Isometric scale, Isometric axes, Isometric Projection from orthographic drawing.

Computer Aided Drafting (CAD): Introduction, benefit, software’s basic commands of drafting entities like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array; solution of projection problems on CAD.

References

1. Visvesvaraya Tech. University; A Premier on Computer Aided Engg drawing; VTU Belgaum
2. Bhatt N.D.; Engineering Drawing,Charotar
3. VenugopalK.;Engineering Graphics; NewAge
4. John KC; Engg. Graphics for Degree;PHI.

5. Gill P.S.; Engineering Drawing;kataria
6. Jeyopoovan T.; Engineering drawing & Graphics Using AutoCAD;Vikas
7. Agrawal and Agrawal; EngineeringDrawing;TMH
8. Shah MB and Rana BC; Engg.drawing; PearsonEducation
9. LuzadderWJand DuffJM;FundamentalofEnggDrawing;PHI
10. JolheDA; Engg. Drawing an Introduction;TMH
11. Narayana K.L.; Engineering Drawing; Scitech

List of Practical:

Sketching and drawing of geometries and projections based on above syllabus

Term work: A min. of 30 hand drawn sketches (on size A4 graphic sketch Book) plus 5 CAD-printouts on size A4 sheets plus 10 sheets of size A2 or 6 sheets of size A1, (50% marks to be allotted for this record + 25% marks for attendance +25%marks for Teachers Assessmen

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Work Shop Practice	YBE 106	Theory	Practical	
			-	Min."D"	5.0

Unit I

Introduction: Manufacturing Processes and its Classification, Casting, Machining, Plastic deformation and metal forming, Joining Processes, Heat treatment process, Assembly nprocess. Powder Metallurgy, introduction to computers in manufacturing. Black Smithy Shop

Use of various smithy tools. Forging operations:Upsetting, Drawing down, Fullering, Swaging, Cutting down, Forge welding, Punching and drafting. Suggested Jobs : Forging of chisel., forging of Screw Driver

Unit II

Carpentry Shop:

Timber : Type, Qualities of timber disease, Timber grains, Structure of timber, Timber, Timber seasoning, Timber preservation .Wood Working tools: Wood working machinery, joints & joinery. Various operations of planning using various carpentry planes sawing & marking of various carpentry joints.

Suggested Jobs :Name Plate ,Any of the Carpentry joint like mortise or tennon joint

Unit III

Fitting Shop:

Study and use of Measuring instruments, Engineer steel rule, Surface gauges caliper, Height gauges, feeler gauges, micro meter. Different types of files, File cuts, File grades, Use of surface plate, Surface gauges drilling tapping Fitting operations: Chipping filling, Drilling and tapping.Suggested Jobs :Preparation of job piece by making use of filling, sawing and chipping , drilling and tapping operations.

Unit IV

Foundry: Pattern Making: Study of Pattern materials, pattern allowances and types of patterns. Core box and core print, .Use and care of tools used for making wooden patterns. Moulding: Properties of good mould& Core sand, Composition of Green , Dry and Loam sand. Methods used to prepare simple green and bench and pit mould dry sand bench mould using single piece and split patterns.

Unit V

Welding: Study and use of tools used for Brazing, Soldering, Gas& Arc welding. Preparing Lap & Butt joints using gas and arc welding methods, Study of TIG & MIG welding processes .Safety precautions.

Reference Books:

1. Bawa HS; Workshop Practice,TMH
2. Rao PN; Manufacturing Technology- Vol.1& 2,TMH
3. John KC; Mechanical workshop practice;PHI
4. HazaraChoudhary; Workshop Practices -, Vol. I &II.

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Engineering Physics	YBE 201	Theory	Practical	
			Min."D"	Min."D"	5.0

Unit I

Quantum Physics

Group and particle velocities & their relationship. Uncertainty principle with elementary proof and applications (determination of position of a particle by a microscope, non existence of electron in nucleus, diffraction of an electron beam by a single slit). Compton scattering. Wave function and its properties, energy and momentum operators, time dependent and time independent Schrödinger wave equation. Application of time independent Schrödinger wave equation to particle trapped in a one dimensional square potential well (derivation of energy eigen values and wave function)

Unit II

Wave Optics

Interference: Fresnel's biprism, Interference in thin films (due to reflected and transmitted lght), interference from a wedge shaped thin film, Newton's rings and Michelson's interferometer experiments and their applications. Diffraction at single slit, double slit and n-slits (diffraction grating).Resolving power of grating and prism. Concept of polarized light, Brewster's laws, Double refraction, Nicol prism, quarter & half wave plate.

Unit III

Nuclear Physics

Nuclear liquid drop model (semi empirical mass formula), nuclear shell model, Linear Particle acceleratos: Cyclotron, general description of Synchrotron, Synchrocyclotron, and Betatron. Geiger- Muller Counter, Motion of charged particles in crossed electric and magnetic fields.Uses ofBainbridge and AustonmassSpectrographs.

Unit IV

Solid State Physics

Qualitative discussion of Kronig Penny model (no derivation), Effective mass, Fermi-Dirac statistical distribution function, Fermi level for Intrinsic and Extrinsic Semiconductors, Zenerdiode, tunnel diode, photodiode, solar-cells, Halleffect. Superconductivity: Meissner effect, Type I and Type II superconductors, Di-electric polarization, Complex permittivity, dielectric losses

UNIT V

Laser and Fiber Optics

Laser: Stimulated and spontaneous processes, Einstein's A & B Coefficients, transition probabilities, active medium, population inversion, pumping, Optical resonators, characteristicsof laser beam. Coherence, directionality and divergence.Principles and working of Ruby, Nd:YAG, He-Ne & Carbon dioxide Lasers with energy level diagram.. Fundamental idea about optical fiber, types of fibers, acceptance angle &cone, numerical aperture, V-number, propagation of light through step index fiber (Raytheory) pulse dispersion, attenuation, losses &various uses.

Applications of lasers and optical fibers.

Reference Books: -

1. Optics By Ghatak, TMH
2. Engineering Physics- V. S. Yadava, TMH
3. Optics by Brijlaland Subhraininyan.
4. Engineering physics by M.N. Avadhanuluand. S. Chand &Co.(2004)
5. Atomic and Nuclear physics by Brijlal andSubraminiyan.
6. Concepts of Modern Physics- Beiser, TMH
7. Solid State Physics by Kittel ,Wiley India
8. Fundamentals of Physics-Halliday, Wiley India

List of suggestive core experiments: -

1. Biprism, Newton's Rings, Michelsons Interferometer.
2. Resolving Powers –Telescope, Microscope, and Grating.
3. G.M. Counter
4. Spectrometers-R.I., Wavelength, using prism and grating
5. Optical polarization based experiments: Brewster's angle, polarimeteretc.
6. Measurements by LASER-Directionality, Numerical aperture, Distanceetc.
7. Uses of Potentiometers and Bridges (Electrical)..
8. Experiments connected with diodes and transistor.
9. Measurement of energy band gap of semiconductor.
10. To study Hall effect.
11. Solar cell.
12. To find the width of s single slit by f He-Ne Laser.
13. To determine the numeral aperture (NA) of a Optical Fibre.
14. To determine plank's constant.
15. Other conceptual experiments related to theory syllabus.

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.Tech. Common	Energy , Environment , Ecology & Society	YBE 202	Min."D"	-	5.0

Unit –I

Energy- Sources of Energy : Renewable & Non Renewable, Fossil fuel, Biomass Geothermal, Hydrogen, Solar, Wind, hydal, nuclear sources.

Unit –II

Ecosystem – Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Cycles in Ecosystem – Water, Carbon, Nitrogen. Biodiversity: Threats and conservation,

Unit–III

Air Pollution & Sound Pollution -

Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution chemical, photochemical, Green house effect, ozone layer depletion, acid Rain. Sound Pollution: Causes, controlling measures, measurement ofsound pollution (deciblage), Industrial and non – industrial.

Unit –IV

Water Pollution– Water Pollution: Pollutants in water, adverse effects.Treatment of Domestic & Industrial water effluent.

Soil Pollution – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

Unit –V

Society, Ethics & Human values– Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, objectives of ethics and its study . Preliminary studies regarding Environmental Protection Acts , introduction to value education, self exploration, sanyam & swasthya.

References:

1. Harris, CE, Prichard MS, Rabin's MJ, "Engineering Ethics"; Cengage Pub.
2. Rana SVS ; "Essentials of Ecology and Environment"; PHI Pub.
3. Raynold, GW "Ethics in information Technology"; Ceng age.
4. Svakumar; Energy Environment & Ethicsin society; TMH
5. AK De "Environmental Chemistry"; New Age Int. Publ.
6. BK Sharma, "Environmental Chemistry"; Goel Publ. House.

7. Bala Krishna moorthy;“Environmental management”; PHI
8. Gerard Kiely, “Environmental Engineering” ; TMH
9. Miller GT JR; living in the Environment Thomson/cengage
10. CunninghanWP and MA; principles of Environment Sc;TMH

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Basic Mechanical Engineering	YBE 203	Theory	Practical	
			Min.“D”	Min.“D”	5.0

UNIT- 1

Materials: Classification of engineering material, composition of cast iron and carbon steels on iron-carbon diagram and their mechanical properties; Alloy steel and their applications; stress-strain diagram, Hooks law and modulus of elasticity. Tensile, shear, hardness and fatigue testing of materials.

UNIT-2

Measurement: Temperature, pressure, velocity, flow, strain, force and torque measurement, concept of measurement error & uncertainly analysis, measurement by Vernier caliper, micrometer, dial gauges, slip gauges, sine-bar and combination set; introduction to lath, drilling, milling and shaping machines.

UNIT-3

Fluids: Fluid properties, pressure, density and viscosity; pressure variation with depth, static and kinetic energy; Bernauli’s equation for incompressible fluids, viscous and turbulent flow, working principle of fluidcoupling, pumps, compressors, turbines, positive displacement machines and pneumatic machines. Hydraulic power & pumped storage plants for peak load management as compared to base load plants.

UNIT-4

Thermodynamics: First andsecond law of thermodynamics; steam properties, steam processes at constant pressure, volume, enthalpy & entropy, classification and working of boilers, efficiency & performance analysis, natural and induced draught, calculation of chimney height. Refrigeration, vapor absorption & compression cycles, coefficient of perform (COP), refrigerant properties &eco friendlyrefrigerants.

UNIT-5

Reciprocating Machines: Steam engines, hypothetical and actual indicator diagram; Carnot cycle and ideal efficiency; Otto and diesel cycles; working of two stroke & four stroke petrol & diesel IC engines

Reference Books:-

1. Narula; Material Science; TMH
2. Agrawal B &CM; Basic Mechanical Engg. WileyIndia
3. Nag PK, Tripathi et al; Basic Mechanical Engg; TMH
4. Rajput; Basic Mechanical Engg;
5. Sawhney GS; Fundamentals of Mechanical Engg; PHI
6. Nakra and Chaudhary; Instrumentation & measurement; TMH
7. Nag PK; Engineering Thermodynamics; TMH
8. Ganesan; Combustion Engines; TMH

List of Suggestive core Experiments(Please Expand it)

1. Tensile testing of standard mild steel specimen.
2. Experiments on Bernoulli's theorem.
3. Flow measurements by ventury and orificemeters.
4. Linear and angular measurement using, Vernier; micrometer, slip gauge, dial gauge and sine-bar.
5. Study of different types of boilers and mountings.
6. Experiment on mini-boiler (50Kg/Hour)
7. To find COP of a refrigeration unit.
8. Study of different IC engines & measurement of B.H.P. using rope/ belt dynamometer.
9. Analysis of exhaust gases on petrol, diesel & bio diesel engines.

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Basic Civil Engineering & Engineering Mechanics	YBE 204	Theory	Practical	
			Min."D"	Min."D"	5.0

Unit I

Building Materials & Construction

Stones, bricks, cement, lime, timber-types, properties, test & uses, laboratory tests concrete and mortar Materials: Workability, Strength properties of Concrete, Nominal proportion of Concrete preparation of concrete, compaction, curing. Elements of Building Construction, Foundations conventional spread footings, RCC footings, brick masonry walls, plastering and pointing, floors, roofs,Doors, windows, lintels, staircases – types and their suitability

Unit – II Surveying & Positioning:

Introduction to surveying Instruments – levels, thedolites, plane tables and related devices.Electronic surveying instruments etc. Measurement of distances – conventional and EDM methods, measurementof directions by different methods, measurement of elevations by different methods. Reciprocal leveling.

Unit –III Mapping & Sensing:

Mapping details and contouring, Profile Cross sectioning and measurement of areas, volumes, application of measurements in quantity computations, Survey stations, Introduction of remote sensing and its applications.

Engineering Mechanics

Unit - IV

Forces and Equilibrium: Graphical and Analytical Treatment of Concurrent and non-concurrent Co- planner forces, free Diagram, Force Diagram and Bow's notations, Application of Equilibrium Concepts: Analysis of plane Trusses: Method of joints, Method of Sections. Frictional force in equilibrium problems

Unit – V

Centre of Gravity and moment of Inertia: Centroid and Centre of Gravity, Moment Inertia of Area and Mass, Radius of Gyration, Introduction to product of Inertia and Principle Axes.

Support Reactions, Shear force and bending moment Diagram for Cantilever & simply supported beam with concentrated, distributed load and Couple.

Reference Books:

1. S. Ramamrutam & R. Narayanan; Basic Civil Engineering, Dhanpat Rai Pub.
2. Prasad I.B., Applied Mechanics, Khanna Publication.
3. Punmia, B.C., Surveying, Standard book depot.
4. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI
5. S.P, Timoshenko, Mechanics of stricture, East West press Pvt. Ltd.
6. Surveying by Duggal – Tata McGraw Hill New Delhi.
7. Building Construction by S.C. Rangwala- Charotar publications House, Anand.
8. Building Construction by Grucharan Singh- Standard Book House, New Delhi
9. Global Positioning System Principles and application- Gopi,TMH
10. R.C. Hibbler– Engineering Mechanics: Statics & Dynamics.
11. A. Boresi & Schmidt- Engineering Mechines- statics dynamics, Thomson' Books
12. R.K. Rajput, Engineering Mechanics S. Chand & Co.

List of suggestive core Experiments:

Students are expected to perform minimum ten experiments from the list suggested below by preferably selecting experiments from each unit of syllabus.

S.No. Title

1. Toper form traverse surveying with prismatic compass, check for local attraction and determine corrected bearings and to balance the traverse by Bowditch's rule.
2. To perform leveling exercise by height of instrument of Rise and fall method.
3. To measure horizontal and vertical angles in the field by usingTheodolite.
4. To determine (a) normal consistency (b) Initial and Final Setting time of a cement Sample.
5. To determine the work ability of fresh concrete of given proportions by slump test or compaction factor test.
6. To determine the Compressive Strength of brick.
7. To determine particle size distribution and fineness modulus of course and fine Aggregate.
8. To verify the law of Triangle of forces and Lami's theorem.
9. To verify the law of parallelogram of forces.
10. To verify law of polygon of forces
11. To find the support reactions of a given truss and verify analytically.
12. To determine support reaction and shear force at a given section of a simply Supported beam and verify in analytically using parallel beam apparatus.
13. To determine the moment of inertia of fly wheel by falling weight method.
14. To verify bending moment at a given section of a simply supported beam.

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Basic Computer Engineering	YBE 205	Theory	Practical	
			Min.“D”	Min.“D”	5.0

UNIT I

Computer: Definition, Classification, Organization i.e. CPU, register, Bus architecture, Instruction set, Memory & Storage Systems, I/O Devices, and System & Application Software. Computer Application in e-Business, Bio-Informatics, health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc.

Operating System: Definition, Function, Types, Management of File, Process &Memory.

Introdcutionto MS word, MS powerpoint, MS Excel

UNIT II

Introduction to Algorithms, Complexities and Flowchart, Introduction to Programming, Categories of Programming Languages, Program Design, Programming Paradigms, Characteristics or Concepts of OOP, Procedure Oriented Programming VS object oriented Programming.

Introduction to C++: Character Set, Tokens, Precedence and Associativity, Program Structure, Data Types, Variables, Operators, Expressions, Statements and control structures, I/O operations, Array, Functions,

UNIT III

Object & Classes, Scope Resolution Operator, Constructors & Destructors, Friend Functions, In heritance, Polymorphism, Overloading Functions & Operators, Types of Inheritance, Virtual functions.

Introduction to Data Structures.

UNIT IV

Computer Networking: Introduction, Goals, ISO-OSI Model, Functions of Different Layers. Internetworking Concepts, Devices, TCP/IP Model. Introduction to Internet, World Wide Web, E-commerce

Computer Security Basics: Introduction to viruses, worms, malware, Trojans, Spyware and Anti-Spyware Software, Different types of attacks like Money Laundering, Information Theft, Cyber Pornography, Email spoofing, Denial of Service (DoS), Cyber Stalking, ,Logic bombs, Hacking Spamming, Cyber Defamation , pharming Security measures Firewall, Computer Ethics & Good Practices, Introduction of Cyber Laws about Internet Fraud, Good Computer Security Habits,

UNIT V

Data base Management System: Introduction, File oriented approach and Database approach, Data Models, Architecture of Database System, Data independence, Data dictionary, DBA, Primary Key, Data definition language and Manipulation Languages.

Cloud computing: definition, cloud infrastructure, cloud segments or service delivery models (IaaS, PaaS and SaaS), cloud deployment models/ types of cloud (public, private, community and hybrid clouds), Pros and Cons of cloud computing

List of Experiment

01. Study and practice of Internal & External DOS commands.
02. Study and practice of Basic linux Commands – ls, cp, mv, rm, chmod, kill, psetc.
03. Study and Practice of MS windows – Folder related operations, My-Computer, window explorer, Control Panel,
04. Creation and editing of Text files using MS-word.
05. Creation and operating of spreadsheet using MS-Excel.
06. Creation and editing power-point slides using MS- power point
07. Creation and manipulation of database table using SQL in MS-Access. 08.WAP to illustrate Arithmetic expressions
09. WAP to illustrate Arrays.
10. WAP to illustrate functions.
11. WAP to illustrate constructor & Destructor
12. WAP to illustrate Object and classes.
13. WAP to illustrate Operator over loading
14. WAP to illustrate Function over loading
15. WAP to illustrate Derived classes &Inheritance
16. WAP to insert and delete and element from the Stack
17. WAP to insert and delete and element from the Queue
18. WAP to insert and delete and element from the Linked List

Recommended Text Books:

1. Fundamentals of Computers : E Balagurusamy, TMH
2. Basic Computer Engineering: Silakari and Shukla, WileyIndia
3. Fundamentals of Computers : V Rajaraman,PHI
4. Information Technology Principles and Application: Ajoy Kumar Ray &Tinku Acharya PHI.

Recommended Reference Books:

1. Introduction of Computers : Peter Norton, TMH
2. Object Oriented Programming with C++ :E.Bala gurusamy, TMH
3. Object Oriented Programming in C++: Rajesh K. Shukla, Wiley India
4. Concepts in Computing: Kenneth Hoganson, Jones & Bartlett.
5. Operating Systems – Silbers chatz and Galvin – Wiley India
6. Computer Networks: And rew Tananbaum, PHI
7. Data Base Management Systems, Korth, TMH
8. Cloud Computing, Kumar, WileyIndia

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.Tech. Common	Communicative Language	YBE 206	Theory	Practical	
			-	Min."D"	5.0

Course objective:

This course intends to impart practical training in the use of English Language for Communicative purposes and aims to develop students' personality through LanguageLab.

Topics to be covered in the Language laboratory sessions:

1. Introducing oneself, family, social roles, personal image design, building relationships, body language, concept of time andspace.
2. Public Speaking and oral skills with emphasis on conversational practice, Role plays, extempore speech, JAM (Just a minute sessions), describing objects and situations, giving directions, debate, telephonicetiquette.
3. Reading Comprehension: Intensive reading skills, rapid reading, and reading aloud (Reading material to be selected by theteacher).
4. Translation from English to Hindi and viceversa.
5. Oral Presentation: preparation and delivery (Topic to be selected by the teacher.)

Assessment Criterion:

OralPresentation	10
Assignment	20
VivaVoice	20

YBN UNIVERSITY, RANCHI, JHARKHAND
School of Engineering & Technology

B.Tech. Semester-III **Computer Science**

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted							Credits Allotted Subject wise			Total Credits	Remark
			Theory Slot			Practical Slot			Total Marks					
			End Sem.	Mid Sem. MST (Two tests average)	Quiz, Assig-nment	End Sem	Term work: Lab work & sessional	Term work: Assignment/ quiz		Period per week: L	T	P		
1	YBE301	Mathematics -II	70	20	10	-	-	-	100	3	1	-	04	
2	YBCS302	Discrete Structures	70	20	10	-	-	-	100	3	1	-	04	
3	YBCS303	Digital Circuit & System	70	20	10	30	10	10	150	3	1	2	06	
4	YBCS304	Electronics Devices & Circuits	70	20	10	30	10	10	150	3	1	2	06	
5	YBCS305	Data Structures	70	20	10	30	10	10	150	3	1	2	06	
6	YBCS306	Computer Programming (Java Technologies)	-	-	-	30	10	10	50	0	0	2	02	
7	YBCS307	Self study (Internal Assesment)	-	-	-	-	-	50	50	0	0	2	02	Grand Total
8.	YBCS308	Seminar / Group Discussion (Internal Assessment)	-	-	-	-	-	50	50	0	0	2	02	
		Total	350	100	50	120	40	140	800	15	5	12	32	800

MST: Mid Semester Tests Taken at Least twice Per Semester
L:Lecture- T:Tutorial- P: Practical

YBE301 - ENGINEERING MATHEMATICS II

Unit I

Fourier Series: Introduction of Fourier series , Fourier series for Discontinuous functions, Fourier series for even and odd function, Half range series Fourier Transform: Definition and properties of Fourier transform, Sine and Cosine transform.

Unit II

Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations

Unit III

Second Order linear differential equation with variable coefficients : Methods one integral is known, removal of first derivative, changing of independent variable and variation of parameter, Solution by Series Method

Unit IV

Linear and Non Linear partial differential equation of first order: Formulation of partial differential equations, solution of equation by direct integration, Lagrange's Linear equation, charpit's method. Linear partial differential equation of second and higher order: Linear homogeneous and Non homogeneous partial diff. equation of nth order with constant coefficients. Separation of variable method for the solution of wave and heat equations

Unit V

Vector Calculus: Differentiation of vectors, scalar and vector point function, geometrical meaning of Gradient, unit normal vector and directional derivative, physical interpretation of divergence and Curl. Line integral, surface integral and volume integral, Green's, Stoke's and Gauss divergence theorem

References

(i) Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India
(ii) Higher Engineering Mathematics by BS Grewal, Khanna Publication
(iii) Advance Engineering Mathematics by D.G.Guffy
(iv) Mathematics for Engineers by S.Arumungam, SCITECH Publuication
(v) Engineering Mathematics by S S Sastri. P.H.I.

YBCS302 Discrete Structures

Unit-I

Set Theory, Relation, Function, Theorem Proving Techniques : Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation, Job-Scheduling problem Function: Definition, type of functions, oneto one, into and onto function, inverse function, composition of functions, recursively defined functions, pigeonhole principle. Theorem proving Techniques: Mathematical induction, Proof by contradiction.

Unit-II

Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.

Unit-III

Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Normal Forms, Universal and existential quantifiers. Introduction to finite state machine Finite state machines as models of physical system equivalence machines, Finite state machines aslanguage recognizers

Unit-IV

Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring,chromatic number, Isomorphism and Homomorphism of graphs.

Unit V

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hassel diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices. Combinatory: Introduction, Permutation and combination, Binomial Theorem, Multinomial Coefficients Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms , Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions , Generating functions ,Solution by method of generating functions,

References:

1. C.L.Liu, “Elements of Discrete Mathematics” Tata Mc Graw-Hill Edition.
2. Trembley, J.P & Manohar; “Discrete Mathematical Structure with Application CS”, McGraw Hill.
3. Kenneth H. Rosen, “Discrete Mathematics and its applications”, McGraw Hill.
4. Lipschutz; Discrete mathematics (Schaum); TMH
5. Deo, Narsingh, “Graph Theory With application to Engineering and Computer.Science.”, PHI.
6. Krishnamurthy V; “Combinatory Theory & Application”, East-West Press Pvt. Ltd., New Delhi.
7. S k Sarkar “ Discrete Mathematics”, S. Chand Pub

YBCS303 Digital Circuit & System

Unit I

Number systems & codes, Binary arithmetic, Boolean algebra and switching function. Minimization of switching function, Concept of prime implicit , Karnaugh map method, Quine & McCluskey's method, Cases with don't care terms, Multiple output switching function.

Unit II

Introduction to logic gates, Universal gate, Half adder, Half subtractor, Full adder, Full subtractor circuits, Series & parallel addition , BCD adders, Look-ahead carry generator.

Unit III

Linear wave shaping circuits, Bistable, Monostable & Astable multivibrator, Schmitt trigger circuits & Schmitt-Nand gates. Logic families : RTL, DTL, All types of TTL circuits , ECL, I2L , PMOS,NMOS & CMOS logic, Gated flip-flops and gated multivibrator , Interfacing between TTL to MOS.

Unit IV

Decoders, Encoders, Multiplexers, Demultiplexers, Introduction to various semi conductor memories & designing with ROM and PLA. Introduction to Shift Registers, Counters, Synchronous & asynchronous counters, Designing of Combinational circuits like code converters.

Unit V

Introduction of Analog to Digital & Digital to Analog converters, sample & hold circuits and V-Fconverters.

References:

1. M. Mano; "Digital Logic & Computer Design"; PHI.
2. Malvino & Leach; "Digital Principles & Applications"; TMH
3. W.H. Gothman; "Digital Electronics"; PHI.
4. Millman & Taub; "Pulse, Digital & Switching Waveforms"; TMH
5. Jain RP; Modern digital Electronics; TMH
6. R.J. Tocci, "Digital Systems Principles & Applications".

List of experiment (Expandable)

1. To study and test of operation of all logic gates for various IC's (IC#7400,IC#7403,IC# 7408,IC#74332,IC#7486).
2. Verification of Demorgan's theorem.
3. To construct of half adder and full adder
4. To construct of half subtractor and full subtractor circuits
5. Verification of versatility of NAND gate.
6. Verification of versatility of NOR gate.
7. Designing and verification of property of full adder.
8. Design a BCD to excess-3 code converter.
9. Design a Multiplexer/ Demultiplexer.

YBCS304 Electronics Devices & Circuits

Unit I

Semiconductor device, theory of P-N junction, temperature dependence and break down characteristics, junction capacitances. Zener diode, Varactor diode, PIN diode, LED, Photo diode,Transistors BJT, FET, MOSFET, types, working principal, characteristics, and region of operation, load line biasing method. Transistor as an amplifier, gain, bandwidth, frequency response, h- parameters equivalent, type of amplifier.

Unit II

Feedback amplifier, negative feedback, voltage-series, voltage shunt, current series and current shunt feedback, Sinusoidal oscillators, L-C (Hartley-Colpitts) oscillators, RC phase shift, Wien bridge, and Crystal oscillators. Power amplifiers, class A, class B, class A B, C amplifiers, their efficiency and power Dissipation.

Unit III

Switching characteristics of diode and transistor, turn ON, OFF time, reverse recovery time, transistor as switch, Multi vibrators, Bistable, Monostable, Astable multi vibarators. Cllipers and clampers, Differential amplifier, calculation of differential, common mode gain and CMRR using hparameters, Darlington pair, Boot strapping technique. Cascade and cascode amplifier.

Unit IV

Operational amplifier characteristics, slew rate, full power bandwidth, offset voltage, bias current, application ,inverting , non inverting amplifier , summer , averager , differentiator, integrator,differential amplifier , instrumentation amplifier , log and antilog amplifier , voltage to current and current to voltage converters , comparators Schmitt trigger , active filters, 555 timer and its application.

Unit V

Regulated power supplies., Series and shunt regulators, current limiting circuits, Introduction to ICvoltage regulators, fixed and adjustable switching regulators, SMPS ,UPS

References:

1. Milliman Hallkias - Integrated Electronics; TMH Pub.
2. Gayakwad; OP-amp and linear Integrated Circuits; Pearson Education
3. Salivahanan; Electronic devices and circuits; TMH
4. Salivahanan; Linear Integrated Circuits; TMH-
5. Miliman Grabel; Micro electronics , TMH
6. RobertBoylestad & Nashetsky; Electronics Devices and circuit Theory; Pearson Ed.

List of Experiments (Expandable):

1. Diode and Transistor characteristics
2. Transistor Applications (Amplifier and switching)
3. OP-Amp and its Applications
4. 555 timer and its Applications

YBCS305 Data Structures

Unit I

Introduction: Basic Terminology, Data types and its classification, Algorithm complexity notations like big Oh,□,□. Array Definition, Representation and Analysis of Arrays, Single and Multidimensional Arrays, Address calculation, Array as Parameters, Ordered List and operations, Sparse Matrices, Storage pools, Garbage collection. Recursion-definition and processes, simulatingrecursion, Backtracking, Recursive algorithms, Tail recursion, Removal of recursion. Tower of HanoiProblem.

UNIT II

Stack, Array Implementation of stack, Linked Representation of Stack, Application of stack: Conversion of Infix to Prefix and Postfix Expressions and Expression evaluation, Queue, Array and linked implementation of queues, Circular queues, D-queues and Priority Queues. Linked list, Implementation of Singly Linked List, Two-way Header List, Doubly linked list, Linked List in Array. Generalized linked list, Application: Garbage collection and compaction, Polynomial Arithmetic.

UNIT III

Trees: Basic terminology, Binary Trees, , algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Binary Search Tree (BST), AVL Trees, B-trees. Application: Algebraic Expression, Huffman coding Algorithm.

UNIT IV

nternal and External sorting ,Insertion Sort, Bubble Sort, selection sort Quick Sort, Merge Sort, Heap Sort, Radix sort, Searching & Hashing: Sequential search, binary search, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation. Symbol Table, Static tree table, Dynamic Tree table.

Unit V

Graphs: Introduction, Sequential Representations of Graphs, Adjacency Matrices Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees.

Reference:

1. R. Kruse et al, “Data Structures and Program Design in C”, Pearson Education Asia, Delhi-2002
2. ISRD Group; Data structures using C; TMH
3. Lipschutz; Data structure (Schaum); TMH
4. Horowitz and Sahani, “Fundamentals of data Structures”, Galgotia Publication Pvt. Ltd., N Delhi.

A. M. Tenenbaum, “Data Structures using C & C++”, Prentice-Hall of India Pvt. Ltd., New Delhi.

5. Data Structures Trembley and Sorenson, TMH Publications
6. Pai; Data structure and algorithm; TMH
7. Introduction to Algorithm- Corman, AWL

YBCS306 Java Technology

UNIT-I

Basic Java Features - C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods, Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and Classes

UNIT–II

Java Collective Frame Work - Data Structures: Introduction, Type-Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Generics: Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and Iterator, Linked List, Vector.

Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java. Util, Class Priority Queueand Interface Queue, Maps, Properties Class, Un-modifiable Collections.

UNIT–III

Advance Java Features - Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor Locks. Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC:Relational Database, SQL, MySQL, Oracle

UNIT–IV

Advance Java Technologies - Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, Multitier Applications, Using JDBC from a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips

UNIT–V

Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

References:

1. Deitel & Deitel, "JAVA, How to Program"; PHI, Pearson.
2. E. Balaguruswamy, "Programming In Java"; TMH Publications
3. The Complete Reference: Herbert Schildt, TMH
4. Peter Norton, "Peter Norton Guide To Java Programming", Techmedia.
5. Merlin Hughes, et al; Java Network Programming , Manning Publications/Prentice Hall
6. Cay Horstmann, Big JAVA, Wiely India.

List of Program to be perform (Expandable)

1. Installation of J2SDK
2. Write a program to show Scope of Variables
3. Write a program to show Concept of CLASS in JAVA
4. Write a program to show Type Casting in JAVA
5. Write a program to show How Exception Handling is in JAVA
6. Write a Program to show Inheritance
7. Write a program to show Polymorphism
8. Write a program to show Access Specifiers (Public, Private, Protected) in JAVA
9. Write a program to show use and Advantages of CONTRUCTOR
10. Write a program to show Interfacing between two classes
11. Write a program to Add a Class to a Package
12. Write a program to show Life Cycle of a Thread
13. Write a program to demonstrate AWT.
14. Write a program to Hide a Class
15. Write a Program to show Data Base Connectivity Using JAVA
16. Write a Program to show “HELLO JAVA ” in Explorer using Applet
17. Write a Program to show Connectivity using JDBC
18. Write a program to demonstrate multithreading using Java.
19. Write a program to demonstrate applet life cycle.
20. Write a program to demonstrate concept of servlet.

YBCS307 Self Study (Internal Assessment)

Objective of Self Study: is to induce the student to explore and read technical aspects of hisarea of interest / hobby or new topics suggested by faculty.

Evaluation will be done by assigned faculty based on report/seminar presentation and viva.

YBCS308 Seminar / Group Discussion(Internal Assessment)

Objective of GD and seminar is to improve the MASS COMMUNICATION and CONVINCING/ understanding skills of students and it is to give student an opportunity to exercise their rights toexpress themselves.

Evaluation will be done by assigned faculty based on group discussion and power point presentation.

YBN UNIVERSITY, RANCHI, JHARKHAND
School of Engineering & Technology

B.Tech. Semester IV **Computer Science**

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted							Credits Allotted Subject wise			Total Credits	Remark
			Theory Slot			Practical Slot			Total Marks					
			End Sem.	Mid Sem. MST (Two tests average)	Quiz, Assig-nment	End Sem	Term work			Period per week				
							Lab work & session al	Assignment/ quiz		L	T	P		
1	YBE401	Mathematics -III	70	20	10	-	-	-	100	3	1	-	04	
2	YBCS402	Computer System Organization	70	20	10	-	-	-	100	3	1	-	04	
3	YBCS403	Object Oriented Technology	70	20	10	30	10	10	150	3	1	2	06	
4	YBCS404	Analysis & Design of Algorithm	70	20	10	30	10	10	150	3	1	2	06	
5	YBCS405	Analog & Digital Communication	70	20	10	30	10	10	150	3	1	2	06	
6	YBCS406	Computer Programming –IV (.Net Technologies)	-	-	-	30	10	10	50	0	0	2	02	
7	YBCS407	Self study (Internal Assessment)	-	-	-	-	-	50	50	0	0	2	02	Grand Total
8.	YBCS408	Seminar / Group Discussion (Internal Assessment)	-	-	-	-	-	50	50	0	0	2	02	
		Total	350	100	50	120	40	140	800	15	5	12	32	800

MST: Mid Semester Tests Taken at Least twice Per Semester
L:Lecture- T:Tutorial- P: Practical

YBE401 - ENGINEERING MATHEMATICS III

Unit-1

Functions of complex variables : Analytic functions, Harmonic Conjugate, Cauchy-Riemann Equations, Line Integral, Cauchy's Theorem, Cauchy's Integral Formula, Singular Points, Poles &Residues,ResidueTheorem,ApplicationofResiduestheoremforevaluationofrealintegrals

Unit II

Errors & Approximations, Solution of Algebraic &Trancedental Equations (Regula Falsi , Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equatins by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods

Unit III

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and NumericalIntegration.

Unit IV

Solution of Ordinary Differential Equations(Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability : Probability Mass function, Probability density function. Discrete Distribution: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution ,Gamma Distribution ,Beta Distribution ,Testing of Hypothesis |:Students t-test, Fisher's z-test, Chi-Square Method

Reference:

(i) Numerical Methods using Matlab by J.H.Mathews and K.D .Fink, P.H.I.
(ii) Numerical Methods for Scientific and Engg. Computation by MK Jain, Iyengar and RK Jain, New Age International Publication
(iii) Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
(iv) Numerical Methods using Matlab by Yang,WileyIndia
(v) Pobability and Statistics by Ravichandran ,Wiley India
(vi) Mathematical Statistics by George R.,Springer

YBCS402 – Computer System Organization

Unit I

Computer Basics and CPU: Von Newman model, various subsystems, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter, Accumulator, Instruction register, Micro operations, Register Transfer Language, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer. 8085 microprocessor organization

Unit-II

Control Unit Organization: Hard wired control unit, Micro and nano programmed control unit, Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming, Arithmetic and Logic Unit: Arithmetic Processor, Addition, subtraction, multiplication and division, Floating point and decimal arithmetic and arithmetic units, design of arithmetic unit.

Unit-III

Input Output Organization: Modes of data transfer – program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor, 8085 I/O structure, 8085 instruction set and basic programming. Data transfer – Serial / parallel, synchronous/asynchronous, simplex/half duplex and full duplex.

Unit-IV

Memory organization: Memory Maps, Memory Hierarchy, Cache Memory-Organization and mappings. Associative memory, Virtual memory, Memory Management Hardware.

UnitV

Multiprocessors: Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication.

References:

1. Morris Mano: Computer System Architecture, PHI.
2. Tanenbaum: Structured Computer Organization, Pearson Education
3. JPHayes,ComputerArchitectureandOrganisations,Mc-GrawHills,NewDelhi
4. Gaonkar: Microprocessor Architecture,Programming,Applicationswith8085;PenramInt.
5. William Stallings: Computer Organization and Architecture, PHI
6. ISRD group; Computer org Organization; TMH
7. Carter; Computer Architecture (Schaum);TMH
8. Carl Hamacher: Computer Organization,TMH

YBCS403 – Object Oriented Technology

Unit I

Abstract data types, Objects and classes, Attributes and Methods, Objects as software units, Encapsulation and Information hiding, Objects instantiation sand interactions, Object lifetime, tatic and dynamic objects, global and local objects, Meta class, Modeling thereal world objects.

Unit II

Relationships between classes, Association of objects, Types of Association, Recursive Association,Multiplicities,Navigability,Namedassociation,Aggregationofobjects.Typesof Aggregation, Delegation, Modeling Association and Aggregation.

Unit III

Inheritance and Polymorphism, Types of polymorphism, Static and dynamic polymorphism, Operator and Method overloading, Inherited methods, Redefined methods, the protected interface, Abstract methods and classes, Public and protected properties, Private operations, Disinheritance, Multiple inheritance.

Unit IV

Container Classes, Container types, typical functions and iterator methods, Hetero geneous containers, Persistent objects, stream, and files, Object oriented programming languages,

Unit V

Study of C++/Java as Object-oriented programming language.

References:

1. David Parsons; Object oriented programming with C++; BPB publication
2. Object oriented programming in C++ by Robert Lafore: Galgotia
3. Bala guru samy; Object oriented programming with C++; TMH
4. Java Complete Reference: Herbert Schildt, Mc Graw Hill
5. Hubbard; Programming in C++ (Schaum);TMH
6. Mastering C++ by Venu gopal, TMH

List of experiments (Expandable):

Programming assignments may be given to students so that they can better understand the conceptsofobjectorientedprogrammingsuchasobjects,classes,class-relationships,association, aggregation, inheritance, poly morphismetc.

YBCS404 – Analysis & Design of Algorithm

Unit I

Algorithms, Designingal gorithms, analyzing algorithms, asymptoticn otations, heapand heap sort. Introduction to divideand conquertechnique,analysis,designand comparison of various algorithms based on this technique, example binary search, mergesort, quicksort, strassen's matrix multiplication.

Unit II

Study of Greedy strategy, examples of greedy method like optimal merge patterns, Huffman coding, minimum spanning trees, knapsack problem, job sequencing with deadlines, single source shortest pathalgorithm

Unit III

Concept of dynamic programming, problems based on this approach such as 0/1 knapsack, multis tage graph, reliability design, Floyd-Warshallalgorithm

Unit IV

Back tracking concept and its examples like 8 queen's problem, Hamiltonian cycle, Graph coloring problem etc. Introduction to branch & bound method, examples of branch and bound method like traveling sale sman problemetc. Meaning of lower bound theory and its use in solving algebraic problem, introduction to parallel algorithms.

Unit V

Binary search trees, height balanced trees, 2-3 trees, B-trees, basic search and traversal techniquesfortreesandgraphs(Inorder,preorder,postorder,DFS,BFS),NP-completeness.

References:

1. Coremen Thomas, Leiserson CE, Rivest RL; Introduction to Algorithms; PHI.
2. Horowitz &Sahani; Analysis & Design of Algorithm
3. Dasgupta; algorithms;TMH
4. Ullmann; Analysis & Design ofAlgorithm;
5. MichaelTGoodrich,RobartoTamassia,AlgorithmDesign,WielyIndia

List of Experiments(expandable):

1. Write a program for Iterative and Recursive Binary Search.
2. Write a program for Merge Sort.
3. Write a program for Quick Sort.
4. Write a program for Strassen's Matrix Multiplication.
5. Write a program for optimal mergepatterns.
6. Write a program for Huff man coding.
7. Write a program for minimum spanning trees using Kruskal's algorithm.
8. Write a program for minimum spanning trees using Prim's algorithm.
9. Write a program for single sources shortest path algorithm.
10. Write a program for Floye-Warshal algorithm.
11. Write a program for traveling sales man problem.

YBCS405 – Analog & Digital Communication

Unit-I

Time domain and frequency domain representation of signal, Fourier Transform and its properties, Transform of Gate, Periodic gate, Impulse periodic impulses ine and cosine wave, Concept of energy density and power density (Parseval's theorem), Powe density of periodic gate and impulse function, impulse response of a system, convolutions, convolution with impulse function, causal and non causal system impulse response of ideal low pass filter, Correlation & Auto correlation.

Unit-II

Base band signal, need of modulation, Introduction of modulations techniques, Amplitude modulation, Equation and its frequency domain representation, Band width, Power distribution.AM suppressed carrier waveform equation and frequency domain representation Generation (Balance/Chopper modulator) and synchronous detection technique, errors in synchronous detection, Introduction to SSB and VSB Transmission Angle modulation, Frequency and phase modulation equation and their relative phase and frequency deviations, modulation index frequency spectrum, NBFM and WBFM, Band width comparison of modulation techniques.

Unit-III

Sampling of signal, sampling theorem for low pass and Band pass signal, Pulse amplitude modulation(PAM),Time division, multiplexing(TDM).Channel Band width for PAM-TDM signal Type of sampling instantaneous, Natural and flat top, Aperture effect, Introduction to pulse position and pulse duration modulations, Digitalsignal,Quantization,Quantizationerror,Pulsecodemodulation, signal to noise ratio, Companding, Data rate and Baud rate, Bit rate, multiplexed PCM signal, Differential PCM(DPCM),Delta Modulation(DM) and Adaptive Delta Modulation(ADM),comparison of various systems.

Unit-IV

Digital modulations techniques, Generation, detection, equation and Bandwidth of amplitude Shift keying(ASK)Binary Phase Shift keying (BPSK),Differential phase shift keying(DPSK),offset and non offset quadrature phase shift keying (QPSK), M-Ary PSK, Binary frequency Shift Keying (BFSK),M-Ary FSK Quadrature Amplitude modulation (QAM),MODEM, Introduction to probability of error.

Unit-V

Information theory and coding-Information, entropies (Marginal and conditional),Model of a communication system, Mathematical representation of source, channel and receiver characteristics, Mutual information, channel capacity efficiency of noise free channel Binary symmetric channel (BSC) Binary erasure channel (BEC), Repetition of signal, NM symmetric Binary channel, Shannon theorem, Shanon-Hartley theorem (S/N-BW trade off)Source encoding code properties; Shanon, Fano and Huffman coding methods and their efficiency error control coding, Minimum Hamming distance, Linear Block Code, Cyclic code and convolution codes. Line Encoding: Manchester coding, RZ, NRZ coding.

References:

1. Singh & Sapre, Communication System, TMH
2. Taub & shilling, Communication System, TMH
3. Hsu; Analog and digital communication(Schaum);TMH
4. B.P. Lathi, Modern Digital and analog communication system,
5. Simon Haykins, Communication System. JohnWilly
6. Wayne Tomasi, Electronic Communication system.
7. Martin S.Roden, Analog & Digital Communication System; Discovery Press.
8. Frank R. Dungan, Electronic Communication System,Thomson/Vikas.

List of Experiments(Expandable)

1. Study of sampling process and signal reconstruction and aliasing.
2. Study of PAM PPM and PDM
3. Study of PCM transmitter andreceiver.
4. Time division multiplexing(TDM) and Demul tiplexing
5. Study of ASKPSK and FSK transmitter and receiver.
6. Study of AM modulation and Demodulatio ntechniques (Transmitter and Receiver) Calculate of parameters
7. Study of FM modulation and demodulation(Transmitter and Receiver) & Calculation of parameters
8. To construct and verify pre emphasis and de-emphasis and plot the wave forms.
9. Studyofsuperhetrodynereceiverandcharacteristicsofratioradioreceiver.
10. To construct frequency multiplier circuit and to observe the wave form
11. Study of AVC and AFC.

YBCS406 – Computer Programming –IV (.Net Technologies)

UNIT I

Introduction.NET framework, features of. Net framework, architecture and component of. Net, elements of.Net.

UNIT II

Basic Features Of C# Fundamentals, Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures.**Advanced Features Of C#** nterfaces, Arrays, Indexers and Collections ;Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT III

Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, classlibrary,over view of ASP .net control, under standing HTML controls, study of standard controls, validations controls, rich controls. **Windows Forms:** All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events, and using various Tolls

UNIT IV

Understanding and handling controls events, **ADO.NET**- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader **Database controls:** Overview of data access data control, using grid view controls, using details view and frame view controls, ado.netdata readers,SQLdata source control, object data source control, sitemapdata source.

UNITV

XML: Introducing XML, Structure, and syntax of XML, document type definition (DTD), XML Schema, Document object model, Presenting and Handling XML .xml data source, using navigation controls, introduction of webparts, using javascript, Web Services

References:

1. C#forProgrammersbyHarveyDeitel,PaulDeitel,PearsonEducation
2. Balagurusamy; Programming in C#;TMH
3. **Web**Commerce**Technology**HandbookbyDaniel**Minoli**,Emma**Minoli**,TMH
4. Web Programming by Chris Bates,Wiley
5. XML Bible by Elliotte Rusty Harold,
6. ASP .Net Complete Reference by McDonald,TMH.
7. ADO .Net Complete Reference by Odey,TMH

List of Experiments/ program (Expandable):

1. Working with call backs and delegates inC#
2. Code access security withC#.
3. Creating a COM+ component withC#.
4. Creating a Windows Service withC#
5. Interacting with a Windows Service withC#
6. Using Reflection inC#
7. Sending Mail and SMTP Mail andC#
8. PerformStringManipulationwiththeStringBuilderandStringClassesandC#:

9. UsingtheSystem.NetWebClienttoRetrieveorUploadDatawithC#
10. ReadingandWritingXMLDocumentswiththeXMLText-Reader/-WriterClassandC#
11. Working with Page using ASP.Net.
12. Working with Forms using ASP.Net
13. Data Sources access throughADO.Net,
14. Working with Data readers ,Transactions
15. Creating WebApplication.

YBN UNIVERSITY, RANCHI, JHARKHAND
School of Engineering & Technology

B.Tech. Semester V **Computer Science**

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted							Credits Allotted Subjectwise			Total Credits	Remark
			Theory Slot			Practical Slot			Total Marks					
			End Sem.	Mid Sem. MST	Quiz, Assig-nment	End Sem	Term work			Period per week				
							Lab work & sessional	Assignment/ quiz		L	T	P		
1	YBCS501	Data Communication	70	20	10	-	-	-	100	3	1	-	04	
2	YBCS502	Operating System	70	20	10	30	10	10	150	3	1	2	06	
3	YBCS503	Data Base Management System	70	20	10	30	10	10	150	3	1	2	06	
4	YBCS504	Computer Graphics & Multimedia	70	20	10	30	10	10	150	3	1	2	06	
5	YBCS505	Theory of Computation	70	20	10	-	-	-	100	3	1	-	04	
6	YBCS506	Computer Programming V (Unix/Linux Lab)	-	-	-	30	10	10	50	0	0	2	02	
7	YBCS507	Self study (Internal Assessment)	-	-	-	-	-	50	50	0	0	2	02	Grand Total
8.	YBCS508	Seminar / Group Discussion (Internal Assessment)	-	-	-	-	-	50	50	0	0	2	02	
		Total	350	100	50	120	40	140	800	15	5	12	32	800

MST: Mid Semester Tests Taken at Least twice Per Semester
L:Lecture- T:Tutorial- P: Practical

YBCS501 – Data Communication

UNIT :- I

Data Communication: Introduction, Components, data representation, data flow and basic model , Serial & Parallel transmission , Modes of data transmission, Encoding: Unipolar, Polar, Bipolar, Line & Block codes.

Data compression: Lossy & Lossless techniques. Review of analog & digital transmission methods.

UNIT:-2

Multiplexing: Introduction & History, FDM, TDM, WDM, Synchronous & Statistical TDM. **Spread spectrum:** Frequency Hopping & Direct Sequence. Terminal handling & Polling. **Network Switching Techniques:** Circuit, Message, Packet & Hybrid. X.25,ISDN.

UNIT:-3

Physical Layer: Introduction, Interface, Standards, EIA-232-D, RJ-45, RJ-11, BNC connector & EIA-449 digital Interface: Connection, specifications & configuration. **Modem:** Types, features, signal constellation, block schematic. **Connecting Devices:** Active and Passive Hubs, Repeaters, Bridges, Two & Three layer switches & Gateway. Network Topologies and their comparative study.

UNIT:-4

Transmission Media: Transmission line characteristics, distortions, Crosstalk. **Guided Media:** Twisted Pair, Baseband & Broadband Coaxial, Fiber Optic Cable. **Unguided media:** Electromagnetic polarization , Rays and waves front , Electromagnetic spectrum, Radiation & Propagation of Waves, Inverse square law , Wave attenuation and absorption, Terrestrial Propagation, Skip distance , Radio waves, Microwave , Infrared & Satellite Communication system .

Telephone Network: Components, LATAs, signaling and Services, Digital Subscriber Line: ADSL, HDSL, SDSL, VDSL, Cable TV network for data transfer.

UNIT:-5

Transmission Errors : Content Error , Flow integrity error , Error detection ,Error correction , Bit error rate.**Error detection & Correction methods:** Parity checking, Checksum Error Detection, Cyclic Redundancy Check , Hamming Distance , Interleaved codes , Block Parity , Convolution code, Hardware Implementation, Checksum .

Suggested Text Books:

1. Gupta Prakash C. “Data communication”, PHILearning
2. Forouzan, “Data communication and Networking”, 5e, TATA McGraw
3. Godbole A., “Data Communication & Network” ,TMH
4. Miller, “ Data Network and Comunication”, Cengage DelmarLearning
5. Stallings William , “Data & Computer Communication”, PearsonEducation

Suggested Reference Books:

1. Tanenbum A.S. “Computer Network”, PearsonEducation.
2. Kennedy G., “Communication Systems”MGH

YBCS502 – Operating System

Unit I

Introduction to System Programs & Operating Systems, Evolution of Operating System (mainframe, desktop, multiprocessor, Distributed, Network Operating System, Clustered & Handheld System), Operating system services, Operating system structure, System Call & System Boots, Operating system design & Implementations, System protection, Buffering &Spooling . Types of Operating System: Bare machine, Batch Processing, Real Time, Multitasking & Multiprogramming, time-sharing system.

Unit II

File: concepts, access methods, free space managements, allocation methods, directory systems, protection, organization ,sharing & implementation issues, Disk & Drum Scheduling, I/0 devices organization, I/0 devices organization, I/0 buffering, I/O Hardware, Kernel I/O subsystem, Transforming I/O request to hardware operations.

Device Driver: Path managements, Sub module, Procedure, Scheduler, Handler, Interrupt Service Routine. File system in Linux & Windows

Unit III

Process: Concept, Process Control Blocks(PCB), Scheduling criteria Preemptive & non Preemptive process scheduling, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling, operations on processes, threads, inter process communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization. Deadlock: Characterization, Methods for deadlock handling, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Process Management in Linux.

Unit IV

Memory Hierarchy, Concepts of memory management, MFT & MVT, logical and physical address space, swapping, contiguous and non-contiguous allocation, paging, segmentation, and paging combined with segmentation. Structure & implementation of Page table.Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation.

Unit V

Distributed operating system:-Types, Design issues, File system, Remote file access, RPC, RMI, Distributed Shared Memory(DSM), Basic Concept of Parallel Processing & Concurent Programming Security & threats protection: Security violation through Parameter, Computer Worms & Virus, Security Design Principle, Authentications, Protection Mechanisms. introduction to Sensor network and parallel operating system. Case study of Unix, Linux &Windows,

List of Experiment

1. Write a program to implement FCFS CPU scheduling algorithm.
2. Write a program to implement SJF CPU scheduling algorithm.
3. Write a program to implement Priority CPU Scheduling algorithm.
4. Write a program to implement Round Robin CPU scheduling algorithm.
5. Write a program to compare various CPU Scheduling Algorithms over different Scheduling Criteria.
6. Write a program to implement classical inter process communication problem(producer consumer).
7. Write a program to implement classical inter process communication problem(Reader Writers).
8. Write a program to implement classical inter process communication problem(Dining_Philosophers).
9. Write a program to implement & Compare various page replacementalgorithm.
10. Write a program to implement & Compare various Disk & Drum schedulingAlgorithms
11. Write a program to implement Banker'salgorithms.
12. Write a program to implement Remote ProccedureCall(RPC).
13. Write a Devices Drivers for any Device orpheriperal.

Suggested Reading:

1. Silberschatz ,"Operating system", WilleyPub.
2. Stuart,"Operating System Principles, Design & Applications", Cengage Learning
3. Tannanbaum, "Modern operating system", PHIL earning
4. Dhamdhere, "OperatingSystem",TMH.
5. Achyut S Godbole,"Operating System", TMH.
6. William stalling, "operating system" Pearson Edu.
7. Deitel&Deitel, "Operating Systems", Pearson Edu.
8. Flynn &Mchoes, "Operating Systems", Cengage Learning
9. Haldar, "Operating System", Pearson Edu.

YBCS503 – Database Management System

Unit I

DBMS Concepts and architecture Introduction, Database approach v/s Traditional file accessing approach, Advantages, of database systems, Data models, Schemas and instances, Data independence, Data Base Language and interfaces, Overall Database Structure, Functions of DBA and designer, ER data model:Entitles and attributes, Entity types, Defining the E-R diagram,Concept of Generalization, Aggregation and Specialization. transforming ER diagram into the tables. Various other data models object oriented data Model, Network data model, and Relational data model, Comparison between the three types of models.

Unit II

Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints.
Referential integrity, Intension and Extension, Relational Query languages:SQL-DDL, DML, integrity constraints, Complex queries, various joins, indexing, triggers, ssertions,Relational algebra and relational calculus, Relational algebra operations like select, Project,Join, Division, outer union. Types of relational calculus i.e. Tuple oriented and domain oriented relational calculus and its operations.

Unit III

Data Base Design: Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and losless join, problems with null valued and dangling tuples, multivalued dependencies.Query Optimization: Introduction, steps of optimization, various algorithms to implement select, project and join operations of relational algebra, optimization methods: heuristic based, cost estimation based.

Unit IV

Transaction Processing Concepts: - Transaction System, Testing of Serilizability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures. Log based recovery. Checkpoints deadlock handling.Concurrency Control Techniques: - Concurrency Control, locking Techniques for concurrency control, time stamping protocols for concurrency control, validation based protocol, multiple granularity. Multi version schemes, Recovery with concurrent transaction. Introduction to Distributed databases, datamining, datawarehousing, Object Technology and DBMS, Comparative study of OODBMS VsDBMS . Temporal, Deductive, Multimedia, Web & Mobile database .

Unit V

Study of Relational Database Management Systems through Oracle/Postgres SQL/MySQL: Architecture, physical files, memory structures, background process. Concept of table

spaces, segments, extents and block. Dedicated server, multi threaded server. Distributed database, database links, and snapshot. Data dictionary, dynamic performance view.Security, role management, privilege management, profiles, invoker defined security model. SQL queries, Data extraction from single, multiple tables equi-join, non equi-join, self-join, outer join. Usage of like, any, all, exists, in Special operators. Hierarchical queries, inline queries, flashback queries. Introduction of ANSI SQL, anonymous block, nested anonymous block, branching and looping constructs in ANSI SQL. Cursor management: nested and parameterized cursors, Oracle exception handling mechanism. Stored procedures, in, out, in out type parameters,usage of parameters in procedures. User defined functions their limitations. Triggers, mutating errors, instead of triggers.

Suggested list of experiments:

1. Delete duplicate row from thetable.
2. Display the alternate row fromtable.
3. Delete alternate row from table.
4. Update multiple rows in using single updatestatement.
5. Find the third highest paid and third lowest paidsalary.
6. Display the 3rd, 4th, 9th rows fromtable.
7. Display the ename, which is start with j, k, l orm.
8. Show all employees who were hired the first half of themonth.
9. Display the three record in the first row and two records in the second row and one record in the third row in a single sqlstatements.
10. Write a sql statements for rollback commit and savepoints.
11. Write a pl/sql for select, insert, update and deletestatements.
12. Write a pl/sql block to delete a record. If delete operation is successful return 1 else return0.
13. Display name, hire date of all employees usingcursors.
14. Display details of first 5 highly paid employees usingcursors.
15. Write a database trigger which fires if you try to insert, update, or delete after 7'o'clock.
16. Write a data base trigger, which acts just like primary key and does not allow duplicate values.
17. Create a data base trigger, which performs the action of the on deletecascade.
18. Write a data base trigger, which should not delete from emp table if the day isSunday.
19. In this subject the students are supposed to prepare a small database application in complete semester like financial accounting system, Railway reservation system, institute timetable management system. Student record system, library management system, hospital management system etc. **in RDBMS** asfollows:

Section A:

Solving the case studies using ER datamodel (design of the database)

Section B:

Implement a miniproject for the problem taken in section A.

Suggested Reading:-

1. Date C J, "An Introduction To Database System", PearsonEducations
2. Korth, Silbertz,Sudarshan, "Fundamental of Database System", Mc Graw Hill
3. Rob, " Data Base System:Design Implementation & Management", Cengage Learninig
4. Elmasri, Navathe, "Fundamentals Of Database Systems", PearsonEducations
5 .Atul Kahate , " Introduction to Database Management System", Pearson Educations
6. Oracle 9i Database Administration Fundamental-I, Volume I, OraclePress, TMH.
7. Paneerselvam,"DataBase Management System", PHIL earning
8. dev.mysql.com 9.www.postgressql.org

YBCS504 – Computer Graphics & Multimedia

Unit-I

Introduction to Raster Scan displays, Pixels, Frame buffer, Vector & Character generation, Random Scan systems, Display devices, Scan Conversion techniques, **Line Drawing**: simple DDA, Bresenham's Algorithm, **Circle Drawing Algorithms**: Midpoint Circle drawing and Bresenham's Algorithm, **Polygon fill algorithm**: Boundary-fill and Flood-fillalgorithms

Unit-II

2-D Transformation: Translation, Rotation, Scaling, Shearing, Reflection. Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation.**Windowing & Clipping**: World Coordinate System, Screen Coordinate System, Viewing Transformation, Line Clipping & Polygon ClippingAlgorithms

Unit-III

3-D Transformations: Translation, Rotation and Scaling. **Parallel & PerspectiveProjection:** Types of Parallel & Perspective Projection, **Hidden Surface elimination**: Depth comparison, Back face detection algorithm, Painter's Algorithm, Z-Buffer Algorithm. Curve generation, Bezier and B-spline methods. **Basic Illumination Model**: Diffuse reflection, Specular reflection, Phong Shading, Gouraud shading, Ray Tracing, Color models like RGB, YIQ, CMY, HSV.

Unit-IV

Multimedia : Characteristics of a multimedia presentation , Uses of Multimedia, **Text** –Types, Unicode Standard ,text Compression, Text file formats, **Audio**-Components of an audio system, Digital Audio, Digital Audio processing, Sound cards, Audio file formats ,Audio Processing software ,**Video**-Video color spaces, Digital Video, Digital Video processing, Video fileformats.

Unit–V

Animation: Uses of Animation, Principles of Animation, Computer based animation, 3D Animation, Animation file formats, Animationsoftwares.

Compression: Lossless/Lossy Compression techniques, Image, Audio & Video Compressions, MPEG Standards ,Multimedia Architecture, Multimedia databases

Recommended Text:

1. Rogers, "Procedural Elements of Computer Graphics", Tata McGrawHill
2. Donald Hearn and M.P. Becker “Computer Graphics” PearsonPub.
3. Parekh “Principles of Multimedia” Tata McGrawHill
4. Maurya, “Computer Graphics with Virtual Reality System “ , WileyIndia
5. Pakhira,”Computer Graphics ,Multimedia &Animation”,PHIlearning
6. Andleigh, Thakral , “Multimedia System Design “ PHILearning

YBCS505 – Theory of Computation

UNIT 1:

Automata:

Basic machine, FSM , Transition graph, Transition matrix, Deterministic and nondeterministic FSM'S, Equivalence of DFA and NDFA, Mealy & Moore machines, minimization of finite automata, Two-way finite automata.

Regular Sets and Regular Grammars:

Alphabet, words, Operations, Regular sets, Finite automata and regular expression, Myhill-Nerode theorem Pumping lemma and regular sets, Application of pumping lemma, closure properties of regular sets.

UNIT 2:

Context –Free Grammars:

Introduction to CFG, Regular Grammars, Derivation trees and Ambiguity, Simplification of Context free grammars, Normal Forms (Chomsky Normal Form and Greibach Normal forms).

UNIT 3:

Pushdown Automata:

Definition of PDA, Deterministic Pushdown Automata, PDA corresponding to given CFG, CFG corresponding to a given PDA.

Context Free Languages:

The pumping lemma for CFL's, Closure properties of CFL's, Decision problems involving CFL's.

UNIT 4:

Turing Machines:

Introduction, TM model, representation and languages acceptability of TM Design of TM,Universal TM & Other modification, Church's hypothesis, composite & iterated TM. Turing machine as enumerators.Properties of recursive & recursively enumerable languages,Universal Turing machine

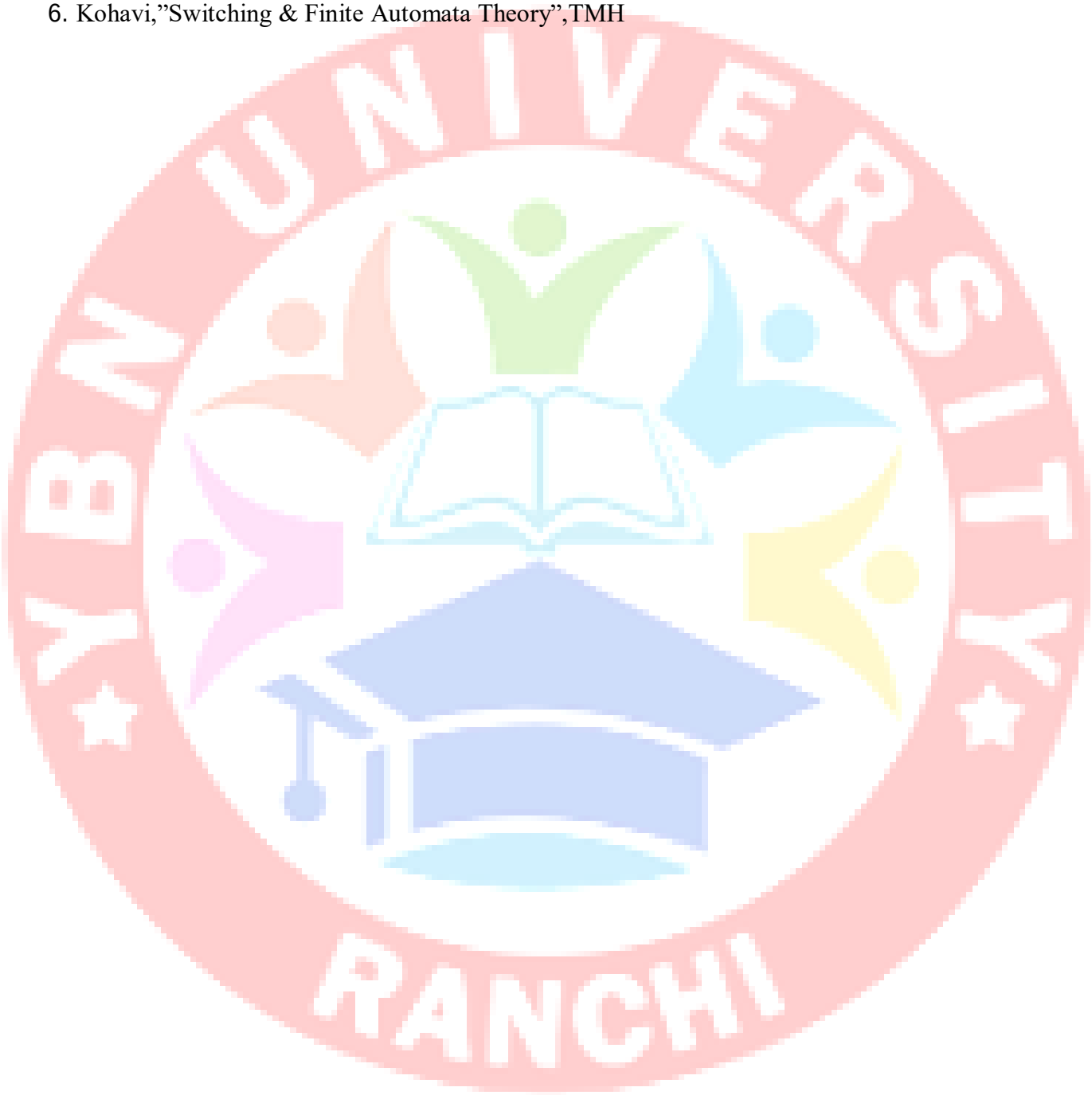
UNIT 5:

Tractable and Untractable Problems:

P, NP, NP complete and NP hard problems, examples of these problems like satisfy ability problems, vertex cover problem, Hamiltonian path problem, traveling sales man problem, Partition problem etc.

Suggested Reading:

1. John E. Hopcroft, Jeffery Ullman,"Introduction to Automata theory, Langauges& computation" ,NarosaPublishers.
2. K.L.P Mishra & N.Chandrasekaran,"Theory of Computer Science", PHILearning
3. Michael Sipsev,"Theory of Computation",CenageLearning
4. John C Martin, "Introdution to languages and theory of computation", McGrawHill
5. Daniel I.A. Cohen,"Introduction to Computer Theory",WileyIndia.
6. Kohavi,"Switching & Finite Automata Theory",TMH



YBCS506 – Computer Programming V (Unix/Linux-Lab.)

Overview of Unix/Linux: -

Concepts, Unix/Linux Installation Process, Hardware Requirements for Unix/Linux ,Advantages of Unix/Linux, Reasons for Popularity and Success of Linux/Unix Operating System, Features of Linux/Unix Operating System, Kernel, Kernel Functions, The Shell Basic Commands, Shell Programming:-Shell Variables, Branching Control Structures, Loop-Control Structure, Continue and break Statements, Sleep Command, Debugging Script. Use of Linux as web-server, file server, directory server, application server, DNS server, SMTP server, Firewall, Proxy server.

File System: -

Definition of File System, Defining Geometry, Disk Controller, Solaris File System, Disk Based File Systems, Network-Based File Systems, Virtual File systems, UFS File System, The Boot Block, The Super Block, The Inode, Tuning File System, Repairing File System.

Process Control: -

Viewing a Process, Command to display Process, Process Attributes, Process States, Process Fields, PS Commands options, PGREP, PRSTAT, CDE Process Manager, Scheduling Process, Scheduling Priorities, Changing the Priority of a time-sharing process, Killing Process.

System Security: -

Physical Security, Controlling System Access, Restricted Shells Controlling File Access, File Access Commands, Access Control List(ACLs), Setting ACL Entries, Modifying ACL entries on a file, Deleting ACL entries on a file, Restricting FTP, Securing Super User Access, Restricting Root Access, Monitoring super user Access, TCPWrappers.

Dynamic Host Configuration Protocol: -

Introduction, DHCP Leased Time, DHCP Scopes, DHCP IP Address, Allocation Types, Planning DHCP Deployment, DHCP Configuration files, Automatic Startup of DHCP Server, Configuration of DHCP Clients, Manually Configuring the DHCP.

Case Study: -

Installation of Linux, Customization of Linux, Installation of SAMBA, APACHE, TOMCAT, Send MAIL, Postfix, Implementation of DNS, LDAP services, Firewall, Proxy server

List of Experiments:-

1. To Study basic & User status Unix/LinuxCommands.
2. Study & use of commands for performing arithmetic operations withUnix/Linux.

3. Create a file called wlcc.txt with some lines and display how many lines, wordsand characters are present in thatfile.
4. Append ten more simple lines to the wlcc.txt file created above and split the appended file into 3 parts. What will be the names of these split files? Display the contents of each of these files.
How many lines will be there on the last file?
5. Given two files each of which contains names of students. Create a programto display only those names that are found on both thefiles.
6. Create a program to find out the inode number of any desiredfile.
7. Study & use of the Command for changing filepermissions.
8. Write a pipeline of commands, which displays on the monitor as well as saves the information about the number of users using the system at present on a file called usere.ux.
9. Execute shell commands through vieditor.
10. Installation, Configuration & Customizations ofUnix/Linux.
11. Write a shell script that accepts any number of arguments and prints them in the reverseorder.
12. Write a shell script to find the smallest of three numbers that are read from the keyboard.
13. Write a shell script that reports the logging in of a specified user within one minute after he/she logs in. The script automatically terminates if the specified user does not login during a specified period oftime.
14. Installation of SAMBA, APACHE,TOMCAT.
15. Implementation of DNS, LDAPservices,
16. Study & installation of Firewall & Proxy server

Suggested Reading:

1. Venkatesh Murthy, “Introduction to Unix &Shell”, Pearson Edu
2. Forouzan, “Unix & Shell Programming”, Cengage Learning
3. Sumitab Das,”Unix Concept & Application”,TMH
4. Gopalan, Shivaselvan,”Beginners Guide to Unix ” PHI Learning
5. Venkateshwavle,”Linux Programming Tools Unveil`ed”, BS Publication.
6. Richard Peterson,”Linux CompleteReference”,TMH
7. Richard Peterson,” Unix Complete Reference”, TMH

YBN UNIVERSITY, RANCHI, JHARKHAND
School of Engineering & Technology

B.Tech. Semester VI **Computer Science**

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted							Credits Allotted Subject wise			Total Credits	Remark
			`Theory Slot			Practical Slot			Total Marks					
			End Sem.	Mid Sem. MST	Quiz, Assig-nment	End Sem	Term work			Period per week				
							Lab work & sessional	Assignment/ quiz		L	T	P		
1	YBCS601	Micro Processor and Inter facing	70	20	10	30	10	10	150	3	1	2	06	
2	YBCS602	PPL	70	20	10	-	-	-	100	3	1	-	04	
3	YBCS603	Software Engineering & Project managements	70	20	10	30	10	10	150	3	1	2	06	
4	YBCS604	Computer Networking	70	20	10	30	10	10	150	3	1	2	06	
5	YBCS605	Advance Computer Architecture(ACA)	70	20	10	-	-	-	100	3	1	-	04	
6	YBCS606	Minor Project-I	-	-	-	30	10	10	50	0	0	2	02	
7	YBCS607	Self study (Internal Assessment)	-	-	-	-	-	50	50	0	0	2	02	Grand Total
8.	YBCS608	Seminar/ Group Discussion (Internal Assessment)	-	-	-	-	-	50	50	0	0	2	02	
		Total	350	100	50	120	40	140	800	15	5	12	32	800

YBCS601 – Micro Processor and Interfacing

Unit-I

Microprocessor and Microprocessor Development Systems: Evolution of Microprocessor, Microprocessor architecture and its operations, memory, inputs-outputs (I/Os), data transfer schemes interfacing devices, architecture advancements of microprocessors, Typical microprocessor development system.

Unit-II

8085 Mirprocessor : Architetcure of 8085 microprocessor ,Instruction set and Adressing modes of 8085 microprocessor,Assembly language programs of 8085 microprocessor, Stack, Subroutines, Time-Delay loops, Modular programming, Macro .

Unit-III

8086 Microprocessor : Architecture , Registers ,Memory Segmentation ,8086 Memory Addressing ,Memory Read and Write Bus Cycle of 8086,Demultiplexing of the system Bus in 8086 and 8088 microprocessors, Instruction set and Addressing modes of 8086 microprocessor ,Assembly language programs of 8086 miroprocessor.

Unit-IV

I/O and Memory Interfacing Using 8085/8086: memory interfacing, Interrupts of 8085/8086 Microprocessors, 8259A Programmable Interrupt Controller, Programmable peripheral Interface, 8253 Programmable Counter/Interval Timer.

Communication and Bus Interfacing with 8085/8086 Microprocessor :Serial Communication Interface, DMA Controller 8257, 8279-Programmable Keyboard and Display I/O Interface, Bus Interface,8089 I/Oprocessor

Unit-V

8051 Microcontroller: Architetcure of 8051 microcontroller**,** Memory organization, Timers/Counters, Interrupts, Addressing modes, 8051 Instruction set , Assembly language Programs, Applications of microcontrollers.

Suggested Reading:

1. Douglas V Hall, “Microprocessors and interfacing – Programming & Hardware”TMH
2. Gaonkar, “Microprocessor Architecture, Programming & Applications with 8085”,TMH

3. Rafiquzzaman, “Microprocessors-Theory & Applications”,PHI

4. Savaliya, “8086 Programming & Advance Processor Architecture”, WileyIndia

5. Ray, Bhurchandi, “Advanced Microprocessor and peripherals” TMHPub

6. Soumitra Kumar Mandal, “Microprocessors and Microcontroller” TMHPub

List of Experiments

1. To study 8085 based microprocessor system

2. To study 8086 based microprocessor system

3. To develop and run a program for finding out the largest/smallest number from a given set of numbers.

4. To develop and run a program for arranging in ascending/descending order of a set of numbers

5. To perform multiplication/division of given numbers

6. To perform conversion of temperature from 0F to 0C andvice-versa

7. To perform computation of square root of a given number

8. To perform floating point mathematical operations (Addition, Subtraction, Multiplication and Division)

9. To obtain interfacing of RAM chip to 8085/8086 based system

10. To obtain interfacing of key board controller

11. To obtain interfacing of DM A controller

12. To obtain interfacing of PPI

13. To perform microprocessor based temperature control of hot water

YBCS602 – Principles Of Programming Languages

UNIT-I

Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. Issues in Language Translation: Syntax, Semantics, Stages, analysis and synthesis, Parse Tree, CFG and BNF grammar.

UNIT-II

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names ,Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Sequence control with Expressions, Conditional Statements, Loops, Exception handling.

UNIT-III

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, design issues for functions overloaded operators, co routines.

UNIT-IV

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, Static and Stack-Based Storage management. heap based storage management. Garbage Collection.object oriented programming in small talk, C++, Java, C#, PHP, Perl . Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

UNIT – V

Exception handling, Exceptions, exception Propagation, Exception handler in C++ and Java. Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming. Functional Programming Languages: Introduction, fundamentals. Introduction to 4GL.

Suggested Reading:

1. Sebesta,"Concept of programming Language", PearsonEdu.
2. Louden, "Programming Languages: Principles & Practices" , Cengage Learning
3. Tucker, " Programming Languages: Principles and paradigms ", Tata McGraw–Hill
4. Terrance W Pratt, "Programming Languages: Design and Implementation" Pearson Edu. 5 CavloGhezzi& Mehdi Jazayeri " Programming Languages Concepts", Willey India
6 E Horowitz, "Programming Languages", 2nd Edition, Addison Wesley

YBCS603 – Software Engineering & Project Management

Unit I: The Software Product and Software Process:
Software Product and Process Characteristics, Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Process Models like Incremental Model, Spiral Model, Component Assembly Model, RUP and Agile processes. Software Process customization and improvement, CMM, Product and Process Metrics

Unit II: Requirement Elicitation, Analysis, and Specification
Functional and Non-functional requirements, Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented software development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability

Unit III: Software Design
The Software Design Process, Design Concepts and Principles, Software Modeling and UML, Architectural Design, Architectural Views and Styles, User Interface Design, Function-oriented Design, SA/SD Component Based Design, Design Metrics

Unit IV: Software Analysis and Testing
Software Static and Dynamic analysis, Code inspections, Software Testing Fundamentals, Software Test Process, Testing Levels, Test Criteria, Test Case Design, Test Oracles, Test Techniques, Black-Box Testing, White-Box Unit Testing and Unit Testing Frameworks, Integration Testing, System Testing and other Specialized Testing, Test Plan, Test Metrics, Testing Tools. , Introduction to Object-oriented analysis, design and comparison with structured softwareengg.

Unit V: Software Maintenance & Software Project Measurement
Need and Types of Maintenance, Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support.

Project Management Concepts, Feasibility Analysis, Project and Process Planning, Resources Allocations, Software efforts, Schedule, and Cost estimations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance (SQA). Project Plan, Project Metrics.

Practical and Lab work

Lab work should include a running case study problem for which different deliverables at the end of each phase of a software development life cycle are to be developed. This will include modeling the requirements, architecture and detailed design. Subsequently the design models will be coded and tested. For modeling, tools like Rational Rose products. For coding and testing, IDE like Eclipse, NetBeans, and Visual Studio can be used.

Suggested Reading:

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1. PankajJalote ,"An Integrated Approach to Software Engineering", Narosa Pub,2005
2. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHILearning
3. R S. Pressman ,"Software Engineering: A Practitioner's Approach", Sixth edition 2006, McGraw-Hill.
4. Sommerville,"Software Enginerring",Pearson Education.
5. Richard H.Thayer,"SoftwareEnginerring& Project Managements",WilleyIndia
6. Waman S.Jawadekar,"Software Enginerring",TMH
7. Schwalbe,"IT Project Managements",CengageLearning.

YBCS604 – Computer Networking

RATIONALE:-
The purpose of this subject is to cover the underlying concepts and techniques used in Computer Networking. This syllabus provides a comprehensive introduction to computer network, network architecture and protocols.

PREREQUISITE:-
The students should have thorough exposure in Analog and Digital Communication and Data Communications. Knowledge of Topology and protocol will help in better understanding

Unit –I

Computer Network: Definitions, goals, components, Architecture, Classifications & Types. Layered Architecture: Protocol hierarchy, Design Issues , Interfaces and Services, Connection Oriented & Connectionless Services, Service primitives, Design issues & its functionality. ISO-OSI Reference Model: Principle, Model, Descriptions of various layers and its comparison with TCP/IP. Network standardization.
Queueing Models: Little's Theorem, Queueing System: M/M/1, M/M/m, M/M/∞, M/M/m/m, M/G/1

Unit-II

Data Link Layer: Need, Services Provided, Framing , Flow Control, Error control. Data Link Layer Protocol: Elementary & Sliding Window protocol: 1-bit, Go-Back-N, Selective Repeat, Hybrid ARQ. Bit oriented protocols: SDLC, HDLC, BISYNC, LAP and LAPB. Protocol verification: Finite State Machine Models & Petri net models.

Unit-III

MAC Sublayer: MAC Addressing, Binary Exponential Back-off (BEB) Algorithm, Distributed Random Access Schemes/Contention Schemes: for Data Services (ALOHA and Slotted-ALOHA), for Local-Area Networks (CSMA, CSMA/CD, CSMA/CA), Collision Free Protocols: Basic Bit Map, BRAP, Binary Count Down, MLMA Limited Contention Protocols: Adaptive Tree Walk, URN Protocol, High Speed LAN: Fast Ethernet, Gigabit Ethernet, FDDI, Performance Measuring Metrics. IEEE Standards 802 series & their variant.

Unit-IV

Network Layer: Need, Services Provided , Design issues, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multicast Routing, Congestion Control Algorithms: General Principles of Congestion control, Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram subnets. IP protocol, IP Addresses, Comparative study of IPv4 &IPv6, MobileIP.

Unit-V

Transport Layer: Design Issues, UDP: Header Format, Per-Segment Checksum, Carrying Unicast/Multicast Real-Time Traffic, TCP: Connection Management, Reliability of Data Transfers, TCP Flow Control, TCP Congestion Control, TCP Header Format, TCP Timer

Management.Session layer: Authentication, Authorisation, Session layer protocol (PAP, SCP, H.245). Presentation layer: Data conversion, Character code translation, Compresion, Encryption and Decryption, Presentation layer protocol (LPP, Telnet, X.25 packet Assembler/Disassembler).Application Layer: WWW and HTTP, FTP, SSH, Email (SMTP, MIME, IMAP), DNS, Network Management (SNMP).

References:

1. Andrew S. Tanenbaum, David J. Wetherall, "Computer Networks" PearsonEducation.
2. DimitriBertsekas, Robert Gallager, "Data Networks", PHI Publication, SecondEdition.
3. Kaveh Pahlavan, Prashant Krishnamurthy, "Networking Fundamentals", Wiley Publication.
4. Uyless Black, "Computer Networks", PHI Publication, SecondEdition.
5. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open Source Approach", McGrawHill.

List of Experiments:

1. Study of Different Type of LAN& NetworkEquipments.
2. Study and Verification of standard Network topologies i.e. Star, Bus, Ringetc.
3. LAN installations andConfigurations.
4. Write a program to implement various types of error correctingtechniques.
5. Write a program to Implement various types of framingmethods.
6. Study of Tool Command Language(TCL).
7. Study and Installation of Standard Network Simulator: N.S-2, N.S-3.OpNet,QualNetetc.
8. Study & Installation of ONE (Opportunistic Network Environment) Simulator for High Mobility Networks.
9. Configure 802.11WLAN.
10. Implement &Simulate various types of routingalgorithm.
11. Study & Simulation of MAC Protocols like Aloha, CSMA, CSMA/CD and CSMA/CAusing Standard NetworkSimulators.
12. Study of Application layer protocols- DNS, HTTP, HTTPS, FTP andTelNet.

YBCS605 – Advance Computer Architecture (ACA)

RATIONALE:

The purpose of this subject is to cover the underlying concepts and techniques used in Advance Computer Architecture. The Syllabus discusses principles of parallel algorithms design and different parallel programming models

PREREQUISITE

The students should have general Idea of Computer Organization. In addition, a familiarity with Memory organization, Computational models is required.

Unit-I

Flynn's Classification, System Attributes to Performance, Parallel computer models - Multiprocessors and multicomputers, Multivector and SIMD Computers. Data and resource dependences,Hardware and software parallelism,Program partitioning and scheduling, Grain size and latency, Control flow, data flow and Demand driven mechanisms. Static interconnection networks,Dynamic interconnection Networks: Bus Systems, Crossbar Switch, Multiport Memory, Multistage and CombiningNetworks

Unit- II

Instruction set architecture, CISC Scalar Processors , RISC Scalar Processors, VLIW architecture, Memory Hierarchy, Inclusion, Coherence and Locality, Memory capacity planning. Interleaved memory organization- memory interleaving, pipelined memory access, Bandwidth and Fault Tolerance. Backplane Bus System :Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt.

Unit-III

Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling - score boarding and Tomosulo's algorithm, Branch handling techniques, Arithmetic Pipeline Design, Static arithmetic pipeline, Multifunctional arithmetic pipelines. Superscaler pipeline design, Super pipeline processordesign.

Unit-IV

Cache coherence, Snoopy protocols, Directory based protocols. Message routing schemes in multicomputer network, deadlock and virtual channel.Vector Processing Principles, Vector instruction types, Vector-access memory schemes. Vector supercomputer architecture, SIMD organization: distributed memory model and shared memory model. Principles of Multithreading: Multithreading Issues and Solutions, Multiple-Context Processors

Unit-V

Parallel Programming Models, Shared-Variable Model, Message-Passing Model, Data-Parallel Model, Object-Oriented Model, Functional and Logic Models, Parallel Languages and Compilers, Language Features for Parallelism, Parallel Programming Environment, Software Tools andEnvironments.

Suggested Reading:

1. Kai Hwang, "Advanced computer architecture",TMH.
2. J.P.Hayes, "computer Architecture and organization";MGH.
3. V.Rajaranam&C.S.R.Murthy, "Parallel computer"; PHILearning.
. 4. Kain,"Advance Computer Architecture: - A System Design Approach", PHI Learning
5. M.J Flynn, "Computer Architecture, Pipelined and Parallel Processor Design";Narosa Publishing.
6. Hwang and Briggs, "Computer Architecture and Parallel Processing";MGH.
7. David E. Callav&Jaswinder Pal Singh Marge Kaufmann"Advance ComputerArchitecture", EISIndia.
8. Sajjan G. Shiva, Taylar& Francis, "Advance ComputerArchitecture

YBN UNIVERSITY, RANCHI, JHARKHAND
School of Engineering & Technology

B.Tech. Semester VII **Computer Science**

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted							Credits Allotted Subject wise			Total Credits	Remark
			Theory Slot			Practical Slot			Total Marks					
			End Sem.	Mid Sem. MST	Quiz, Assig-nment	End Sem	Term work			Period per week				
							Lab work & sessional	Assignment/ quiz		L	T	P		
1	YBCS701	Compiler Design	70	20	10	30	10	10	150	3	1	2	06	
2	YBCS702	Distributed System	70	20	10	-	-	-	100	3	1	-	04	
3	YBCS703	Cloud Computing	70	20	10	30	10	10	150	3	1	2	06	
4	YBCS704	Information Storage & Management	70	20	10	-	-	-	100	3	1	-	04	
5	YBCS705	Elective -I	70	20	10	-	-	-	100	3	1	-	04	
6	YBCS706	Industrial Training (2Week)	-	-	-	30	10	10	50	0	0	2	02	
7	YBCS707	Major Project	-	-	-	30	10	10	50	0	0	2	02	
8	YBCS708	Self study	-	-	-	-	-	50	50	0	0	2	02	Grand Total
9.	YBCS709	Seminar /Group Discussion	-	-	-	-	-	50	50	0	0	2	02	
		Total	350	100	50	120	40	140	800	15	5	12	32	800

YBCS705 (Elective –I)
705(A) - N/W & Web Security
705(B) - Simulation & Modelling
705(C) – Embedded Computer System
705(D) - Real Time Fault Tolerant Systems

YBCS701 – Compiler Design

Unit-I

Introduction to compiling & Lexical Analysis

Introduction of Compiler, Major data Structure in compiler, BOOT Strapping & Porting, Compiler structure: analysis-synthesis model of compilation, various phases of a compiler, Lexical analysis: Input buffering , Specification & Recognition of Tokens, LEX.

Unit-II

Syntax Analysis &Syntax Directed Translation

Syntax analysis: CFGs, Top down parsing, Brute force approach, recursive descent parsing, transformation on the grammars, predictive parsing, bottom up parsing, operator precedence parsing, LR parsers (SLR,LALR, LR),Parser generation.Syntax directed definitions: Construction of Syntax trees, Bottom up evaluation of S-attributed definition, L-attribute definition, Top down translation, Bottom Up evaluation of inherited attributes Recursive Evaluation, Analysis of Syntax directeddefinition.

Unit-III

Type Checking & Run Time Environment

Type checking: type system, specification of simple type checker, equivalence of expression, types, type conversion, overloading of functions and operations, polymorphic functions. Run time Environment: storage organization, Storage allocation strategies, parameter passing, dynamic storage allocation , Symboltable

Unit –IV

Code Generation

Intermediate code generation: Declarations, Assignment statements, Boolean expressions, Case statements, Back patching, Procedure calls Code Generation: Issues in the design of code generator, Basic block and flow graphs, Register allocation and assignment, DAG representation of basic blocks, peephole optimization, generating code fromDAG.

Unit –V

Code Optimization

Introduction to Code optimization: sources of optimization of basic blocks, loops in flow graphs, dead code elimination, loop optimization, Introduction to global data flow analysis, Code Improving transformations ,Data flow analysis of structure flow graph Symbolic debugging of optimized code.

List of Experiments:

□ Develop a lexical analyzer to recognize a fewpatterns.
□ Write a programme to parse using Brute force technique of Topdownparsing.
□ Develop LL (1) parser (Construct parse tablealso).
□ Develop an operator precedence parser (Construct parse tablealso)
□ Develop a recursive descent parser
□ Write a program for generating for various intermediate codeforms
i) Three address code ii) Polish notation
□ Write a program to simulate Heap storage allocationstrategy
□ Generate Lexical analyzer usingLEX
□ Generate YACC specification for a few syntacticcategories.

□ Given any intermediate code form implement code optimizationtechniques
□ Study of an Object OrientedCompiler.

References:

1. A. V. Aho, R. Sethi, and J. D. Ullman. Compilers: Principles, Techniques and Tools , Pearson Education
2 Raghavan, Compiler Design, TMH Pub.
3. Louden. Compiler Construction: Principles and Practice, CengageLearning
4. A. C. Holub. Compiler Design in C , Prentice-Hall Inc.,1993.
5. Mak, writing compiler & Interpreters,

YBCS702 – Distributed System

Unit-I

Introduction to distributed systems

Architecture for Distributed System, Goals of Distributed system, Hardware and Software concepts, Distributed Computing Model, Advantages & Disadvantage distributed system, Issues in designing Distributed System,

Unit-II

Distributed Share Memory And Distributed File System

Basic Concept of Distributed Share Memory (DSM), DSM Architecture & its Types, Design & Implementations issues In DSM System, Structure of Share Memory Space, Consistency Model, and Thrashing. Desirable features of good Distributed File System, File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File Application & Fault tolerance. Naming: - Features, System Oriented Names, Object Locating Mechanism, Human OrientedName.

Unit-III

Inter Process Communication And Synchronization

API for Internet Protocol, Data Representation & Marshaling, Group Communication, Client Server Communication, RPC- Implementing RPC Mechanism, Stub Generation, RPC Messages. Synchronization: - Clock Synchronization, Mutual Exclusion, Election Algorithms:- Bully & Ring Algorithms**.**

Unit-IV

Distributed Scheduling AndDeadlock

Distributed Scheduling-Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its issues. Deadlock-Issues in deadlock detection & Resolutions, Deadlock Handling Strategy, Distributed DeadlockAlgorithms,

Unit-V

Distributed Multimedia & Database system

Distributed Data Base Management System(DDBMS), Types of Distributed Database, Distributed Multimedia:- Characteristics of multimedia Data, Quality of Service Managements. Case Study of Distributed System:- Amoeba, Mach, Chorus

References:

□ Sinha, Distributed Operating System Concept & Design,PHI
□ Coulouris&Dollimore, Distributed System Concepts and Design, PearsonPub
□ Singhal&Shivratari, Advance Concept in Operating System, McGrawHill
□ Attiya& Welch, Distributed Computing, WileyPub.

YBCS703 – Cloud Computing

Unit-I

Introduction: Historical development ,Vision of Cloud Computing, Characteristics of cloud computing as per NIST , Cloud computing reference model ,Cloud computing environments, Cloud services requirements, Cloud and dynamic infrastructure, Cloud Adoption and rudiments .Overview of cloud applications: ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis ,Satellite Image Processing ,CRM and ERP ,Social networking .

Unit-II

Cloud Computing Architecture: Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and FaultTolerance,

Cloud Solutions: Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management.

Cloud Offerings: Cloud Analytics, Testing Under Control, Virtual Desktop Infrastructure.

Unit –III

Cloud Management & Virtualization Technology: Resiliency, Provisioning, Asset management,Conceps of Map reduce , Cloud Governance, High Availability and Disaster Recovery. Virtualization: Fundamental concepts of compute ,storage, networking, desktop and application virtualization .Virtualization benefits, server virtualization, Block and file level storage virtualization Hypervisor management software, Infrastructure Requirements , Virtual LAN(VLAN) and Virtual SAN(VSAN) and their benefits .

Unit-IV

Cloud Security: Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing SecutityArchitecture.

Unit-V

Market Based Management of Clouds , Federated Clouds/Inter Cloud: Characterization & Definition ,Cloud Federation Stack , Third Party Cloud Services .

Case study : Google App Engine, Microsoft Azure , Hadoop , Amazon , Aneka

List of Experiments:

1. Installation and configuration of Hadoop/Euceliptus etc.
2. Service deployment & Usage overcloud.
3. Management of cloudresources.
4. Using existing cloud characteristics & Service models.
5. Cloud SecurityManagement.
6. Performance evaluation of services over cloud.

Recommended Text:

1. Buyya, Selvi ," Mastering Cloud Computing ",TMHPub
2. Kumar Saurabh, "Cloud Computing" , WileyPub
3. Krutz , Vines, "Cloud Security " , WileyPub
4. Velte, "Cloud Computing- A Practical Approach" ,TMH Pub
5. Sosinsky, " Cloud Computing" , WileyPub

YBCS704 – Information Storage & Management

Unit-I

Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Datacategorization.

Unit-II

Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

Unit-III

Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparision. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

Unit -IV

Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM), standard framework applications, Key management metrics (Thresholds, availability, capacity, security, performance).

Unit-V

Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security andintegration.

References:

1. G. Somasundaram&AlokShrivastava(EMC Education Services) editors; Information Storage and Management: Storing, Managing, and Protecting Digital Information; WileyIndia.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE, WileyIndia.
3. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation, Management and Security, CRC Press, Taylor FrancesPub.
4. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System &Application, Springer.
5. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach, TMHPub.
6. Saurabh , Cloud Computing : Insight into New EraI

Elective –I (YBCS 705(A) Network & Web Security)

UNIT I

Introduction to Network Security, Computer Securit y and Cyber Security.Security Terminologies and Principle, Security Threats, Types of attacks (Operating System, application level, Shrink Wrap code, Misconfiguration attacks etc.). Introduction to Intrusion, Terminologies, Intrusion Detection System (IDS), Types of Intrusion Detection Systems, System Integrity Verifiers (SIVS).Indication of Intrusion: System Indications, File System Indications Network Indications. Intrusion Detection Tools ,Post attack IDS Measures & Evading IDS Systems. Penetration Testing, Categories of security assessments, Vulnerability Assessment, Types of Penetration Testing. Risk Management.

UNIT II

Cryptography, Classical Cryptographic Techniques, Encryption, Decryption, Code Breaking: Methodologies, Cryptanalysis, Cryptography Attacks, Brute-Force Attack, Use of Cryptography. Public key cryptography, Principles of Public key Cryptosystems, Cryptographic Algorithms RSA, Data Encryption Standard (DES), RC4, RC5, RC6, Blowfish, Key Management, Diffie-Hellman key exchange, elliptic curve crypto graphy.

UNIT III

Hash Functions, One-way Hash Functions, SHA (Secure Hash Algorithm), Authentication Requirements, Authentication Functions, Kerberos. Message Authentication codes ,Message Digest Functions, MD5, SSL (Secure Sockets Layer), SSH (Secure Shell), Algorithms and Security, Disk Encryption, Government Access to Keys (GAK) **Digital Signature:** Analysis, Components, Method, Applications, Standard, Algorithm: Signature Generation/Verification, ECDSA, EIgamal Signature Scheme, Digital
Certificates.

UNIT IV

Trojans and Backdoors: Overt and Covert Channels, Working, Types (Remote Access Trojans, Data-Sending Trojans, Destructive Trojans, Trojans, Proxy Trojans, FTP Trojans, Security SoftwareDisablers).

Viruses and Worms: Characteristics, Working, Infection Phase, Attack Phase. Sniffers: Definition, spoofing, Sniffing, Vulnerable Protocols, Types.

Phishing: Methods, Process, Attacks Types (Man-in-the-Middle Attacks, URL Obfuscation Attacks, Hidden Attacks, Client-side Vulnerabilities, Deceptive Phishing, Malware-Based Phishing, DNSBased Phishing, Content-Injection Phishing, Search Engine Phishing).

Web Application Security- Secured authentication mechanism, secured session management, Cross-site Scripting, SQL Injection and other vulnerabilities

Denial-of Service Attacks: Types of Attacks (Smurf Attack, Buffer Overflow Attack, Ping of Death Attack, Teardrop Attack, SYN Attack, SYN Flooding), DDoS Attack(Distributed DoS Attack.), Session Hijacking, Spoofing v Hijacking, TCP/IP hijacking, CAPTCHA Protection

UNIT V

IP Security, Web Security, Firewalls: Types, Operation, Design Principles, Trusted Systems. Computer Forensics, Need, Objectives,Stages& Steps of Forensic Investigation in Tracking Cyber Criminals, Incident Handling. Hacking, Classes of Hacker (Black hats, grey hats, white hats, suicide hackers), Footprinting, Scanning (Types-Port, Network, Vulnerability), E-Mail Spiders, Overview of System Hacking Cycle.

List of Experiments:

1. Footprinting using footprintingtools(Open Source & Free)(ex-nslookup, ARIN, Whois, Google Earthetc..)
2. Scanning for vulnerabilities using (Angry IP, HPing2, IPScanner, Global Network Inventory Scanner, Net Tools SuitePack.)
3. NetBIOS Enumeration Using NetView Tool, Nbtstat Enumeration Tool (OpenSource).
4. Steganography using tools: Tool: Merge Streams, Image Hide, Stealth Files, Blindside, STools, Steghide, Steganos, Pretty Good Envelop,Stegdetect,.
5. Steganalysis - Stego Watch- Stego Detection Tool,StegSpy.
6. How to Detect Trojans by using – Netstat, fPort, TCPView, CurrPorts Tool, Process Viewer.
7. Lan Scanner using look@LAN,wireshark.
8. Understanding DoS Attack Tools- Jolt2 ,Bubonic.c, Land and LaTierra,Targa, Nemesy Blast, Panther2, Crazy Pinger, Some Trouble, UDP Flood,FSMax.

Suggested Reading:

1. William Stallings, “Cryptography and Network Security: Principles and Practice” Pearson
2. Charlie Kaufman, Radia Perlman, Mike Speciner, Michael Speciner, “Network Security-
Private communication in a public world” TMH
3. Fourozon, “Cryptography & Network Security” TMH
4. Joseph MiggaKizza, Computer Network Security, , Springer InternationalEdition
5. AtulKahate,”Cryptography and Network Security” McGrawHill
6. Carl Endorf, Eugene Schultz, Jim Mellander**“**INTRUSION DETECTION& PREVENSION**”**TMH
7. Neal, Krawetz, Introduction to Network Security,CengageLearning

Elective –I (YBCS 705(B) Simulation &Modelling)

Unit-I

Introduction to Modeling and Simulation

Nature of Simulation. Systems , Models and Simulation, Continuous and Discrete Systems, system modeling, concept of simulation, Components of a simulation study, Principles used in modeling Static and Dynamic physical models, Static and Dynamic Mathematical models Introduction to Static and Dynamic System simulation , Advantages ,Disadvantages and pitfalls of Simulation.

Unit-II

System Simulation and Continuous System Simulation

Types of System Simulation, Monte Carlo Method, Comparision of analytical and Simulation methods, Numerical Computation techniques for Continuous and Discrete Models, Distributed Lag Models, Cobweb Model. Continuous System models, Analog and Hybrid computers, Digital- Analog Simulators, Continuous system simulation languages ,Hybrid simulation ,Real Time simulations.

Unit –III

System Dynamics & Probability concepts in Simulation

Exponential growth and decay models, logistic curves ,Generalization of growth models , System dynamics diagrams, Multi segment models , Representation of Time Delays. Discrete and Continuous probability functions, Continuous Uniformly Distributed Random Numbers, Generation of a Random numbers, Generating Discrete distributions, Non-Uniform Continuously Distributed Random Numbers, RejectionMethod.

Unit-IV

Simulation of Queueing Systems and Discrete System Simulation

Poisson arrival patterns, Exponential distribution, Service times, Normal Distribution Queuing Disciplines, Simulation of single and two server queue. Application of queuing theory in computer system. Discrete Events ,Generation of arrival patterns, Simulation programming tasks, Gathering statistics, Measuring occupancy and Utilization, Recording Distributions and Transit times .

Unit-V

Introduction to Simulation languages and Analysis of Simulation output

GPSS: Action times, Succession of events, Choice of paths, Conditional transfers, program control statements . SIMSCRIPT: Organization of SIMSCRIPT Program, Names & Labels, SIMSCRIPT statements . Estimation methods , Relication of Runs, Batch Means , Regenerative techniques , Time Series Analysis , Spectral Analysis and Autoregressive Processes.

List of Experiments:-

1. Simulate CPU scheduling algorithm using queueingsystem
a) FCFS b) SJF c) Priority Algo
2. Simulate multiplexer/concentrator using queuingsystem
3. Simulate congestion controlalgorithms.
4. Simulate disk schedulingalgorithms.
5. Simulate a Manufacturing shop and write a program inGPSS.
6. Simulate Telephone system model and write a program inSIMSCRIPT.

References:

□ Gorden G., System simulation, PrenticeHall.
□ Seila, Simulation Modeling, CengageLearning
□ Law .,Simulation Modeling And Analysis, McGrawHill
□ Deo, System Simulation with Digital Computer,PHI
□ Harrington, Simulation Modeling methods, McGrawHill
□ Severance, " System Modeling & Simulation, WilleyPub

Elective –I (YBCS 705(C) Embedded Computer System)

Unit – I

Introduction to Embedded systems

Embedded Systems Vs General Computing Systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Purpose of Embedded systems ,Core of the Embedded system, Memory, Sensors and Actuators, Communication Interface, Embedded firmware, PCB and Passive Components, Characteristics and Quality attributes of a Embedded System .

Unit – II

Design of Embedded Systems with 8bit Microcontrollers-8051

Factors for considering in selecting a Controller ,Designing with 8051 microcontroller Different addressing modes supported by 8051 , Instruction set for 8051 microcontroller. Fundamental issues in Hardware Software Co-Design , Computational models in Embedded Design .

Unit – III

Embedded Hardware & Firmware Design and Development

Analog &Digital Electronic components, VLSI & Integrated circuit design, Electronic Design Automation tools , PCB layout Design and its fabrication .Embedded firmware design approaches , Embedded firmware Development Languages ,Programming in Embedded C . Integration and testing of Embedded Hardware and Firmware , Safe & robust Design, Reliability, Faults, errors & Failure, Functional Design, Architecture Design, Prototyping.

Unit -IV

Embedded System Development Environment

Integrated Development Environment (IDE) , Types of files Generated on Cross- Compilation , Disassembler / Decompiler, Simulators, Emulators and Debugging, Boundary Scan.

Unit – V

Embedded Product Development Lifecycle(EDLC) and Trends in Embedded Industry What is EDLC ,Objectives of EDLC , Different phases of EDLC , EDLC Approaches-Linear or waterfall model , Iterative Model , Prototyping/Evolutionary Model, Spiral Model . Processor trends in Industry , Embedded OS Trends , Development Language trends Open Standards, Frameworks and Alliances ,Bottlenecks.

References:

1. Shibu, Introduction to Embedded System:,TMH
2. Barrett ,Embedded Systems :Design and Applications ,PearsonEducation
3. Rajkamal, Embeded System,TMH
4. Vahid ,Givargis ,Embedded System Design,Wiley
5. Balbno, Embedded Micro Computer System CengageLearning
6. Siewert, Real Time Embeded System&
7. **Peckol, Embeded System, WilleyIndi**

Elective –I (YBCS 705(D) Real Time Fault Tolerant Systems)

Unit-I

Structure of Real Time System, Performance Measure for real time system, Task Assignments,Fault Tolerant Scheduling, Real Time Vs General purpose Data Bases, Data Bases for Hard Real Time System, Real TimeCommunication

Unit-II

Fault Tolerance, Fault-Error-Failure. Redundancy, Error Detection, Damage Confinement, Error Recovery, Fault Treatment, Fault Prevention, anticipated and unanticipated Faults. Error models: General coding scheme Error detection techniques: Watchdog processors, Heartbeats, consistency and capability checking, Data audits, Assertions, Control-flow checking, Error control coding. Application:DHCP

Unit-III

Fault tolerance: Coding technique-fault tolerant self checking and fail safe circuits-fault tolerance in combinatorial and sequential circuits- synchronous and asynchronous fail safe circuits. Software fault tolerance: Process pairs, robust data structures, N version programming, Recovery blocks, Replica consistency & reintegration, multithreaded programs Application: VAX. Network fault tolerance: Reliable communication protocols, Agreement protocols, Database commit protocols -Application: Distributed SQL server Check pointing & Recovery - Application: Micro check pointing, IRIXCheckpoints

Unit-IV

Experimental Evaluation: Modelling and simulation based, Fault injection based - Application: NFTAPE fault injector .Modelling for performance, dependability and perform ability: dependability-specific methods (fault trees, reliability block diagrams), queues, stochastic Petri nets and stochastic activity networks - Application: Ultra SAN

Unit-V

Practical Systems for Fault Tolerance: - Application: Ad-hoc wireless network - Application: NASA Remote Exploration & Experimentation System Architecture: Fault tolerant computers - general purpose commercial systems-fault tolerant multiprocessor and VLSI based communication architecture. Fault tolerant software: Design-N-version programming recovery block - acceptance tests-fault trees- validation of fault tolerant systems.

REFERENCES :-

1. K.K.Pradhan, “Fault Tolerant computing theory and techniques” volume III. PrenticeHall,1989.
2. Krishna, Real Time System,TMH
3. Anderson and Lee, “Fault Tolerant principles and practice” ,PHI1989.
4. Siewert, Real Time Embeded System, Cengage Learning.
5. Rajiv Mall, Real Time System, PearsonEdu.
6. Parag K. Lala, “Fault Tolerant and Fault Testable, Hardware design” PHI1985.
7. Shem , toy Levei , Ashok K.Agarwala , “Fault Tolerant System design”,Tata McGrawHill

YBCS 706- Industrial Training

SCHEME OF STUDIES

Duration: 6 weeks after the VI semester in the summer break, Assessment in VII semester.

SCHEME OF EXAMINATION

For the assessment of industrial training undertaken by the students, following components are considered with their weightage.

(a) Termwork

In Industry Marks allotted

1. Attendance and General Discipline 10
2. Daily diary Maintenance10
3. Initiative and participative attitude during training10
4. Assessment of training by Industrial Supervisor20

TOTAL 50

(b) Practical/Oral Examination (Viva-Voce)

In Institution Marksallotted

1. Training Report25
2. Seminar and cross questioning (defense)25

TOTAL 50

Marks of various components in industry should be awarded to the students, in consultations with the

Training and Placement Officer/Faculty of Institute and I/c of training from Industry. During training students will prepare a first draft of training report in consultation with section in-charge. After training they will prepare final draft with the help of T.P.O./Faculty of the institute. Then they will present a seminar on their training and they will face viva-voce on training in the institute.

1.1 OBJECTIVE OF INDUSTRIALTRAINING

The objective of undertaking industrial training is to provide work experience so that student's engineering knowledge is enhanced and employment prospects are improved. The student should take this course as a window to the real World of Work and should try to learn as much as possible from real life experiences by involving and interacting with industry staff. Industrial training also provides an opportunity to students to select an engineering problem and possibly an industry guide for their Major Project in final semester.

Industrial training of the students is essential to bridge the wide gap between the classroom and industrial environment. This will enrich their practical learning and they will be better equipped to integrate the practical experiences with the classroom learning process.

1.2 LEARNING THROUGH INDUSTRIALTRAINING

During industrial training students must observe following to enrich their learning:

- Industrial environment and workculture.
- Organisational structure and inter personalcommunication.
- Machines/ equipment/ instruments - their working andspecifications.
- Product development procedures andphases.
- Project planning, monitoring andcontrol.
- Quality control andassurance.
- Maintenance system.
- Costingsystem.
- Stores and purchasesystems.
- Layout of Computer/ EDP/MIScentres.
- Roles and responsibilities of different categories ofpersonnel.
- Customerservices.
- Problems related to various areas of Worketc.

Faculty and TPO are supposed to plan industrial training in such a manner that students get exposure on most of the above arena in the field (world of work). Students are supposed to acquire the knowledge on
above by -

1. Observation,
2. Interaction with officials at theworkplace
3. Study of Literature at the workplace (e.g. User Manual, standards,maintenance schedules,etc.)
4. "Hand's on"experience
5. Undertaking / assisting projectwork.
6. Solving problems at the workplace.
7. Presenting aseminar.
8. Participating in-group meeting/discussion.
9. Gathering primary and secondary data/ information through various sources,Storage, retrieval and analysis of the gathereddata.
10. Assisting officials and managers in theirworking.
11. Undertaking a short action researchwork.
12. Consulting current technical journals and periodicals in thelibrary.
13. Discussions withpeers.

1.2 GUIDANCE TO THE FACULTY/TPO FOR PLANNING AND IMPLEMENTING THE INDUSTRIAL TRAINING

The industrial training programme, which is spread to 6 weeks' duration, has to be designed in consultation with the authorities of the work place, keeping in view the need of the contents. Following are some of the salient points:

□ Spelling out the objectives of the industrial training in behavioral terms and same is informed in advance to the 1) students, 2) authorities of the work place and 3)supervising facultymembers.

□ Discussing and preparing students for the training for which meetings with thestudents has to beplanned.

□ Meeting with industrial personnel and orienting them regarding the objective ofthe training and the expectations of theprogramme.
□ Correspondence with the authorities of the workplace.
□ Orientation classes for students on how to make the training most beneficial - monitoring daily diary, writing weekly reports, how to interact with various categoriesof industrial personnel, how to behave and undertake responsibilities, how to gather information from the workplace, ethics etc.
□ Guiding students to make individual plans (week wise/ day wise) toundertake industrialtraining
□ Developing a system of maintaining training records, by teachers for every batchof studentsfor
convenient retrieval.
□ Inviting industrial personnel to deliver lectures on some aspects oftraining.

1.4 ACTION PLAN FOR PLANNING STAGES AT THE INSTITUTION LEVEL

S.No.	Activity	Commencing Week	Finishing week	Remarks
1.	Meeting withPrincipal			
2.	Meeting withColleagues			
3.	Correspondence with work place (Industries concerned)			
4.	Meeting with authorities of workplace			
5.	Orientation of students for industrialtraining			
6.	Scrutinizing individual training plan ofstudents			
7.	Commencement of industrialtraining			
8.	First monitoring of industrialtraining			
9.	Second monitoring of industrialtraining			
10.	Finalization of Trainingreport			
11.	Evaluation of performance at Industrylevel			
12.	Evaluation of industrial programmein theinstitution			

YBN UNIVERSITY, RANCHI, JHARKHAND
School of Engineering & Technology

B.Tech. Semester VIII **Computer Science**

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted							Credits Allotted Subject wise			Total Credits	Remark
			Theory Slot			Practical Slot			Total Marks					
			End Sem.	Mid Sem. MST	Quiz, Assig-nment	End Sem	Term work			Period per week				
							Lab work & sessional	Assign ment/ quiz		L	T	P		
1	YBCS801	Soft Computing	70	20	10	30	10	10	150	3	1	2	06	
2	YBCS802	Web Engineering	70	20	10	30	10	10	150	3	1	2	06	
3	YBCS820	Elective -II	70	20	10	-	-	-	100	3	1	-	04	
4	YBCS830	Elective -III	70	20	10	-	-	-	100	3	1	-	04	
5	YBCS805	Major Project	-	-	-	120	40	40	200	-	-	08	08	
6	YBCS806	Self study	-	-	-	-	-	50	50	0	0	2	02	
7	YBCS807	Seminar /Group Discussion	-	-	-	-	-	50	50	0	0	2	02	Grand Total
		Total	280	80	40	180	60	160	800	12	4	16	32	800

Elective –II
YBCS8201 - N/W Management
YB8202 – Cyber Security
YBCS 8203 – Data Mining and Knowledge Discovery
YBCS 8204 – Semantic Web & Ontologies

Elective-III
YBCS8301Bioinformatics
YBCS8302 Digital imageprocessing
YBCS8303wireless network
YBCS8304Quantum computing

YBCS801 – Soft Computing

Unit – I

Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.
Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Prepositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Unit – II

Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm, Linear separability, Widrow & Hebb;s learning rule/Delta rule, ADALINE, MADALINE, AI v/s ANN. Introduction of MLP, different activation functions, Error back propagation algorithm, derivation of BBPA, momentum, limitation, characteristics and application of EBPA,

Unit – III

Counter propagation network, architecture, functioning & characteristics of counter Propagation network, Hopfield/ Recurrent network, configuration, stability constraints, associative memory, and characteristics, limitations and applications. Hopfield v/s Boltzman machine. Adaptive Resonance Theory: Architecture, classifications, Implementation and training. Associative Memory.

Unit – IV

Fuzzy Logic: Fuzzy set theory, Fuzzy set versus crisp set, Crisp relation & fuzzy relations, Fuzzy systems: crisp logic, fuzzy logic, introduction & features of membership functions, Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

Unit – V

Genetic algorithm : Fundamentals, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, Generational Cycle, Convergence of GA, Applications & advances in GA, Differences & similarities between GA & other traditional methods.

References :

- S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication.
- S.N. Sivanandam & S.N. Deepa, Principles of Soft Computing, Wiley Publications
- Rich E and Knight K, Artificial Intelligence, TMH, New Delhi.
- Bose, Neural Network fundamental with Graph , Algo.& Appl, TMH
- Kosko: Neural Network & Fuzzy System, PHI Publication

- Klir & Yuan ,Fuzzy sets & Fuzzy Logic: Theory & Appli.,
- PHI Pub.
- Hagen, Neural Network Design, Cengage Learning

YBCS802 – Web Engineering

UNIT-1

Web Engineering: Introduction, History, Evolution and Need, Time line, Motivation, Categories & Characteristics of Web Applications, Web Engineering Models, Software Engineering v/s WebEngineering. World Wide Web: Introduction to TCP/IP and WAP, DNS, Email, TelNet, HTTPand FTP.
Browser and search engines: Introduction, Search fundamentals, Search strategies, Directories search engines and Meta search engines, Working of the search engines.
Web Servers: Introduction, Features, caching, case study-IIS, Apache.

UNIT- 2

Information Architecture: Role, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites parameters and Intranets
Website Design: Development, Development phases, Design issues, Conceptual Design, High-Level Design, Indexing the Right Stuff, Grouping Content. Architectural Page Mockups, Design Sketches, Navigation Systems. Searching Systems, Good & bad web design, Process of Web Publishing. Web-site enhancement, submission of website to search engines.
Web security: issues, security audit. Web effort estimation, Productivity Measurement, Quality usability and reliability. **Requirements Engineering for Web Applications:** Introduction, Fundamentals, Requirement Source, Type, ,Notations Tools. Principles Requirements Engineering Activities, Adapting RE Methods to Web Application.

UNIT- 3

Technologies for Web Applications I:
HTML and DHTML: Introduction, Structure of documents, Elements, Linking, Anchor Attributes, Image Maps, Meta Information, Image Preliminaries, Layouts, Backgrounds, Colors and Text, Fonts, Tables, Frames and layers, Audio and Video Support with HTML Database integration, CSS, Positioning with Style sheets, Forms Control, Form Elements.
Introduction to CGI, PERL, JAVA SCRIPT, JSP, PHP, ASP & AJAX.
Cookies: Creating and Reading

UNIT-4

Technologies for Web Applications II:
XML: Introduction, HTML Vs XML, Validation of documents, DTD, Ways to use, XML for data files, Embedding XML into HTML documents, Converting XML to HTML for Display, Displaying XML using CSS and XSL, Rewriting HTML as XML, Relationship between HTML, SGML and XML, web personalization , Semantic web, Semantic Web Services, Ontology.

UNIT- 5

E- Commerce: Business Models, Infrastructure, Creating an E-commerce Web Site, Environment and Opportunities. Modes & Approaches, Marketing & Advertising Concepts.

Electronic Publishing issues, approaches, legalities and technologies,
Secure Web document, Digital Signatures and Firewalls, Cyber crime and laws, IT Act. Electronic Cash, **Electronic Payment Systems:** RTGS, NEFT, Internet Banking, Credit/Debit Card. **Security:** Digital Certificates & Signatures, SSL, SET, 3D Secure Protocol.

Suggested Experiments:

At least ten practical experiments based on above syllabus and a mini project is desirable tobe completed by a group of three that cover following.

1. HTML/ DHTML
2. PHP
3. XML
4. Java Script, CGI, PERL
5. ASP
6. Configuration of Web Servers.

Recommended Books:

1. Roger S.Pressman, David Lowe, "Web Engineering", Tata Mc Graw Hill Publication, 2007
2. Achyut S Godbole and Atul Kahate, "Web Technologies", Tata McGraw Hill
3. Gopalan N P , Akilandeswari, "Web Technology: A Developer s Perspective" , PHI
4. Neil Gray, "Web server Programming" Wiley
5. Chris Bates, "Web Programming: Building Internet applications" Wiley
6. Moller, "An Introduction to XML and Web Technologies", Pearson Education New Delhi,2009
7. "Web Technologies: Black Book", Kogent, Dreamtech
8. Internet & World Wide Web How to Program, Pearson education, 3rd edition, by: H.M.Deitel, P.J. Deitel, A.B. Goldberg.
9. C. Xavier, "Web Technology & Design ", Tata McGraw Hill. 10
Ivan Bay Ross, "HTML,DHTML,Java script,Perl CGI" , BPB

YBCS8201 – Network Management

Unit-I

Introduction to Network Managements, Network Management Framework, Network Based Managements, Evolution of Network Management: SGMP, CMIP, SNMP. Network Implementation and Management Strategies, Network Management Categories: Performance Management, Fault Management, Configuration Management, Security Managements, Accounting Managements. Network Management Configuration: Centralized Configuration, Distributed Configuration. Selected Management Strategy.

Unit –II

Management Information Base (MIB), Structure of Management Information, NMS Presentation of the SMI, NMS Meter-ware Network View. Remote Monitoring (RMON), RMON Group. Desktop Management: Desktop Management Interface(DMI), DMI Architecture, DMI Browser, DMI/SNMP Mapping, Desktop SNMP Extension Agents. Setting up LAN Access, SNMP Configuration.

Unit-III

Introduction, layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration, Internet Addresses, Internet protocol: introduction, IP header,IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet format, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format, RARP Examples, RARP server design

Unit-IV

Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing Module, Classless Addressing: CIDR. Internet Protocol (IP), Datagram, Fragmentation, Options, IP Package. Interior and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP. Private Networks. Virtual Private Network (VPN), Network Address Translation (NAT).

Unit –V

Internet Control Message Protocols (ICMP):- Types of message, message format, error reporting, query, checksum, ICMP Package. IGMP, IGMP Message and its Operation, IGMP Package.Transmission control protocol, Process-to-Process Communication, TCP Services Flow Control, TCP Timers. TCP Operation, TCP Package.. Application layers protocol, Telnet Protocol, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), X-Window system protocol, Remote procedure call, and Network file system.

References:

- Forouzan, TCP/IP Protocol Suite 4th edition, TMH
- J.Richard Burkey, Network Management Concept and Practice, PHI
- Stevens, TCP/IP Illustrated Volume-I, Pearson
- Tittel: TCP/IP, Cenage Learning
- Uyless Black, TCP/IP and related protocols, McGraw Hill.
- Doughals E. Comer, Internetworking with TCP/IP Vol. I, Principles, Protocols, and Architecture, Prentice Hall, India.

YBCS8202 – Cyber Security

UNIT 1

Introduction of Cyber Crime, Challenges of cyber crime, Classifications of Cybercrimes: E-Mail Spoofing, Spamming, Internet Time Theft, Salami attack/Salami Technique, Data Diddling, Web jacking, Online Frauds, Software Piracy, Computer Network Intrusions, Password Sniffing, Identity Theft, cyber terrorism, Virtual Crime , Perception of cyber criminals: hackers, insurgents and extremist group etc. Web servers hacking, session hijacking.

UNIT 2

Cybercrime on Mobile and Wireless Device: Proliferation of Mobile and Wireless Devices, trends in Mobility Credit Card Frauds in Wireless Computing, Types and techniques of Credit Card Frauds, Attacks on Mobiles: Mobile Viruses, Mishing, Vishing, Smishing & Hacking Bluetooth. Web servers hacking, session hijacking.

UNIT 3

Tools and Methods in Cybercrime: Proxy Servers and Anonymizers, Password Cracking, Keyloggers and Spyware, virus and worms, Trojan Horses, Backdoors, DoS and DDoS Attacks , Buffer and Overflow, Attack on Wireless Networks, Phishing : Method of Phishing, Phishing Techniques.

UNIT 4

Cyber Crime and Criminal justice: Concept of Cyber Crime and the IT Act, 2000, Hacking, Teenage Web Vandals, Cyber Fraud and Cheating, Defamation, Harassment and E-mail Abuse, Other IT Act Offences, Monetary Penalties, jurisdiction and Cyber Crimes, Nature of Criminality, Strategies to tackle Cyber Crime and Trends.

The Indian Evidence Act of 1872 v. Information Technology Act, 2000: Status of Electronic Records as Evidence, Proof and Management of Electronic Records; Relevancy, Admissibility and Probative Value of E-Evidence, Proving Digital Signatures, Proof of Electronic Agreements, Proving Electronic Messages.

UNIT 5

Introduction to Cyber Forensics: Information Security Investigations, Corporate Cyber Forensics, Scientific Method in Forensic analysis, investigating large scale Data breach cases. Analyzing Malicious software. Types of Computer Forensics Technology, Types of Business Computer Forensic Technology, Specialized Forensics Techniques.

References

1. Principles of Cyber crime, Jonathan Clough Cambridge University Press
2. John R. Vacca, Computer Forensics:Computer Crime Scene Investigation, 2nd Edition, CharlesRiver Media, 2005
3. Cyber Law Simplified, Vivek Sood, Pub: TMH.
4. Cyber Security by Nina Godbole, Sunit Belapure Pub: Willey-India
5. Information Warfare : Corporate attack and defense in digital world, William Hutchinson, Mathew Warren, Elsevier.

YBCS8203 – Data Mining and Knowledge Discovery

Unit-I

Introduction, to Data warehousing, needs for developing data Warehouse, Data warehouse systems and its Components, Design of Data Warehouse, Dimension and Measures, Data Marts:- Dependent Data Marts, Independents Data Marts & Distributed Data Marts, Conceptual Modeling of Data Warehouses:-Star Schema, Snowflake Schema, Fact Constellations.
Multidimensional Data Model & Aggregates.

Unit-II

OLAP, Characteristics of OLAP System, Motivation for using OLAP, Multidimensional View and Data Cube, Data Cube Implementations, Data Cube Operations, Guidelines for OLAP Implementation, Difference between OLAP & OLTP, OLAP Servers:-ROLAP, MOLAP, HOLAP Queries.

UNIT-III

Introduction to Data Mining, Knowledge Discovery, Data Mining Functionalities, Data Mining System categorization and its Issues. Data Processing :- Data Cleaning, Data Integration and Transformation. Data Reduction, Data Mining Statistics. Guidelines for Successful Data Mining.

Unit-IV

Association Rule Mining:-Introduction, Basic, The Task and a Naïve Algorithm, Apriori Algorithms, Improving the efficiency of the Apriori Algorithm, Apriori-Tid, Direct Hasing and Pruning(DHP),Dynamic Itemset Counting (DIC), Mining Frequent Patterns without Candidate Generation(FP-Growth),Performance Evaluation of Algorithms,.

Unit-V

Classification:-Introduction, Decision Tree, The Tree Induction Algorithm, Split Algorithms Basedon Information Theory, Split Algorithm Based on the Gini Index, Overfitting and Pruning, Decision Trees Rules, Naïve Bayes Method.
Cluster Analysis:- Introduction, Desired Features of Cluster Analysis, Types of Cluster Analysis Methods:- Partitional Methods, Hierarchical Methods, Density- Based Methods, Dealing with Large Databases. Quality and Validity of Cluster Analysis Methods.

References:

1. Berson: Data Warehousing & Data Mining &OLAP , TMH
2. Jiawei Han and Micheline Kamber, Data Mining Concepts & Techniques, Elsevier Pub.
3. Arun.K.Pujari, Data Mining Techniques, University Press.
4. N.P Gopalan: Data Mining Technique & Trend, PHI
5. Hand, Mannila & Smith: Principle of Data Mining, PHI
6. Tan, Introduction to Data Mining, Pearson Pub.

YBCS8204 – Semantic Web & Ontologies

Unit-I

Semantic Web: Building Models , Calculating with knowledge, Exchanging Information, Semantic Web Technologies ,Types of Web :Smart Web & Dumb Web, Applications ,Semantic Data ,Search Engine for Semantic Web

Unit-II

Semantic Modeling: Modeling for human communication, Explanation and prediction, Mediating Variability: Variation & Classes, Variation & Layers, Expressivity in Modeling.

Unit-III

Resource Description Language RDF : Introduction , Advanced features , simple ontologies inRDF Schema , encoding of special data structures, RDF formal semantics ,syntactic reasoning with deduction rules ,Distributing data across web , Managing data from multiple sources .

Unit-IV

Web Ontology Language OWL : OWL syntax and Intuitive semantics , OWL species , **Owl formal semantics** : Description Logics , Model-Theoretic Semantics of OWL, Automated reasoning with OWL ,Ontology Matching and Distributed Information .

Unit-V

Semantic Web Application Architecture: RDF Parser/Serializer, RDF store: RDF data standards and Interoperability of RDF stores , RDF query engines , SPARQL: Query language for RDF , conjunctive Queries for OWL DL ,RDF backed web portals , Data federation .

Ontology Engineering: Constructing Ontologies manually, Reusing Existing Ontologies, Semiautomatic Ontology Acquisition, Ontology Mapping

Text Books:

1. Hitzler, Markus, Rudolph , " Foundations of Semantic Web Technologies" , Chapman & Hall/CRC,2009,ISBN 9781420090505
2. Allemang , Hendler , " Semantic Web for the working Ontologist" 2nd ed. Elsevier Pub
3. Liang Yu , " Introduction to the Semantic Web and Semantic Web Services", Chapman & Hall/CRC
4. Antoniou , Harmelen , "A semantic Web Primer", PHI Pub.
5. Rajendra Akerkar ," Foundations of Semantic Web" , Narosa Publishing ,NewDelhi

YBCS8301 – Bioinformatics

Unit-I

Introduction

Introduction to bioinformatics, objectives of bioinformatics, Basic chemistry of nucleic acids, structure of DNA & RNA, Genes, structure of bacterial chromosome, cloning methodology, Data maintenance and Integrity Tasks.

Unit-II

Bioinformatics Databases & Image Processing

Types of databases, Nucleotide sequence databases, Protein sequence databases, Protein structure databases, Normalization, Data cleaning and transformation, Protein folding, protein function, proteinpurification and characterization, Introduction to Java clients, CORBA, Using MYSQL, Feature Extraction.

Unit-III

Sequence Alignment and database searching

Introduction to sequence analysis, Models for sequence analysis, Methods of optimal alignment, Tools for sequence alignment, Dynamics Programming, Heuristic Methods, Multiple sequence Alignment

Unit-IV

Gene Finding and Expression

Cracking the Genome, Biological decoder ring, finding genes through mathematics & learning, Genes prediction tools, Gene Mapping, Application of Mapping, Modes of Gene Expression data, Mining the Gene Expression Data

Unit-V

Proteomics & Problem solving in Bioinformatics

Proteome analysis, tools for proteome analysis, Genetic networks, Network properties and analysis, complete pathway simulation: E-cell, Genomic analysis for DNA & Protein sequences , Strategies and options for similarity search , flowcharts for protein structure prediction .

List of References

1.Gopal & Jones, BIOINFORMATICS with fundamentals of Genomics & Proteomics ,TMH Pub2.Rastogi , Bioinformatics –Concepts , skills & Applications , CBS Pub
3.Bergeron , Bioinformatics computing , PHI
4.Claverie , Bioinformatics , Wiley pub
5.Baxevanis , Bioinformatics , Wiley Pub
6.Stekel , Micrarray Bio Informatics ,
Cambridge

YBCS8302 – Digital Image Processing

Unit-I

Digital Image fundamentals, A simple image model, Sampling and Quantization. Relationship between pixels. Imaging geometry. Image acquisition systems, Different types of digital images

Unit-II

Image transformations, Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation, Hadmord transformation, Discrete Cosine Transformation.

Unit-III

Image enhancement, Filters in spatial and frequency domains, Histogram based processing. Image subtraction, Averaging, Image smoothing, Nedion filtering, Low pass filtering, Image sharpening by High pass filtering.

Unit-IV

Image encoding and segmentation, Encoding: Mapping, Quantizer, Coder. Error free compression, Lossy Compression schemes. JPEG Compression standard. Detection of discontinuation by point detection, Line detection, edge detection, Edge linking and boundary detection, Local analysis, Global processing via Hough transforms and graph theoretic techniques

Unit-V

Mathematical morphology- Binary, Dilation, crosses, Opening and closing, Simple methods of representation, Signatures, Boundary segments, Skeleton of a region, Polynomial approximation

References:

1. Rafael C Gonzalez, Richard E Woods 3rd Edition, Digital Image Processing Pearson.
2. Rafael C Gonzalez, Richard E Woods 3rd Edition, Digital Image Processing using Matlab –TMH.
3. Sonka, Digital Image Processing & Computer Vision , Cengage Learning4
Jayaraman, Digital Image Processing, TMH.
5. Pratt, Digital Image Processing, Wiley India
6 Annadurai, Fundamentals of Digital Image Processing ,Pearson Education .

YBCS8303 – Wireless Network

Unit 1

Introduction of Wireless Networks, Different Generations of Wireless Networks. Characteristics of the Wireless Medium: Radio Propagation Mechanisms, Path Loss Modelling and Signal Coverage, Effect of Multipath and Doppler, Channel Measurement and Modelling Techniques.

Unit 2

Network Planning: Introduction, Wireless Network Topologies, Cellular Topology, Cell Fundamentals, Signal to Interferences Radio Calculations, Network Planning for CDMA Systems. Wireless Network Operations**:** Mobility Management, Radio Resources and Power Management

Unit 3

Multiple Division Techniques: FDMA, TDMA, CDMA, OFDM, SDMA. Comparison of Multiple Division Techniques, Modulation Techniques – AM, FM, FSK, PSK, QPSK, QAM, 16QAM Mobile Data Networks: Introduction, Data Oriented CDPD Network, GPRS, EDGE and HighData Rates, SMS in GSM, Mobile Application Protocols.

Unit 4

Introduction to Wireless LAN, Evolution of WLAN, Wireless Home Networking, Technologies for Home Area Network (HAN), Overview of IEEE 802.11, Reference Architecture, PHY and MAC Layer, Wireless ATM, HIPERLAN.

UNIT 5

IEEE 802.15 WPAN, HomeRF, Bluetooth, Interference between Bluetooth and 802.11, Adhoc Networks, Introduction to 2.5 G and 3 G Networks.

References

1. Kaveh Pahlavan, Prashant Krishnamurthy “principles of Wireless Networks”, PHI.
2. Qing- An Zeng, Dharma Prakash Agrawal “Introduction to Wireless and Mobile Systems” CENGAGE Learning.
3. Sumit Kasera, Nishit Narang, A P Priyanka “2.5 G Mobile Networks: GPRS and EDGE”, TMH
4. Dr. KAMILO FEHER “Wireless Digital Communications” , PHI
5. Jochen Schiller “ Mobile Communications”, PEARSON

YBCS8304 – Quantum Computing

UNIT I

Introduction to quantum mechanics :

Postulates of quantum mechanics, Qubit and quantum states, Vector Spaces, Single Qubit Gates, multiple Qubit Gates, Controlled Gates, Composite Gates, Matrices and operators.

UNIT II

Density operators :

Density Operator for a Pure State, Density Operator for a Mixed State,Properties of a Density Operator, Characterizing Mixed States, Completely Mixed States, Partial Trace and Reduced Density Operator.

Quantum measurement theory:

Distinguishing Quantum States and Measurement,Projective Measurements, Measurements on Composite Systems, Generalized Measurements, Positive Operator Valued Measures.

UNIT III

Entanglement:

Quantum state entanglement ,Bell's Theorem, The Pauli Representation, Using Bell States For Density Operator Representation, Quantum gates and circuits: Single Qubit Gates, The Z Y Decomposition ,Basic Quantum Circuit Diagrams, Controlled Gates, Application of Entanglement in teleportation and supper dense coding., Distributed quantum communication

Quantum Computer :

Guiding Principles, Conditions for Quantum Computation, Harmonic Oscillator Quantum Computer, Optical Photon Quantum Computer – Optical cavity Quantum electrodynamics, Ion traps, Nuclear Magnetic resonance.

UNIT IV

Quantum Algorithm:

Hadamard Gates, The Phase Gate, Matrix Representation of Serial and Parallel Operations, Quantum Interference, Quantum Parallelism and Function Evaluation, Deutsch -Jozsa Algorithm, Quantum Fourier Transform, Phase Estimation, Shor's Algorithm ,Quantum Searching and Grover's Algorithm

UNIT V

Quantum Error Correction:

Introduction, Shor code, Theory of Quantum Error Correction, Constructing Quantum Codes, Stabilizer codes, Fault Tolerant Quantum Computation, Entropy and information –Shannon Entropy, Basic properties of Entropy,Von Neumann, Strong Sub Additivity, Data Compression, Entanglement as a physical resource.

TEXTBOOK:

1. Quantum Computing Explained: David McMahon, Wiley Interscience (IEEE Computer Science).
2. Quantum Computing without Magic Devices : Zdzislaw Meglicki; PHI .
3. Quantum Computation and Quantum Information: M.A. Nielsen & Isaac L. Chuang, Cambridge University Press .
4. Quantum Computing and communications: An Engineering Approach: Sandor Imre andFerenc Balazs, Wiley.

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