BHARTI VISHWAVIDYALAYA, DURG

SCHEME OF TEACHING AND EXAMINATION

Courses of Study and Scheme of Examination of P 1 Group

B. Tech. (First Semester - Common to all Branches of Engineering)

S. No.	Courses (Subject)	Course Code	Period per Week			Scheme of Examination			Total Marks	Credit (L+T+P/2)
						Theory/Lab				
			L	T	P	ESE	CT	TA		
1.	Physics-I	BT00101	3	1	-	70	10	20	100	4
2.	Mathematics-I**	BT00102	3	1	-	70	10	20	100	4
3.	Basic Electrical and Electronics Engg.	BT00103	2	1	-	70	10	20	100	3
4.	Engineering Graphics and Design	BT00104	1	0	-	70	10	20	100	1
5.	Fundamentals of Computer	BT00105	2	0	-	70	10	20	100	2
6.	Physics (Lab)	BT00106	-	-	2	35	-	15	50	1
7.	Basic Electrical and Electronics Engg. (Lab)	BT00107	-	-	2	35	-	15	50	1
8.	Fundamentals of Computer (Lab)	BT00108	-	-	2	35	-	15	50	1
9.	Engineering Graphics and Design (Lab)	BT00109	-	-	4	35	-	15	50	2
10.	Value Education	BT00110	-	-	-	-	-	50	50	-
Total Marks			11	3	10	490	50	210	750	19

L-Lecture, T-Tutorial, P-Practical, ESE-End Semester Exam,

CT–Class Test, TA–Teacher's Assessment

Note: - (a) The teaching in the 1st and 2nd Semester will be divided in two groups consisting of branches as shown below:

P1–GROUP: Mechanical Engineering, Electronics & Telecommunication Engineering, Civil Engineering.

Q1–GROUP: Computer Science & Engineering, Electrical Engineering.

(b) *Mathematics–I will be taught to both the groups in the first semester.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 1st | **Branch: Common to all Branches**

Subject: Physics-I | **Course Code: BT00101**

Total Marks in End Semester Exam: 70 | **L: 3 T: 1 P: 0**

Minimum number of Class Tests: 02 | **Min. Marks - 28**

Unit-1: Physical Quantities, Motion in Two or Three dimensions (10hrs.)

Standards and Units, Unit consistency and conversions, Uncertainty and Significant figures, Position and velocity vectors, The Acceleration vector, Projectile motion, Motion in a circle, Relative velocity, Free body diagrams, Conservative and Non-conservative Forces; Central forces, No inertial frames of reference.

Unit-2: Mechanics of Solids (10hrs.)

Angular velocity and acceleration, Rotation with constant angular acceleration, Energy in rotational motion, Parallel axis theorem, Moment of Inertia calculations, Conditions for equilibrium, Bending Stress, Shear stress, Concept of strain energy, *Determination of Moment of Inertia of Fly Wheel, Young's Modulus*, Elastic Module, Concepts of elasticity and plasticity.

Unit-3: Wave Optics (10hrs.)

Superposition of waves and interference of light by wave front splitting and amplitude splitting, Fresnel bi- prism; wedge shaped film, Newton's rings, *Diffraction*, Farunhofer diffraction from a single slit, Diffraction gratings and their resolving power, *Difference between Interference and Diffraction*.

Unit-4: Electrostatics in vacuum and dielectric medium (10hrs.)

Calculation of electric field and electrostatic potential for a charge distribution, Divergence and curl of electrostatic field, Laplace's and Poisson's equations for electrostatic potential, Laws of electrostatics, Polarization, Permeability and dielectric constant, Polar and non-polar dielectrics.

Unit-5: Magneto static in a linear magnetic medium (10hrs.)

Bio-Savart law, Divergence and curl of static magnetic field, vector potential and calculating it for a given magnetic field using Stokes' theorem, Magnetization, Solving for magnetic

field due to simple magnets likea bar magnet, Permeability and Susceptibility, Classification of magnetic materials, Ferromagnetism, Paramagnetic and diamagnetic materials, Magnetic domains and hysteresis.

Unit-6: Faraday's law and Electromagnetic waves (10hrs.)

Faraday's law of electromagnetic induction, Continuity equation for current densities, Maxwell's equation in vacuum, Energy in an electromagnetic field, Flow of energy and Pointing vector, Plane electromagnetic waves in vacuum, Their transverse nature and polarization, Relation between electric and magnetic fields of an electromagnetic wave.

Unit-7: Introduction to Quantum Mechanics (10hrs.)

Wave nature of Particles, Time-dependent and time-independent Schrodinger equation for wave function, Free-particle wave function and wave-packets, Uncertainty principle, Solution of stationary-state Schrodinger equation for one dimensional problem like particle in a box.

Unit -8: Solid electronic materials (10hrs.)

Electron in periodic potential, Kronig-Penny model (only basic to introduce origin of band gap), E-k diagram, Electron conduction, Conductivity, Drift velocity, Energy bands in solids, Direct and indirect band gaps, Types of electronic materials: metals, semiconductors, and insulators, Fermi level, Effective mass, Density of states and energy band diagrams.

Unit -9: Semiconductors (10hrs.)

Intrinsic and extrinsic semiconductors, Electron and hole concentration, Concept of Fermi Level, Dependence of Fermi level on carrier-concentration and temperature, Doping, impurity states, n and p type semiconductors, Carrier generation and recombination, Law of mass action, Charge neutrality condition, Carrier transport: diffusion and drift, p-n junction, Depletion region and potential barrier, Energy band structure of PN junction in forward and reverse biasing.

Unit-10: Lasers & Fiber Optics (10hrs.)

Einstein's theory of matter radiation interaction and A & B coefficients, amplification of light by population inversion in optical resonator, different types of lasers: gas lasers (He Ne,),

solid-state lasers (ruby, Neodymium), semiconductor laser, Properties of laser beams. Fiber Optics: Introduction, Optical fiber as a dielectric wave guide, Total internal reflection, Numerical aperture, Losses associated with optical fibers, Step and graded index fibers, Application of optical fibers.

Text Books:

1. Introduction to Mechanics-Mahindra K. Verma, Universities Press, Hyderabad
2. David Griffiths, Introduction to Electrodynamics, Addison-Wesley Professional
3. H. J. Pain, The Physics of Oscillations and Waves, Wiley
4. J. Singh, Semiconductor Optoelectronics: Physics and Technology McGraw-Hill Inc
5. Quantum Mechanics, Ajay Ghatak S. Lokanathan, Trinity
6. Engineering Physics by Gaur & Gupta, Dhanpat Rai Publications

Reference Books:

1. Engineering Physics by PG Kshirsagar & M N Avadhanulu, S. Chand Publications
2. Modern Physics for Engineers, S.P. Taneja, R. Chand
3. Engineering Physics, Malik and Singh, Tata McGraw Hill
4. Sears and Zemansky's University Physics, Volume-1 Mechanics, Pearson
5. Mechanics, Mathur, S.Chand Publishing
6. Electromagnetic Theory, Prabir K. Basu & Hrishikesh Dhasmana, An eBooks
7. David Griffiths, Quantum Mechanics, Pearson Education
8. Quantum Mechanics: A Text Book for undergraduates, Mahesh C Jain, TMH
9. A. Ghatak , Optics, McGraw Hill Education
10. O. Svelto, Principles of Lasers, Springer Science & Business Media
11. The Physics of waves and Oscillations, N.K. Bajaj, TMH
12. H. C. Verma, Concepts of Physics Vol – 1&2, Bharti Bhawan Publication
13. Halliday and Resnick, Physics.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.- Ist | **Branch: Common to all Branches**

Subject: Mathematics - I | **Course Code: BT00102**

Total Marks in End Semester Exam: 70 | **Min. Marks - 28**

Minimum number of Class Tests: 02 | **L: 3 T: 1 P: 0**

UNIT I: Calculus **(8 hours)**

Evaluation of improper integrals, reduction formulae, Beta and Gamma functions and their properties; *Applications areas and volumes*.

UNIT II: Calculus **(8 hours)**

Rolle's Theorem, Mean value theorems, *Taylor's and Maclaurin's theorems*; indeterminate forms and Maxima and minima.

UNIT III: Sequences and series **(8 hours)**

Convergence of sequence and series, tests for convergence; Power series, Taylor's series, series for exponential, trigonometric and logarithm functions; Fourier series: Half range sine and cosine series.

UNIT IV: Multivariable Calculus (Differentiation) **(8 hours)**

Limit continuity and partial derivatives, total derivative; Tangent plane and normal line; Maxima,minima and saddle points; Gradient, curl and divergence directional derivatives.

UNIT V: Matrices **(8 hours)**

Elementary row and column transformations, Consistency of linear system of equations; Symmetric, skew symmetric and orthogonal matrices; Eigen values and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem and Orthogonal transformation, *Complex and unitary matrixes.*

Text/Reference Books

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

3. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
4. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
5. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint,2010.
6. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications,Reprint, 2010.
7. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
8. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, AffiliatedEast–West press, Reprint 2005.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.- 1st | **Branch: Common to all Branches**

Subject: Basic Electrical and Electronics | **Course Code: BT00103**

Total Marks in End Semester Exam: 70 | **Min. Marks - 28**

Minimum number of Class Tests: 02 | **L: 2 T: 1 P: 0**

Unit – I: D.C. Networks:

Introduction, Ohm's law, Kirchhoff's laws, Mesh and Nodal analysis, *Definition of Electrical Component*. Definitions of MMF, Magnetic field strength, Reluctance, Leakage flux and fringing, Core losses, Comparison of the Electric and Magnetic Circuits, Problems on Series and Parallel Magnetic Circuits.

Unit – II: A. C. Circuits:

Production of AC voltage, Basic Definitions of root mean square and average values, form factor and peak factor and *Phasor Algebra*, Analysis of ac series and Parallel Circuits, Series-Parallel Circuits.

Unit – III: Single phase Transformers:

Introduction, Principles of operation, Constructional details, Ideal Transformer and Practical Transformer, EMF equation, Rating, Phasor diagram at no load *and on load*, Losses in Transformers.

Unit-IV: Diode:

Brief Review of Semiconductors, N-Type & P-Type Semiconductors, Formation of Depletion Layer in a PN Junction, Forward & Reverse Biased, V-I Characteristic, Diode Current Equation. LED, Seven-segment displays.

Unit-V: Transistor:

BJT Construction, Junction Biasing of BJT, Operation of NPN & PNP BJT, Input and Output Characteristics of Transistor in CE configuration; *Characteristics of Transistor in CB configuration*; Transistor as an Amplifier & as a Switch.

Text Books:

1. Fundamentals of Electrical Engineering & Electronics, B.L. Theraja, S. Chand Publication.

2. Principles of Electronics by V. K. Mehta, 3rd Edition, S. Chand and Co. Ltd. (Unit-IV & V).
3. D.P. Kothari and I.J. Nagrath, "Theory and Problems of Basic Electrical Engineering", PHI.

Reference Books:

1. Fitzrald and Higgonbothom, "Basic Electrical Engineering", Fifth Edition, McGraw Hill.
2. V.N. Mittal and Arvind Mittal, "Basic Electrical Engineering", Second Edition, Tata McGraw Hill.
3. Electrical and Electronic Technology By Hughes 10th Edition, Pearson Education.
4. A textbook of Electronic Circuits. By R. S. Sedha, S. Chand Publication.
5. H. Cotton,"Advance Electrical Technology," ISSAC Pitman, London.
6. Parker Smith S. (Ed. Parker Smith N.N.), "Problems in Electrical Engineering", Tenth edition, Asia publication.
7. Del Torro, Vincent "Electrical Engineering Fundamentals", Second Edition Prentice Hall of India Pvt. Ltd.
8. Basic Electrical & Electronics Engineering 1stEdition by D. P. Kothari and I. J. Nagrath,
9. Electronics Devices and Circuits by Jacob Millman and Christos C. Halkias, 3rd Edition Mc. Grah Hill Pub.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.- 1st	**Branch: Common to all Branches**
Subject: Engineering Graphics and Design	**Course Code: BT00104**
Total Marks in End Semester Exam: 70	**Min. Marks - 28**
Minimum number of Class Tests: 02	**L: 1 T: 0 P: 0**

Unit I: Introduction to Engineering Drawing

Principles of Engineering drawing and their significance, Lines, Lettering, Dimensioning, Scales, *Types of Scale – Plain, Diagonal*.

Unit II: Projection

Principles of projection, Method of projection, First and third angle projections, *Traces*, Orthographic projections, Isometric projection, Projection of Plain, Solid.

Unit – III: Development of Surface

Development of Surface of Right, Regular Solids, Development of Prisms, Cylinders, Pyramids, Cone and their Parts.

Isometric Projection: Principles of Isometric Projection – Isometric View, Isometric Scale, Conventional Plane figure, Simple and Compound Solids.

Unit IV: Basic concept of drafting software

Introduction to CAD software, merits and demerits of CAD, Application of CAD, GUI, limits and units, Basic co-ordinate system, setting of status bar option-snap, grid, O-snap, Dynamic input, ortho, polar, and etc. concept of block, viewports and layer.

Unit V: Drafting using CAD software

Drawing Tools: Circle, Arcs, Rectangle, Polygon, Ellipse, Spline, Poly-Line, and Multi-Line. Editing Tools: Trim, Move, and Copy, Rotate. Geometry Modifying Tools: Fillet, Chamfer, Scale, Stretch. Copying Tools: Array, Mirror, and Offset. Dimensioning and Annotations.

Text Books:

1. Bhatt, N. D.., "Elementary Engineering Drawing", Charotar Book Stall, Anand
2. George Omura, " Mastering AutoCAD" B.P.B. Publication, New Delhi

Reference Books:

1. Engineering Graphics – Laxminarayanan & V. and Vaish Wanar, R.S. Jain Brothers, New Delhi
2. Engineering Graphics – Chandra, AM & Chandra Satish 1998.
3. Engineering Graphics – K.L. Narayan and P. Kannaih, Tata McGraw Hill
4. AutoCAD: A problem solving approach- Tickoo, S. Delmar Cengage Learning 2015.
5. Mastering AutoCAD and AutoCAD LT-George Omura, Brian C. Benton, Wiley publisher, 2018.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.- 1st | **Branch: Common to all Branches**

Subject: Fundamentals of Computer | **Course Code: BT00105**

Total Marks in End Semester Exam: 70 | **Min. Marks - 28**

Minimum number of Class Tests: 02 | **L: 2 T: 0 P: 0**

Unit I: Fundamentals of Computers

History of computer, concept of data and information, computer hardware and software components: Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Memory Hierarchy: Primary and Secondary Storage (Auxiliary Storage), Secondary storage; magnetic disks vs. optical disks (CD, CD-RW and DVD Memory), data – numeric data, alpha numeric data, concept of data and information: storage, seeking, processing and transmission, *and file organization*.

Unit II: Hardware and Software

Introduction of Computer Peripherals: Cables, Buses, Device drivers, installation of devices: keyboard, mouse, scanner, printer, web-camera, speakers and many more; plug-and-play devices; expansion slots……..System software, *difference between software and hardware*, Program Language Translators, application software, Programming Language Paradigms: Imperative, Object-Oriented and Logic languages, Basics of Popular Operating Systems (Windows and Linux); The User Interface, Using Mouse and Organizing Desktop components, Running an Application, File, Folders and Directory management features, Using Help; Creating Short cuts, Configuring Operating System: Windows and Ubuntu, BIOS, System Utilities and Antivirus software.

Unit III: Basic Computer Literacy

Word Processing Basics (MS Word / LibreOffice Writer): *Creating, deleting,* Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document; Using Spread Sheets (MS Excel / LibreOffice Calc) Basic operations of Spreadsheets; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet; Basics of presentation software (MS PowerPoint / LibreOffice Impress) Preparation and Presentation of Slides; Slide Show; *with shortcuts* How to make an effective presentation: Working with

Presentation Tools (Create, Edit, Move, Delete, Resize, Format text object), Working with Graphics tools (Creating Tables, Organization Charts, Hyperlinks), Saving, editing and closing presentation; Taking printouts of presentation / handouts.

Unit IV: Computers and Communication

WWW and Web Browsers: Basic of Computer networks; LAN, WAN, *MAN*, *PAN*, *SAN*; Networking Devices, Topologies, Cables and connectors, Connecting to internet; ISP; Basics of internet connectivity related troubleshooting, Web Browsing software, *IP Addressing, Wi-Fi and Bluetooth technology* overview Search Engines; URL; Domain Names;, Internet and Intranet: architecture, various file formats, Applications of INTERNET: Electronic mailing systems (Google Mail features): Creating and Managing mailing accounts, folders, Document collaboration, Instant Messaging, Netiquettes; Skype calling and Messenger services; functioning and features of smart gadgets: Smartphones, 4K smart television gadgets, kindle, gaming-gadgets, fitness gadgets and alike.

Unit V: Application Domains

Computer applications in office automation, *graphics and multimedia,* book publishing, data analysis, accounting, investment, inventory control, robotics, cyber security, air and railway ticket reservation sites, Audio and Video-conferencing, social networking, surveillance, Case Studies: Computer Literacy for banking, KYC, Insurance and financial transactions, operating mobile banking, Nine Pillars of Mission Digital India (DI-Initiatives) and their scheme highlights.

Text Books:

1. Computer Basics by IGNOU.
2. Suresh K Basendrea: Computers Today
3. Pradeep K. Sinha, Priti Sinha, “Computer Fundamentals”. BPB Publications.
4. Rajaraman, V., “Fundamental of Computers”. Prentice Hall India, New Delhi
5. Sanders Donald H Computers Today

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 1st | **Branch: Common to all Branches**

Subject: Physics (Lab) | **Course Code: BT00106**

Total Marks in End Semester Exam: 35 | **L: 0 T: 0 P: 2**

Min. Marks - 14

Total 36 labs. Hrs. About 10 – 12 experiments to illustrate the concepts learnt in Physics (Hrs. 3/ week).Suitable number of experiments from the following categories:

- Mechanics
- Optics and its applications
- Electromagnetic
- Semiconductor Physics
- Laser & Optical fiber

Text book:

1. A textbook of Engineering Physics Practical 2nd edition, University Science Press

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 1st **Branch: Common to all Branches**

Subject: Basic Electrical and Electronics Engineering (Lab) **Course Code: BT00107**

Total Marks in End Semester Exam: 35 **L: 0 T: 0 P: 2**

Min. Marks - 14

List of Experiments (To perform minimum 10 experiments):

1. To verify Superposition theorem.
2. To verify Kirchhoff's Current Law and Kirchhoff's Voltage Law.
3. To determine V– I characteristics of Incandescent lamp.
4. To study B-H curve.
5. To measure current, power, voltage and power factor of series RLC circuit.
6. To measure current, power, voltage of parallel RLC circuit.
7. To measure current, power, voltage of series parallel RLC circuit.
8. To measure R and L of choke coil.
9. To study construction of a single phase transformer.
10. To perform ratio test and polarity test of a single phase transformer.
11. To calculate efficiency of a single phase transformer by direct loading.
12. To verify the venin's theorem and Norton's theorem.
13. To study construction of Single Phase A.C. machines.
14. To study construction of Three Phases Induction motors.
15. To study charging and discharging of a capacitor.
16. To study types of meters in the lab.
17. To study construction of D.C. machine.
18. To plot V-I characteristics of PN Junction Diode.
19. To plot V-I characteristics of Light Emitting Diode.
20. To plot Static Characteristics of Transistor in CE configuration
21. To study the operation of transistor as a switch.
22. To study the operation of transistor as an amplifier.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.- 1st **Branch: Common to all Branches**

Subject: Fundamental of Computer (Lab) **Course Code: BT00108**

Total Marks in End Semester Exam: 35 **L: 0 T: 0 P: 2**

Min. Marks - 14

The laboratory should be preceded or followed by a Practical Lecture to explain the approach oralgorithm to be implemented for the problem given. Open Source software can be used.

Practical Lecture (L T P) – 0 0 1	**Lab. Work (L T P) – 0 0 3**
Practical Lecture 1:Introduction and workingof Hardware Components	**Lab1**: Identifying the computer hardware likeinput output devices, CPU, mother board, Buses etc.
Practical Lecture 2: Introduction and workingof Software.	**Lab 2**: Making Algorithm, DFD, ER diagram. Working of software's like system, Utility, Application software.
Practical Lecture 3: Introduction and working of Operating System	**Lab 3**: Basic operations of Operating System: creating file, Directory, Removing file, directory, date time setting, renaming etc. use internal and external connabds.
Practical Lecture 4: Introduction and working of MS Office	**Lab 4**: use the basic features of MS Office
Practical Lecture 5: Introduction of MS Word	**Lab5: Create** the document with a Alignment. Use the different properties of MSWord
Practical Lecture 6: Introduction of MS Excel	**Lab 6**: Make the use of Spreadsheet for data representations, Calculation and graphical presentations. Use properties of Excel
Practical Lecture 7: Introduction of Power presentation	Lab 7: MS-PowerPoint Make the presentation with features. Use the animation tools Multimedia
Practical Lecture 8 &9: Introduction of computer communication	**Lab 8 and 9**: *Computer communication related practical*

	1. Connect the Internet; open any website of your choice and save the WebPages. 2. Search any topic related to your syllabi using any search engine and download the relevant material. 3. Send any greeting card to your friend. 4. Create your E-Mail ID on any free E-Mail Server. 5. Login through your E-Mail ID and do the following: a. Read your mail b. Compose a new Mail c. Send the Mail to one person d. Send the same Mail to various persons e. Forward the Mail f. Delete the Mail g. Send file as attachment 6. Surf Internet using Google to find information about your state 7. Surf Internet using Google to find Tourism information about your state 8. Surf Internet using Yahoo to find Hotels around your state 9. Surf Internet using Google to find information about educational institutes for teaching M.S in comp science in India a. Surf Internet using Google to find information about Indian Compare the cost, overheads and

Practical Lecture 10: installing Computer System	**Lab 10:** Installing the working computer system
Practical Lecture 11: Different ICT use of Government Schemes	**Lab 11: Filling online AAADHAR, Voter id, PAN etc. form**
Practical Lecture 12: Applications of Computer in Digital India	**Lab 12**: online filling of different digital India applications

Laboratory Outcomes:

- To give idea about fundamentals of Computer
- To make familiar with MS Office
- To be able to write, document, present their work when developing project
- To be able to better foundations in Computer Field.
- To be able to know online applications of Digital India.

Text & Reference books:

1. Pradeep K. Sinha, Priti Sinha, "Computer Fundamentals". BPB Publications.
2. Rajaraman, V., "Fundamental of Computers". Prentice Hall India, New Delhi
3. Suresh K Basendrea: Computers Today
4. Sanders Donald H Computers Today

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.- 1st **Branch: Common to all Branches**

Subject: Engineering Graphics and Design (Lab) **Course Code: BT00109**

Total Marks in End Semester Exam: 35 **L: 0 T: 0 P: 4**

Min. Marks - 14

List of Practical:

1. Study of any drafting software- GUI, limits and units, drawing tools, editing tools, annotations, etc.
2. Study of co-ordinates systems- Cartesian and polar (absolute and relative system of measurement) and Practice drawing by using following tools: Grid, snap, O-snap, Lines, Erase, Zoom.
3. Study and create drawing by using Drawing tools: Circle, arcs, rectangle, polygon, ellipse, Editing tools: trim, move, copy, rotate and practice of drawing using these commands.
4. Study and create drawing by using Geometry modifying tools: fillet, chamfer, scale, stretch
5. Study and create drawing by using copying tools like array, mirror, block and offset.
6. Study and detailing of drawing by using dimensioning and annotations tools.
7. Study and create drawing with different types of line by using Layer command
8. Create geometry by modify it by using Scales- plane and diagonal scale and create conicssections- ellipse, parabola, hyperbola, rectangular hyperbola, involutes.
9. Draw regular solids: Cube, Prism, Pyramid, Cylinder, Cones
10. Draw sectional views of solids- Cube, Prism, Pyramid, Cylinder, Cones.

BHARTI VISHWAVIDYALAYA, DURG

SCHEME OF TEACHING AND EXAMINATION

Courses of Study and Scheme of Examination of Q1 Group

B. Tech. (Second Semester - Common to all Branches of Engineering)

S. No.	Courses (Subject)	Course Code	Period per Week			Scheme of Examination			Total Marks	Credit (L+T+P/2)
						Theory/Lab				
			L	T	P	ESE	CT	TA		
1.	Chemistry-I	BT00201	3	1	-	70	10	20	100	4
2.	Mathematics-II**	BT00202	3	1	-	70	10	20	100	4
3.	Programmingfor Problem Solving	BT00203	3	-	-	70	10	20	100	3
4.	English	BT00204	2	-	-	70	10	20	100	2
5.	Basic Civil Engineering and Mechanics	BT00205	3	-	-	70	10	20	100	3
6.	Chemistry (Lab)	BT00206	-	-	2	35	-	15	50	1
7.	Programming forProblem Solving(Lab)	BT00207	-	-	4	35	-	15	50	2
8.	Basic CivilEngg. & Mechanics(Lab)	BT00208	-	-	2	35	-	15	50	1
9.	Workshop Practice/ ManufacturingProcess(Lab)	BT00209	-	1	4	35	-	15	50	3
10.	Language (Lab)	BT00210	-	-	2	-	-	50	50	1
Total Marks			14	3	14	490	50	210	750	24

L-Lecture, T-Tutorial, P-Practical, ESE-End Semester Exam,

CT–Class Test, TA–Teacher's Assessment

Note: - (a) The teaching in the 1st and 2nd Semester will be divided in two groups consisting of branches as shown below:

P1–GROUP: Mechanical Engineering, Civil Engineering

Q1–GROUP: Computer Science and Engineering, Electrical Engineering

(b) **Mathematics–II will be taught to both the groups in the first semester.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 2nd | **Branch: Common to all Branches**

Subject: Chemistry–I | **Course Code: BT00201**

Total Marks in End Semester Exam: 70 | **L: 3 T: 1 P: 0**

Minimum number of Class Tests: 02 | **Min. Marks – 28**

Unit – I Atomic & Molecular Structure **10 hours**

Molecular orbital Theory: Equations for atomic and molecular orbitals (LCAO), Energy level diagram of homo(H2, N2, O2, Li2, F2) & hetero molecules (CO, NO, HF), Concept of bond order. Pi-molecular orbitals of butadiene, Aromaticity.

Crystal Field Theory: Splitting of d-orbital of octahedral and tetrahedral complexes, Energy level diagram of transition metal ion & magnetic property, Application of crystal field Theory.

Unit – II Spectroscopic Techniques and Applications **10 hours**

Principle of spectroscopy. Electromagnetic radiation, Spectrophotometer (line diagram) Electronic Spectroscopy (Ultraviolet–visible spectroscopy): Theory, Types of electronic transition, Chromosphere, auxo chromes , Electronic excitation in conjugated Dienes , Uses or application of Electronic Spectroscopy, Vibrational spectroscopy (Infrared spectroscopy): Molecular vibration, Selection rule, functional group region, fingerprint region and uses or application of Vibrational spectroscopy. Nuclear magnetic resonance spectroscopy: Introduction, number of signal, chemical shift, Spin-spin coupling and uses or application of Nuclear magnetic resonance spectroscopy.

Unit – III Use of free energy in Chemical Equilibriums **8 hours**

Thermodynamic Functions: Energy, Entropy, Free energy, Cell potential, Estimations of entropy and free energies, Nernst Equation & its application to voltaic cell.

Corrosion: Electrochemical theory of corrosion, galvanic series, Galvanic corrosion, Differential aeration corrosion, Pitting, and Water line corrosion, factors affecting corrosion , Cathodic Protection, *Boiler Corrosion Scale of Sludge*.

Unit –IV Periodic properties **8 hours**

Periodic table, atomic and ionic radii, ionization energies, electron affinity, electronegativity. Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms. Polari ability, Oxidation states, coordination numbers and geometries, Hard, soft acids

and bases (Classification, Pearson's HSAB principle, its applications & limitations) Molecular Geometry(Valence shell electron pair repulsion theory to NH3,H3O+, SF4, CIF3, ICl2 and H2O), *Application of Molecular Geometry*.

Unit –V Organic reactions and synthesis of drug molecule 8 hours

Introduction to reactions involving substitution (free radical-Chlorination of molecule, Gomberg reaction, Wurtz reaction, Electrophilic, Nucliophilic-SN1, SN2), Addition (Electrophilic–Morkownihoff rule, Nucleophile)Elimination (α elimination , β elimination , unimolecular E1, bimolecular E2), oxidation (Baeyer villager oxidation), reduction (Clemmensen reduction, Wolff Kishner reduction), Reimer- Thiemann reaction, Canannizaro, *Condensation Reaction, Aldal Condensation*.

Synthesis of a commonly used drug molecule: General guidelines of drug making, synthesis of Aspirin, Paracetamol.

Unit – VI Introduction to quantum theory 8 hours

Schrodinger equation & its importance, Applications to hydrogen atom, Wave mechanical model for many electron atoms, radial distribution curves.

Unit –VII Chemical Bonding in Molecules 10 hours

MO theory, Structure, bonding and energy levels of bonding and shapes of many atom molecules, Coordination Chemistry, Electronics plectra and magnetic properties of complexes with relevance to bio- inorganic chemistry, organometallic chemistry.

Unit –VIII Stereochemistry: 8 hours

Introduction to Stereochemistry: Representations of 3 dimensional structures, Chirality, Optical activity. Isomerism structural isomerism, stereoisomers, enantiomers, diastereomers, Configurations (D, L & R, S), Geometrical isomerism (cis and Trans & E and Z). Racemic modification & their resolution, Isomerism in transitional metal compounds. Conformational analysis: Conformations of cyclic (cyclohexane) and acyclic compounds (ethane & butane).

Unit –IX Reactivity of organic molecules: 8 hours

Organic acids and bases: factors influencing acidity, basicity, and nucleophilicity of

molecules, kinetic vs. thermodynamic control of reactions.

Unit –X Strategies for synthesis of organic compounds: 10 hours

Reactive intermediates substitution, elimination, rearrangement, kinetic and thermodynamic aspects, role of solvents.

Text Books:

1. A Text Book of Engg. Chemistry, Shashi Chawala, Dhanpat Rai &Co.(P)Ltd.
2. Engineering Chemistry by P. C. Jain (Dhanpat Rai Publishing Company.
3. Engineering Chemistry, Concept in engineering Chemistry by Satyaprakash and Manisha Agrawal by Khanna Publication.

Books for Chemical Engineering:

1. Advanced Inorganic Chemistry Vol 1 & II by Gurdeep Raj, Goel Publishing House.
2. Organic Reaction and Their Mechanism, P. S Kalsi, New Age International Publishers.

Reference Books:

1. University chemistry, by B. H. Mahan
2. Chemistry: Principles and Applications, by M. J. Sienko and A. Plane
3. Fundamentals of Molecular Spectroscopy, by C. N. Banwell
4. Engineering Chemistry (NPTEL Web- book), by B. L. Tembe, Kamal uddin and M. S. Krishnan
5. Physical Chemistry, by P. W. Atkins
6. Organic Chemistry: Structure and Function by K. P. C. Volhardt and N. E. Schore, 5thEdition
7. Essentials of Physical Chemistry, Bahi & Tuli, S. Chand Publishing
8. Introduction to Nano science by S. M. Lindsay

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 2nd | **Branch: Common to all Branches**

Subject: Mathematics - II | **Course Code: BT00202**

Total Marks in End Semester Exam: 70 | **L: 3 T: 1 P: 0**

Minimum number of Class Tests: 02 | **Min. Marks – 28**

UNIT I Multivariable Calculus (Integration) (8 hours)

Double and triple integrals (Cartesian), change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: areas and volumes, Center of mass and Gravity (constant and variable densities); Triple integrals (Cartesian),

Orthogonal curvilinear coordinates, Simple applications involving cubes, sphere and rectangular parallelepipeds; Scalar line integrals, vector line integrals, scalar surface integrals, vector surface integrals, Theorems of Green, Gauss and Stokes (without proof) & its applications.

UNIT II First Order Ordinary Differential Equations (8 hours)

Exact, linear and Bernoulli's equations, Euler's equations, *Formation of Differential Equation, Linear Equation*, *Equation Reducible to exact equation*, Equations of first order and higher degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut'stype.

UNIT III Ordinary differential equations of higher orders (8 hours)

Higher order linear differential equations with constant coefficients & variable coefficients, methodof variation of parameters, Cauchy-Euler equation. Power series solutions; Legendre polynomials and their properties, Bessel functions of the first kindand their properties.

UNIT IV Complex Variable – Differentiation (8 hours)

Limit of complex function, Cauchy-Riemann equations, analytic functions, harmonic functions, finding harmonic conjugate; elementary analytic functions (exponential, trigonometric, logarithm) and their properties; Conformal mappings, Mobius transformations and their properties.

UNIT V Complex Variable – Integration (8 hours)

Contour integrals, Cauchy-Goursat theorem (without proof), Cauchy Integral formula (without proof), Lowville's theorem and Maximum-Modulus theorem (without proof); Taylor's series, zeros of analytic functions, singularities, Laurent's series. Residues, Cauchy Residue theorem (without proof), Evaluation of definite integral involving sine and cosine, Evaluation of certain improper integrals using the Bromwich contour.

Textbooks/References:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint,2002.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006
3. W. E. Boyce and R. C. Di Prima, Elementary Differential Equations and Boundary ValueProblems,9th Edn., Wiley India, 2009.
4. S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.
5. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice HallIndia, 1995.
6. E. L. Ince, Ordinary Differential Equations, Dover Publications, 1958.
7. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., Mc-Graw Hill, 2004.
8. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications,Reprint, 2008.
9. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 2nd | **Branch: Common to all Branches**

Subject: Programming for Problem Solving | **Course Code: BT00203**

Total Marks in End Semester Exam: 70 | **L: 3 T: 0 P: 0**

Minimum number of Class Tests: 02 | **Min. Marks – 28**

Unit I: Introduction **(4 lectures)**

Introduction to Programming, *Evaluation of programming language*, Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.), and Idea of Algorithm: steps to solve logical and numerical problems.

Unit II: Programming Concepts **(9 lectures)**

Algorithm: Flowchart, Pseudo code and Source code with examples. Variables, data types, memory locations, Syntax and Logical Errors in compilation, object and executable code, Arithmetic expressions and precedence, Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching, Iteration and loops, *Sub program implementing sub program.*

Unit III: Arrays **(9 lectures)**

Introduction to Arrays (1-D, 2-D), Character arrays and Strings, Basic Algorithms: Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs (no formal definition required), *Expression statements*.

Unit IV: Function **(9 lectures)**

Function programming, prototyping, built in libraries, Parameter passing in functions, call by value, Passing arrays to functions: idea of call by reference, Recursion: Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc. Quick sort or Merge sort.

Unit V: Structure **(9 lectures)**

Defining structures and Array of Structures, Union, and enumeration, Pointers: Idea of pointers, Defining pointers, Use ofPointers in self-referential structures, notion of linked list (no implementation), bit-fields. File handling: concept of a file, text files and binary files, Formatted I/O, file I/O operations,example programs

Text Books:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill

Reference Books:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 2nd | **Branch: Common to all Branches**

Subject: English | **Course Code: BT00204**

Total Marks in End Semester Exam: 70 | **L: 2 T: 0 P: 0**

Minimum number of Class Tests: 02 | **Min. Marks – 28**

UNIT – I

Vocabulary Building

1.1 Root words from foreign languages and their use in English

1.2 Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives.

1.3 Synonyms, antonyms, Homonyms and Homophones.

1.4 One Word Substitution

1.5 Basics of Phonetics: Definitions, Phonetic Symbols, Transcription of one and two syllablewords

1.6 Communication: Definition, Cycle, Elements, 7Cs & Barriers

UNIT – II

Basic Writing Skills

2.1 Types of Sentences and Tenses, Voices and narration

2.2 Use of phrases and clauses in sentences

2.3 Importance of proper punctuation

2.4 Creating coherence

2.5 Techniques for writing precisely

UNIT – III

Identifying Common Errors in Writing

3.1 Parts of speech, Subject-verb agreement

3.2 Noun-pronoun agreement

3.3 Misplaced modifiers

3.4 Articles

3.5 Prepositions

3.6 Redundancies

3.7 Clichés

3.8 Errors in Spelling/ Misspelled words

UNIT – IV

Writing Practices

4.1 Comprehension

4.2 Précis Writing

4.3 Essay Writing

4.4 Business Letters & Job Application

4.5 Formal Reports: Components & Characteristics

4.6 Writing e-mails

UNIT – V

Listening

5.1 Listening: Definition, purposes, types, and strategies to improve listening.

5.2 Characteristics of effective listening.

5.3 Barriers to Listening and measures to overcome barriers

5.4 Note making: types and conversion of notes into texts.

UNIT – VI

Oral Communication (This unit involves interactive practice sessions in Language Lab)

6.1 Listening Comprehension

6.2 Pronunciation, Intonation, Stress and Rhythm

6.3 Common Everyday Situations: Conversations and Dialogues

6.4 Communication at Workplace

6.5 Interviews

6.6 Formal Presentations

Suggested Books:

1. Practical English Usage. Michael Swan. OUP. 1995.
2. Remedial English Grammar. F.T. Wood. Macmillan.2007

3. On Writing Well. William Zinsser. Harper Resource Book. 2001
4. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
5. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
6. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press
7. English and Communication Skills for Students of Science and Engineering. S.P. Dhanavel.Orient Blackswan Ltd.2009.
8. Scientific English: A Guide for Scientists and Other Professionals. R A Day. UniversitiesPress. 2000.
9. Word Power Made Easy. Norman Lewis. W R Goyal Publishers and Distributors. Publishers. 2009
10. Textbook of English Phonetics for Indian Students. T Balasubramaniam. MacmillanPublishers.2012
11. Technical Communication: Principles and Practice. Meenakshi Raman and SangeetaSharma. Oxford University Press. 2015.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 2nd	**Branch: Common to all Branches**
Subject: Basic Civil Engineering & Mechanics	**Course Code: BT00205**
Total Marks in End Semester Exam: 70	**L: 3 T: 0 P: 0**
Minimum number of Class Tests: 02	**Min. Marks – 28**

UNIT – I Building Material

Nominal and actual dimensions of modular and traditional bricks, Qualities of good brick, Water absorption and Compressive Strength test for bricks. Types of Cement, Ingredients of Portland cement and their functions, Fineness, Setting Times and Compressive Strength of Cement, Functions of Sand in mortar, Mortar Mix proportions for various uses.

UNIT – II Building Construction

Ingredients of Cement Concrete, *Coarse and Fine Aggregates*, Grades of Concrete, proportions for Nominal mix concrete, Workability & Compressive Strength of Concrete, Curing of Concrete.

Define Footing Foundation, Necessity of foundations, Definitions of Safe bearing capacity, Ultimate bearing capacity and factor of safety, *Relationship between SBC, UBC and FOS*, Difference between Load Bearing & framed Construction.

UNIT – III Surveying & Leveling

Principles of Surveying, Technical terms, Calculation of reduced level by Height of instrument and Rise & Fall method, Simple problems in leveling.

UNIT – IV General System of Forces

Equations of equilibrium for a system of concurrent forces in a plane. Constraint, Action and Reaction. Types of support and support reactions. Free Body Diagram – Body subjected to two forces & Body subjected to three forces. Theorem of Varigonon's, Equations of Equilibrium.

UNIT –V Analysis of Plane Trusses

Rigid or perfect Truss, Determination of Axial forces in the members of truss, Method of Joints, Method of Sections.

Text books:

1. Comprehensive Basic Civil Engineering B.C. Punmia
2. Building construction by Ahuja and Birdi
3. Engineering Mechanics by A. K. Tayal

Reference books:

1. Basic Civil Engineering by Ramamurutham
2. Engineering Mechanics by R. K. Bansal

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 2nd | **Branch: Common to all Branches**

Subject: Chemistry-I (Lab) | **Course Code: BT00206**

L: 0 T: 0 P: 2 | **Minimum number of Class Tests: 02**

Total Marks in End Semester Exam: 35 | **Min. Marks – 14**

List of Experiments:

Choice of 8 – 10 experiments from the following:

1. Determination of surface tension and viscosity.
2. Thin layer chromatography.
3. Ion exchange column for removal of hardness of water.
4. Determination of chloride content of water.
5. Colligative properties using freezing point depression.
6. Determination of the rate constant of a reaction.
7. Determination of cell constant and conductance of solutions.
8. Potentiometric - determination of redox potentials and emfs.
9. Synthesis of a polymer/drug/ organic compounds.
10. Saponification/acid value of oil.
11. Chemical analysis of salt / organic compounds.
12. Lattice structures and packing of spheres.
13. Models of potential energy surfaces.
14. Chemical oscillations- Iodine clock reaction.
15. Determination of the partition coefficient of a substance between two immiscible liquids.
16. Adsorption of acetic acid by charcoal.
17. Use of the capillary viscometers to the demonstrate of the isoelectric point as the Ph ofminimum viscosity for gelatin sols and/or coagulation of the white part of egg .
18. Spectrophotometric determination.

Text Books:

1. Laboratory Manual Engg. Chemistry, Anupama Rajput, Dhanpat Rai & Co. (P) Ltd.
2. Laboratory Manual on Engg. Chemistry, S. K. Bhasin& Sudha Rani, Dhanpat Rai & Co. (P) Ltd.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 2nd **Branch: Common to all Branches**

Subject: Programming for Problem Solving (Lab) **Course Code: BT00207**

Total Marks in End Semester Exam: 35 **L: 0 T: 0 P: 4**

Min. Marks - 14

The laboratory should be preceded or followed by a Practical Lecture to explain the approach oralgorithm to be implemented for the problem given.

Practical Lecture (L T P) – 0 0 1	**Lab. work (L T P) – 0 0 3**
Practical Lecture 1: Problem solving using computers	**Lab1**: Familiarization with programming environment
Practical Lecture 2: Variable types and type conversions	**Lab 2**: Simple computational problems using arithmetic expressions
Practical Lecture 3: Branching and logical expressions	**Lab 3**: Problems involving if-then-else structures:
Practical Lecture 4: Loops, while and for loops	**Lab 4**: Iterative problems e.g., sum of series
Practical Lecture 5: 1D Arrays: searching, sorting	**Lab 5**: 1D Array manipulation
Practical Lecture 6: 2D arrays and Strings	**Lab 6**: Matrix problems, String operation
Practical Lecture 7: Functions, call by value	**Lab 7**: Simple functions
Practical Lecture 8 & 9: Numerical methods (Root finding, numerical differentiation, numerical integration):	**Lab 8 & 9**: Programming for solving Numerical methods problems
Practical Lecture 10: Recursion, structure of recursive calls	**Lab 10**: Recursive functions
Practical Lecture 11: Pointers, structures and dynamic memory allocation	**Lab 11**: Pointers and structures
Practical Lecture 12: File handling	**Lab 12**: File operations

Text Books:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill.

Reference Books:

3. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 2nd | **Branch: Common to all Branches**

Subject: Basic Civil Engineering & Mechanics (Lab) | **Course Code: BT00208**

Total Marks in End Semester Exam: 35 | **L: 0 T: 0 P: 2**

Min. Marks - 14

List of Experiments:

1. Water Absorption test on bricks.
2. Compressive strength test on bricks.
3. Fineness of cement by sieve analysis.
4. Initial setting time of cement.
5. Compressive Strength test of Cement.
6. Sieve analysis and F.M. of fine aggregate.
7. Sieve analysis and F.M. of coarse aggregate.
8. Compressive strength test of Concrete.
9. Difference in level between two given stations by Height of Instrumentmethod.
10. Difference in level between two given stations by Rise & Fall method.

BHARTI VISHWAVIDYALAYA, DURG

Semester: B. Tech.– 2nd **Branch: Common to all Branches**

Subject: Workshop **Course Code: BT00209**

Practice/Manufacturing Process (Lab)

Total Marks in End Semester Exam: 35 **L: 0 T: 1 P: 4**

Min. Marks - 14

Unit I:

Forging: Introduction to manufacturing process, and its classification, use of various forging tools,forging operations, forging defects.

Suggested Jobs: Forging of chisel, forging of screw driver.

Unit II:

Carpentry: Different types of wood, carpentry tools, different joints, polishing, wood workingLathe.

Suggested Jobs: Making of name plate, stools and a small job on wood working lathe.

Unit III:

Fitting Shop: Introduction to bench working. Work holding devices, measuring instruments, fittingtools and their specification, types of joints fitting operations.

Suggested Jobs: Preparation of job by use of filling, sawing, chipping, drilling and tapping operations.

Unit IV:

Moulding: Pattern materials, allowances, moulding terminology.

Suggested Jobs: Prepare moulds of patterns, casting small household objects like paper-weight etc.

Unit V:

Welding: Study and use of gas, Arc, soldering, brazing methods. Safety precaution.

Suggested Jobs: Preparing Lap and Butt joints by gas and arc welding method.

Unit VI:

Metal Cutting: Common machining operations, different machine tools, cutting tools

materials, different type of Lathes, Lathe operations, shaper and its specification. Quick return mechanism of shaper.

Suggested Jobs: Making small shaft, cutting screw thread on Lathe.

Text Books:

1. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
2. Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.
3. B.S. Raghuvanshi, Workshop Technology, Vol I&II, Dhanpat Rai & Sons.

Reference Books:

1. Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition,Pearson Education India Edition, 2002.
2. Gowri P. Hariharan and A. Suresh Babu,"Manufacturing Technology – I" Pearson Education, 2008.
3. Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998.
4. M.L.Begeman and B.H.Amstead, Manufacturing Process, Wiley
5. W.A.J.Chapman and E. Arnold, Workshop Technology, Vol I, II, & III, CRC Press, Prentice Hall
6. V. Narula, Workshop Technology, S.K. Kataria and sons.

BHARTI VISHWAVIDYALAYA, DURG

SCHEME OF TEACHING AND EXAMINATION
B. Tech. (Third Semester – Computer Science & Engineering)

Sl. No.	Courses(Subject)	CourseCode	Period per Week			Scheme of Examination			Total Marks	Credit (L+T+P/2)
						Theory/Lab				
			L	T	P	ESE	CT	TA		
1.	Mathematics – III	BT01301	3	1	-	70	10	20	100	4
2.	Data structure & Algorithms	BT01302	3	1	-	70	10	20	100	4
3.	Principles of Programming Languages	BT01303	2	1	-	70	10	20	100	3
4.	Digital Electronics & Logic Design	BT01304	2	1	-	70	10	20	100	3
5.	Operating Systems	BT01305	2	1	-	70	10	20	100	3
6.	Data structure & Algorithms Laboratory	BT01306	-	-	2	35	-	15	50	1
7.	Digital Electronics& Logic DesignLaboratory	BT01307	-	-	2	35	-	15	50	1
8.	Operating Systems Laboratory (UNIX)	BT01308	-	-	2	35	-	15	50	1
9.	Software Laboratory (Sci-Lab / MATLAB)	BT01309	-	-	4	35	-	15	50	2
10.	Personality Development	BT01310	-	-	-	-	-	50	50	-
Total Marks			11	3	10	490	50	210	750	21

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III)	**Branch: Computer Science & Engineering**
Subject: Mathematics - III	**Course Code: BT00301**
Total Theory Periods: 03	**Total Tutorial Periods: 01**
Class Tests: Two (Minimum)	**Assignments: Two**
ESE Duration: 03 Hours	**Marks: Max. – 70 Min. – 28**

UNIT-I Laplace transform:

Definition, Transform of elementary functions, Properties of Laplace transform, Transform of derivatives & integrals, Multiplication by t", Division by t, Evaluation of integrals, Inverse Laplace Transform, Convolution theorem, Unit step function,Unit impulse function, Periodic function, *Simultaneous Linear Equationwith Constant Coefficients*.

UNIT- II Partial differential equation:

Formation of Partial Differential Equation, Solution of Partial Differential Equation, Equation Solvable by Direct Method, homogeneous linear equations, Method of separation of variables.

UNIT- III Random variable:

Discrete and continuous probability distributions, Mathematical expectation, Mean and Variance, Moments, Moment generating function, probability distribution, Binomial, Poisson and Normal distributions.

UNIT- IV Interpolation with equal and unequal intervals:

Finite differences, Newton's Forward & Backward Difference Formulae, Central Difference Formula, Stirling's Formula, Bessel's Formula, Lagrange's Formula and Newton's Divided Difference Formula.

UNIT-V Numerical Solution of Ordinary Differential Equations:

Picard's Method, Taylor's Series Method, Euler's Method, Euler's Modified Method, Runge-Kutta Methods, Predictor-corrector Methods- Milne’s Method, Adams-Bash forth Method, Second Order Differential Equation..

Text Books:

1. "Higher Engg. Mathematics", Dr. B.S. Grewal, Khanna Publishers.
2. “Advanced Engg. Mathematics", Erwin Kreyszig - John Wiley & Sons "Numerical
3. “Methods in Engineering and Science", Dr. B.S. Grewal, Khanna Publishers.
4. "Numerical Methods for Scientific and Engineering Computation", M.K. Jain, S. R. K

Reference Books:

1. “Applied Mathematics”, P. N. Wartikar& J. N. Wartikar. Vol-II Pune Vidyarthi GrihaPrakashan, Pune.
2. “Applied Mathematics for Engineers & Physicists”, Louis A. Pipes- TMH.
3. "Numerical Methods for Scientists and Engineers” K. Shankar Rao, Prentice Hall of India.
4. "Numerical Methods” P. Kandasamy, K. Thilagavathy and K. Gunavathi, S. Chand publication.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III)	**Branch: Computer Science & Engineering**
Subject: Principles of Programming Languages	**Course Code: BT01302**
L: 2 T: 1 P: 0	**Total Tutorial Periods: 01**
Class Tests: Two (Minimum)	**Assignments: Two**
ESE Duration: 03 Hours	**Marks: Max. – 70 Min. – 28**

UNIT- I Program Design:

Introduction- fundamental design concepts - Modules and modularization criteria – *Principle of language design*, Design notation: Procedure template, Pseudo code - Structured flow chart decision. Tables - Design techniques: Stepwise refinement, Levels of abstraction, Top down- Test Plans-Design guidelines, *Programming environment.*

UNIT-II Programming language processors:

*Introduction of primary data type***,** Characteristics of programming languages, Factors influencing the evolution of programming language, Development in programming methodologies, desirable features and design issues, Structure and operations of translators, software simulated computer, syntax, semantics, structure, virtual computers, binding and binding times, storage management comparisons.

UNIT- III Functional & Logic programming languages:

Introduction, comparison and applications of functional and logic programming languages; fundamentals of LISP (Objects, Control constructs, List processing) & PROLOG (Syntax, Lists, Operators and arithmetic, Control constructs), *Programming language construct*.

UNIT-IV Object-Oriented Programming Concepts-I:

Introduction to Basic Object- Oriented Concepts: (Object, Class, Encapsulation, Abstraction, Data Hiding, Inheritance, Polymorphism, Message Passing), Basic structure of a C++ program, C++ Compiler, C++ Classes, Methods, Objects, Nested Class, Const, Static members, this pointer, Comparison between Pointer and Reference Variables, Comparison between New and Delete Operators, statement.

UNIT-V Object-Oriented Programming Concepts-II:

Constructor, Destructor, Function and Operator Overloading, Friend functions and Friend classes, Inheritance, Abstract classes, Polymorphism, Virtual Function and Classes, Dynamic Binding, Exception Handling and Templates, Parameter passing.

Text Books:

1. “Software Engineering Concepts" by Richard Fairley, Tata McGraw Hill,
2. “Programming Languages, Design and implementation" by Terrance W. Pratt, and Marvin
3. V. Zelkowitz, Prentice-Hall of India, Fourth edition, 2002.
4. E. Balagurusamy, Object Oriented Programming with C++, Tata McGraw Hill

Reference Books:

1. “Programming Languages - Concepts and Constructs” by Ravi Sethi, Addison-Wesley,2nd Ed. 1996.
2. “Programming Languages: Principles and Paradigms” by Allen B. Tucker, Robert Noonan,TMH, 2006.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III)	**Branch: Computer Science & Engineering**
Subject: Data Structures & Algorithms	**Course Code: BT01303**
L: 2 T: 1 P: 0	**Total Tutorial Periods: 01**
Class Tests: Two (Minimum)	**Assignments: Two**
ESE Duration: 03 Hours	**Marks: Max. – 70 Min. – 28**

UNIT-I Introduction:

Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off. Abstract Data Types (ADT) Arrays: Definition, Single and Multidimensional Arrays, Row Major & Column Major Order Representation of Arrays, Application of arrays, Sparse Matrices and their representations. Linked lists: Array Implementation and Dynamic Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal, Polynomial Representation and Addition, Generalized Linked List.

UNIT-II Stacks:

Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Recursion, Tower of Hanoi Problem, Simulating Recursion, Principles of recursion, Tail recursion, Removal of recursion Queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C, Dequeue and Priority Queue.

UNIT- III Trees:

Basic terminology, Binary Trees, Binary Tree Representation: Array Representation and Dynamic Representation, Complete Binary Tree, Algebraic Expressions, Extended Binary Trees, Array and Linked Representation of Binary trees, Search Trees: Binary Search Trees (BST), Insertion and Deletion in BST Trees, Traversal algorithms: Inorder, Preorder and Post order, Threaded Binary trees, Traversing Threaded Binary trees.

UNIT-IV Graphs:

Terminology, Sequential and linked Representations of Graphs: Adjacency Matrices, Adjacency List, Adjacency Multi list, Graph Traversal: Depth First Search and Breadth First Search, Connected Component, Spanning Trees, Minimum Cost Spanning Trees: Prims and Kruskal's algorithm. Transitive Closure and shortest Path algorithm: Warshal Algorithm and Dijikstra Algorithm.

UNIT-V Searching: Sequential search, Binary Search, Comparison and Analysis Internal Sorting: Insertion Sort, Selection, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort, Radix Sort, Tree (BST) Sort; Complexity of Search Algorithm, AVL trees, Introduction to m-way Search Trees, B Trees & B+ Trees, Hashing: Hash Function, Collision Resolution Strategies, Storage Management: Garbage Collection and Compaction.

Text books:

1. Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein "Data StructuresUsing C and C/C++", PHI
2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication.
3. Lipschutz, "Data Structures" Schaum's Outline Series, TMH

References books:

1. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures withapplications", McGraw Hill
2. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education 3. GA VPai, "Data Structures and Algorithms", TMH

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III)	**Branch: Computer Science & Engineering**
Subject: Digital Electronics	**Course Code: BT01304**
L: 2 T: 1 P: 0	**Total Tutorial Periods: 01**
Class Tests: Two (Minimum)	**Assignments: Two**
ESE Duration: 03 Hours	**Marks: Max. – 70 Min. – 28**

UNIT- I Digital Fundamentals:

*Number system & codes***,** Sequential codes, self- complementing codes, Cyclic codes, 8-4-2-1 BCD code, Excess-3 code, Gray code: Binary to Gray and Gray to binary code conversion, Error detecting code, Error correcting code, 7-bit Hamming code, ASCII code, Binary Arithmetic, Boolean Algebra, Minimization of Switching Function , DE Morgan's Theorem, Karnaugh's Map Method, Quine-McCluskey's Method (Tabular Method). Basic and Universal logic Gates, Realization of switching functions using gates.

UNIT-II Digital Logic Families and Memory:

Transistor Inverter: Basic Concepts of RTL and DTL; TTL: Open collector gates, TTL subfamilies, IIL, ECL; MOS Logic: CMOS Logic,Dynamic MOS Logic, Interfacing: TTL to ECL, ECL to TTL, TTL to CMOS, CMOS to TTL, and Comparison among various logic families. Memories: ROM and RAM, PLA, PAL and FPGA; *Encoder & decoder*.

UNIT- III Combinational Circuits:

Adder & Subtractor: Half adder, Full adder, Half- subtractor, Full subtractor, Parallel Binary adder, Look Ahead carry adder, Serial adder, BCD adder. Code converter, Parity bit generator/Checker, Comparator. Decoder: 3-line to 8-line decoder, 8-4-2-1 BCD to Decimal decoder, BCD to 7 segments decoder, multiplexer & de-multiplexer.

UNIT-IV Sequential Circuits:

NAND GATE NOR GATE, Half duplex, full duplex, Flip-Flops: SR, JK, T, D, Master/Slave JK FF and their conversion, Excitation Tables. Introduction to registers (SISO, SIPO, PIPO, PISO) and Design of Counters- Ripple Counters, Ring Counters, Shift registers, Universal Shift Register, Circuits: code converters & counters.

UNIT-V Machines and Application:

Finite State Machine, Mealy Machine, Moore Machine, Introduction to VHDL: Behavioral-data flow and algorithmic and structural description, lexical elements, data objects types, attributes, operators; VHDL coding examples, *Stable and unstable state, output specification.*

Text Books:

1. R. P. Jain: “Modern Digital electronics”, TMH.
2. B. Soma Nathan Nair, “Digital Electronics & Logic Design”, Prentice-Hall of India.
3. Pedroni V.A., “Digital Circuit Design with VHDL”, Prentice Hall, India 2nd Edition.
4. W. H. Crothman, Digital Electronics PHI, latest.

Reference Books:

1. R J Tocci, “Digital System principles and Applications”
2. “Digital Electronics" by A. K. Maini, Wiley India.
3. M. M. Mano: “Digital logic and computer design”, PHI.
4. Floyd: “Digital fundamentals”, UBS.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III)	**Branch: Computer Science & Engineering**
Subject: Operating System	**Course Code: BT01305**
L: 2 T: 1 P: 0	**Total Tutorial Periods: 01**
Class Tests: Two (Minimum)	**Assignments: Two**
ESE Duration: 03 Hours	**Marks: Max. – 70 Min. – 28**

UNIT- I Introduction: Operation System objectives and functions, The Evolution of operating Systems, Batch interactive systems, time sharing and real time systems, Protection, Operating System Structure, System Components, operating system service, System structure, Distributed Computing, *Parallel OS, Embedded OS.*

UNIT-II Concurrent Processes: Process concept: Introduction, Definitions, Process States, Process State Transitions, The process Control Block, Operations on Processes, Suspend and Resume, *Thread, User level thread*, Interrupt Processing. Mutual Exclusion, the Producer/ Consumer problem, the critical section problem, Semaphores, Classical problems in concurrency, inter process communication. CPU scheduling: concepts, performance criteria, and scheduling Algorithms. Algorithm evaluation, Multiprocessor scheduling, *real time scheduling.*

UNIT- III Dead Locks: System model, Deadlock characterization. Prevention, Avoidance and Detection, Recovery from deadlock, combined approach, *recovery from threads.*

UNIT-IV Memory Management: Base machine, Resident Monitor, multiprogramming with fixed partition, Multiprogramming with variable partitions, Paging, Segmentation, paged - segmentation, virtual Memory concepts, Demand paging, performance, Page Replacement algorithms, Allocation of frames, Thrashing, cache memory organization, *impact of performance.*

UNIT-V I/O Management & *File* Scheduling: I/O system Interrupts Direct Memory Access, I/O Buffering, File system: File Concepts - File organization and Access mechanism, File Directories, File sharing, Implementation issues. Disk Scheduling algorithms.

Text Books:

1. Operating system concepts Galvin by Silberschatz, John Wiley & Sons.
2. Operating System Design & Implementation by Tanenbaum, A.S., PHI.
3. The Design of UNIX Operating System, Maurice J. Bach, Pearson Education.

Reference Books:

1. Modern Operating System: Andrew S. Tanenbaum, PEARSON EDUCATION INTERNATIONAL.
2. Operating System concepts by Silberscatz A and Peterson, J.L, PE- LPE.
3. Operating systems: Internals & Design Principles, William Stallings, PHI.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III) **Branch: Computer Science & Engineering**

Subject: Data Structures (Laboratory) **Course Code: BT01306**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments: (At least 10 experiments are to be performed by each student)

1. Write a program to perform following operations in one dimensional array, Insertion,Deletion and Searching (Linear & Binary).
2. Write a program to implement stack and perform push and pop operations.
3. Write a program to convert infix to postfix expressions using stack.
4. Write a program to perform following operations on a linear queue - addition, deletion,traversing.
5. Write a program to perform following operations on a circular queue - addition, deletion,traversing.
6. Write a program to perform following operations on a double ended queue - addition,deletion, traversing.
7. Write a program to perform following operations on a single link list-creation, insertion,deletion.
8. Write a program to perform following operations on a double link list - creation, insertion,deletion.
9. Write a program to implement polynomial in link list and perform. a) Polynomial arithmetic b) Evaluation of polynomial
10. Write a program to implement a linked stack and linked queue. 9. Write programs toperform Insertion, selection and bubble sort.
11. Write a program to perform quick sort.
12. Write a program to perform merge sort.
13. Write a program to perform heap sort.
14. Write a program to create a Binary search tree and perform -insertion, deletion & traversal.
15. Write a program to traversal of graph (Breadth-first Search, Depth-first Search methods)

Remarks: The students are free to choose any programming platform from (C++ / JAVA / PYTHON) to perform the above-mentioned set of laboratory experiments.

Laboratory Outcomes [After undergoing the course, students will be able to]:

1. Understand the importance of abstract data types, structure types and their usability indifferent applications through different programming platforms.
2. Implement various data structure operations (traversal, accession, insertion, deletion & updation) on stacks, linked lists, queues, trees & graphs.
3. Design and analysis the time and space efficiency of implemented data structures.
4. Identity the selection of appropriate data structure for given problem situations.
5. Implement various kinds of searching and sorting techniques.

Recommended Books:

1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein “Data StructuresUsing C and C/C++”, PHI
2. Jean Paul Trembley and Paul G. Sorenson, “An Introduction to Data Structures withapplications”, McGraw Hill.
3. Lipschutz, “Data Structures" Schaum's Outline Series, TMH

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III) **Branch: Computer Science & Engineering**

Subject: Digital Electronics Laboratory **Course Code: BT01307**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments: (At least 10 experiments are to be performed by each student)

1. To study the characteristics and operations of TTL Inverters, OR, AND, NOR and NANDgate using ICs.
2. To study NAND and NOR gates as a universal logic.
3. To study and prove DE Morgan's Theorem.
4. To design half and Full adder circuits using logic gates.
5. To design half and full subtractor circuits using logic gates.
6. To study the binary parallel adder.
7. To design 4 bit magnitude comparator circuits.
8. To study the 7 segment decoder.
9. To design 4:16 decoder using two 3:8 decoder and four 2:4 decoder
10. To design 16: 1 multiplexer using 4:1 Multiplexer.
11. To study various types of flip flops using logic gates and ICs.
12. To design Mode-N and divide by K counter.
13. To construct a 4 bit binary to gray converter and vice versa using IC 7486.
14. To study Up-Down counter.
15. To study programmable shift registers.

Experiments using VHDL (At least 4 Experiments are to be performed by each student)

1. Design AND, OR, XOR gates.
2. Design Half Adder (Data Flow Style)
3. Design Half Adder (Behavioral Style)
4. Design Half Adder (Structural style Direct entity instantiation)
5. Design Half Adder (Structural style indirect entity instantiation(Component))
6. Design Half Adder (Mixed Style)
7. Design 4 bit comparator using std_logic_vector inputs.
8. Design 4:1 Multiplexer using Boolean expression
9. Design the 7 segment decoder.
10. Design 3:8 decoder

Laboratory Equipment / Machine Requirements: Logic gate trainer, Digital ICs Trainer,Various ICs 7400,7402,7404,7408,7432,7486,74138,74151,74155 etc., Xilinx ISE Web PACK

Laboratory Outcomes [After undergoing the course, students will be able to]:

1. Acknowledge about the fundamentals of digital circuit Design.
2. Understand the concepts of logic families.
3. Take interest to design and develop ICs in VLSI industries.
4. Understand the operations of latch circuits, flip flops, counters & semiconductor memories.
5. Understand and design combinational circuits.

Recommended Books:

1. M. M. Mano : "Digital Logic and Computer Design";
2. Kenneth L. SHORT "VHDL FOR ENGINEERS", Pearson Education.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III) **Branch: Computer Science & Engineering**

Subject: Operating Systems (UNIX) Laboratory **Course Code: BT01308**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments: (At least 10 experiments are to be performed by each student)

1. Practice session: Study the features of Linux environment, basic Linux commands (echo, who, date, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, find, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, comm, cmp, diff, tr); also document the syntax and semantics of those commands.
2. Write a shell script that accepts a name from the user and displays whether it is a file, directory or something else.
3. Write a shell script that creates users; also check if a particular user has logged in or not. If not, continue the loop till he/she logins. Once the required user logins display a message.
4. Write a shell script that searches for a given string in a text input file.
5. Write a shell script that compiles all C files in your home directory and creates executablefiles.
6. Write a shell script that given a filename as argument, deletes all even lines in a file &removes duplicate lines from a file.
7. Write a shell script that enhances find command by adding error messages that explainwhy the command failed.
8. Write a shell script to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following logic: Percentage >= 90%: Grade A, Percentage >= 80%: Grade B, Percentage >= 70%: Grade C, Percentage >= 60%: Grade D, Percentage >= 40%: Grade E, Percentage < 40%: Grade F.
9. Write a shell script to accept the name, grade, and basic salary from the user. Write the details into a file called employee, separating the fields with a colon (,) continue the process till the user wants.
10. Write an Awk'script to count the number of lines in a file that do not contain vowels.
11. Write an Awk' script to find the number of characters, words and lines in a file.

12. Write a C program to simulate following non-preemptive CPU scheduling algorithms: a) FCFS b) SJF c) Round Robin (pre-emptive) d) Priority scheduling techniques.
13. to find average turnaround times and waiting times;
14. To display / print Gantt chart (in any convenient format).
15. Implement the Producer - Consumer problem using semaphores (using UNIX systemcalls).
16. Write a C program to simulate disk-scheduling algorithms: a) FCFS b) SCAN c) C-SCAN techniques.
17. Write a C program to simulate page replacement algorithms: a) FIFO b) LRU C) LFU d)OPT techniques.

Remarks: The laboratory experiments may be performed in with of the LINUX shell environments: BOURNE Shell / KORN Shell / Ç Shell.

Laboratory Outcomes [After undergoing the course, students will be able to]:

1. Understand the concept of UNIX and shell programming.
2. Learn the working of Linux OS Kernel.
3. Analyze the differences between features provided in Windows and Linux operating system.
4. Learn the concept of loops and decision-making statements.
5. Analyze the logic & procedure of problem solving through Scripts.

Recommended Books:

1. Advance UNIX, a Programmer's Guide, S. Prata, BPB Publications, New Delhi.
2. The Complete Reference UNIX, Rosen, Host, Klee, Farber, Rosinski, Second Edition,TMH.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III) **Branch: Computer Science & Engineering**

Subject: Software Laboratory (SciLAB / MATLAB) **Course Code: BT01309**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments: (At least 10 experiments are to be performed by each student)

1. Identification of different matrix types.
2. Properties and Operations of arrays and matrices.
3. Write a program to find probability of tossing a coin and rolling a die through large no. ofexperimentation.
4. Compute y-coordinates of a STRAIGHT LINE y= mx + c, where slope of line m =0.5,intercept c= -2 and x coordinates: x = 0 to 10 for 0.5 increments.
5. Plot y = Sin x where 0 SXS2.
6. Plot y = e - 0.4 x Sin x where 0 SXS 4.
7. Find the solution of linear algebraic equations in 2 variables, 3 variables: a. x + 4y = 18; 2x +3y=16
   b. x + 2 y + 3 z = 1; 3x + 3y + 4z = 1; 2x + 3 y + 3 z = 2
8. Determination of roots of a given polynomial & quadratic equations.
9. Determination of Eigen Value & Eigen Vectors for matrices.
10. Write a script file to draw a unit circle.
11. Write a function factorial to compute the factorial n! for any integer n.
12. Write a function factorial to compute the factorial n! using RECURSION for any integern.
13. Write a function to compute the geometric series 1+ r + r2 + r3 + ...+ rn for given rand n.
14. Write a function file cross prod to compute the cross product of two vectors u and v.
15. Design of a toy project as an independent study towards problem-based learning.

Laboratory Equipment: The experiments may be performed in FOSS (Spoken Tutorials SciLAB Project: www.scilab.org, www.scilab.in.

Laboratory Outcomes [After undergoing the course, students will be able to]:

1. Understand the main features of the MATLAB/SCILAB program development environment to enable their usage in the higher learning.
2. Realize the power of interactive calculation, programming, graphics, animation in SciLAB
3. / MATLAB and complete portability across platforms.
4. Enjoy SciLAB / MATLAB as a scientific computing and visualization tool.
5. Explore Interactive Computation with matrices and arrays of n-dimensions.
6. Interpret and visualize simple mathematical functions and operations there on using plots/display.

Recommended Books:

1. Getting started with MATLAB: A Quick Introduction for Scientists and Engineers by Rudra Pratap, IIS Bangalore.
2. Scilab Manual for Probability Theory and Statistics Lab by Prof S N Chandra Shekhar, https://scilab.in/lab migration run/82
3. Scilab Manual for Numerical techniques lab by Prof Kanika Gupta; https://scilab.in/lab_migration run/82
4. Scilab Manual for Probability Theory and Random Processes by Prof Shital Thakkar; https://scilab.in/lab migration run/82.
5. Scilab Manual for Numerical Techniques by Dr Javed Dhillon; https://scilab.in/lab_migration run/82

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B.Tech. (III)	**Branch: Computer Science & Engineering**
Subject: Soft Skills & Personality Development	**Course Code: BT01310**
Marks: Max. – 50 (TA) Min. - 20	**L: 0 T: 0 P: 2**

UNIT-1 Communication Skills-Basics: Understanding the communicative environment, Listening: What to listen for and why, When to speak and how, Starting and sustaining a conversation, Presentation and Interaction, Common errors during communication, Humour in Communication.

UNIT-2 Interpersonal communication: Building Relationships, Understanding Group Dynamics- I, Emotional and Social Skills, Groups, Conflicts and their Resolution, Social Network, Media and Extending Our Identities.

UNIT- 3 Vocational skills: Managing time: Planning and Goal setting, managing stress: Types of Stress; Making best out of Stress, Resilience, Work-life balance, Applying soft-skills to workplace.

UNIT-4 Mindsets and Handling People: Definitions and types of Mindset, Learning Mindset, Developing Growth Mindset, Types of People, How to say NO.

UNIT-5 Inner Development: Motivating oneself, Persuasion, Survival Strategies, Negotiation, Leadership and motivating others, controlling anger, Gaining Power from Positive Thinking.

Text Books:

1. Petes S. J., Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw-Hill Education, 2011.
2. Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and YourSuccess. Canada: Wiley & Sons, 2006.
3. Dorch, Patricia. What Are Soft Skills? New York: Execu Dress Publisher, 2013.

Reference Books:

- Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. Washington, DC: Pfeiffer & Company, 2013.
- Canfield, Jack. The Success Principles (TM) – 10th Anniversary Edition: How to get from Where You Are to Where You want to Be. New York Times. 2009.
- Peale Norman Vincent. The Power of Positive Thinking: 10 Traits for Maximum Result. Paperback Publication, 2011.
- Klaus, Peggy, Jane Rohman & Molly Hamaker. The Hard Truth about Soft Skills. London: Harper Collins E-books, 2007.

BHARTI VISHWAVIDYALAYA, DURG

SCHEME OF TEACHING AND EXAMINATION

B. Tech. (Fourth Semester – Computer Engineering)

Sl. No.	Courses(Subject)	Course Code	Period per Week			Scheme of Examinationon Theory/Lab			Total Marks	Credit (L+T+P/2)
			L	T	P	ESE	CT	TA		
1.	Discrete Mathematics	BT01401	3	1	-	70	10	20	100	4
2.	Microprocessor & Organization	BT01402	2	1	-	70	10	20	100	3
3.	Database Management Systems	BT01403	3	1	-	70	10	20	100	4
4.	Object Oriented Programming (with Java)	BT01404	2	1	-	70	10	20	100	3
5.	Design & Analysis of Algorithms	BT01405	2	1	-	70	10	20	100	3
6.	Microprocessor & Organization Laboratory(8085)	BT01406	-	-	2	35	-	15	50	1
7.	Object Oriented Programming Laboratory (Java)	BT01407	-	-	2	35	-	15	50	1
8.	Database Management Systems Laboratory	BT01408	-	-	2	35	-	15	50	1
9.	Virtual Laboratory	BT01409	-	-	2	35	-	15	50	1
10.	Environmental Sciences (Constitution of India)	BT01410	-	-	2	-	-	50	50	-
Total Marks			11	3	10	490	50	210	750	21

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Discrete Mathematics **Course Code: BT01401**

Marks: Max. – 70 Min. – 28 **L: 3 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each **Duration (End Semester Exam): 03 Hours**

UNIT-I MATHEMATICAL LOGIC & BOOLEAN ALGEBRA: Basic concept of mathematical logic, Statements, Connectives, Conditional and bi-conditional statements, Logical equivalence, Logical implication & quantifiers, Basic concept of Boolean Algebra, Properties of Boolean Algebra, Boolean functions, Disjunctive & conjunctive normal forms of Boolean functions, *Applications of Boolean* Algebra in switching circuits & logic circuits.

UNIT-II SET THEORY, RELATIONS, FUNCTIONS: Basic concept of set theory, Relations, Properties of relation in a set, Equivalence relation, Composition of relations, Partial order & total order relations, Lattices & Hassel diagram, Introduction to function, *Inverse*, *Identity*, Injective, Surjective & Bijective functions, Composition of functions and some special functions.

UNIT-III ALGEBRAIC STRUCTURES: Groups, Subgroups, Cosets, Lagrange's theorem, Isomorphism, Auto orphism, *Homomorphism*, Codes & group codes, Rings, Integral domains and Fields.

UNIT-IV GRAPH THEORY: Introduction to graph theory, Walks, Paths & Circuits, Types of graphs, Shortest path problems, Eulerian and Hamiltonian graphs, Basic concept of tree: spanning tree, *minimum spanning tree*, search tree, rooted binary tree, Cut-sets, Network flow, Matrix representation of graphs.

UNIT-V COMBINATORICS: Permutation and combination, Pigeon-hole principle, Mathematical induction, Principle of Inclusion and Exclusion, Generating function, Recurrence relation.

Text Books:

1. Elements of discrete mathematics by C.L. Liu, Tata McGraw-Hill, publications.

2. Discrete Mathematical structures, by Bernard Kolman, Robert C. Busby and Sharon Cutler Ross, Pearson Education.

Reference Books:

1. A Text Book of Discrete Mathematics, Swapan Kumar Sarkar, S. Chand & Company Ltd.
2. Graph theory with applications to engineering and computer science, by Narsingh Deo, Prentice Hall of India.
3. Discrete mathematics for computer scientists and mathematicians, by J.L. Mott, A. Kandeland
4. T.P. Baker, Prentice Hall of India.
5. Discrete Mathematical Structures with applications to computer science, by J.P. Tremblayand R. Manohar, Tata McGraw-Hill.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Microprocessor & Organization **Course Code: BT01402**

Marks: Max. – 70 Min. – 28 **L: 2 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each **Duration (End Semester Exam): 03 Hours**

UNIT- I MICROPROCESSOR ARCHITECTURE*: Introduction to Microprocessors, Architecture of 8085, Pin Configuration and Function, internal register & flag register, Generation of Control Signals: Bus Timings: Demultiplexing of address/ data bus; Fetch Cycle, Execute Cycle, Instruction Cycle, Instruction Timings and Operation Status, Timing Diagram. Architecture of 8085, Pin Configuration and Function, internal register & flag register,*

UNIT- II. INSTRUCTION SET AND PROGRAMMING: *Instruction for Data Transfer, Arithmetic and Logical Operations, Branching Operation, Machine Cycle Concept, Addressing Modes, Instructions Format, Stacks, Subroutine and Related Instructions, Elementary Concepts of Assemblers, Assembler Directives, Looping and Counting, Software Counters with Time Delays, Simple Programs using Instruction Set of 8085, Debugging, Programs Involving Subroutines,*

UNIT- III INTERRUPTS*: Restart Instruction, Hardware Implementation, Interrupt Processing, Multiple Interrupts and Priority Concepts, Interrupt Structure of 8085, Instructions related to interrupts, Pending Interrupts, Use of Interrupt and Handshaking Signals in Interfacing, Application of Interrupts and Illustrative Programs*

UNIT- IV Input/ Output Organization: Peripheral Devices, I/O interfaces I/O- mapped I/O and memory-mapped I/O, interrupts and interrupt handling mechanisms, vectored interrupts, synchronous vs. asynchronous data transfer, Direct Memory Access, *I/O Processor, DMA vs. IOT.*

UNIT- V The Memory System: Various technologies used in memory design, *Instruction code, register and memory basic concepts*, Memory Hierarchy: Main Memory, Auxiliary

Memory, Associative Memory, Cache memory, Virtual Memory. Memory Management Hardware, Multi-module memories and Interleaving,

Text Books:

1. Microprocessor and Digital Systems Douglus V. Hall, Mc. Graw Hill Pub
2. Introduction to Microprocessor Vibhuti

Reference Books:

1. Microprocessor Architecture Programming & Application. Gaonkar, Ramesh S. Willey Eastern, Publication,1st , 1989.
2. Introduction To Microprocessor Mathur, Aditya P., Tata-Mc Graw Hills Pub. , 1st, 1990
3. Microprocessors & Interfacing Dougus V. Hall Mc. Graw Hill Pub, 1st , 1984

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Database Management System **Course Code: BT01403**

Marks: Max. – 70 Min. – 28 **L: 3 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each **Duration (End Semester Exam): 03 Hours**

UNIT I Database System Architecture: *Advantages of DBMS***,** Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML). **Data models:** Entity-relationship model, network model, relational and object- oriented data models, integrity constraints, data manipulation operations, *DBMS Architecture*.

UNIT II Relational Query Languages: Relational algebra, *Tuple relational calculus* and domain relational calculus,SQL3, DDL, *DCL* and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server. **Relational database design:** Domain and data dependency, Armstrong's axioms, Normal forms, Dependency preservation, Lossless design, *view*, *index*.

UNIT III Query Processing and Optimization: *Entity relationship diagram***,** Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms. **Storage strategies**: Indices, B-trees, hashing, *D+ tree, weak and strong entity set.*

UNIT IV Transaction Processing: Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp-based schedulers, Multi-version and optimistic Concurrency Control schemes, Database Recovery, *level up transaction consistency, deadlock, nested transaction.*

UNIT V Database Security: Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection. **Advanced topics:** Objectoriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining.

Text books:

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.
2. "Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe, Pearson Education
3. "Introduction to Database Systems", 8th Edition by C J Date, Addison Wesley, 2003

Reference books

1. "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, Computer Science Press.
2. "Foundations of Databases", Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, and Addison-Wesley.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Object Oriented Programming (with JAVA) **Course Code: BT01404**

Marks: Max. – 70 Min. – 28 **L: 2 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each **Duration (End Semester Exam): 03 Hours**

UNIT- I Introduction & *History of JAVA,* Background of JAVA, About *Java Features*, Java's architecture, Reading console inputs, Arrays, Constructors, Finalize method, final, this method and reference, static members.

UNIT-II Concrete class, Abstract class, *Definition of Interface*, Inner classes. Aggregation, Composition and Inheritance, *class, object, super class, & sub class* and reference. Method overloading and overriding. Singleton classes. Package concepts. Exception Handling: Inbuilt, User defined, Checked and Unchecked.

UNIT- III String class. Wrapper classes (Integer, Boolean, Character, etc.). Multi- threading: Thread concept, Thread class, Runnable interface, creating customized threads, Thread synchronization, Thread class methods. Java I/O: Use of Input Stream, Output Stream, Reader and Writer classes for reading from and writing data into disk files, *array list and link list, Collections Frameworks: Hash Set, Tree Set, Array List, Linked List, Vector, Hash Map, Tree Map, Hash table classes.*

UNIT-IV AWT & SWING: *Introduction of several swing component*, Frame, Panel, Dialog, Checkbox, Choice, List, JComboBox, JFrame, JPanel, JRadioButton, JScrollPane, And JTabbedPane, Using Listeners: Action Listener, Container Listener, Focus Listener, Item Listener, Key Listener, Mouse Listener, Text Listener, And Window Listener. Applets. JDBC: Type1 to Type4 drivers.Java Networking: Server Socket, Socket, RMI.

UNIT-V Generics in Java: Creating instances of generic classes, generic types, Declaring (and invoking) methods that take generic types. Creating and running executable JAR (Java Archives).

Text Books:

1. Herbert Schildt: “Java A Beginner's Guide, 7th edition”,Oracle Press.
2. Maurice Naftalin, Philip Wadler, “Javas Generics and Collections”, O'Reilly Media, Inc.
3. Benjamin J Evans, David Flanagan., “Java in a Nutshell”, O'Reilly Media, Inc.

Reference Books:

1. Kathy Sierra, Bert Bates, “Head First Java”, O'Reilly Media, Inc.
2. Kathy Sierra, Bert Bates, “OCA Java SE 8 Programmer I Exam Guide”, McGraw Hill Professional.
3. Kathy Sierra, Bert Bates, “OCA Java SE 8 Programmer II Exam Guide”, McGraw Hill Professional.
4. Kathy Sierra, Bert Bates, “OCA/OCP Java SE 8 Programmer Certification Bundle”, McGraw Hill Professional.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Design & Analysis of Algorithms **Course Code: BT01405**

Marks: Max. – 70 Min. – 28 **L: 2 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each **Duration (End Semester Exam): 03 Hours**

UNIT I Algorithms: Definitions and Application of notations, asymptotic notations: big oh, small oh, omega and theta notations, worst case, best case and average case analysis. Solving recurrence equations: General recurrence equation, Master Method, Recursive Tree Method, substitution method, analyzing control structures. Analysis of Sorting and Searching: Heap, insertion, selection and bubble sort; sequential, binary and Fibonacci search.

UNIT II Divide-Conquer & Greedy Paradigm: Introduction to Divide and conquer paradigm, Quick and merge sorting techniques, the basic divide and conquer algorithm for matrix multiplication, Greedy Method: The basic greedy strategy & computing minimum spanning trees, Algorithms of Kruskal's and Prims, use of greedy strategy in algorithms for the Knapsack problem and Huffman trees.

UNIT III Dynamic Programming and String-Matching Algorithms: The basic dynamic programming paradigm, Dynamic programming solution to the optimal matrix chain multiplication and the longest common subsequence problems, String matching algorithm: The general string problem as a finite automata, Knuth Morris and Pratt algorithms, Boyer-Moore Algorithm, linear time analysis of KMP algorithm and Boyer-Moore algorithm.

UNIT IV Backtracking: Back tracking and Recursive back tracking, the general method, 8-queens problem, sum of subsets, graph coloring, Hamiltonian cycle, Knapsack problem

UNIT V Branch and Bound & NP Complete Problem: General method, applications: Travelling sales person problem, 0/1 knapsack problem, LC (Least-cost search), FIFO Branch and Bound solution. NP-Hard and NP- Complete problems: Basic concepts, non-deterministic algorithms, NP – Hard and NP-Complete classes, Cook's theorem.

Text Books:

1. Cormen, Lelserson, Rivert, “Introduction to Algorithms”, Second Edition, PHI.
2. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, “Fundamentals ofComputer Algorithms”, GalgotiaPublications Pvt. Ltd., 2008

Reference Books:

1. Paneerselvam, “Design and Analysis of Algorithms”, Prentice-Hall of India, 2006
2. Anany Levitin, “Introduction to the Design and Analysis of Algorithms”, Pearson Education, 2005.
3. Gilles Brassard and Paul Bratley, “Fundamentals of Algorithms”, Prentice-Hall of India, 1997

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Computer System Architecture (Laboratory) **Course Code: BT01406**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments:

1. Study of architecture of microprocessor 8085
2. Assembly Language Programming
3. Addition of two 8-bit numbers
4. Addition of two 16- bit nos.
5. Subtraction of two 8- bit nos.
6. Subtraction of two 16 – bit nos.
7. Multiplication of two 8- bit nos. using repeated Addition.
8. Division of two 8- bit nos.
9. Find 1's & 2's complement of a 8 – bit & a 16 –bit number
10. Find Larger No. of two 8 bit Numbers
11. Find largest smallest No. from an array
12. Transfer Block of data bytes from one memory location to another in same order & in reverse order.
13. Arrange data bytes in ascending / descending order.
14. Find the sum of positive nos. from an array & store the result at some memory location (Ignore negative nos.)

Laboratory Equipment's / Machine Requirements: Hardware trainer kits 8085

Recommended Books:

1. Microprocessor Architecture Programming & Application. Gaonkar, Ramesh S. Willey Eastern, Publication, 1st, 1989.
2. Introduction to Microprocessor Mathur, Aditya P., Tata-Mc Graw Hills Pub. , 1st, 1990
3. Microprocessors & Interfacing Dougus V. Hall Mc. Graw Hill Pub, 1st , 1984
4. Introduction to Microprocessor Vibhuti
5. Microprocessor & Microcontroller B. Ram.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Object Oriented Programming (withJAVA) Laboratory **Course Code: BT01407**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments :(At least ten experiments are to be performed by each student)

1. Write a program in Java to read from console employee details of 5 employees with following details: Name of employee, Department, Age, Salary. Print the details of every employee.
2. Write a program to show the use 'this' keyword to call the default and parameterized constructors.
3. Write a program in Java to display the count of number of objects created and finalized. Provide unique IDs to every object while creation and display the same ID during finalization.
4. Create a Shape Interface which has a member method area (). Derive two subclasses Circle and Triangle from it. Using reference of Shape class fill the required members in Circle and Triangle also display the area of Circle and Triangle. Take input from user while filling data members.
5. Write a program to demonstrate the effect of access modifiers (default, protected, public and private) on members with and without inheritance within a package and outside a package.
6. Write a program to show inbuilt and user defined: checked and unchecked exceptions.
7. Write a program to show the use of various member methods of String class.
8. Create two threads T1 and T2. The thread T1 should print numbers from 1 to 10 and thread T2 prints characters from A to J. Ensure that T2 starts first and T1 should only start when T2 finishes. (Note: use join())
9. Demonstrate using a Java program, how DEADLOCK occurs between threads and also give solution program.
10. Write a program to merge the contents of text files T1.txt and T2.txt into T3.txt. The contents of T1.txt should appear first and then T2.txt in the destination file T3.txt.
11. Develop a GUI application that gives text equivalent of any numeric value entered by the user ranging from 0to 9.

12. Develop a GUI application to implement Date of Birth validator. The DOB
13. Should only be in the form "dd/mm/yyyy". Use customized exception handlingmethod as the validator.
14. Develop an Applet to insert username and password into a MySQL (or any) database.
15. Develop an Applet to display all the usernames and passwords present in a MySQL(or any) database.
16. Develop two applications in Java using Sockets to communicate with each other using text messages.
17. Develop two applications in Java using RMI to communicate with each other using text messages.
18. Develop a Java program to demonstrate the use of Hash Set, Tree Set, Array List, Linked List classes.
19. Develop a Java program to demonstrate the use of Vector, Hash Map, Tree Map, Hash table classes.
20. Develop a Java program to demonstrate the use of generics.
21. Create and run an executable JAR.

Laboratory Equipments / Machine Requirements: Windows operating system, 4GB RAM, 500GB HDD, JDK8and Netbeans IDE.

Recommended Books:

1. Maurice Naftalin, Philip Wadler, “Java Generics and Collections”, O'Reilly Media, Inc.
2. Benjamin J Evans, David Flanagan., “Java in a Nutshell”, O'Reilly Media, Inc.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Database Management System Laboratory **Course Code: BT01408**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments: (At least ten experiments are to be performed by each student)

Topics to be covered during LAB

1. How to install Oracle/ MySQL/ Post gre SQL in Windows/ Linux platforms. Creating users and database objects, inserting rows in the database tables.
2. Introduction to SQL, DDL, DDL, DCL queries and constraints. Populating and manipulating database tables using DML statements.
3. Selecting data from tables: SELECT statement, where clause, having clause, group by, order by, selecting NULL values, use of IN and DISTINCT keywords.
4. SQL functions: Study the use of SQL string, date, arithmetic and aggregate functions with examples.
5. JOINS: study the use of joining tables using natural, inner, outer joins.
6. Sub queries and set operations: Study the use of nested queries and how to apply themin database.
7. Views: Study the use of inline and external views.
8. Introduction to PL/ SQL: Pl/ SQL block, PL/ SQL statements, if else statements, looping statements.
9. Cursor: Study the use of cursor and exceptions.
10. Functions and procedures: Study the use of functions and procedures in PL/ SQL programs.
11. Trigger: Study the use of triggers to enforce constraints.
12. Forms and Report generation using PL/SQL.

Hardware / Software Requirements:

- At least Dual Core or Core-I3 Pro Computing System, 2GB RAM, 80GB HDD
- All systems are configured in **DUAL BOOT** mode i. e. Students can boot from Windows 7/8 or Linux as per their lab requirement.

- MySQL/ Pg SQL /Oracle May be used as Database Management System

Recommended Books:

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.
2. "Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe, Pearson Education.
3. "Introduction to Database Systems", 8th Edition by C J Date, Addison Wesley, 2003.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Virtual Laboratory (PHP/ MySQL) **Course Code: BT01409**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments :(At least ten experiments are to be performed by each student)

1. Create a PHP webpage and print “hello world”.
2. Write a PHP program to find maximum of three numbers. Write a PHP program Create a switch statement that will output "Hello" if $var is "1", and "welcome" if
3. $var is "2".
4. Write a PHP program to compute factorial of a number using While loop.
5. Write a program to enter numbers till the user wants. At the end it should display the count of positive, negative and zeros entered. (Using do-while loop)
6. Write a program that will accept an array of integers as input, and output an array where for each item in the source array, the new array will perform the following operations:
    a. For even numbers divide by 2
    b. For odd numbers multiply by 3
7. Create an associative array using the countries as keys, the cities as values and display the data as a table.
8. Write a function calculate Average () which takes four arguments which aremarks for four courses in the semester and returns their average.
9. Write a PHP program to compute factorial of a number using recursion.
10. Write a program that displays a different message based on time of day. For-example, page should display “Good Morning” if it is accessed in the morning.
11. Write a program for Student Mark List Processing by executing DDL, DML, DCL commands on MySQL database.
12. Create pages for signup and sign-in process using PHP MySQL database operations.
13. Create pages for profile updating and deletion of an employee using PHP MySQL.
14. Write a php program to demonstrate Login Panel by session creation, checking and deletion.
15. Create the pages for Petrol and diesel with their rates, quantity, write the program to calculate the total, display the selected item and total in separate page using Cookies.

Remarks: Design of a toy project as an independent study towards problem-based learning to be submitted at the end of semester for evaluation.

Laboratory Equipment / Machine Requirements:

Dual Core or Core-I3 Pro Computing System (2GB RAM, 80GB HDD): systems configured in DUAL BOOT mode (inter-switching bootable between Windows 7/8 or Linux as per their lab requirements); MySQL to be used as Database Management System -php7.0 as scripting language

Recommended Books:

1. PHP: The Complete Reference by Steven Holzner
2. Head First PHP & MySQL – by Lynn Beighley & Michael Morrison
3. The Joy of PHP Programming: A Beginner's Guide – by Alan Forbes

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(IV) **Branch: Computer Science & Engineering**

Subject: Constitution of India **Course Code: BT014010**

Total Marks (TA): 50 Min. - 20 **L: 0 T: 0 P: 2**

Class Tests & Assignments to be conducted: 2 each **Duration (End Semester Exam): NA**

Unit 1: The Constituent Assembly & The Constitution Of India: Historical Context of Constituent Assembly, Compositions & Functions, Critical Evaluation, Features of Indian Constitution, Preamble to the Constitution of India, Introduction to Fundamental Rights, Right to Equality, Right to Freedom, Constitutional Position of Some Democratic Rights, Right against Exploitation, Right to Freedom of Religion, Right To Constitutional Remedies, Directive Principles

Unit 2: Organs Of The Government: The President of India, Powers and Functions of President, Emergency Powers and the Position of the President, Union Council of Ministers, Prime Minister, The Rajya Sabha, The Lok Sabha & Lok Sabha Speaker, Relation between Lok Sabha & Rajya Sabha

Unit 3: Indian Judiciary: The Structure and Organization of the Judiciary & the High Court, The Supreme Court, Role of The Supreme Court, Judicial Activism in India, Basic Structure Doctrine & PIL

Unit 4: Federalism & Decentralization: Legislative Procedures of the Parliament, Parliamentary Committees, Centre-State Legislative Relations, Centre-State Administrative Relations, Centre-State Financial Relations, The 5th & 6th Schedules

Unit 5: Indian Municipality and Gram Panchayats: Municipality-1 (History of Indian Municipality), Municipality-2 (Organization & Functions), Panchayat---1 (Idea of Panchayat), Organization and Powers of Panchayats in India

Text Books:

1. Durga Das Basu --- Introduction to the Constitution of India, 23rd Edition (Gurgaon; LexisNexis, 2018).
2. J.C.Johari -- The Constitution of India: A Politico-Legal Study (Greater Noida: Sterling Publishers Pvt. Ltd.2013).
3. Himangshu Roy and M.P.Singh – Indian Political System, 4th Edition (Bengalaru; Pearson Education, 2018).
4. Vidya Bhushan &VishnooBhagwan--- Indian Administration (S. Chand, 2011).

Reference Books:

1. S.R.Maheswari --- Indian Administration (Orient Blackswan, 2001).
2. Dr. A.Avasthi& A.P. Avasthi --- Indian Administration (L.N. Agarwal Educational Publishing, 2017).
3. B. L. Fadia --- Indian Government and Politics (Sahitya a. Bhawan, 13th Revised Edition, 2017).
4. P.M.Bakshi – The Constitution of India (Prayagraj, UP; a. Universal Law Publishing, January, 2018).

SCHEME OF TEACHING AND EXAMINATION
B. Tech. (Fifth Semester – Computer Engineering)

S. No.	Courses(Subject)	Course Code	Period per Week			Scheme of Examination			Total Marks	Credit (L+T+P/2)
						Theory/Lab				
			L	T	P	ESE	CT	TA		
1.	*Advance Microprocessors & Architectures*	BT01501	3	1	-	70	10	20	100	4
2.	Computer Networks	BT01502	3	1	-	70	10	20	100	4
3.	Formal Languages and AutomataTheory	BT01503	3	1	-	70	10	20	100	4
4.	Data Analytics with Python	BT01504	2	1	-	70	10	20	100	3
5.	Professional Elective-I	BT01505	2	0	-	70	10	20	100	2
6.	*Advance Microprocessors & Architectures* Laboratory	BT01506	-	-	2	35	-	15	50	1
7.	Computer Networks Laboratory	BT01507	-	-	2	35	-	15	50	1
8.	Data Analytics with Python Laboratory	BT01508	-	-	2	35	-	15	50	1
9.	Project-I based on Summer Internship/ Industrial Training	BT01509	-	-	2	35	-	15	50	1
10	Environmental Studies	BT01510	-	-	2	-	-	50	50	-
Total Marks			11	3	10	490	50	210	750	21

L – Lecturer ,T – Tutorial, P – Practical , CT –Class Test ESE – End Semester Exam TA – Teacher'sAssessment

Note: - The students have to attend the four weeks industrial training /summer internship in B. Tech.program after fourth semester, which will be evaluated in fifth semester

Table I (Professional Elective I)

S.N.	Board of Studies	Course Code	Subject
1.	Computer Science Engineering	BT01505(01)	Computer Graphics
2.	Computer ScienceEngineering	BT01505(02)	Object Oriented Analysis & Design
3.	Computer ScienceEngineering	BT01505(03)	Digital Image Processing
4.	Computer ScienceEngineering	BT01505(04)	Multimedia & Virtual Reality

Note:

1. 1/4th of total strength of students subject to minimum of 20 students is required to offerand elective in the college in a particular academic
2. Choice of elective course once made for an examination cannot be changed in future examinations.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V)

Branch: Computer Science &Engineering

Subject: Advance Microprocessors & Architectures

Course Code: BT01501

Marks: Max. – 70 Min. – 28

L: 3 T: 1 P: 0

Class Tests & Assignments to be conducted:2 each

Duration (End Semester Exam): 03 Hours

UNIT I: Introduction to Basic Microprocessors: Historical Background, the Harvard and Princeton architecture, The Microprocessor-Based Personal Computer Systems. The 8088 basics and comparison *with 8086* (Block & Pin diagram only).

UNIT II: Microprocessor Architecture 8086: 8086 basic block diagram, Internal Microprocessor Architecture, *Minimum and Maximum mode configuration of 8086 And Timings,* Real Mode Memory Addressing, Registers, pin configuration, *Physical Memory Organization,* segmentation. *Signal Description.*

UNIT III: Data Movement Instructions: MOV, PUSH/POP, Load- Effective Address, String Data Transfers, Miscellaneous Data Transfer Instructions, Segment Override Prefix, Assembler Details. Arithmetic and Logic Instructions: Addition, Subtraction and Comparison, Multiplication and Division, BCD and ASCII Arithmetic, Basic Logic Instructions, Shift and Rotate, String Comparisons. Program Control Instructions: The Jump Group, Controlling the Flow of the Program, Procedures,and Introduction to Interrupts: *Stack structure, Interrupt service Routines, Interrupt Cycle* Machine Control and Miscellaneous Instructions. Assembler directives, assembler instructions, Assembly Language Programming.

UNIT IV: Memory and I/O Interfacing: *Memory Interface (RAM, ROM, and EPROM) with 8086 microprocessor*, Address Decoding. Basic I/O Interface: Introduction to I/O Interface, I/O Port Address Decoding. Direct Memory Access: Basic DMA Operation and Definition.

UNIT V: Advanced Microprocessors: 80386- Features, block diagram, data types,

Addressing Mode, Registers Organization, memory system, real mode, *virtual mode* and protected mode operation, Descriptors, Cache Register, Control Register, Paging Mechanism, Virtual Mode, And Protection Mechanism For Operating System. Comparative Study of Modern Microprocessor (Web based Reference for study): Pentium Pro (Pentium II, Pentium III, and Pentium IV).

Text Books:

1. Barry B Brey: The Intel Microprocessors, 8th Edition, Pearson Education, 2009. (Listed topics only from theChapters 1 to 13)
2. Ramesh S. Gaonkar : Microprocessor Architecture, programming and Application with 8085, 4th Edition,Wiley,2012

Reference Books:

1. Douglas V. Hall: Microprocessors and Interfacing, Revised 2nd Edition, TMH, 2006.
2. James L. Antonakos: The Intel Microprocessor Family: Hardware and Software Principles and Applications, Cengage Learning, 2007.
3. Nilesh B. Bahadure: Microprocessors: The 8086/8088, 80186/80286, 80386/80486and the Pentium family, 2ndedition (2014), Prentice Hall of India (PHI).
4. K. Udaya Kumar & B.S. Uma Shankar: Advanced Microprocessors & IBM-PC Assembly Language Programming, TMH 2003.
5. Microprocessor: Theory and Applications- Intel and Motorolla, Rafiquuzzaman, PHI.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V)

Branch: Computer Science &Engineering

Subject: Computer Networks

Course Code: BT01502

Marks: Max. – 70 Min. – 28

L: 3 T: 1 P: 0

Class Tests & Assignments to be conducted:2 each

Duration (End Semester Exam): 03 Hours

UNIT- I Introduction: *Uses of computer network, Network hardware*, OSI, TCP/IP and other networks models, Network Topologies WAN, LAN, and MAN. Transmission media copper, twisted pair wireless, switching and multiplexing and De-multiplexing, Networking Devices.

UNIT-II Data link layer: Framing, *Flow Control*, and Error detection and correction, *Stock and wait protocol*. Multiple Access Protocols – Data Link Layer Addressing, ARP, RARP, DHCP, Ethernet standards. Media Access Control Protocols. MAC addresses. Wireless LANS. High Level Data Link Control, Asynchronous Transfer Mode, *IEEE standards: 802.3, 802.4, 802.5.*

UNIT- III Network Layer: Internet Protocol (IP), IPv4 and IPv6, Sub-netting and Super-netting, ICMP, Uncast Routing Protocols: Link State Routing, Distance Vector Routing, Hierarchical Routing, RIP, OSPF, BGP Multicast Routing, and Multicast Routing Protocols: DVMRP, MOSPF, CBT, PIM, MBONE, Mobile IP, and IPSec, *ARP, RARP, ICMP, Mobile IP*.

UNIT-IV Transport Layer: Transport Layer Services Connectionless Protocols: UDP, *Wireless TCP/UDP*, UDP segment, Reliable Data Transfer. Connection-Oriented Protocols: TCP Segment Structure, RTT estimation, Flow Control, Connection Management, Congestion Control, Integrated and Differentiated Services: Intserv – Diffserv.

UNIT-V Application Layer: *Protocol and services, Email, WWW,* Principles of Network Applications, The Web and HTTP, FTP, Electronic Mail, SMTP, Mail Message Formats and MIME, DNS, Socket Programming with TCP and UDP. Multimedia Networking: Internet Telephony, RTP, RTCP, RTSP. Network Security: Principles of Cryptography, Firewalls,

Attacks and Countermeasures.

Text Books:

1. Data Communications and Networking – Behrouz A. Forouzan.Third Edition TMH.
2. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, Third edition, 2006

Reference Books:

1. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
2. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson
3. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V)

Branch: Computer Science &Engineering

Subject: Formal Languages and Automata Theory

Course Code: BT01503

Marks: Max. – 70 Min. – 28

L: 3 T: 1 P: 0

Class Tests & Assignments to be conducted:2 each

Duration (End Semester Exam): 03 Hours

UNIT- I The Theory Of Automata: Introduction to automata theory, Examples of automata machine, Finite automata as a language acceptor and translator, Deterministic finite automata. Non-deterministic finite automata, *Properties and limitation of FSM*, finite automata with output (Mealy Machine. Moore machine), Finite automata with moves, Minimizing number of states of a DFA, My hill Nerode theorem, Application of finite automata.

UNIT-II Regular Expressions: Alphabet, String and Languages, Regular expression, Properties of Regular Expression, Finite automata and Regular expressions, Arden's Theorem, Regular Expression to DFA conversion & vice versa. Pumping lemma for regular sets, Application of pumping lemma, Regular sets and Regular grammar, Closure properties of regular sets. Decision algorithm for regular sets and regular grammar, *language of NFA, equivalence of NFA and DFA.*

UNIT- III Grammars: Definition and types of grammar, Chomsky hierarchy of grammar, Relation between types of grammars, Context free grammar, Left most & right most derivation trees, Ambiguity in grammar, Simplification of context free grammar, Chomsky Normal From, Greenback Normal From, properties of context free language, Pumping lemma for context free language, Decision algorithm for context tree language.

UNIT-IV Push Down Automata And Turing Machine: *Description and definition instantaneous description language of push down automata acceptance by final state, acceptance by empty stack, deterministic push down automata, equivalence of push down automata and CFG, CFG to PDA, PDA to CFG, Two stack PDA*, Representation of Turing Machine, Construction of Turing Machine for simple problems, Universal Turing machine

and other modifications. Church's Hypothesis, Halting problem of Turing Machine.

UNIT-V Computability: Introduction and Basic concepts, Recursive function, Partial recursive function, Initial functions, Composition of functions, Ackerman's function, Recursively Enumerable and Recursive languages, Decidable and undecidable problem, Post correspondence problem, Space and time complexity.

Text books:

1. Theory of Computer Science (Automata Language & Computation), K.L.P. Mishra and N. Chandrasekran,PHI.
2. Introduction to Automata theory. Language and Computation, John E. Hopcropt & Jeffery D. Ullman, Narosa, Publishing House.

References books:

1. John Martin, "Introduction to Languages and the Theory of Computation", Tata McGraw Hill.
2. Kamala Krithivasan, Rama R., "Introduction to Formal Languages Automata Theory and Computation",2nd Edition, Pearson Education.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V)

Branch: Computer Science &Engineering

Subject: Data Analytics with PYTHON

Course Code: BT01504

Marks: Max. – 70 Min. – 28

L: 3 T: 1 P: 0

Class Tests & Assignments to be conducted:2 each

Duration (End Semester Exam): 03 Hours

UNIT- I Introduction: Key Concepts: Python Identifiers & Keywords, Indentations, *Statements & Comments in Python, Python Data Types, Type Conversion, Python Variables*, Operators, Membership operator, String, Tuple, List, Set, Dictionary, File input/output, *and Import*.

UNIT-II An Introduction to Data Analysis: Knowledge Domains of the Data Analyst, Understanding the Nature of the Data, *Clean and prepare data for analysis*, The Data Analysis Process, Quantitative and Qualitative Data Analysis, *import data sets*.

UNIT- III The NumPy Library: *Installation of NumPy, Import NumPy*, ND array, Basic Operations, Indexing, Slicing, and Iterating, Conditions and Boolean Arrays, Shape Manipulation, Array Manipulation, Vectorization, Broadcasting, Structured Arrays, Reading and WritingArray Data on Files.

UNIT-IV The pandas Library: *Introduction of Panda in python***,** *Pandas features***,** The Series, The Data Frame, The Index Objects, Reindexing, Dropping, Arithmetic and Data Alignment, Operations between Data Frame and Series, Functions by Element, Functions by Row or Column, Statistics Functions, Sorting and Ranking, Correlation and Covariance, "Not a Number" Data. Reading and Writing Data: CSV and Textual Files, HTML Files, XML, Microsoft Excel Files.

UNIT-V Data Visualization with matplotlib: *Installation of pip module***,** A Simple Interactive Chart, Set the Properties of the Plot, matplotlib and NumPy, Working with Multiple Figures and Axes, Adding Text, Adding a Grid, Adding a Legend, Saving the Charts. Line Chart, Histogram, Bar Chart, Pie Charts.

Text Books:

1. Python Data Analytics– Fabio Nelli, APress.
2. Python for Data Analysis, Wes McKinney, O'Reilly.

Reference Books:

1. Mastering Machine Learning with Python in Six Steps, Manohar Swamynathan, 2 Data Structures and Algorithms Using Python, Rance D. Necaise, WILEY

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V)	**Branch: Computer Science &Engineering**
Subject: Computer Graphics (Professional Elective – I)	**Course Code: BT01505(01)**
Marks: Max. – 70 Min. – 28	**L: 2 T: 0 P: 0**
Class Tests & Assignments to be conducted: 2 each	**Duration (End Semester Exam): 03 Hours**

UNIT- I Introduction to computer graphics & graphics systems: *Introduction of Computer graphics,* Overview of computer graphics, storage tube graphics display, Raster scan display. Points & lines, Line drawing algorithms, DDA algorithm, Brenham's line algorithm, Circle generation algorithm, Ellipse generating algorithm, scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm, *Graphics input techniques.*

UNIT-II Two-Dimensional and Three-dimensional Transformations: Transformations and Matrices, Transformation Conventions, 2D & 3D Transformations, Homogeneous Coordinates and Matrix Representation of 2D & 3D Transformations, Translations and Homogeneous Coordinates, Rotation, Reflection, Scaling, *need for dipping and windowing* 3D- Shearing, Combined 2D & 3D Transformation, Transformation of Points, Transformation of The Unit Square, Solid Body Transformations, Rotation About an Arbitrary Point / Plane, Reflection through an Arbitrary Line, A Geometric Interpretation of Homogeneous Coordinates, Window-to-Viewport Transformations, Affine and Perspective Geometry, Perspective Transformations, Techniques for Generating Perspective Views, Vanishing Points, the Perspective Geometry and camera models, Orthographic Projections, Axonometric Projections, Oblique Projections, View volumes for projections.

UNIT- III Viewing in 3D: Stages in 3D viewing, *need of 3D image,* Canonical View Volume (CVV), Specifying an Arbitrary 3D View, Examples of 3D Viewing, The Mathematics of Planar Geometric Projections, Combined transformation matrices for projections and viewing, Coordinate Systems and matrices, camera model and viewing pyramid.

Light: Radiometry, Transport, Equation, Photometry, *shading, kinetic depth effect.*

Color: Colorimetric, Color Spaces, Chromatic Adaptation, Color Appearance

UNIT-IV Visible-Surface Determination: Techniques for efficient Visible-Surface Algorithms, Categories of algorithms, Back face removal, The z-Buffer Algorithm,Scan-line method, Painter's algorithms (depth sorting), Area sub-division method, BSP trees.

Plane Curves and Surfaces: Curve Representation, Nonparametric Curves, Parametric Curves, Parametric Representation of a Circle, Parametric Representation of an Ellipse, Parametric Representation of a Parabola, Parametric Representation of a Hyperbola, Representation of Space Curves, Cubic Splines, , Bezier Curves, B- spline Curves, B- spline Curve Fit, B-spline Curve Subdivision, Parametric Cubic Curves, Quadric Surfaces.

UNIT-V Animations & Realism 10 Animation Graphics: Design of Animation sequences – animation function raster animation – key frame systems – motion specification –morphing – twining. COMPUTER GRAPHICS REALISM: Tiling the plane – Recursively defined curves – Koch curves – C curves – Dragons – space filling curves – fractals – Grammar based models – fractals – turtle graphics – ray tracing, *3D clipping, and Perspective view of cube.*

Text Books:

1. Computer Graphics – Principles and Practice by J. D. Foley, A. Van Dam, S.
2. K. Feigner and J. F. Hughes2nd edition, Pearson
3. Fundamentals of Computer Graphics by S. Marschner, P. Shirley, 4th Edition, CRCPress.

Reference Books:

1. Computer Graphics: H. Baker, 2nd Edition, Pearson.
2. Principles of Interactive Computer Graphics by W.M. Newman & R. F. Sproull, Peterson, 2nd Edition, TMH.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V) | **Branch: Computer Science &Engineering**

Subject: Object Oriented Analysis & Design (Professional Elective – I) | **Course Code: BT01505(02)**

Marks: Max. – 70 Min. – 28 | **L: 2 T: 0 P: 0**

Class Tests & Assignments to be conducted: 2 each | **Duration (End Semester Exam): 03 Hours**

UNIT- I Introduction: Modeling Concepts and Class Modeling: What is Object 8 Hours orientation? What is OO development? OO Themes; Evidence for usefulness of OO development; OO modeling history. Modeling as Design technique: Modeling; abstraction; The Three models. Class Modeling: Object and Class Concept; Link and associations concepts; Generalization and Inheritance; A sample class model; Navigationof class models; Advanced Class Modeling, Advanced object and class concepts; Association ends; N-ray associations; Aggregation; Abstract classes; Multiple inheritance; Metadata; Reification; Constraints; Derived Data; Packages.

UNIT-II Use Case Modeling and Detailed Requirements: Overview; Detailed object- 8 Hours oriented Requirements definitions; System Processes-A use case/Scenario view; Identifying Input and outputs-The System sequence diagram; Identifying Object Behavior-The state chart Diagram; Integrated Object-oriented Models.

UNIT- III Process Overview: System Conception and Domain Analysis: Process Overview: 8 Hours Development stages; Development life Cycle; System Conception: Devising a system concept; elaborating a concept; preparing a problem statement. Domain Analysis: Overview of analysis; Domain Class model: Domain state model; Domain interaction model; Iterating the analysis.

UNIT-IV System design and Class Design: System design: Overview of System Design, Estimating Performance, Making a Reuse Plan, Breaking a System into Subsystems, Identifying Concurrency, Allocating Subsystems, Management of Data Storage, Handling Global Resources, Choosing Software Control Implementation, Handling Boundary Conditions, Setting Trade-off Priorities, Common Architectural Styles, and Architecture of

the ATM System. Class design: Overview of Object Design, Bridging the gap, Realizing Use Cases, Designing Algorithms, Recusing Downward, Refactoring, Design Optimization, Reification of Behavior, Adjustment of Inheritance, Organizing a Class Design, ATM Example.

UNIT-V Design Patterns: Introduction; what is a design pattern?, Describing design patterns, the catalogue of design patterns, Organizing the catalogue, How design patterns solve design problems, how to select a design patterns, how to use a design pattern; Creational patterns.

Text Books:

1. Object – Oriented Modeling and Design with UML, Michael R Blaha and James R Rumbaugh, 2ndEdition, Pearson Education, India.
2. Object oriented systems development, Ali Bah rami, McGraw-Hill HigherEducation, 1999.

Reference Books:

1. Object Oriented Analysis & Design, Atul Kahate, Tata McGraw-Hill Education
2. Object-Oriented Analysis and Design with Applications, Third Edition,Grady Booch, Robert A. Maksimchuk Michael W. Engle, Bobbi J., Young, Ph.D., Jim Conallen, Kelli A. Houston.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V)	**Branch: Computer Science &Engineering**
Subject: Digital Image Processing (Professional Elective – I)	**Course Code: BT01505(03)**
Marks: Max. – 70 Min. – 28	**L: 2 T: 0 P: 0**
Class Tests & Assignments to be conducted: 2 each	**Duration (End Semester Exam): 03 Hours**

UNIT I: Introduction: Fundamental Steps in Digital Image Processing, Components of an Image Processing System, Image formation model, Image Acquisition , Image Sampling and Quantization , Spatial & Gray level resolution, Basic Relationships Between Pixels.

UNIT II: Image Enhancement & Restoration: Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging, spatial filters smoothing and sharpening, Image Restoration and Reconstruction

UNIT III: Morphological Image Processing & Image segmentation: Logic operations involving binary image, Dilation & Erosion, Opening & Closing, Applications to Boundary extraction, region filling, connected component extraction. Line detection, Edge detection, Edge linking & boundary detection, Thresholding, Region based segmentation.

UNIT IV: : Image Descriptor & Classification: Image Descriptors, Boundary descriptors, Shape numbers, Texture, Feature Extraction, Image Pattern Classification, Neural Networks and Deep Learning

UNIT V Image compression: Coding redundancy- Huffman coding, LZW coding, run length coding, Lossy compression- DCT, JPEG, MPEG, video compression.

Text Books:

1. Ganzalez and Woods, Digital Image Processing, Pearson education.
2. Sonka and Brooks, Image Processing, TSP ltd,

Reference Books:

1. Jain and Rangachar, Machine Vision, MGH.
2. Schalkoff, Digital Image Processing, John Wiley and sons.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V)
Branch: Computer Science &Engineering
Subject: Multimedia & Virtual (Professional Elective-I)
Course Code: BT01505(04)
Marks: Max. – 70 Min. – 28
L: 2 T: 0 P: 0
Class Tests & Assignments to be conducted: 2 each
Duration (End Semester Exam): 03 Hours

UNIT- I Theory of Internet:-Introduction, Evolution of Internet, Internet applications, Internet Protocol: TCP/IP, Protocol, Versions, Class full addressing, IP data gram, ICMP &IGMP. Functions of ARP and RARP, User Data gram Protocol (UDP), Transmission Control Protocol (TCP): Flow-Control, Error-Control. Internet Security& Firewalls.

UNIT-II Bounded Media for Internet: Cable media, Telephone network, ISDN: Overview, Interfaces& Functions, Physical Layer, Data Link Layer, Network Layer Services, And Signaling System Number7.ATM& B- ISDN: Introduction Services& Applications, Principles& building blocks of B-ISDN, DIAS network.

UNIT- III Un-Bounded Media for Internet: Wireless media: Components and working of Wireless network, IEEE 802.11standardsandWLANtypes, Ad-hoc networks, MACAW Protocol. Features and Goals of Bluetooth, Bluetooth products and security, TCP OverWireless&Ipv6: Mobile IP, support of Mobility on the Internet, Mobile TCP, Traffic Routing in Wireless Networks, Circuit switched Data Services, Packet switched Data services. WLL Architecture, WLL Technologies and frequency spectrum, Local Multipoint Distribution Service (LMDS), Ultra Wideband Technology.

UNIT-IV Introduction to Multimedia:-Concept of Non-Temporal and Temporal Media. Hypertext and Hypermedia. Presentations: Synchronization, Events, Scripts and Interactivity, Compression Techniques: Basic concepts of Compression. Still Image Compression: JPEG Compression. Features of JPEG2000.Video Compression: MPEG- 1&2 Compression Schemes, MPEG-4 Natural Video Compression. Audio Compression: Introduction to speech and Audio Compression, MP3 Compression Scheme. Compression of synthetic graphical objects.

UNIT-V Multimedia Systems Technology: Architecture for Multimedia Support: Multimedia PC/Workstation Architecture, Characteristics of MMX instruction set, I/O systems: IEEE 1394 interface, Operating System Support for Multimedia Data: Resource Scheduling with real time considerations, File System, I/O Device Management. Multimedia Information Management: Multimedia Database Design, Content Based Information Retrieval: Image Retrieval, Video Retrieval, OverviewofMPEG-7, Design of Video-on-demand systems.

Text Books:

1. Multimedia System Design, Andleigh and Thakarar , PHI, 2003.
2. Multimedia Technology & Application, David Hillman, Galgotia Publications.

Reference Books:

1. Multimedia Computing Communication and Application, Steinmetz, Pearson Edn.
2. Virtual Reality Systems, John Vince, Pearson Education.
3. Fundamentals of Computer Graphics and Multimedia, D.P. Mukherjee, PHI

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V) **Branch: Computer Science & Engineering**

Subject: Advance Microprocessors & Architectures (Laboratory) **Course Code: BT01506**

Marks: Max. – 35 Min. – 14 **L: 0 T: 0 P: 2**

List of Experiments: (E**ach student should perform, at least, 10 experiments.)**

1. To perform addition & subtraction of two 8 – bit hexadecimal numbers.
2. To perform addition & subtraction 16 – bit hexadecimal numbers.
3. To perform addition & subtraction 32 – bit hexadecimal numbers.
4. To perform addition & subtraction of two 8 – bit decimal numbers and store the resultin DX register.
5. To perform addition & subtraction of two decimal digits 9 and 7 using ASCII codestore the result in ASCII format.
6. To perform addition & subtraction of two decimal digits 97 and 25 using ASCIIcode store the result in ASCII format in CX-BX register.
7. To perform multiplication of 4 and 5 .
8. To perform division of 16 – bit number with 8-bit number.
9. To perform multiplication of two 8-bit numbers using ASCII code store theresult in ASCII form in DX register.
10. To perform division of two 8-bit numbers using ASCII code store the result in ASCIIform in DX register.
11. To solve Arithmetic equation 3AX+5DX+BP and store the result in CX register.
12. To solve Arithmetic equation (P*Q) +(R*S).
13. To add only positive number from 100 data bytes.
14. To write a program to add series of 20 bytes.
15. To find positive & negative byte from 100 data bytes.
16. To find largest & smallest byte from block of data.

Laboratory Equipment / Machine Requirements: 8086 based microprocessor kit, MASM assembler, 8086simulator, PCs.

The students are free to choose any programming platform from (C++ / JAVA /

PYTHON) to perform the above-mentioned set of laboratory experiments.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Apply a basic concept of digital fundamentals to Microprocessor based personal computer system.
2. Identify a detailed s/w & h/w structure of the Microprocessor
3. Design, write and test assembly language programs of moderate complexity.
4. Illustrate how the different peripherals are interfaced with Microprocessor
5. Apply concepts of microprocessor for developing system to solve real world problems.

Recommended Books:

1. IBM PC Assembly Language and Programming, P. Abel, 5th Edition, PHI/Pearson Education.
2. Introduction to Assembly Language Programming, Sivarama P. Dandamudi, Springer Int. Edition, 2003.
3. The 8088 and 8086 Microprocessors: Programming , Interfacing, Software, Hardware and Application,4th edition, W.A. Triebel, A. Singh, N. K. Srinath, Pearson Education

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V) **Branch: Computer Science & Engineering**

Subject: Computer Networks Laboratory **Course Code: BT01507**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments: (Each student should perform, at least, 10 experiments.)

1. Introduction to Local Area Network with its cables, connectors and topologies.
2. Installation of UTP, Co-axial cable, Cross cable, parallel cable NIC and LAN card.
3. To connect two Personal Computer with UTP cable.
4. Installation of Switch. Their cascading and network mapping.
5. Case Study of Ethernet (10 base 5,10 base 2,10 base T)
6. Installation and working with Telnet (Terminal Network).
7. Installation and working with FTP (File Transfer Protocol).
8. Installation and basic operation of a packet sniffer wire shark.
9. Installation of Modem and Proxy Server.
10. Simulation of LAN protocol using NETSIM/Packet Tracer/Lan Trainer Kit.
11. Introduction to Server administration.
12. Installation of Windows 2003 server/ Windows 2000 server.
13. Configuration of DHCP.
14. Configuring Switch/Router.
15. Installation and working of Net meeting and Remote Desktop.

List of Equipment / Machine Required:

Windows 2003 server/Windows 2000 server. . NETSIM, WIRESHARK, cisco packet tracer, LAN Trainer Kit LAN Card Cable, WIRE CUTTER, Connectors, Switch, Crimping Tools.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Design LAN
2. Configure Windows 2003 /2000/DHCP, Proxy Server.
3. Configure L2/L3 Switches.
4. Install net sim and simulate various LAN Protocols.
5. Install wire shark and Analyze network data using it.

Recommended Books.

1. Computer Network and internet by Dougles E. Comer (Pearson Education)
2. List of Software required :-
3. Windows 2003 server/Windows 2000 server.
4. List of Hardware required :-
5. LAN Trainer Kit LAN Card Cable, Connectors, HUB, Switch, Crimping Tools.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V) **Branch: Computer Science & Engineering**

Subject: Data Analytics with PYTHON Laboratory **Course Code: BT01508**

Marks: Max. – 35 **Min. – 14** **L: 0 T: 0 P: 2**

List of Experiments: (E**ach student should perform, at least, 10 experiments.)**

1. Write programs to understand the use of Python, identifiers, Keywords, Indentations, Comments in Python, Operators, Membership operator.
2. Write programs to understand the use of Python String, Tuple, List, Set, Dictionary,and File input/output.
3. Write programs to understand the use of Numpy's Ndarray, Basic Operations, Indexing, Slicing, and Iterating, Conditions and Boolean Arrays.
4. Write programs to understand the use of Numpy's Shape Manipulation, Array Manipulation, and Vectorization.
5. Write programs to understand the use of Numpy's Structured Arrays, Reading and Writing Array Data on Files.
6. Write programs to understand the use of Pandas Series, Data Frame, Index Objects, Reindexing, Dropping, Arithmetic and Data Alignment.
7. Write programs to understand the use of Pandas Functions by Element, Functions by Row or Column, Statistics Functions, Sorting and Ranking, Correlation and Covariance, "Not a Number" Data.
8. Write programs to understand the use of Pandas for Reading and Writing Data using CSV and Textual Files, HTML Files, XML, Microsoft Excel Files.
9. Write programs to understand the use of Matplotlib for Simple Interactive Chart, Set the Properties of the Plot, matplotlib and NumPy.
10. Write programs to understand the use of Matplotlib for Working with Multiple Figures and Axes, Adding Text, Adding a Grid, Adding a Legend, Saving the Charts.
11. Write programs to understand the use of Matplotlib for Working with Line Chart, Histogram, Bar Chart, Pie Charts.

Recommended Books:

1. Python Data Analytics– Fabio Nelli, A Press.
2. Python for Data Analysis, Wes McKinney, O'Reilly.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Use various data structures available in Python.
2. Apply the concepts of Data Analysis.
3. Apply the use of NumPy Library for performing various data processing activities.
4. Apply the use of Pandas library for data handling activities.
5. Apply the use of Matplotlib for data visualization activities.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V)	**Branch: Computer Science & Engineering**
Subject: PROJECT-I I (based on Summer Internship/ Industrial Training)	**Course Code: BT01509**
Marks: Max. –35 Min. – 14	**L: 0 T: 0 P: 2**

Each student has to undergo Project I using any language platform based on Summer Internship and /or Industrial Training

Guidelines for Perusal / Assessment of Project I Laboratory:

1. Students are encouraged to pursue live / research based / survey based / case study based projects under this Laboratory post summer internship or Industrial Training period;
2. Students are encouraged to make teams of maximum FOUR to work under a single project title;
3. Students are initially advised to get approval of their project titles and mentorship consent under any faculty from own discipline and training supervisor in the prescribed format provided;
4. Student groups can be of inter-disciplinary nature;
5. Students are required to submit weekly progress report with due approval signature(s) of their project mentors till the completion of that project;
6. At the end, the students must submit the project reports with due signature(s) of project mentor (in-house Teaching Faculty from relevant discipline) and training supervisor (representing the organization of training) in the following format.

Vocational / Industrial Training Report Format

1. Cover Page (1 page) Inner Pages (3 pages)
2. Certificate by Company/Industry/Institute Declaration by student About Company/Industry/Institute (1 page)Table of Contents (1 page) List of Tables (1 page)List of Figures (1 page)
3. Abbreviations and Nomenclature (If any)Chapters (1-2 page each) Introduction to Project Tools & Technology Used Snapshots
4. Task Deliverables / Project Outcome Conclusions and Future Scope
5. Bibliography / Webliography / References (1page)Weekly Progress Sheets (4 pages)

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(V)	**Branch: Computer Science &Engineering**
Subject: Environmental Studies	**Course Code: BT01510**
Total Marks (TA): 50	**L: 0 T: 0 P: 2 Credit(s): 0**
Min. Marks – 20	
Internal Assessments to be conducted: 02	**Duration (End Semester Exam): NA**

PREREQUISITE: Knowledge of basic Chemistry, Physics and Mathematics.

UNIT I: Introduction to environmental studies, ecology and ecosystems (06 hours)
Introduction to environment; Concept and structure of ecology and ecosystem, energy flow; Community ecology; Food chains and webs; Ecological succession; Characteristic features of forest, grassland, desert and aquatic ecosystem; Multidisciplinary nature of environmental studies, scope and importance; Concept of sustainability and sustainable development.

UNIT II: Biodiversity and conservation (06 hours)
Introduction to biological diversity and levels of genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hotspots; Threats to biodiversity, habitat loss, conflicts and biological invasions; In-situ and Ex-situ conservation of biodiversity: Ecosystem and biodiversity services.

UNIT III: Natural resources and environment (08 hours)
Concept of Renewable and non-renewable resources; Land resources, land use change, land degradation, soil erosion; Desertification; Deforestation: causes, consequences and remedial measures; Water: Use and over- exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state); Energy resources: environmental impacts of energy generation, use of alternative and nonconventional energy sources, growing energy needs.

UNIT IV: Human communities, social issues and environment (08 hours)
Basic concept of human population, growth and communities; Impacts on environment, human health, welfare and human rights; Resettlement and rehabilitation; Environmental natural disaster: floods, earthquake, cyclones, tsunami and landslides; manmade disaster;

Environmental movements; Environmental ethics: role of gender and cultures in environmental conservation; Environmental education and public awareness; Human health risks and preventive measurements.

UNIT V: Environmental pollution, policies, legislations, assessment and practices (12 hours)

Environmental pollution: Causes, effects and controls of air, water, soil, noise and marine pollution; Concept of hazardous and non-hazardous wastes, biomedical and e-wastes; Solid waste management and control measures; Climate change, global warming, ozone layer depletion, acid rain and their societal impacts; Environment laws: Wildlife Protection Act, Forest Conservation Act, Water (Prevention and control of Pollution) Act, Air (Prevention& Control of Pollution) Act, Environment Protection Act, Biodiversity Act, International agreements negotiations, protocols and practices; EIA, EMP.

On completion of each unit, students have to submit one assignment from each unit.

TEXT BOOKS:

1. De, A.K., (2006).*Environmental Chemistry*, 6th Edition, New Age International, NewDelhi.
2. Bharucha, E. (2013). *Textbook of Environmental Studies for Undergraduate Courses*.
3. Universities Press.
4. Asthana, D. K. (2006).*Text Book of Environmental Studies*. S. Chand Publishing.

REFERENCE BOOKS:

1. Odum, E. P., Odum, H. T., & Andrews, J. (1971).Fundamentals of ecology. Philadelphia: Saunders.
2. Basu, M., Xavier, S. (2016). Fundamentals of Environmental Studies, Cambridge University Press, India.
3. Sharma, P. D., & Sharma, P. D. (2005).Ecology and Environment. Rastogi Publications.

OPEN SOURCE LEARNING: http://nptel.ac.in/

BHARTI VISHWAVIDYALAYA, DURG

SCHEME OF TEACHING AND EXAMINATION
B. Tech.(Sixth Semester – Computer Science & Engineering)

Sl. No.	Courses (Subject)	Course Code	Period per Week			Theory/Lab			Total Marks	Credit (L+T+P/2)
			L	T	P	ESE	CT	TA		
1.	Compiler Design	BT01601	3	1	-	70	10	20	100	4
2.	Software Engineering &Project Management	BT01602	3	1	-	70	10	20	100	4
3.	Artificial Intelligence& Expert Systems	BT01603	3	1	-	70	10	20	100	4
4.	Professional Elective-II (Refer Table-I)	BT01604	2	1	-	70	10	20	100	3
5.	Open Elective – I (Refer Table III)	BT01605	2	0	-	70	10	20	100	2
6.	Software Engineering &Project Management Laboratory	BT01606	-	-	2	35	-	15	50	1
7.	Artificial Intelligence& Expert Systems Laboratory	BT01607	-	-	2	35	-	15	50	1
8.	Internet of Things Laboratory	BT01608	-	-	2	35		15	50	1
9.	Android Application Laboratory	BT01609	-	-	2	35	-	15	50	1
10.	Technical Communicationand Soft Skill	BT01610	-	-	2	-	-	50	50	-
Total			13	4	10	490	50	210	750	21

L – Lecturer, T – Tutorial, TA – Teacher's Assessment, P – Practical,

ESE – End Semester Exam, CT – Class Test

Table I (Professional Elective II)

S. NO.	Board of Studies	Subject	Course Code
1	Computer Science Engg	Web Technologies	BT01604(01)
2	Computer Science Engg	Internet Of Things	BT01604(02)
3	Computer Science Engg	Soft Computing	BT01604(03)
4	Computer Science Engg	Network Programming	BT01604(04)

Note:

(1) 1/4th of total strength of students subject to minimum of 20 students is required to offer andelective in the college in a particular academic session.

(2) Choice of elective course once made for an examination cannot be changed in future examinations.

List of Open Elective – I (Table III) (For 6th Semester)

S. NO.	Board of Studies	Subject	Course Code
1	Computer Science Engg	Cyber Security	BT01605(01)
2	Computer Science Engg	Cryptography & Network Security	BT01605(02)
3	Computer Science Engg	Cloud Computing	BT01605(03)
4	Computer Science Engg	Computer Networks	BT01605(04)
5	Information Technology	E-Commerce	BT01605(05)

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) | **Branch: Computer Science &Engineering**

Subject: Compiler Design | **Course Code: BT01601**

Max. No. – 70 Min. - 28 | **L: 3 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each | **Duration (End Semester Exam): 03 Hours**

UNIT I: Introduction : Introduction to Compiler, single and multi-pass compilers, Translators, *Interpreters* Phases of Compilers, Compiler writing tools, Finite Automata and Lexical Analyzer: Role of Lexical Analyzer, Specification of tokens, Recognition of tokens, Regular expression, Finite automata, *finite automata to regular expression*, transition diagrams, Implementation of lexical analyzer with LEX, *Context free grammar (CFG)*.

UNIT II: Syntax Analysis and Parsing Techniques: *Introduction to parsing Technique*, Bottom-up parsing and top down parsing, Top down Parsing: elimination of left recursion, recursive descent parsing, Predicative Parsing, Bottom Up Parsing: Operator precedence parsing, LR parsers, Construction of SLR, Canonical LR and LALR parsing tables, Construction of SLR parse tables for Ambiguous grammar, parser generator- YACC, error recovery in top down and bottom up parsing.

UNIT III: Syntax Directed Translation & Intermediate Code Generation : *Definition of Syntax Directed Translation,* Synthesized and inherited attributes, Construction of syntax trees, bottom up and top down evaluation of attributes, Postfix notation; Three address codes, quadruples, triples and indirect triples, Translation of assignment statements, control flow, Boolean expression and Procedure Calls, S- attributed and L- attributed definitions.

UNIT IV: Run-time Environment: Storage organization, activation trees, activation records, allocation strategies, Parameter passing symbol table, dynamic storage allocation.

UNIT V: Code Optimization and Code Generation: Basic blocks and flow graphs, Optimization of basic blocks, Loop optimization, and Global data flow analysis, Loop invariant computations. Issue in the design of Code generator, register allocation, the target machine, and simple Code generator.

Text Books:

1. Compilers Principles, Techniques and Tools, Alfred V. Aho, Ravi Sethi and Ullman J.D., 2nd edition, AddisonWesley.
2. Principle of Compiler Design, Alfred V. Aho and J.D. Ullman, Narosa Publication
3. Introduction to Compiler Techniques, J.P. Bennet, 2nd edition, Tata McGraw-Hill

Reference Books:

1. Compiler Design in C, A.C. Holub, PHI.
2. Compiler construction (Theory and Practice), A. Barret William and R.M., Bates, Galgotia Publication.
3. Compiler Design, O.G. Kakde, 4th edition, Laxmi Publication.
4. Algorithms to generate code for a target machine.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) | **Branch: Computer Science &Engineering**

Subject: Software Engineering & project management | **Course Code: BT01602**

Max. No. – 70 Min. - 28 | **L: 3 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each | **Duration (End Semester Exam): 03 Hours**

UNIT I: Introduction to software engineering and project management: Software, Evolving role of software, Three "R"-Reuse, Reengineering and Retooling, Define project, project management framework, The role of project Manager, Systems View of Project Management, Stakeholder management, Project phases and the project life cycle. Software Process Models-Waterfall Model, Evolutionary Process Model: Prototype and Spiral Model, Incremental Process model: Iterative approach, *The RAD model*, Concurrent Development Model.

UNIT II: Software Requirement Analysis and Specification: *Cost Estimation: COCOMO (Numerical), COCOMO-II (Numerical). Earned Value Management*, Types of Requirement, Feasibility Study, Requirement Analysis and Design: DFD, Data Dictionary, HIPO Chart, Warnier Orr Diagram, And Requirement Elicitation: Interviews, Questionnaire, Brainstorming, Facilitated Application Specification Technique (FAST), Use Case Approach. SRS Case study, Software Estimation: Size Estimation: Function Point (Numerical).

UNIT III: Software Project Planning : Business Case, Project selection and Approval, Project charter, Project Scope management: Scope definition and Project Scope management, Creating the Work Breakdown Structures, Scope Verification, Scope Control, Project Scheduling and Procurement management- Relationship between people and Effort: Staffing Level Estimation, Effect of schedule Change on Cost, Degree of Rigor & Task set selector, Project Schedule, Schedule Control, CPM (Numerical), Basic Planning Purchases and Acquisitions, Planning Contracting, Requesting Seller Responses, Selecting Sellers, Out Sourcing: The Beginning of the outsourcing phenomenon, Types of outsourcing relationship, The realities of outsourcing, Managing the outsourcing relationship, *Software complexity &*

size measure.

UNIT IV :Software Quality : Software and System Quality Management: Overview of ISO 9001, SEI Capability Maturity Model, McCall's Quality Model, Six Sigma, Formal Technical Reviews, Tools and Techniques for Quality Control, Pareto Analysis, Statistical Sampling, Quality Control Charts and the seven Run Rule. Commitment to Quality, Crosby and Striving for Zerodefects, Ishikawa and the Fishbone Diagram.

UNIT V: Human Resource Management: Human Resource Planning, Acquiring the Project Team: Resource Assignment, Loading, And Leveling, Developing the Project Team: Team Structures, Managing the Project Team, Change management: Dealing with Conflict & Resistance Leadership & Ethics. Software Risk Management and Reliability issues- Risk Management: Identify IT Project Risk, Risk Analysis and Assessment, Risk Strategies, Risk Monitoring and Control, Risk Response and Evaluation, *Software testing, software maintenance.*

Text Books:

1. Software Engineering, 5th and 7th edition, by Roger S Pressman, McGraw Hill publication.
2. Managing Information Technology Project, 6edition, by Kathy Schwalbe, Cengage Learning publication.
3. Information Technology Project Management by Jack T Marchewka Wiley India publication.

Reference Books:

1. Software Engineering 3rd edition by KK Agrawal, Yogesh Singh, New Age International publication.
2. Software Engineering Project Management by Richard H. Thayer Wiley India Publication
3. Software Engineering for students: A Programming Approach by Douglas Bell, Pearson publication.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) | **Branch: Computer Science &Engineering**

Subject: Artificial Intelligence & Expert Systems | **Course Code: BT01603**

Max. No. – 70 Min. - 28 | **L: 3 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each | **Duration (End Semester Exam): 03 Hours**

UNIT I: Introduction: *Introduction of AI*, examples of successful recent AI applications. The Turing test, Rational versus non-rational reasoning. Search Strategies: Problem spaces (states, goals and operators), problem solving by search. Uninformed search (breadth-first, depth-first, depth-first with iterative deepening). Heuristics and informed search (hill-climbing, generic best-first, *AO* Search*). Minimax Search, Alpha-beta pruning. Space and time efficiency of search. *Game of chance.*

UNIT II: Knowledge representation and reasoning: *Introduction Knowledge representation,* Review of propositional and predicate logic, first order logic, Resolution and theorem proving, forward chaining, backward chaining, Temporal and spatial reasoning. Review of probabilistic reasoning, Bayes theorem. Totally-ordered and partially-ordered Planning, *Boolean circuit agents, Rule based system*.

UNIT III: Planning: The blocks world, Components of Planning Systems, Goal stack planning, Non-linear planning, Hierarchical planning. *Forward planning*, Learning-Learning from example, Learning by advice, Explanation based learning, Learning in problem solving, Definition and examples of broad variety of machine learning tasks, Classification, Inductive learning, Simple statistical-based learning such as Naive Bayesian Classifier, decision trees.

UNIT IV: Natural Language Processing: *Overview of Natural Language Processing*, Language models, n-grams, Vector space models, Bag of words, Text classification, Information retrieval, Page rank, Information extraction, Question-answering, *black word*.

UNIT V: Agents: Definition of agents, Agent architectures (e.g., reactive, layered, cognitive), Multi-agent systems- Collaborating agents, Competitive agents, Swarm systems and biologically inspired models. Expert Systems: Representing and Using Domain Knowledge, Expert System Shells, Explanation, Knowledge Acquisition, *Lisp syntax, List programming.*

Text Books:

1. Title Artificial Intelligence Author Elaine Rich, Kevin Knight and Shiva Shankar B Nair Publisher Tata McGrawHill Edition 3rd Edition 2009

Reference Book:

1. Title Introduction to Artificial Intelligence and Expert Systems Author Dan W. Patterson Publisher Pearson Education Edition 1st Edition, 2015
2. Title Artificial Intelligence: A Modern Approach Author S. Russell and P. Norvig. Publisher Prentice HallEdition 3rd Edition 2009

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) | **Branch: Computer Science &Engineering**

Subject: Web Technologies (Professional Elective – II) | **Course Code: BT01604(01)**

Max. No. – 70 Min. - 28 | **L: 3 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each | **Duration (End Semester Exam): 03 Hours**

UNIT- I

Introduction to WWW: Protocols and programs, Internet Protocol -TCP/IP, UDP, HTTP, Secure Http(http), secure connections, application and development tools, the web browser, what is server, choices, setting up UNIX and Linux web servers, Domain Name Server and IP Addresses, dynamic IP

Web Design: Web site design principles, planning the site and navigation

UNIT-II

HTML: Planning for designing Web pages, Model and structure for a Website, Developing Websites, Basic HTML using images links, Lists, Tables and Forms, Frames for designing a good interactive website

CSS: Introduction Cascading Style Sheets: Syntax, Class Selector, Id Selector, External Style Sheets, Internal Style Sheets, Inline Style, the class selector, div & span tag, introduction to AJAX, Ajax based web application

UNIT- III

JAVA SCRIPT: Programming Fundamentals, Statements, Expressions, Operators, Popup Boxes, Control Statements, Try…. Catch Statement, Throw Statement, and Objects of JavaScript: Date object, array object,Boolean object, math object

Advance Script: HTML DOM, inner HTML, Dynamic HTML (DHTML), DHTML form, forms and validations

UNIT-IV

XML & JSON: Introduction to XML, uses of XML, simple XML, and XML key components, DTD and Schemas, Well formed, using XML with application.XML, XSL and

XSLT. Introduction to JSON, JSON syntax, Data types,objects and JSON parse

Ajax: Introduction, AJAX request, AJAX Response, AJAX XML File

UNIT-V

PHP: Starting to script on server side, Arrays, function and forms, advance PHP

Databases: Basic command with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP my admin and database bugs.

Text Books:

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education
2. Web Warrior Guide to Web Design Technologies, Don Gosselin, Joel Sklar& others, Cengage Learning
3. Web Technologies, Black Book, DreamTech Press

Reference Books:

1. Web Technology and Design by Xavier, C, New Age International
2. HTML, DHTML, Java Script, Perl & CGI by Ivan Bayross, BPB Publication.
3. Internet and Web Design by Ramesh Bangia, New Age International
4. Web Technology: A developer perspective, Gopalan & Akilandeswari, PHI

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) | **Branch: Computer Science &Engineering**

Subject: Internet Of Things (Professional Elective – II) | **Course Code: BT01604(02)**

Max. No. – 70 Min. - 28 | **L: 3 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each | **Duration (End Semester Exam): 03 Hours**

Unit-I Introduction to Internet of Things: Origin of Terminology IoT, Applications, Characteristics, Components of IoT, Associated technologies with IoT (M2M, Big Data, Cloud, Smart Grid, IoV, CPS, SDN, 3G/4G/5G), Challenges in IoT.

Unit-II Connectivity: IoT Network Configurations, Gateway Prefix Allotment, IPv4, IPv6, IPv4versus IPv6, RPL

Data Protocol: MQTT, CoAP, AMQP,

Communication Protocols: IEEE 802.15.4, ZWave, Bluetooth, ZigBee,6LowPAN, HART and Wireless HART, NFC, RFID.

Unit-III Actuation: Actuator, Actuator Types: Hydraulic Pneumatic, Electrical, Thermal/ MagneticMechanical, Soft Actuators, Shape memory polymer (SMP)

Types of Motor Actuators: Servo motor, Stepper motor, Hydraulic motor, SolenoidRelay, AC motor

Sensing: Definition, Types of sensors, Transducers, Sensors Classes

Unit-IV Introduction to Arduino Programming: Operators in Arduino, Control Statement, Loops, Integration of Sensors and Actuators with Arduino.

Implementation of IoT: Interoperability in IoT, Introduction to Node MCU (ESP8266), Connectivity of Sensors and Actuators with NodeMCU, Introduction to Python programming, Introduction to Raspberry PI.

Unit-V Cloud Computing Fundamentals: Recent Trends in Computing, Evolution of CloudComputing, Evolution of Cloud Computing, Business Advantages, Components

Service Models: Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) Infrastructure-

as-a-Service (IaaS), Multi-cloud, Inter-cloud, Cloud Computing Service Management and Security,

Case studies: Amazon Elastic Compute Cloud (EC2), Microsoft Azure.

Text Books:

1. Vijay Madisetti, Arshdeep Bahga, “Internet of Things: A Hands-On Approach”
2. Waltenegus Dargie,Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory andPractice".

Reference Book:

1. Internet of Things with Arduino Cookbook by Macro Schwart Published by Packt Publishing Ltd.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) | **Branch: Computer Science &Engineering**

Subject: Soft Computing (Professional Elective – II) | **Course Code: BT01604(03)**

Max. No. – 70 Min. - 28 | **L: 3 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each | **Duration (End Semester Exam): 03 Hours**

UNIT- I Introduction: Concept of computing systems. "Soft" computing versus "Hard" computing, Characteristics of Soft computing, some applications of Soft computing techniques.

UNIT-II Fuzzy logic: Introduction to Fuzzy logic. Fuzzy sets and membership functions. Operations on Fuzzy sets. Fuzzy relations, rules, propositions, implications and inferences. Defuzzification techniques. Fuzzy logic controller design. Some applications of Fuzzy logic.
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- III Artificial Neural Networks: Neural Network: Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference b/w ANN and human brain, characteristic and applications of ANN, single layer network. Perceptron: Perceptron training algorithm, linear separability Introduction of MLP, and different activation functions, Error back propagation algorithm, Applications of ANNs to solve some real life problems.

UNIT-IV Genetic Algorithms: Fundamental, 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.

UNIT-V Multi–objective Optimization Problem Solving: Concept of multi-objective optimization problems (MOOPs) and issues of solving them. Multi-Objective Evolutionary Algorithm (MOEA). Non-Pareto approaches to solve MOOPs, Pareto-based approaches to solve MOOPs, Some applications with MOEAs.

Text Books:

1. Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis & Applications, S. Rajasekharan, G. A.Vijayalakshami, PHI.
2. Neural Networks and Learning Machines, (3rd Edn.), Simon Haykin, PHI Learning, 2011.
3. Soft Computing, D. K. Pratihar, Narosa, 2008.

Reference Books:

1. Fuzzy Logic: A Pratical approach, F. Martin, , Mc neill, and Ellen Thro, AP Professional, 2000.
2. Genetic Algorithms In Search, Optimization And Machine Learning, David E. Goldberg, Pearson Education, 2002.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) | **Branch: Computer Science &Engineering**

Subject: Network Programming (Professional Elective – II) | **Course Code: BT01604(04)**

Max. No. – 70 Min. - 28 | **L: 2 T: 1 P: 0**

Class Tests & Assignments to be conducted: 2 each | **Duration (End Semester Exam): 03 Hours**

UNIT- I Networking & TCP/IP: Communication protocols, Network architecture, UUCP, XNS, IPX/SPX for LANs, Programming Applications: Time & date routines, Internet protocols: Application layer, Transport layer, Network layer, Data link layer protocols, Chat, Email, Web server working method & programming, *TCP & IP headers, IPv4 & v6 address structures.*

UNIT-II *Unix* Socket Programming: Creating sockets, *Socket addresses, Posix data type*, Assigning address to a socket, Java socket programming, Thread programming, Berkeley Sockets: Overview, socket address structures, byte manipulation & address conversion functions, elementary socket system calls – socket, connect, bind, listen, accept, fork, exec, close, TCP ports (ephemeral, reserved), Berkeley Sockets: I/O asynchronous & multiplexing models, select & poll functions, signal & *fcntl* functions, socket implementation (client & server programs), UNIX domain protocols.

UNIT- III APIs & Winsock Programming: Windows socket API, window socket & blocking I/O model, blocking sockets, blocking functions, timeouts for blocking I/O, API overview, Different APIs & their programming technique.

UNIT- IV Web Programming & Security: Distributed System Design concept, RMI, Component technology, *Introduction of CGI programming PHP/PERL*, Overview of JavaScript, Firewall & security technique, Cryptography, Digital Signature, *and Multithreading to server.*

UNIT- V *Advance Java Programming*: Java network programming, packages Client side programming: Creating sockets, implementing generic network client, Parsing data using

string Tokenizer, Retrieving web documents by using the URL class. Server side programming: Steps for creating server, Accepting connection from browsers, creating an HTTP server.

Text Books:-

1. UNIX Network Programming, Steven. W.R, PHI (VOL I& II)
2. Window Socket Programming by Bobb Quinn and Dave Schutes
3. TCP/IP Protocol Suite by Behrouz A. Forouzan

Reference Books:-

1. Windows Network Programming, Davis R., Addison Wesley
2. Network Programming With Windows Socket By Baner P. PH New Jersey.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) **Branch: Computer Science &Engineering**

Subject: Software Engineering & Project Management (Laboratory) **Course Code: BT01606**

Max. No. – 35 Min. - 14 **L: 2 T: 1 P: 0**

Note: The course pre-requisite for pursuing Software Development and Project Management Laboratory PHP/MySQL; which if not covered beforehand; students should be encouraged to undertake SPOKEN TUTORIAL COURSE on PHP (duration: 4 – 6 Weeks before pursuing this laboratory.

Course Objectives: The goal of this course is to teach and provide experience building software projects in service to real-time end-user beneficiaries. The laboratory is pursued in the following sequence of stages with due coordination with co-projectees in teams (of 3–4 students) and supervision of laboratory instructor upon which the project is graded accordingly:

1. Writing the complete problem statement.
2. Writing the Software Requirement Specification document.
3. Drawing the entity relationship diagram.
4. Drawing the data flow diagrams at level 0 and level 1.
5. Drawing use case diagram.
6. Drawing activity diagram of all use cases.
7. Drawing state chart diagram of all use cases.
8. Drawing sequence diagram of all use cases.
9. Drawing collaboration diagram of all use cases.
10. Assigning objects in sequence diagram to classes and make class diagram.
11. Performing system analysis on any of the selected modules designed above.

Each team can choose any one-project theme (around and similar to below stated List of Sample Project Themes, also not repeating with any other group and are expected to provide the above mentioned project deliverables.)

[Student Result Management System, Library management system, Inventory control system,

Accounting system, Fast food billing system, Bank loan system, Blood bank system, Railway reservation system, Automatic teller machine, Video library management system, Hotel management system, Hostel management system, E-ticking, Share online trading, Hostel management system, Resource management system, Court case management system]

Once project deliverable sequence is decided, each team meets with its client to understand the requirements and priorities of the client, which starts the software development process, a process that continues until the end of the semester.

Guidelines for Perusal / Assessment of Software Development and Project Management Laboratory:

1. The students are free to choose any Technology or Tool like (C/C++/VB/Gambas/Php/Core Java/Servlet/ JSP/ Python and alike) for developing their case study on selected Project Theme.
2. This course is a CI (communications intensive) course. The meetings with end-user client, project supervisor involve extensive communication and involve frequent coordination with team members in order to assign tasks and communicate questions, issues, and completions. Hence, 20% of total grade shall be evaluated on the meeting-conduction patterns by the project team.
3. Also, the project team is expected to submit duly filled and signed (phase-wise) project progress reports by the authorized signatories (as provided in Annexure I) with reference to their progress in ongoing project work till its completion within scheduled semester deadline.
4. The documentation of the project should begin after exhibiting targeted project deliverables only, dulychecked by project supervisor.
5. The final documentation should be made with due guidance from project mentor or supervisor and shouldbe submitted (in both soft and hard copy formats).
6. Before the Final Practical examinations, every individual student should submit his own hardcopy of the documentation in a Punched Cardboard File Only, with a CD containing the softcopy of the same.
7. During Final Submissions, every copy of the documentation should be accompanied by a Submission Certificate duly signed by signatory authorities (Project Supervisor &Head of Department)

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Define various software application domains and remember different process model used in softwaredevelopment.
2. Explain needs for software specifications also they can classify different types of software requirementsand their gathering techniques.
3. Convert the requirements model into the design model and demonstrate use of software and user-interfacedesign principles.
4. Justify the role of SDLC in Software Project Development and evaluate importance of SoftwareEngineering in PLC.
5. Generate project schedules, deliverables and construct, design and develop network diagram for differenttype of projects; also practicing the activities of each phase.

Recommended Books:

1. Fundamentals of Software engineering - Rajib Mall.
2. Software design – From programming to architecture - Eric Braude

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) **Branch: Computer Science &Engineering**

Subject: Artificial Intelligence & Expert Systems Laboratory **Course Code: BT01607**

Max. No. – 35 Min. - 14 **L: 2 T: 1 P: 0**

List of Experiments: (E**ach student should perform, at least, 10 experiments.)**

1. Write a prolog program to find the rules for parent, child, male, female, son, daughter, brother, sister, uncle,aunt, ancestor given the facts about father and wife only.
2. Write a program to find the length of a given list
3. Write a program to find the last element of a given list
4. Write a program to delete the first occurrence and also all occurrences of a particular element in a given list.
5. Write a program to find union and intersection of two given sets represented as lists.
6. Write a program to read a list at a time and write a list at a time using the well-defined read & write functions.
7. Write a program given the knowledge base,If x is on the top of y, y supports x.
8. If x is above y and they are touching each other, x is on top of y.
9. A cup is above a book. The cup is touching that book. Convert the following into wff's, clausal form; Is itpossible to deduce that `The book supports the cup'.
10. Write a program given the knowledge base,
11. If Town x is connected to Town y by highway z and bikes are allowed on z, you can get to y from x by bike.If Town x is connected to y by z then y is also connected to x by z.
12. If you can get to town q from p and also to town r from town q, you can get to town r from town p.Town A is connected to Town B by Road 1. Town B is connected to Town C by Road 2.
13. Town A is connected to Town C by Road 3. Town D is connected to Town E by Road 4. Town D is connected to Town B by Road 5. Bikes are allowed on roads 3, 4, 5.
14. Bikes are only either allowed on Road 1 or on Road 2 every day. Convert the following into wff's, clausalform
15. And deduce that `one can get to town B from town D'.
16. Solve the classical problems for demonstrating AI search heuristics: (Water Jug problem, Monkey Bananaproblem, Missionary Cannibals problem, Travelling Salesman

Problem and alike).

17. Solve the classical Crypt arithmetic problems in AI: (DONALD + GERALD = ROBERT, CROSS + ROADS
18. = DANGER, SEND + MORE = MONEY and alike).
19. Solve the classical Blocks World Problem demonstrating Planning Problem-solving simulation in AI.
20. Write a program to search any goal given an input graph using AO* algorithm.
21. **List of Equipment's/Machine required:** PC with Windows XP Operating System, Visual prolog compiler

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Acquire an overview of logic constructs for performing inferencing techniques. (First Order Predicate Calculus) in toy problems /classical problems using PROLOG / LISP syntax.
2. Gain confidence in drafting production rules (iterative / recursive) for an AI simulating code, given a story domain.
3. Understand, on how to use different data structures (lists, trees, stacks and queues) for solving routing problems and implementing heuristic searches.
4. Gain exposure to deal with situations that crop up syntax / compile-time / run-time errors.
5. Simulate game playing / puzzle problems using general solution in PROLOG / LISP syntax.

Recommended Books:

1. Ivan Bratko: Logic & prolog programming.
2. Carl Townsend: Introduction to Turbo Prolog, BPB, Publication.
3. W.F. Clocks in & Mellish : Programming in PRLOG, Narosa Publication House

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) **Branch: Computer Science &Engineering**

Subject: Internet of Things Laboratory **Course Code: BT01608**

Max. No. – 35 Min. - 14 **L: 0 T: 0 P: 2**

List of Experiments: (Each student should perform, at least, 10 experiments.)

Note: Students need to perform at least 10 experiments. Use of sensors and actuators are not restricted asprovided. Student may use any other components also.

1. Introduction to various sensors and actuators.
   a. PIR Motion Sensor.
   b. Rain Drop Sensor.
   c. Moisture Sensor.
   d. Temperature Sensor.
   e. Touch Sensor.
   f. Infrared Sensor.
   g. RFID Sensor.
   h. Ultrasonic Sensor.
   i. Bluetooth Module.
   j. Wi-Fi Module.
   k. LED/OLED
   l. Servo Motor.
2. Acquaintance with Arduino /Raspberry Pi/Node MCU and perform essential programmingestablishment.
3. Perform Experiment using Arduino Uno to measure the distance of any object using UltrasonicSensor.
4. Connect LED/Buzzer with Arduino/Raspberry Pi and compose a program to turn ON LED for 1sec later at regular intervals.
5. Connect Push button/Digital sensor (IR/LDR) with Arduino/Raspberry Pi and compose a program to turn ON LED when press button is squeezed or sensor activates.
6. Interact with DHT11 sensor with Arduino/Raspberry Pi and compose a program to printtemperature and humidity readings on screen.
7. Connect engine utilizing hand-off with Arduino/Raspberry Pi and compose a program to turn ONengine when push button is squeezed.
8. Communicate OLED with Arduino/Raspberry Pi and compose a program to print temperature andmoistness readings on it.
9. Communicate Bluetooth with Arduino/Raspberry Pi and compose a program to send sensorinformation to cell phone utilizing Bluetooth.

10. Connect Bluetooth with Arduino/Raspberry Pi and compose a program to turn LEDON/OFF when'1'/'0' is sent from cell phone utilizing Bluetooth.
11. Compose a program on Arduino/Raspberry Pi to transfer temperature and stickiness informationto thing speaks cloud.
12. Compose a program on Arduino/Raspberry Pi to recover temperature and moistness informationfrom thing speaks cloud.
13. Getting started and working with ESP8266 Wi-Fi to control devices from mobile.
14. Creating a webpage and display the values received from sensors through Arduino.
15. Study of other IoT Boards and components available.(Student Activity).

Recommended Books:

1. Vijay Madisetti, Arshdeep Bahga, İnternet of Things, "A Hands on Approach", University Press
2. Dr. SRN Reddy, RachitThukral and Manasi Mishra, "Introduction to Internet of Things: A practicalApproach", ETI Labs
3. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, andUse Cases", CRC Press Laboratory Outcomes

[After undergoing the course, students will be able to:]

1. Describe what IoT is and how it works today
2. Recognize the factors that contributed to the emergence of IoT, Design and program IoT devices
3. Use real IoT protocols for communication, secure the elements of an IoT device
4. Design an IoT device to work with a Cloud Computing infrastructure
5. Transfer IoT data to the cloud and in between cloud providers

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI) **Branch: Computer Science &Engineering**

Subject: Android Application Laboratory **Course Code: BT01609**

Max. No. – 35 Min. - 14 **L: 0 T: 0 P: 2**

List of Experiments: (Each student should perform, at least, 10 experiments.)

1. Download and setup Android Environment
2. Using the Development environment
    a. Create a new Project using wizard
    b. Add source and resource files.
    c. Import existing projects into workspace
    d. Create testing Emulator
    e. Compile and run the project
    f. Debug the project
    g. Debug on android device.
3. XML Files
    a. AndroidManifest.xml
        i. Edit the manifest and change min sdk and target sdk of application.
        ii. Add main activity entries in manifest.
        iii. Add second activity entries in manifest.
        iv. Add Entries for Service, Broadcast receivers.
        v. Add uses permissions for reading files, internet, camera.
    b. Layouts
        i. Create Linear Layout in xml
        ii. Create Relative Layout in xml
        iii. Create frame layout in xml
        iv. Create a complex mixed layout using all above layouts
    c. Drawables
        i. Create xml Drawables for rectangular, oval and other basic shapes
        ii. Create xml Drawables with Layer list for complex shapes.
    d. Values
        i. Create strings.xml to store all your application strings.
        ii. Create color.xml to store all your color values

iii. Create styles.xml to store all your custom themes and style objects

e. Alternate resources based on qualifiers

i. Create separate draw tables folders and xml files based on screen density (LDPI, MDPI, HDPI, XHDPI, XXHDPI)

ii. Create separate styles.xml based on different android versions.

iii. Create separate layout folders based on device screen sizes and orientations.

4. Creating User Interface

a. Create application with Basic Views (Text view, Button, List View)

b. Create application with different Layouts (Linear, Relative, Frame)

c. Create application to handle and respond on click using Click Listeners

5. Assets and Images

a. Create application which will access files from Assets folder (Images, sounds, Custom Fonts)

6. Application Fundamentals

a. Activities

i. Create application with one activity and display a layout created in xml.

ii. Create application which will log all activity lifecycle events using Android log api.

iii. Create application which should be Saving and restoring app state (e.g. text view text, checkbox checkedstate)

b. Intents

i. Create application which will start another activity using intent.

ii. Create an activity which will pass data to second activity using intent.

iii. Create activity which will start second activity and get response back from second activity.

c. Services

7. Content Providers

a. System provided content providers

i. Create application which can access/modify Contacts of device.

ii. Create application which can access & display Images available on device.

iii. Create application which can access and play Media files (Audio & Video)

b. Custom Contact providers

i. Create application which will provide some data to other applications using Content Provider system.

8. Broadcast Receivers
   a. Create application to Listen to following system events using Receivers
      i. Incoming SMS
      ii. In and outgoing Phone Call
      iii. Low Battery & Storage state changed
   b. Create application which will broadcast Custom event to custom Receivers.
9. Create application which will display following Notifications
   a. Toast notification
   b. Status bar notification
   c. Dialog notification
10. Preference & Data Storage
   a. Create application which will save and read back data using Shared Preference
   b. SQLite database
      i. Create app to create database using Open helper
      ii. Create app to read, write and delete database entries
11. Networking & Web API
   a. HTTP connectivity
      i. Create app to connect and fetch data from a Http server/ website using URLConnection
      ii. Create app to connect and fetch data from a Http server/ website using HTTPClient library
      iii. Create app to connect and post data to Http server/ website using URL Connection
      iv. Create app to connect and post data to Http server/ website using HTTP Client library
   b. TCP Sockets or Sockets
      i. Create a server app using tcp socket, it will send “Welcome” to client when its connected.
      ii. Create a client app using tcp socket, it will send “Hello” to server once connected.

12. Google API
    a. Create application using Maps api, it should display marker on current location of user
    b. Create application which will display ads using Admob api
13. Accessing android hardware
    a. Create Application to take picture and save it to file storage using camera api
    b. Create application to display current direction using sensor api
    c. Create application to show a toast if phone is waved in air.
    d. Create application to show list of paired and nearby Bluetooth devices.
14. Facebook SDK
    a. Create application which can share link on Facebook using Facebook sdk.
    b. Create application which can share photo on Facebook using Facebook sdk.
15. Publish to play store
    a. Enable Obfuscation for your application using Proguard
    b. Export Signed application package
    c. Prepare Store listing
    d. Upload and publish apk

Recommended Books:

1. Head First Android- By Jonathan Simon

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Understand basic concepts and technique of developing applications for the Android phone.
2. Able to use the SDK and other development tools.
3. Acquire to know, how to publish Android applications to the Android Market.

BHARTI VISHWAVIDYALAYA, DURG

Program / Semester: B. Tech.(VI)	**Branch: Humanities**
Subject: Technical Communication & Soft Skills	**Course Code: BT01610**
Total Marks (TA): 50	**L: 0 T: 0 P: 2**
Min. marks - 20	
Internal Assessments to be conducted: 02	**Duration (End Semester Exam): NA**

UNIT-1 Communication Skills-Basics: Understanding the communicative environment, Verbal Communication; Non Verbal Communication & Cross Cultural Communication, Body Language & Listening Skills; Employment Communication writing CVs, Cover Letters for correspondence. Common errors during communication, Humour in Communication.

UNIT-2 Interpersonal communication: Presentation, Interaction and Feedbacks, Stage Manners, Group Discussions (GDs) and facing Personal Interviews, Building Relationships, Understanding Group Dynamics- I, Emotional and Social Skills, Groups, Conflicts and their Resolution, Social Network, Media and Extending Our Identities.

UNIT- 3 Vocational skills: Managing time: Planning and Goal setting, managing stress: Types of Stress; Making best out of Stress, Resilience, Work-life balance, Applying soft-skills to workplace.

UNIT-4 Mindsets and Handling People: Definitions and types of Mindset, Learning Mindset, Developing Growth Mindset, Types of People, How to Lead a Meeting, How to Speak Effectively in Meetings, Behavior & Roles in Meetings, Role Play: Meeting. On Saying "Please", How to say "NO".

UNIT-5 Positive Psychology: Motivating oneself, Persuasion, Survival Strategies, Negotiation, Leadership and motivating others**,** controlling anger**,** Gaining Power from Positive Thinking.

Text Books:

1. Petes S. J., Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw-HillEducation, 2011.

2. Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and Your Success. Canada:Wiley & Sons, 2006.
3. Dorch, Patricia. What Are Soft Skills? New York: Execu Dress Publisher, 2013.

Reference Books:

- Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams,and Leaders. Washington, DC: Pfeiffer & Company, 2013.
- Peale Norman Vincent. The Power of Positive Thinking: 10 Traits for Maximum Result. PaperbackPublication. 2011.
- Klaus, Peggy, Jane Rohman & Molly Hamaker. The Hard Truth about Soft Skills. London: HarperCollins E-books, 2007.