DEPARTMENT OF COMPUTER ENGINEERING AND COMPUTER SCIENCE & ENGINEERING
INDUS INSTITUTE OF TECHNOLOGY & ENGINEERING
INDUS UNIVERSITY

B-TECH COMP. SCIENCE & ENGG., SEMESTER –I TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017

SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	SH0101	Differential Calculus & Matrix Algebra	04	02	00	05	06	30	10	60	00	00	100
2	SH0001	Engineering Physics	03	00	02	04	05	30	10	60	40	60	200
3	EL0001	Electrical Workshop	00	00	02	01	02	00	00	00	40	60	100
4	EL0002	Elements of Electrical Engineering	03	00	02	04	05	30	10	60	40	60	200
5	ME0001	Engineering Graphics	01	06	00	04	07	30	10	60	00	00	100
6	EC0001	Basic Electronics	02	00	02	03	04	30	10	60	40	60	200
7	MT0001	Materials Science	03	00	00	03	03	30	10	60	00	00	100
8	SH0102	Technical English	01	02	00	02	03	30	10	60	00	00	100
TOTAL			**17**	**10**	**08**	**26**	**35**	**210**	**70**	**420**	**160**	**240**	**1100**

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INDUS UNIVERSITY

B-TECH COMP. SCIENCE & ENGG., SEMESTER –II TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017

SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	SH0201	Integral Calculus and Linear Algebra	04	02	00	05	06	30	10	60	00	00	100
2	SH0002	Engineering Chemistry	03	00	02	04	05	30	10	60	40	60	200
3	ME0004	Mechanical Workshop	00	00	02	01	02	00	00	00	40	60	100
4	ME0002	Elements of Mechanical Engineering	03	00	02	04	05	30	10	60	40	60	200
5	CE0001	Computer Programming	03	00	02	04	05	30	10	60	40	60	200
6	CV0002	Engineering Mechanics	03	02	00	04	05	30	10	60	00	00	100
7	CV0001	Environmental Science	01	00	02	02	03	30	10	60	40	60	200
8	SH0202	Business Communication and Presentation Skill	01	02	00	02	03	30	10	60	00	00	100
TOTAL			**18**	**06**	**10**	**26**	**34**	**210**	**70**	**420**	**200**	**300**	**1200**

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

DEPARTMENT OF COMPUTER ENGINEERING AND COMPUTER SCIENCE & ENGINEERING
INDUS INSTITUTE OF TECHNOLOGY & ENGINEERING
INDUS UNIVERSITY

B-TECH COMP. SCIENCE & ENGG., SEMESTER –III TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017

SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	SH0301	Differential Equations and Integral Transforms	03	02	00	04	05	30	10	60	00	00	100
2	CS0301	Principles of Database Management System	04	00	02	05	06	30	10	60	40	60	200
3	EC0301	Digital Logic Design	03	00	02	04	05	30	10	60	40	60	200
4	CS0302	Object Oriented concepts and Programming	03	00	02	04	05	30	10	60	40	60	200
5	CS0303	Data Communication Engineering	03	00	02	04	05	30	10	60	40	60	200
6	CS0304	Web Design	03	00	02	04	05	30	10	60	40	60	200
7	SH0307	Human values & professional Ethics	01	00	00	00	01	40	00	60	00	00	100
TOTAL			**20**	**02**	**10**	**25**	**32**	**220**	**60**	**420**	**200**	**300**	**1200**

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

DEPARTMENT OF COMPUTER ENGINEERING AND COMPUTER SCIENCE & ENGINEERING
INDUS INSTITUTE OF TECHNOLOGY & ENGINEERING
INDUS UNIVERSITY

B-TECH COMP. SCIENCE & ENGG., SEMESTER –IV TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017

SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	SH0401	Complex Analysis and Numerical Methods	03	02	00	04	05	30	10	60	00	00	100
2	CS0401	Fundamentals of Data Structure	04	00	02	05	06	30	10	60	40	60	200
3	CS0402	Operating System	04	00	02	05	06	30	10	60	40	60	200
4	CS0403	Core Java Programming	04	00	02	05	06	30	10	60	40	60	200
5	CS0404	Computer Organization & Architecture	03	00	00	03	03	30	10	60	00	00	100
6	CS0405	Object Oriented Analysis & Design	03	00	00	03	03	30	10	60	00	00	100
7	CE0407	Cyber security & Intellectual Property Rights	01	00	00	00	01	40	00	60	00	00	100
TOTAL			**22**	**02**	**06**	**25**	**30**	**220**	**60**	**420**	**120**	**180**	**1000**

DEPARTMENT OF COMPUTER ENGINEERING AND COMPUTER SCIENCE & ENGINEERING
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B-TECH COMP. SCIENCE & ENGG., SEMESTER –V TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017

SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	CS0506	Microprocessor	03	02	00	04	05	30	10	60	00	00	100
2	CS0501	Computer Networks	03	00	02	04	05	30	10	60	40	60	200
3	CS0502	Design and Analysis of Algorithms	04	00	02	05	06	30	10	60	40	60	200
4	CS0503	Formal Languages and Automata Theory	04	00	00	04	04	30	10	60	00	00	100
5	CS0504	Web Technologies	03	00	02	04	05	30	10	60	40	60	200
6	CS0505	Software Engineering	03	02	00	04	05	30	10	60	00	00	100
7	SH0507	Technical Communication and Soft Skills	01	00	00	00	01	40	00	60	00	00	100
TOTAL			**21**	**02**	**08**	**25**	**31**	**220**	**60**	**420**	**160**	**240**	**1100**

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

DEPARTMENT OF COMPUTER ENGINEERING AND COMPUTER SCIENCE & ENGINEERING
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B-TECH COMP. SCIENCE & ENGG., SEMESTER –VI TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017

SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	CS0601	Computer Graphics	03	00	02	04	05	30	10	60	40	60	200
2	CS0602	Python Programming	03	00	02	04	05	30	10	60	40	60	200
3	CS0603	Advance Java Technology	04	00	02	05	06	30	10	60	40	60	200
4	CS0604	System Programming	03	00	02	04	05	30	10	60	40	60	200
5	CS0605	Parallel Computing (Mooc)	03	00	02	04	05	30	10	60	40	60	200
	CS0606	Soft Computing											
	CS0607	Android Programming											
6	CS0608	Data Warehouse & Mining	03	00	02	04	05	30	10	60	40	60	200
	CS0609	Distributed Operating System											
	CS0610	Distributed Database Management System											
7	SH0607	Advanced Technical Communication And Soft Skills	01	00	00	00	01	40	00	60	00	00	100
TOTAL			**20**	**00**	**12**	**25**	**31**	**220**	**60**	**420**	**200**	**300**	**1200**

MOOC link - https://www.coursera.org/learn/parprog1

DEPARTMENT OF COMPUTER ENGINEERING AND COMPUTER SCIENCE & ENGINEERING
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B-TECH COMP. SCIENCE & ENGG., SEMESTER –VII TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017

SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	CS0701	Mobile Computing	04	00	02	05	06	30	10	60	40	60	200
2	CS0702	Compiler Design	03	00	00	03	03	30	10	60	00	00	100
3	CS0703	Big Data Analytics	03	00	02	04	05	30	10	60	40	60	200
4	CS0704	Advanced. Net Framework	04	00	02	05	06	30	10	60	40	60	200
5	CS0705	Cryptography & Network Security	03	00	02	04	05	30	10	60	40	60	200
6	CS0706	Iot & Applications	03	00	02	04	05	30	10	60	40	60	200
	CS0707	High Performance Computing											
	CS0708	Web Data Management											
7	CV0712	Disaster Management	01	00	00	00	01	40	00	60	00	00	100
TOTAL			**21**	**00**	**10**	**25**	**31**	**220**	**60**	**420**	**200**	**300**	**1200**

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B-TECH COMP. SCIENCE & ENGG., SEMESTER –VIII TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017														
SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME						
								THEORY			PRACT		TOTAL
								CIE		ESE	CIE	ESE	
			L	T	P			MID	IE				
1	CS0801	Project	00	00	40	20	40	00	00	00	40	60	100
TOTAL			**00**	**00**	**40**	**20**	**40**	00	00	00	40	60	**100**

1ST SEMESTER

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

B-TECH COMP. SCIENCE & ENGG., SEMESTER –I TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017													
SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE		ESE	CIE	ESE	
			L	T	P			MID	IE				
1	SH0101	Differential Calculus & Matrix Algebra	04	02	00	05	06	30	10	60	00	00	100
2	SH0001	Engineering Physics	03	00	02	04	05	30	10	60	40	60	200
3	EL0001	Electrical Workshop	00	00	02	01	02	00	00	00	40	60	100
4	EL0002	Elements of Electrical Engineering	03	00	02	04	05	30	10	60	40	60	200
5	ME0001	Engineering Graphics	01	06	00	04	07	30	10	60	00	00	100
6	EC0001	Basic Electronics	02	00	02	03	04	30	10	60	40	60	200
7	MT0001	Materials Science	03	00	00	03	03	30	10	60	00	00	100
8	SH0102	Technical English	01	02	00	02	03	30	10	60	00	00	100
TOTAL			**17**	**10**	**08**	**26**	**35**	**210**	**70**	**420**	**160**	**240**	**1100**

Subject: **Differential Calculus & Matrix Algebra**								
Program: **B.Tech All Branches**				Subject Code: SH0101			Semester: **I**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	2	0	5	60	00	40	00	100

Course Objectives:

1. To provide mathematical knowledge and skills needed to support their concurrent and subsequent engineering studies.
2. To provide an ability to apply knowledge of basic science and engineering fundamentals.
3. To provide an ability to undertake problem identification, formulation and solution.
4. To provide an ability to analyze different mathematical models within science and technology and work creatively, systematically and critically.
5. To provide an ability to find strategies for the solution of different types of mathematical models using knowledge about the possibilities and limitations of the different methods and tools.
6. To provide an ability to develop abstract, logical and critical thinking and the ability to reflect critically upon their work and work of others.
7. To provide an ability to insight their strengths and weakness as learners and to appreciate the value of errors or mistakes as powerful motivators to enhance learning and understanding.

Contents

UNIT I **Differential Calculus** **10 hrs.**

Derivatives of nth Derivative of some Elementary Functions
Leibnitz's Theorem
Taylor's Series and Maclaurin's Series Expansions
Indeterminate Forms.
Functions of Several Variables: Limit and Continuity

UNIT II **Partial Differentiation and its Applications** **13 hrs.**

Partial Differentiation
Variable Treated as Constant, Total Derivative
Partial Differentiation of Composite Functions: Change of Variable-Differentiation of an Implicit Function -Euler's Theorem
Jacobian, Error and Approximations

Taylor's Theorem for Function of two Variables
Maxima and Minima of Functions of two Variables: with and without constraints
Lagrange's Method of Undetermined Multipliers.

UNIT III **Basic of Matrix algebra** **13 hrs.**

Concepts of Determinants and Matrices, Types of Matrices
Row Echelon and Reduced Row Echelon form
Inverse of a Matrix, Rank of a Matrix, Normal Form
System of Linear Homogeneous Equations
System of Non-Homogeneous Equations, Gaussian Elimination Method

UNIT IV **Vector Differential Calculus** **12hrs.**

Curvilinear coordinate system, Cartesian, Spherical and Cylindrical coordinate system
Vector Differentiation, Directional Derivative, Gradient of a Scalar Function and Conservative Field
Directional Derivative, Gradient of a Scalar Function and Conservative Field
Divergence and Curl, Related Properties of Gradient, Sums of Divergence and Curl

Subject: **Engineering Physics**								
Program: **B.Tech All Branches**				Subject Code: SH0001			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Objectives:

1. An ability to apply knowledge of basic physics, mathematical foundations and engineering theory in the modeling and design of real-world problems (**fundamental engineering analysis skills).**
2. An ability to design and conduct experiments, as well as to analyze and interpret data **(information retrieval skills).**
3. An ability to analyze a problem , identify and formulate using the concept of physics and to solve engineering problem**(engineering problem solving skills).**
4. Recognition of the need for, and an ability to engage in continuing professional development and life-long learning **(continuing education awareness).**
5. An ability to use current techniques, skills, and tools necessary for Physics and engineering practice **(practical engineering analysis skills).**

Course Content:

UNIT-I **[12]**

Wave motion and Sound

Propagation of waves, longitudinal and transverse waves, mechanical and non-mechanical waves Introduction to sound waves, Characteristics and Properties of Sound, Absorption co-efficient, Reverberation time, Sabine's formula (without derivation), Factors affecting architectural acoustics,

Introduction of Ultrasonic waves, Generation of ultrasonic waves, Detection of ultrasonic waves, Applications of Ultrasonic waves: NDT, SONAR & others.

Optics

Introduction to Reflection, Refraction and Total Internal Reflection;

Wavefront and Huygen's principle;Interference: Types of interferences, Thin film interference, Newton's rings and its applications

Diffraction of light waves: Types of Diffraction, Single-slit Fraunhoffer diffraction, Plane diffraction grating, Resolving power of grating, Rayleigh Criterion, Optical polarization (Introduction)

UNIT-II **[11]**

Quantum Mechanics

Black body radiation: Planck's law (without derivation), Wien's displacement law and Rayleigh – Jeans' law from Planck's theory; Compton effect (Theory and experimental verification), De-Broglie theorem, Uncertainty principle; Schrodinger's wave equation – Time independent and time dependent equations – Physical significance of wave function, Particle in one dimensional rigid box.

Laser

Energy levels in atoms, Absorption, Spontaneous Emission and Stimulated Emission of light, Relation between Einstein's Coefficients, Population Inversion, Metastable State, Pumping Mechanism, Optical Resonators, Fundamentals of LASER, Characteristics of Laser radiation
Types of Laser: Solid State Laser (Nd-YAG laser), Gas laser (He-Ne laser), Applications of Laser: Medical, Industrial, Holography (introduction).

UNIT-III **[12]**

Electromagnetism & Dielectrics

Coulomb's law for distribution of charges, Gauss's law and applications, Electric current and Equation of continuity, Electric field intensity, Electric flux, Electric dipole moment, Electric field due to dipole, Introduction to dielectrics, Polarizability, Types of polarization – electronic, ionic, orientational, Polarization of dielectrics, Gauss's law in presence of dielectric, Dielectric constant, Electric susceptibility and Permittivity, Internal (Local) field in dielectric, ClausiusMossotti equation (with derivation)
Magnetic field, Steady current, Biot-Savart law, Ampere's law and applications, Faradays law of Induction, Lenz's Law; Effect of magnetic field on current carrying conductor, Lorentz force

Magnetism

Basic important terms and units in Magnetism, Concept and origin of magnetic moment, magnetic susceptibility, Total angular momentum, Diamagnetism, Paramagnetism, Ferromangnetism, Ferrimagnetism, Antiferromagnetism, Domain theory of Ferromagnetism, Curie temperature and hysteresis loss

UNIT-IV **[10]**

Superconductivity

Superconductivity: Zero resistance, Critical temperature, Meissner effect, Critical field, General properties of superconductors**,** Type-I and Type-II superconductors, BCS theory of Superconductor, High temperature superconductors
Applications of Superconductors: SQUID, Maglev

Nanophysics

Nanoscale, Surface to volume ratio, Surface effects on nanomaterials, Quantum size effect, Electron confinement, Nanoparticles and Nanomaterials, Properties of Nanomaterials
Advantages & Disadvantages of Nanomaterials**,**

Synthesis of nanomaterials: Laser ablation, ball milling, chemical vapor deposition, sol gel, Carbon nanotubes: structure, synthesis, properties and applications, Applications of Nanomaterials.

Text Books:

1. Engineering Physics by Rajendran (Tata Mc Graw Hill)
2. Engineering Physics by D.K. Bhattacharya, Poonam Tandon (Oxford University Press)

Reference Books:

1. Resnick and Haliday, Physics Part-I & II, Wiley Eastern publication
2. Engineering Physics by P. Khare&Swarup (Jones & Bartlett Learning)
3. A textbook of Engineering Physics by S.O. Pillai (New Age International)
4. An introduction to Electrodynamics by David Griffiths (Pearson Education)
5. Optics by A. Ghatak (Tata McGraw-Hill)
6. Engineering Electromagnetics by W H Hayt& J A Buck (Tata McGraw-Hill)
7. Engineering Physics by K. Rajagopal (Prentice Hall India)
8. Engineering Physics by M. N. Avadhanulu, P. G. Khirsagar (S.Chand Pub.)

Web resources:

1. http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Guwahati/engg_physics/index_cont.htm
2. http://ncert.nic.in/html/learning_basket.htm
3. http://science.howstuffworks.com/laser1.htm
4. http://physics-animations.com/Physics/English/optics.htm
5. http://www.epsrc.ac.uk
6. http://www.pitt.edu/~poole/physics.html#light
7. https://www.khanacademy.org/science/physics

MOOCs:

https://www.edx.org/course/subject/physics

List of Experiments:

1 Photocell: To verify the inverse square law using photocell.

2 Ultrasonic Interferometer: To determine the wavelength and velocity of ultrasonic wave through ultrasonic interferometer.

3 Determination of Refractive index: To determine the refractive index of a given material (prism) using spectrometer.

4 Resolving power of grating: To determine resolving power of a diffraction grating.

5 Newton's Ring: To determine the wavelength of monochromatic light

6 Planck's Constant : To determine the Planck's Constant using LED

7 Determination of Wavelength of Laser: To determine the wavelength of LASER using diffraction grating.

8 Determination of wavelength of laser using single slit

9 Dielectric constant: To determine the dielectric constant of a dielectric substance.

10 Hysteresis loss: To determine the Hysteresis loss in a Ferromagnetic material.

11 To determine the magnetic field at the center of a coil and its variation with distance and radius of the coil.

12 To verify the Faraday's law of electromagnetic induction.

Text Books

1. B.V.RAMANA: "HIGHER ENGINEERING MATHAMATICS", TATA McGraw Hill**.**
2. R K Jain, S R K Iyengar: " Advanced Engineering Mathematics. Third Edition", Narosa Publishing House

Reference Books

1. Erwin Kreyszig: "Advanced Engineering Mathematics (8th Edition) ",Wiley Eastern Ltd., New Delhi.
2. Dr. B.S. Grewal : "Higher Engineering Mathematics", Khanna Publishers, New Delhi
3. Murray Spiegel : "Advanced Mathematics for Engineering & Science: Schaum's Outline Series" ,Tata - McGraw Hill Publication
4. Merel C Potter, J L Goldberg: "Advanced Engineering Mathematics (3rd Edition)"Oxford India Publication.

Digital Learning Resources & Moocs

1. http://freevideolectures.com/blog/2010/11/130-nptel-iit-online-courses/
2. http://nptel.ac.in/video.php?subjectId=122107036
3. http://ocw.mit.edu/index.htm
4. https://www.khanacademy.org/

Subject: **Electrical Workshop**								
Program: **B.Tech All Branches**				Subject Code: EL0001			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
0	0	2	1	00	60	00	40	100

Course Objectives:

After completion of this course, expected outcomes from the students:

1. **Fundamental Engineering Analysis Skill**: Ability to apply knowledge of Electrical Engineering.
2. **Information Retrieval Skills:** Ability to design electrical circuits and conduct experiments with electrical engineering as well as to analyze and interpret data.
3. **Practical Engineering Analysis Skills:** Ability to acquire new knowledge to use modern engineering tools and equipments to analyze problems necessary for engineering practice. Knowledge of basic electrical and electronic device.

LIST OF EXPERIMENTS

Exp. No.	Title	Learning Outcome
1	Introduction to symbols and abbreviations used in electrical engineering.	• Basic knowledge of symbols and abbreviations that are used in electrical engineering
2	Introduction to IE rules.	• Understanding of safety rules • Safety precautions to be taken in the laboratory
3	Identify different types of cables/wires, switches, fuses, MCB, ELCB, MCCB with their ratings and usage.	• To understand basic working principle of different protective devices • To recognize the practical applications of these protective devices by their demonstration
4	Performance of Electric shock phenomena, precautions, preventions, earthing.	• To identify the importance of earthing in electric network. • To understand, how earthing works

5	Measuring instruments like Ammeter, Voltmeter, Wattmeter, Watt-hour Meter, and Megger with their description and usage.	• To get familiar with different measuring devices • To understand the working principle on which these devices work
6	To measure earthing resistance using insulation tester (Megger).	• Basic knowledge of earthing resistance • Working principle of insulation tester (megger)
7	Wiring of power distribution arrangement using single phase MCB distribution board with ELCB, Main switch and Energy meter.	• To identify different components used in wiring scheme • Basic knowledge of designing a simple wiring scheme • To identify the principle and working of energy meter
8	Wiring of light/fan circuit using Two way switches (Staircase wiring), Wiring of fluorescent lamps and light sockets (6 A)	• Basic knowledge of staircase wiring • Wiring of fluorescent lamps • Identification of sockets
9	Wiring of backup power supply including inverter, battery and load for domestic installations.	• To have the basic idea of inverter and battery • Basic knowledge of back-up power supply
10	Demonstration and measurement of power consumption of Electric Iron, Mixer Grinder, Single phase pump, exhaust fan or other home appliance.	• To have the knowledge of working of electric iron, mixer grinder and pump • To demonstrate the power consumption by these devices
11	Preparing the drawing for wiring a newly built room, without any electrical wiring along with a bill of materials with specifications; the room may be a class-room, an office, a shop, a clinic, a small workshop etc.	• Exercise for students to make a wiring scheme for any of the given example • To estimate the total cost of appliances, materials and wiring

Subject: **Elements of Electrical Engineering**								
Program: **B.Tech All Branches**			Subject Code: EL0002			Semester: **I/II**		
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	24/60	24/60	16/40	16/40	200

Course Outcome:

1. **Fundamental Engineering Analysis Skill**: Ability to apply knowledge of Electrical Engineering.
2. **Information Retrieval Skills:** Ability to design electrical circuits and conduct experiments with electrical engineering as well as to analyze and interpret data.
3. **Engineering Problem Solving Skills:** Ability to identify, formulate and solve engineering problems.
4. **Practical Engineering Analysis Skills:** Ability to acquire new knowledge to use modern engineering tools and equipment's to analyze problems necessary for engineering practice.

Contents:

UNIT-I **[07]**

DC Circuits

Elementary Concepts:

Ohm's Law and Kirchhoff's Laws, Analysis of series, parallel and series-parallel circuits; Star–Delta conversion; Nodal analysis, Mesh analysis, voltage sources and current sources, Super position theorem, Thevenin's theorem, Norton's theorem, Equvalence of thevenin's and norton's theorem, Maximum power transfer theorem.

UNIT-II **[12]**

Electrostatics:

Electric charge and Laws of electrostatic, Capacitor; Capacitor in series and parallel, variable capacitor, Instantaneous voltage and current in capacitor, charging and discharging of capacitor, Energy stored in a capacitor, types of capacitor.

Magnetic Circuit:

Magneto motive force, magnetic field strength, reluctance, Relation between magnetic circuit parameter, Laws of magnetic circuit, composite magnetic circuit: series magnetic circuit, parallel magnetic circuit, comparison of Electric and magnetic circuit, Effect of magnetic field on current carrying conductor; Statically and dynamically induced EMF; Concepts of self inductance, mutual inductance, energy stored in inductor, coefficient of coupling; Inductance in series and parallel; Hysteresis and Eddy current losses.

UNIT-III **[16]**

Single Phase A.C. Circuits:

Generation of sinusoidal voltage, Definition of average value, root mean square value, form factor and peak factor; Phasor representation of alternating quantities; Analysis with phasor diagrams of R, L, C, R-L, R-C and R-L-C circuits; Concepts of Real power, Reactive power, Apparent power and Power factor, methods to improve power factor, Series, Parallel and Series - Parallel circuits; Power in AC circuit, Resonance in series and parallel circuits.

Three Phase A.C. Circuits:

Necessity and Advantages of three phase systems, Generation of three phase power, definition of Phase sequence, balanced supply and balanced load; Relationship between line and phase values of balanced star and delta connections; Power in balanced three phase circuits, measurement of power by two wattmeter method; Work, Power, Energy, Problems

UNIT-IV **[13]**

Transformers: Principle of operation and construction of single phase transformers (core and shell types). EMF equation, losses, efficiency.

DC Machines: Working principle of DC machine as a generator and a motor; DC series motor, DC shunt motor, DC compound motor constructional features.

Induction Motor: Concept of rotating magnetic field; Principle of operation, types and constructional features, slip and its significance.

Text Books:

1. A. Chakrabarti, “Basic Electrical Engineering”, Tata McGraw Hill
2. A.E Fitzgerald, David E. Higginbotham, Arvin Grabel, “Basic Electrical Engineering”, 5th Edition, Tata McGraw Hill.

Reference Books:

1. Vincent Del. Toro (2012), “Principles of Electrical Engineering”, Prentice Hall, India
2. Electrical Estimating & Costing by Surjit Singh (Dhanpat Rai & sons).
3. J.N. Swamy, “Elements of Electrical Engineering” Mahajan Publishing House.
4. Nagrath I.J. and D. P. Kothari (2001), “Basic Electrical Engineering”, Tata McGraw Hill.
5. Rajendra Prasad (2009), “Fundamentals of Electrical Engineering”, Prentice Hall, India

Web Resources:

1. www.nptel.ac.in
2. www.youtube.com

Subject: **Engineering Graphics**								
Program: **B.Tech All Branches**				Subject Code: ME0001			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
1	6	0	4	24/60	00	16/40	00	100

Content:

Unit - I

1. **Introduction to engineering graphics**
   Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions- Dimensioning systems – polygons-types of lines
2. **Engineering curves**
   Classification and application of Engineering Curves, Construction of different methods of Ellipse, parabola and Hyperbola, construction of Conics, Cycloid Curves – Cycloid, Hypocycloid, Epicycloids, Involutes and Spirals.

Unit- II

3. **Projections of Points and Lines**
   Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes. True length and inclination with the reference planes.
4. **Projections of Planes**
   Projections of planes (polygons, circle, and ellipse) with its inclination to one reference plane and with two reference planes, Concept of auxiliary plane method for projections of the plane.

Unit- III

5. **Projections of Solids**
   Classification of solids. Projections of solids (Cylinder, Cone, Pyramid, Prism) along with frustum of cone and pyramid with their inclinations to one reference plane and with two reference planes.

Unit- IV

6. **Orthographic And Sectional Orthographic Projections**
   Fundamental of projection along with classification, Projections from the pictorial view of the object on the principal planes for view from front, top and sides using first angle projection method and third angle projection method, introduction of section of objects, full sectional view.

7. **Isometric Projections**
   Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing.

Text Books

1. P.J. Shah, "A Text Book of Engineering Graphics" Publication: S.Chand.
2. A Text Book of Machine Drawing By P. J. Shah S.Chand & Company Ltd., New Delhi

Reference Books

1. N.D.Bhatt , "Elementary Engineering Drawing", Charotar Publishing House, Anand
2. P.D.Patel, " Engineering Graphics" Publication: Mahajan
3. A text book of Engineering Drawing by R.K.Dhawan, S.Chand &Company Ltd., New Delhi
4. A text book of Engineering Drawing by P.S.Gill, S.K.Kataria & sons, Delhi

Web Resources

1. www.nptel.ac.in

Subject: **Basic Electronics**								
Program: **B.Tech All Branches**				Subject Code: EC0001			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
2	0	2	3	24/60	24/60	16/40	16/40	200

Course Outcome:

After completion of the course, the student will be able to –

1. Recognize basic electronic components and devices used for different electronic functions
2. Explain the concepts of semiconductor physics
3. Design and test basic electronic circuits using active components
4. Solve basic problems in simple electronic circuits

Contents

UNIT 1 **[10]**

Energy Bands in Solids

Charged Particles, Field Intensity, Potential Energy, The eV Unit of Energy, Nature of Atom, Atomic Energy Levels, Electronic Structure of the Elements, Energy distribution of electrons, Fermi-Dirac function, Energy Band Theory of Crystals, Insulators, Semiconductors and Metals

Transport Phenomena in Semiconductors

Mobility and Conductivity, Electrons and Holes in an Intrinsic Semiconductor, Donor and Acc in a Semiconductor, Electrical properties of Ge and Si, Hall Effect, Conductivity Modulatio of Charges, Diffusion, The Continuity Equation, Injected Minority–Carrier Charge, Pot Semiconductor,

UNIT 2 **[10]**

Junction –Diode Characteristics: Open circuit p-n Junction, p-n Junction as a Rectifier, Current Components in a p-n diode, Volt-Ampere Characteristic, Temperature Dependence of the V/I Characteristic, Diode Resistance, Space Charge, Transition Capacitance, Charge-Control Description of a Diode, Diffusion Capacitance, Junction Diode Switching Times, Breakdown Diodes, Tunnel Diode, Semiconductor Photodiode, Photovoltaic Effect, Light – Emitting Diodes, Schottky diode, varactor diode, GUNN diode, SCR

Diode Circuits:
Diode as a Circuit Element, Load-Line Concept, Piecewise Linear Diode Model, Clipping Circuits, Clipping at Two Independent Levels, Comparators, Sampling Gate, Rectifiers, Other Full-Wave Circuits, Capacitor Filters, Additional Diode Circuits

UNIT 3 **[5]**

Transistor Characteristics:
Junction Transistor, Transistor Current Components, Transistor as an Amplifier, CB Configuration, CE Configuration, CC Configuration, Analytical Expressions for Transistor Characteristics Maximum Voltage Rating, Phototransistor, Transistor biasing.

UNIT4 **[7]**

Field Effect Transistors:
Junction FET, JFET Volt-Ampere Characteristics, MOSFET

Operational Amplifiers:
Introduction to Op Amps, Inverting Amplifier, Non-inverting amplifier, Op Amp applications

Introduction to Data converters:
ADC & DAC

Introduction to Microprocessors and Microcontrollers:
Basic digital ICs, Architecture of processors and controllers

Text book

1. 'Integrated Electronics' By J. Millman and C. C. Halkias, Chetan Parikh, 2nd Ed., Tata McGraw Hill Publication

Reference Books

1. 'Electronic Principles' by Albert Malvino and David Bates, 7th Ed., Tata McGraw Hill Publication
2. 'Electronic Devices and Circuit Theory' by Robert Boylestad and Louis Nashelsky, 9th Ed., Prentice Hall India
3. "Digital Electronics" by Morris Mano, 2006

List of Experiments

1. To plot VI characteristics of PN junction diode
2. To plot VI characteristics of Zener diode

3. To plot VI characteristics of Tunnel diode
4. To measure ripple factor of a rectifier
5. Build and test wave shaping circuits
6. To plot input and output VI characteristics of CB configuration using BJT
7. To plot input and output VI characteristics of CE configuration using BJT
8. To plot input and output VI characteristics of CC configuration using BJT
9. To plot drain and transfer characteristics of a JFET
10. To build and test inverting and non-inverting amplifier
11. To build an LED driver circuit and test
12. To build and test an integrator and differentiator with Op Amp

Subject: **Materials Science**								
Program: **B.Tech All Branches**				Subject Code: MT0001			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	0	3	24/60	00	16/40	00	100

1. Course Outcomes

- Evaluate different materials for engineering applications.
- To categorize material according to their properties and requirement.
- To classify materials and understand the importance of each material in order to find applications in other fields of engineering.

2. Contents

		Time Allotted
Unit 1	Introduction, Engineering requirement of different materials, Classification of Engineering materials, Properties of engineering materials , Criteria for selection of materials for engineering application. Crystal Physics; Structure of crystalline solids; Lattices, unit cells; Indexing of directions and planes, notations, Interplanar spacings and angles, Crystal structure analysis - Bragg's law for X-ray diffraction.	8 hours
Unit 2	Ferrous metals & Alloys- Pig iron, cast iron, carbon steel, alloy steels- Classification, properties, composition and applications. Non-Ferrous Metals & Alloys- Important non-ferrous metals (Al, Cu, Pb, Zn, Sn, Mg, Ti, Ni,), Non-ferrous alloys (Cu alloys, Al alloys, Mg-alloys, Ni-alloys) – Composition, properties, classification and applications.	12 hours
Unit 3	Introduction, Simple crystal structure, Classification- Traditional (clay-products, refractories, abrasives, cement) and Engineering Ceramics- Glass Ceramics, Properties of ceramics, Application of Ceramics, Glasses, Glass structure, Properties and application of Glass, Types of glass. Introduction, Classification and forms of Polymers, Thermosetting & thermoplastic polymer, types of polymerizations, Molecular weight, Plastics, Natural rubber and synthetic rubber, Applications of polymeric materials.	12 hours

Unit 4	Introduction, Classification & Applications, Dispersion-strengthened, Composites, Particulate Composites, Fiber-reinforced Composites: Influence of Fiber Length, Influence of Fiber Orientation and Concentration, The Fiber Phase, The Matrix Phase, Polymer-Matrix. Composites, Metal-Matrix Composites, Ceramic - Matrix Composites, Carbon–Carbon Composites, Processing of Fiber-Reinforced Composites. Smart materials (Shape memory material, Piezo electric material) Photoconductors, Bio-materials, Nano materials, Dielectric materials, magnetic materials, metamaterials, Cryogenics, Optical Fiber.	14 hours

3. Text Book(s)

1) Material Science and Metallurgy by O.P Khanna, Dalpat Rai Publications
2) Engineering Materials by R. K Rajput, S. Chand Publications.
3) Material Science & Engineering – An Introduction by W.D. Callister, John Wiley.

4. Reference Books

1) Introduction to Materials Science for Engineers – James Shackelford, Pearson, Prentice Hall; 8 edition.
2) Elements of Materials Science –by L.H. Vanvlack, Addision-Wisley Series
3) Element s of Metal lurgy by D. Swarup, Rastogi Publication
4) Engineering Materials by S.C. Rangwala and P.S. Rangwala, Charotar publication house Pvt. Ltd.
5) Materials Science and Engineering by Willing F. Smith, TMH publication

5. Web Resources

http://nptel.ac.in/

Subject: **Technical English**								
Program: **B.Tech All Branches**				Subject Code: SH0102			Semester: **I**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
1	2	0	2	60	00	40	00	100

Course Objectives:

1. To help students develop comprehension and soft skills
2. To increase student's ability to improve and utilize the technical skills necessary for reading and writing.
3. To improve students' communication skills in both technical and professional contexts.

Course Content:

Unit 1:
Language Focus Vocabulary
Technical vocabulary, Synonyms and Antonyms, Idiom & Proverbs, One Word Substitutes, Phrasal Verbs, Collocations.

Unit 2:
Language Focus Grammar (Rules & Exception)
Sub-Verb-Agreement, Tenses, Numerical adjectives, Conjunction and Preposition clauses, Noun and adjective clauses, Relative clauses, Imperative and infinitive structures, Question pattern, Auxiliary verbs (Yes or No questions), Contrasted time structures, Adverbial clauses of time, place and manner, Intensifiers, Basic pattern of sentences(Simple, Complex, Compound Construction).

Unit 3:
Listening
Listening to lectures, seminars, workshops, TED Talks, Writing a brief summary or answering questions on the material listened.

Unit 4:
Speaking
Phonetics (Pronunciation, stress and intonation), Role Play Activity, Group Discussion & Debate (Acceptance & Arguing each other's view points), Verbal & Non-Verbal Communication.

Reference Books:

1. English for Engineers and Technologists, Volumes 1 and 2, Department of Humanities and Social Sciences, Anna University, Chennai, Orient Longmans Publication, 2008.

1. Balasubramanyam, M and Anbalagan, G., Perform in English, Anuradha Publications, Kumbakonam, 2010.
2. Meenakshi Raman and Sangeetha Sharma, Technical Communication: Principles and Practice, Oxford University Press, New Delhi, 2004.
3. KiranmaiDutt, P. et al., A Course on Communication Skills, Edition Foundation Books, New Delhi, 2007.
4. Ashraf Rizvi, M., Effective Technical Communication, Tata McGraw Hill Publication, New Delhi, 2008.
5. Geoffrey Leech, Jan Swartvik, 'A Communicative Grammar of English', ELBS – Longman.
6. Norman and Lewis, 'English Made Easy', Oxford Publication.
7. E- Writing: 21st –Century Tools for Effective Communication, Dianna Booher, Macmillan India Ltd., 2007, ISBN – 1403-93202-6
8. R. K Bansal, spoken English for India (Orient Longman, Madras, 1972.

Web resources/ MOOCs:

1. Grammar Clauses: https://www.khanacademy.org/humanities/grammar/syntax-sentences-and-clauses
2. Parts of Speech Conjunctions & Prepositions: https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-preposition-and-the-conjunction
3. Nouns: https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-noun
4. Verbs: https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-verb
5. Pronouns: https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-pronoun
6. Adjectives & Adverbs: https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-modifier
7. Syntax: Conventions of Standard English: https://www.khanacademy.org/humanities/grammar/syntax-conventions-of-standard-english

2ND SEMESTER

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

B-TECH COMP. SCIENCE & ENGG., SEMESTER –II TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017													
SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE		ESE	CIE	ESE	
			L	T	P			MID	IE				
1	SH0201	Integral Calculus and Linear Algebra	04	02	00	05	06	30	10	60	00	00	100
2	SH0002	Engineering Chemistry	03	00	02	04	05	30	10	60	40	60	200
3	ME0004	Mechanical Workshop	00	00	02	01	02	00	00	00	40	60	100
4	ME0002	Elements of Mechanical Engineering	03	00	02	04	05	30	10	60	40	60	200
5	CE0001	Computer Programming	03	00	02	04	05	30	10	60	40	60	200
6	CV0002	Engineering Mechanics	03	02	00	04	05	30	10	60	00	00	100
7	CV0001	Environmental Science	01	00	02	02	03	30	10	60	40	60	200
8	SH0202	Business Communication and Presentation Skill	01	02	00	02	03	30	10	60	00	00	100
TOTAL			**18**	**06**	**10**	**26**	**34**	**210**	**70**	**420**	**200**	**300**	**1200**

Subject: **Integral Calculus and Linear Algebra**								
Program: **B.Tech All Branches**				Subject Code: SH0201			Semester: **II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	2	0	5	60	00	40	00	100

Course Objectives:

1. To provide mathematical knowledge and skills needed to support their concurrent and subsequent engineering studies.
2. To provide an ability to apply knowledge of basic science and engineering fundamentals.
3. To provide an ability to undertake problem identification, formulation and solution.
4. To provide an ability to analyze different mathematical models within science and technology and work creatively, systematically and critically.
5. To provide an ability to find strategies for the solution of different types of mathematical models using knowledge about the possibilities and limitations of the different methods and tools.
6. To provide an ability to develop abstract, logical and critical thinking and the ability to reflect critically upon their work and work of others.
7. To provide an ability to insight their strengths and weakness as learners and to appreciate the value of errors or mistakes as powerful motivators to enhance learning and understanding.

CONTENTS

UNIT I **Infinite Series** **8 hrs.**

Standard Infinite Series: Geometric Series and Harmonic Series
Tests for Convergence and Divergence
Comparison Test, Cauchy's Integral test, D'alembert's ratio Test, Cauchy's nth Root Test
Alternating Series Leibnitz's Theorem, Absolute Convergence and Conditionally Convergence, Power Series

UNIT II **Multiple Integration** **13 hrs.**

Curve Tracing: Curves in Cartesian and Polar Form

Reduction Formulae
Double Integral, Change of order of Integration in Double integral
Change of Variables in Double Integral from Cartesian to polar
Application of Double Integral to find area and volume
Triple Integral

UNIT III **Linear Algebra** **14 hrs.**

Eigen Values and Eigen Vectors - Properties of Eigen Values and Eigen Vectors
Cayley-Hamilton Theorem – Diagonalization, Powers of a Matrix
Real Matrices: Symmetric, Skew Symmetric, Orthogonal
Complex Matrices: Hermition, Skew Hermition, Unitary Matrices.

UNIT IV **Vector Integral Calculus** **13 hrs.**

Vector Integration: Integration of a Vector Function of a Scalar Argument
Line Integrals: Work Done, Potential, Conservative Field and Area
Introduction to Surface Integrals, Volume Integrals
Green's Theorem in Plane, Stokes' Theorem, Gauss Divergence Theorem

Text Books

1. B.V.RAMANA: "HIGHER ENGINEERING MATHAMATICS", TATA McGraw Hill**.**
2. R K Jain, S R K Iyengar: " Advanced Engineering Mathematics. Third Edition", Narosa Publishing House

Reference Books

1. Erwin Kreyszig: "Advanced Engineering Mathematics (8th Edition) ",Wiley Eastern Ltd., New Delhi.
2. Murray Spiegel : "Advanced Mathematics for Engineering & Science: Schaum's Outline Series" ,Tata - McGraw Hill Publication
3. Dr. B.S. Grewal : "Higher Engineering Mathematics", Khanna Publishers, New Delhi
4. Merel C Potter, J L Goldberg: "Advanced Engineering Mathematics (3rd Edition)"

Web Resources & Moocs

1. http://freevideolectures.com/blog/2010/11/130-nptel-iit-online-courses/
2. http://nptel.ac.in/video.php?subjectId=122107036
3. http://ocw.mit.edu/index.htm
4. https://www.khanacademy.org/

Subject: **Engineering Chemistry**								
Program: **B.Tech All Branches**				Subject Code: SH0002			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. To study the basic concepts of chemistry & Engineering Applications of Chemistry.
2. To address the principles of general chemistry and specific topics relevant to various engineering disciplines, wherein the students should apply this learning in their respective areas of expertise.
3. To present sound knowledge of chemistry fundamentals.
4. To enrich students to understand the role of Applied Chemistry in the field of science and engineering.
5. To inculcate habit of scientific reasoning to do the task rationally.
6. To develop an ability to identify, formulate & solve chemistry & Engineering related Problems.
7. To provide mathematical knowledge and skills needed to support their concurrent and subsequent engineering studies.
8. Understand the various basic concepts used in engineering and process calculations.
9. Use fundamental chemistry concepts with direct application to the built environment.
10. Solve chemistry problems typically found on the Fundamentals of Engineering exam.

CONTENTS

UNIT I **(A) Electrochemistry** **7 hrs.**

Conductance, Cell constant and its determination; Electrochemical Cell, Galvanic Cell, Electrolytic Cell, Types of electrodes, Single electrode potentials, Reference Electrodes, Standard Hydrogen Electrode (SHE), Standard Calomel Electrode (SCE), Quinhydrone Electrode, EMF series, Cell emf measurement, Nernst equation, Conductometric titrations, Numerical.

(B) Corrosion **6 hrs.**

Definition and types of corrosion, Dry (chemical corrosion), Wet (Electrochemical corrosion) and its mechanisms; Types of electrochemical corrosion, (differential aeration, galvanic, concentration cell, water line, pitting, stress, erosion and soil corrosion, Caustic embrittlement, Factors affecting on corrosion (Metallic and Environmental), Pourbaix diagram, Protective measures to control Corrosion, Sacrificial anode and Cathode process for corrosion control.

UNIT II **Water Treatment Technology** **10 hrs.**

Sources of water, Soft Water & Hard Water, Types of hardness, Units of hardness measurement, Impurities in water, Disadvantages of hard water, Determination of water hardness by EDTA method, Alkalinity of water and its significance, Boiler feed water, Scale and sludge formation in boilers and pipes etc , Boiler Corrosion, Water softening through Soda lime process, Zeolite Process & Ion-exchange Process, Characteristics of Potable water, Specifications for drinking water (BIS and WHO standards), Sources and quality of drinking water, Treatment of water for domestic use: Filtration, Coagulation, Sedimentation and Disinfection, Concept of water harvesting, storage and recycling. Desalination through Electro Dialysis & Reverse Osmosis, Numerical problems.

UNIT III **(A) Dimensions, Units & Energy balances** **6 hrs.**

Dimensions and Units: Basic chemical calculations – atomic weight, molecular weight, equivalent weight, Mole concept, Inter-conversion of concentration units.
Material Balance without chemical reactions: Flow diagram for material balance, simple material balance with or without recycles or bypass.
Material Balance involves chemical reactions: concept of limiting reactant, conversion, yield, selectivity and liquid phase reaction, gas phase reaction with or without recycle or bypass.

(B) Instrumental Techniques **6hrs.**

Fundamentals of Spectroscopy; Principles and applications of UV-visible, IR, NMR, Mass & Atomic absorption Spectroscopy; Principles and applications of Chromatographic techniques including TLC, PC, Gas, HPLC.

UNIT IV **(A) Advance Organic Materials** **6 hrs.**

Liquid Crystals: Introduction, classification and applications, Organic Electronic Materials: Introduction, types and applications, Chemical Sensors: Introduction, types and applications, Ionic Liquids: Introduction and applications, Chromic Materials: Introduction, types and applications.

(B) Catalysis & Adsorption **7hrs.**

Catalysis: Types of catalysis, Positive & Negative catalysis, Homogeneous and Heterogeneous catalysis, Characteristics of Catalytic action, Poisoning of catalysis, Promoters, Auto Catalysis, Acid-Base Catalysis, Industrial Applications of Catalysts. Adsorption: Types of adsorption, adsorption isotherm: Freundlich adsorption isotherm, Langmuir adsorption Isotherm, Determination of surface area by BET method, Application of adsorption.

Text Books

1. P.C. Jain, M. Jain, Engineering Chemistry, Dhanpat Rai Publishing Company, New Delhi, **2005**.

2. Shashi Chawla, Textbook of Engineering Chemistry, Dhanpat Rai Publishing Co.**2004**.

Reference Books

1. Dara, S.S., Umare S.S.; A Text Book of Engineering Chemistry (Twelfth edition); S. Chand. Co. 2010.
2. P. Atkins, J.D. Paula, Physical Chemistry, Oxford University Press, **2002**.
3. A. J. Mee, Physical Chemistry, 6th Ed. English Language Book Society and Heinemann Educational Books Ltd. London, **1962**.
4. Douglas A. Skoog, Donald M. West, Fundamentals of Analytical Chemistry, Cengage Learning, Ninth Edition, **2014**.
5. Puri B. R., Sharma L. R. , Pathania M.S; Principles of Physical Chemistry; Vishal Publishing Co. (46nd Edition), **2013**.
6. Arthur E. Morris, Gordon Geiger and H. Alan Fine, Handbook on Material & Energy Balance Calculations in Material Processing,Third Edition, **2011**.

Digital Learning Resources & Moocs

1. http://freevideolectures.com/blog/2010/11/130-nptel-iit-online-courses/
2. http://nptel.ac.in/courses/113108051/
3. http://ocw.mit.edu/index.htm
4. https://www.khanacademy.org/

List of Practical:

1. Determination of the alkalinity of unknown water sample.
2. Estimation of hardness of water sample by EDTA method.
3. Estimation of dissolved oxygen in water sample.
4. Determination of metal ions (Ca^{2+}/Zn^{2+}) from the mixture by EDTA titration.
5. Determination of metal ions (Pb^{2+}/Mg^{2+}) from the mixture by EDTA titration.
6. Determination of the concentration of chloride ions in unknown water sample.
7. Thin Layer Chromatography (TLC) and Paper Chromatography (PC).
8. Determination of strength of Acid or Base by pH meter.
9. Determination of strength of Acid or Base by Conductometer.
10. To calculate the Acid value of the given sample of oil.
11. Determination of the saponification value of a given oil sample.
12. Determination of iron content from unknown sample by spectrophotometer.

Text Books:

1. G. H. Jeffery, J. Bassett, J. Mendham, R. C. Denney, Vogel's Textbook of Quantitative Chemical Analysis, 5th Edition, Longman Group of Publication, UK, **1989**.
2. Manual on Engineering Chemistry, S.K. Bhasin, S. Rani, Dhanpat Rai Publishing Company, New Delhi, 2011.

Subject: **Mechanical Workshop**								
Program: **B.Tech All Branches**				Subject Code: ME0004			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
0	0	2	1	60	00	40	00	100

Content

Unit - I

1. **Introduction**
   Introduction to Mechanical Workshop, Safety, and Safety rules, Safety Slogans, Tools and Equipments used for safety purpose.

Unit- II

2. **Fitting Shop:**
   Introduction, Fitting materials, Tools and Equipments used in Fitting, Fitting Joints.
   1 Job in for practical demonstration

Unit- III

3. **Carpentry Shop:**
   Introduction, Carpentry materials, Tools and Equipments used in Carpentry, Carpentry Joints.
   1 Job in for practical demonstration

Unit- IV

4. **Welding Shop:**
   Introduction, Welding Tools, Equipments and Machines, Various Welding Joints
   1 Job in for practical demonstration

Text Books

1. Workshop Technology Vol. 1 and 2, by Raghuvanshi B.S. Dhanpat Rai & Sons 1998.

Reference Books

1. Mechanical Workshop Practice by K C John, PHI Learning.
2. Workshop Technology by Chapman W.A. J and Arnold E. Viva low priced student edition, 1998.
3. Workshop Practices, H S Bawa, Tata McGraw-Hill, 2009.
4. Workshop Practices and Materials, B J Black, CRC Press

Web Resources

1. www.nptel.ac.in

Subject: **Elements of Mechanical Engineering**								
Program: **B.Tech All Branches**				Subject Code: ME0002			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Content

Unit - I

1. **Basic Concepts of Thermodynamics**
   Basic units and dimensional analysis, Intensive and Extensive Properties, Energy, heat, temperature, specific heat capacity, Interchange of heat, change of state, mechanical equivalent of heat, Internal energy, enthalpy, entropy, efficiency, Open and Closed systems, statements of Zeroth Law, First law and its limitations, Second law of Thermodynamics

2. **Properties of Gases**
   Ideal and Real Gases, Gas laws, Boyle's law, combined gas law, gas constant, Internal energy, Relation between Cp and Cv, Enthalpy, Non flow process, constant volume process, Constant pressure process, Isothermal process, Poly-tropic process, Adiabatic process.

Unit- II

3. **Fuels and Lubricants**
   Different types of fuels, their properties and applications. Different types of lubricants, their properties and applications.

4. **Internal Combustion Engines**
   Classifications, Difference between I.C. and E.C. , Otto four-stroke engine, Diesel-four-stroke engine, Difference between Otto cycle and Diesel engine, Two-stroke engines, Difference between two- stroke and four-stroke engines, indicated power (ip), Brake power (bp), Efficiencies.

Unit- III

5. **Properties of Steam**
   Introduction, steam formation, types of steam, enthalpy, specific volume of steam and dryness fraction of steam, Internal energy, steam tables, Measurement of

dryness fraction throttling calorimeter, separating calorimeter, Combined calorimeter.

6. **Steam Boilers**
   Introduction, Classification, Simple vertical and horizontal boiler, Boiler details, Boiler performance. Functioning of different mountings and accessories.

Unit- IV

7. **Refrigeration and Air-conditioning**
   Introduction, Refrigerant, Vapor compression & absorption cycles & system, basic applications.

8. **Transmission of Motion and Power**
   Introduction, Couplings methods of drive, power transmission elements, shaft and axle, Belt-drive, pulleys, power transmitted by a belt, Chain drive, Friction drive, Gear drive.

Text Books

1. Basant Agrawal 'Basic mechanical Engineering' Wiley-India, 2008.
2. Shanmugam G and Palanichamy M S, 'Basic Civil and Mechanical Engineering', Tata McGraw Hill publishing Co., New Delhi.

Reference Books

1. Elements of Mechanical Engineering by K.P. Roy and Prof. S.K. Hajra Chaudhary, Media Promoters and publishers Pvt. Ltd. Bombay
2. A Text Book of Elements of Mechanical Engineering by S. M. Bhatt, H. G. Katariya, J. P. Hadiya – Books India Publications, New Delhi
3. Basic & Applied Thermodynamics by P K Nag - Tata McGraw Hill Pvt. Ltd., Mumbai

Web Resources

1. www.nptel.ac.in

Subject: **Computer Programming**								
Program: **B.Tech All Branches**				Subject Code: CS0001			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. Identify the parts of the computer system.
2. Adequately explain functioning of computer components.
3. Explain the process of problem solving using computer
4. Design an algorithmic solution for a given problem
5. Write a maintainable C program for a given algorithm.
6. Trace the given C program manually.

Contents:

Unit No	Sub unit	Name of Topic	Hours
		UNIT 1	
1	**1.1**	**Introduction to Programming** What is programming?, Problem solving methods with examples- Algorithm and Flowchart, Types of Programming languages ,Characteristics of higher level language, Some Programming languages	**4**
	1.2	**Introduction to 'C'** Introduction, Importance of C, Sample C programs, Basic structure of C programs, Programming style, executing a C program. Introduction, Character Set, C tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of Variables, Defining symbolic constants.	**3**
	1.3	**Operators and Expression:** Introduction, Arithmetic of Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise	**4**

		Operators, Special Operators, Arithmetic Expressions, Evaluation of expressions, Precedence of arithmetic operators, Type conversions in expressions, Mathematical function.	
		UNIT 2	
2	**2.1**	**Decision Making Statements** Introduction, Decision making with IF statement, Simple IF statement, the IF ELSE statement, Nesting of IF … ELSE statements, The ELSE IF ladder, The switch statement, the turnery (? :) Operator, the GOTO statement,	**4**
	2.2	**Looping** WHILE statement, the DO statement, The FOR statement, Jumps in loops Break and continue.	**5**
	2.3	**Array & Handling of Character strings:** Introduction, One-dimensional arrays, Two-dimensional arrays, Initialization of two dimensional arrays, Concept of Multidimensional arrays.	**4**
		UNIT 3	
3	**3.1**	**Handling of Character strings:** Introduction, Declaring and initializing string variables, Reading string from terminal, Writing string to screen, Arithmetic operations on characters, Putting string together, String Operations : String Copy, String Compare, String Concatenation and String Length, String Handling functions, Table of strings	**5**
	3.2	**User-Defined Functions :** Introduction, Need for user-defined functions, Return values and their types, Calling a function, category of functions, No arguments and no return values, Arguments with return values, Handling of non-integer functions, Nesting of functions, Recursion, Functions with arrays, The scope and Lifetime of variables in functions.	**5**
		UNIT 4	
4	**4.1**	**Pointers:** Introduction, Understanding pointers, Accessing the address of variable, Declaring and initializing pointers, Accessing a variable through its pointer, Pointer expressions, Pointer increments and scale factor, Pointers and arrays, Pointers and character strings, Pointers and Functions, Pointers and structures	**5**
	4.2	**Structures and Unions:**	**2**

		Introduction, Structure definition, Giving values to members, Structure initialization, Comparison of structures, Arrays of structures, Arrays within structures, Structures within Structures, Structures and functions, Unions,	
	4.3	**Introduction to Object Oriented Concepts & Programming** Review of fundamental concepts of Object-oriented programming, Introduction to C++, class and objects, Functions in C++,Constructors & Destructors	**4**
		TOTAL	**45**

Text Books:

1. Programming in ANSI C, by Balagurusamy, Publisher - Tata McGraw Hill.
2. Object-oriented programming with C++,E.Balagurusamy, 2nd Edition, TMH.

Reference Books:

1. Introduction to C by Reema Thareja, Publisher-Oxford
2. Programming with ANSI and Turbo C, by Ashok N Kamthane, Publisher – Pearson Education.
3. Let us C, by Yashwant Kanitkar, Publisher – BPB Publication

Online Courses:

1. http://nptel.ac.in/courses/106105085/2
2. https://onlinecourses.nptel.ac.in/iitk_cs_101/preview
3. https://onlinecourses.nptel.ac.in/noc15_cs15/preview

Subject: **Engineering Mechanics**								
Program: **B.Tech All Branches**				Subject Code: CV0002			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	2	0	4	60	00	40	00	100

Course Objectives:

1. To provide fundamental knowledge of Engineering Mechanics.
2. To make students realize the importance of applications of engineering Mechanics in their day to day life.
3. To focus on the applicability aspect of the subject in their respective branch.

Course Outcomes:

1. Students will be able to understand the fundamentals of mechanics.
2. Students should be able to apply the knowledge of Engineering Mechanics to solve complex Problems by making them comprehensible and simple.
3. Students should be able to construct free-body diagrams.
4. To calculate the reactions necessary to ensure static equilibrium.
5. Students will be able to calculate centre of gravity and moment of inertia.
6. Students can analyse the dry surfaces in contact with each other considering friction between Surfaces.
7. Students will be able to determine the parameters of motion for the bodies in motion.

COURSE CONTENTS

UNIT -I (08 HRS)

Introduction: Beginning and Development of Engineering Mechanics, Fundamental Principles of Mechanics, Idealizations in Mechanics, Branches of Mechanics, Units.

Coplanar Forces: Effect of Force, Characteristics of Force, Principle of Transmissibility of Forces, System of Forces, Resultant Force, Composition of Forces, Methods for Resultant Force, All major Laws of Forces, Principle of Equilibrium, Analytical Method for the Equilibrium of Coplanar Forces, Lami's Theorem.

Non-Coplanar Forces: Moment of a Force, Graphical Representation of Moments, Types of Moments, Varignon's Principle of Moments, Application of Moments, Levers, Types of Levers.

UNIT - II **(12 HRS)**

Beams: Types of Loads, Types of Supports, Types of Beams, Analytical Method for Determination of Support Reactions of a Beam (Simply Supported Beam, Cantilever Beam).

Friction: Static Friction, Limiting Friction, Normal Reaction, Angle of Friction, Coefficient of Friction, Laws of Friction, Equilibrium of a Body on a Rough Horizontal Plane, Equilibrium of a Body on a Rough Inclined Plane, Equilibrium of a Body on a Rough Inclined Plane Subjected to a Force Acting Along the Inclined Plane, Equilibrium of a Body on a Rough Inclined Plane Subjected to a Force Acting Horizontally. Ladder & Wedge Friction.

UNIT - III **(13 HRS)**

Centre of Gravity: Centroid, Methods for Centre of Gravity, Centre of Gravity by Geometrical Considerations, Axis of Reference, Centre of Gravity of Plane Figures, Centre of Gravity of Symmetrical Sections, Centre of Gravity of Unsymmetrical Sections, Centre of Gravity of Solid Bodies, Pappus Guldinus Theorem.

Moment of Inertia

Moment of Inertia of Plane area, Methods for Moment of Inertia, Moment of Inertia by Integration Method, Moment of Inertia of simple lamina, Parallel and Perpendicular Axis Theorem, Moment of Inertia of Built-up Section.

UNIT IV **(15 HRS)**

Graphical Method: Method for the Resultant of two Co- Planar forces, Equilibrium of Coplanar Forces (Force Polygon), Funicular Polygon Method to find Support Reactions, Graphical Method for determination of CG, MI.

Kinematics & Kinetics: Linear Motion, Relative Motion, Rectilinear Motion of Particle, Curvilinear Motion of Particle Newton's Second Law of Motion, Work, Work Done by Force, Energy, Law of Conservation of Energy, Work- Energy Principle, Power, Efficiency.

Mechanical Vibrations: Simple Harmonic Motion, Vibrations, D'alembert's Principle, Classification of Vibration, Damping and Vibration, Derivation of Free Vibration without Damping

Text Books:

1. R C Hibbler, 'Engineering Mechanics', Pearson Publication.

Reference Books:

1. Ferdinand P. Beer & E. Russell Johnston, "Statics and Dynamics"- McGraw Hill Publication.
2. S. Ramamrutham, 'Engineering Mechanics', Dhanpat Rai Publication.
3. Basudeb Bhattacharya, 'Engineering Mechanics', Oxford University Press.
4. R S Khurmi, 'Engineering Mechanics', S Chand Publication.
5. S B Junnarkar, H J Shah, 'Applied Mechanics', Charotar Publishing House.

Web Resources:

1. http://nptel.ac.in/courses/122102004/
2. http://textofvideo.nptel.iitm.ac.in/122102004/

Subject: **Environmental Science**								
Program: **B.Tech All Branches**				Subject Code: CV0001			Semester: **I/II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
1	0	2	2	24/60	24/60	16/40	16/40	200

Course Objectives:

1. To make students understand the importance of Environment in their day to day life.
2. To make students familiar with environmental Bio-diversity and related concepts.
3. Also to make students familiar with environmental legislations.

Course Outcomes:

1. Students will be able to understand the studies and importance related to environmental problems.
2. Students will be able to understand the legal procedures pertaining to environmental legislations
3. Students should be able to apply the knowledge gained in their respective branches of engineering & technology.

Course Contents:

UNIT I **(04 HRS)**

Concepts of Environmental Sciences: Environment, Levels of organizations in environment, Structure and functions in an ecosystem; Biosphere, its Origin and distribution on land, in water and in air, Broad nature of chemical composition of plants and animals, Natural Resources: Renewable and Non-renewable Resources, Forests, water, minerals, Food and land (with example of one case study); Energy, Growing energy needs, energy sources (conventional and alternatives)

UNIT II **(05 HRS)**

Biodiversity and its conservation: Biodiversity at global, national and local levels; India as a mega-diversity nation; Threats to biodiversity (biotic, abiotic stresses), and strategies for conservation. Environmental Pollution: Types of pollution- Air, water (including urban, rural, marine), soil, noise, thermal, nuclear; Pollution prevention; Management of pollution- Rural/Urban/Industrial waste management [with case study of any one type, e.g., power (thermal/nuclear), fertilizer, tannin, leather, chemical, sugar], Solid/Liquid waste management, disaster management.

UNIT III **(04 HRS)**

Environmental Biotechnology: Biotechnology for environmental protection- Biological indicators, bio-sensors; Remedial measures- Bio-remediation, phytoremediation, bio-pesticides, bio-fertilizers; Bio-reactors- Design and application. Social Issues and Environment: Problems relating to urban environment- Population pressure, water scarcity, industrialization; remedial measures; Climate change- Reasons, effects (global warming, ozone layer depletion, acid rain) with case studies.

UNIT IV **(05 HRS)**

Legal issues- Environmental legislation (Acts and issues involved), Environmental ethics. Environmental Monitoring: Monitoring- Identification of environmental problem, tools for monitoring (remote sensing, GIS); Sampling strategies- Air, water, soil Sampling techniques.

Text Books:

1. R C Hibbler, 'Engineering Mechanics', Pearson Publication.

Reference Books:

1. Ferdinand P. Beer & E. Russell Johnston, "Statics and Dynamics"- McGraw Hill Publication.
2. S. Ramamrutham, 'Engineering Mechanics', Dhanpat Rai Publication.
3. Basudeb Bhattacharya, 'Engineering Mechanics', Oxford University Press.
4. R S Khurmi, 'Engineering Mechanics', S Chand Publication.
5. S B Junnarkar, H J Shah, 'Applied Mechanics', Charotar Publishing House.

Web Resources:

1. http://nptel.ac.in/courses/122102004/
2. http://textofvideo.nptel.iitm.ac.in/122102004/

List of Practicals:

1. Plotting of bio geographical zones and expanse of territorial waters on the map of India.
2. Identification of biological resources (minimum 20) (plants, animals, birds) at a specific locations.
3. Determination of:
   (i) pH value
   (ii) Water holding capacity
   (iii) Electrical conductivity of different types of soils.
4. Determination of energy content of plants by bomb calorimeter.
5. Measurement and classification of noise pollution.
6. Determination of particulate matter from an industrial area by high volume sampler.
7. Determination of ico-chemical parameters (Alkalinity, Acidity) of tap water well water, rural water supply industrial effluent and sea water & potability issues.
8. Determination of ico-chemical parameters (Salinity, COD, BOD) of tap water well water, rural water supply industrial effluent and sea water & potability issues.
9. Demonstration of Remote Sensing and GIS methods.
10. Understanding Environmental Biotechnology Processes.

Subject: **Business Communication and Presentation Skills**								
Program: **B.Tech All Branches**				Subject Code: SH0202			Semester: **II**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
1	2	0	2	60	00	40	00	100

Course Objectives:

1. To orient students about the varied uses of business communication.
2. Under the importance of personality and its reflection in communication.
3. Train students to develop business correspondence in writing and presentation skills.

Course Content:

Unit 1:
Business Communication- Role of Communication in Information Age, concept and meaning of communication; skills necessary for technical communication; Communications in a technical organization; Barriers to the process of communication. Style and organization in technical communication covering, Language skills, Objectivity, clarity, precision, and organizational etiquettes as defining features of technical communication.

Unit 2:
Effective Presentation Skills-Oral Presentation and professional speaking, Elements of effective presentation; Planning and preparing a model presentation; organizing the presentation to suit the audience and context; Basics of public speaking and Group Discussion.

Unit 3:
Reading- Intensive reading, Predicting content, Interpretation, Inference from text, skimming & scanning techniques of reading, Critical Interpretation, Editorial of newspapers.

Unit 4:
Writing: Basic Writing skill development & Paragraph development(Unity, coherence, cohesive devices), Letters; Inquiry- reply to inquiry, Complain, request , business letters, Using e-mail for business communication; Language in e-mail.

Reference Books:

1. Fred Luthans, Organizational Behaviour, McGraw Hill
2. Lesikar and petit, Report writing for Business

3. M. Ashraf Rizvi, Effective Technical Communication, McGraw Hill
4. Wallace and masters, Personal Development for Life and Work, Thomson Learning
5. Hartman Lemay, Presentation Success, Thomson Learning
6. Malcolm Goodale, Professional Presentations
7. Farhathullah, T. M. Communication skills for Technical Students
8. Michael Muckian, John Woods, The Business letters Handbook
9. Herta A. Murphy, Effective Business Communication
10. Lehman, Dufrene, Sinha BCOM, Cengage Learning

Web resources/ MOOCs:

1. Business Conversation Rule 1 :https://www.youtube.com/watch?v=wB8mr4iViy0
2. Business English Conversations Rule 2: https://www.youtube.com/watch?v=wB8mr4iViy0
3. Business English Conversations 3: https://www.youtube.com/watch?v=wB8mr4iViy0
4. Business English Conversations Rule 4: https://www.youtube.com/watch?v=wB8mr4iViy0
5. Business English Conversations Rule 5: https://www.youtube.com/watch?v=wB8mr4iViy0
6. English Presentation Video: https://www.youtube.com/watch?v=wB8mr4iViy0
7. Powerful Presentation Skills: Body Language: https://www.youtube.com/watch?v=wB8mr4iViy0
8. Make Body Language Your Superpower: https://www.youtube.com/watch?v=wB8mr4iViy0
9. Make a Presentation Like Steve Jobs: https://www.youtube.com/watch?v=wB8mr4iViy0

3RD SEMESTER

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

B-TECH COMP. SCIENCE & ENGG., SEMESTER –III TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017													
SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	SH0301	Differential Equations and Integral Transforms	03	02	00	04	05	30	10	60	00	00	100
2	CS0301	Principles of Database Management System	04	00	02	05	06	30	10	60	40	60	200
3	EC0301	Digital Logic Design	03	00	02	04	05	30	10	60	40	60	200
4	CS0302	Object Oriented concepts and Programming	03	00	02	04	05	30	10	60	40	60	200
5	CS0303	Data Communication Engineering	03	00	02	04	05	30	10	60	40	60	200
6	CS0304	Web Design	03	00	02	04	05	30	10	60	40	60	200
7	SH0307	Human values & professional Ethics	01	00	00	00	01	00	00	00	00	00	100
TOTAL			**20**	**02**	**10**	**25**	**32**	**180**	**60**	**360**	**200**	**300**	**1200**

Subject: **Differential Equations and Integral Transforms**								
Program: **B.Tech. CS**				Subject Code: SH0301			Semester: **III**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	2	0	4	60	00	40	00	100

1. Course Outcomes:

- To provide an ability to see differential equations as a rigorous way of modelling physical phenomena.
- To provide an ability to derive major differential equations from physical principles.
- To provide an ability to understand the role of initial and boundary conditions in determining the solutions of equations.
- To provide an ability to choose and apply appropriate methods for solving differential equations.
- To provide an ability to undertake problem identification, formulation and solution.
- To provide an ability to calculate Laplace transforms and inverse Laplace transforms and uses them to solve differential equations (Initial value problems, Boundary value problems).
- To provide an ability to understand various concepts of Control System -Theory using Laplace Transform.

2. Contents:

UNIT-I **[12 Hours]**

Ordinary Differential Equations with applications: Revision of ordinary differential equation: Introduction of Mathematical Modeling, Basic Definitions, First Order First Degree Differential Equations, Variable Separable equation, Homogeneous Equation, Exact Differential Equations, Reduction of Non-exact Differential Equations to exact form using Integrating Factors, First Order Linear Differential Equation, Bernoulli Equation, Applications: Orthogonal Trajectories, Simple Electric Circuits, Solution of Linear differential equations of higher order with constant coefficients, complimentary function and particular integral.

UNIT-II **[12 Hours]**

Ordinary and Partial Differential Equations with applications: Method of variation of parameters, Method of Undetermined coefficients, Linear differential equations with variable coefficients (Cauchy's and Legendre forms), Simultaneous linear differential equations, Bessel and Legendre functions, Application of Linear differential equation - Application ofDeflection of Beams, Electric circuits, Series Solution of Ordinary Differential Equations – Power series

method, Formation of Partial differential equations, Directly Integrable equations, Method of separation of variables, solution of one dimensional wave equation, heat equation and Laplace equation.

UNIT-III **[12 Hours]**

Laplace transforms: Relation between Laplace and Fourier Transform, Definition, Linearity property, Laplace transforms of elementary functions, Shifting theorem, Inverse Laplace transforms, Laplace transforms of derivatives and integrals, Convolution theorem, Application of Laplace transform in solving ordinary differential equations, Laplace transforms of periodic, Unit step and impulse functions.

UNIT-IV **[12 Hours]**

Fourier series, Fourier Integrals, Fourier Transforms and Z-Transforms: Fourier series, Drichlet's conditions, Euler's formula, Fourier expansion of periodic functions, Fourier series of even and odd functions, Half range Fourier series, Fourier integral theorem (only statement), Fourier sine and cosine integrals, Complex form of Fourier integral, Fourier transforms, Fourier sine and cosine transforms, Introduction to Z-transforms:Definition and Standard Z-transforms, Linearity Property, dumping Rule and some standard results, Some useful Z-transforms.

3. Text books:

1. Erwin Kreyszig: Advanced Engineering Mathematics (8th Ed.) , Wiley Eastern Ltd., New Delhi.

4. Reference Books:

1) B. V. Ramana: Higher Engineering Mathematics, Mc Graw Hill, New Delhi.
2) Dr. B.S. Growl: Higher Engineering Mathematics, Khanna Publishers, New Delhi.
3) R K Jain, S R K Iyengar: Advanced Engineering Mathematics. Third Edition, Narosa Publishing House
4) Merel C Potter, J L Goldberg: Advanced Engineering Mathematics (3rd Ed.), Oxford India Publication.
5) Murray Spiegel: Advanced Mathematics for Engineering & Science: (Schaum's Outline Series),Tata – McGraw Hill Publication

5. Digital resources

http://freevideolectures.com/blog/2010/11/130-nptel-iit-online-courses/
http://nptel.ac.in/video.php?subjectId=122107036
http://ocw.mit.edu/index.htm
https://www.khanacademy.org/

Subject: **Principles of Database Management System**								
Program: **B.Tech. CS**				Subject Code: CS0301			Semester: **III**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	0	2	5	60	60	40	40	200

Course Outcomes:

1. Understand and evaluate the role of database management systems in information technology applications within organisations;
2. Recognise and use contemporary logical design methods and tools for databases;
3. Derive a physical design for a database from its logical design;
4. Implement a database solution to an information technology problem;
5. Understand the SQL data definition and SQL query languages;
6. Have been introduced to the alternative design techniques utilised for Management Reporting applications.
7. Develop sophisticated queries to extract information from large datasets.

Contents:

UNIT-I **[12 Hours]**

Overview of database management

Introduction: data, database, database management, database management system, application of database, why database? , Data independence

Architecture: The three levels of architecture-Levels, mapping, Database users and DBA

Brief overview of different types of model

Entity-Relationship model:

Introduction, An overview of the E/R model, E/R diagrams, Database design with the E/R model, extended E-R features – generalization, specialization, aggregation, reduction to E-R database schema

UNIT-II **[12 Hours]**

Relational Model:

Structure of relational databases, relational model, relations, relational integrity, Domains, Relational Algebra (fundamental and extended) and query

Relation database design: Functional Dependency – definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization – 1Nf,2NF,3NF, composition using FD- dependency preservation, BCNF, Multivalued dependency, 4NF, Join dependency and 5NF

UNIT-III **[12 Hours]**

Transaction Management and Security:

Transaction concepts, properties of transactions, serializability of transactions, testing for serializability, System recovery, Two- Phase Commit protocol, Recovery and Atomicity, Log-based recovery, concurrent executions of transactions and related problems, Locking mechanism, solution to concurrency related problems, deadlock, , two-phase locking protocol, Isolation, Intent locking

Security: Introduction, Discretionary access control, Mandatory Access Control, Data Encryption

UNIT-IV **[12 Hours]**

SQL & PL/SQL Concepts:

SQL: Basics of SQL, DDL,DML,DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator, aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries, correlated sub-queries, join, Exist, Any, All , view and its types., transaction control commands.

PL/SQL: Cursors, Stored Procedures, Stored Function, Database Triggers

Text Book:

1. Database System Concepts, Abraham Silberschatz, Henry F. Korth & S.Sudarshan, McGraw Hill.
2. SQL- PL/SQL by Ivan bayross

Reference Book:

1. An introduction to Database Systems, C J Date, Addition-Wesley.
2. Understanding SQL by Martin Gruber, BPB

Online courses:

- http://nptel.ac.in/courses/106106095/
- http://nptel.ac.in/courses/106106093/
- http://nptel.ac.in/courses/106106095/
- http://nptel.ac.in/courses/106106095/

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Wk No.	Class Activity	Subject content to be delivered
01	Lab 1	Introduction to SQL.
02	Lab 2	Practice on below SQL clauses. Select with from, distinct, where, and, or, between, not, in, not in, like clauses, order by clause and delete
03	Lab 3	Write the sql statement for Use of inbuilt functions
04	Lab 4	Write the sql statement for Use of inbuilt string functions
05	Lab 5	Create the given tables with given constraints and write SQL statement for use of SUB query
06	Lab 6	Write the SQL statements for following. (Use of grant, revoke, join, exist)
07	Lab 7	Write the query based on view.
08	Lab 8	Write a PL/SQL block to reverse a given number.
09	Lab 9	Write a PL/SQL block to check given num is odd or even.
10	Lab 10	Write a PL/SQL block to accept id of employee (emp2 table) from user and fetch a record of that employee. Check the salary and update the salary Column as follows: a. If salary >10000and salary<=20000, then salary = salary+30% of salary. b. If salary>20000 and salary<=30000, then salary =salary+ 40% of salary.
11	Lab 11	Write a PL/SQL block that will display the information of the first 5 employee holding the highest salary of emp2 table
12	Lab 12	Write a pl/sql block that merge ft_work and pt_work.fetch name of emp from pt_work, check if it is in ft_work. If it is not there then insert that record in ft_work,otherwise display appropriate message.
13	Lab 13	Create trigger on supplier table which allow access between 9 AM to 5 PM only.
14	Lab 14	Create trigger on Supplier Detail on update or insert of Sname to convert Sname into capital letter.
15	Lab 15	Create a stored procedure which accept CNUM from the user and print that order is placed by that customer or not. Also write a pl/sql block for using this procedure.

Subject: **Digital Logic & Design**								
Program: **B.Tech. CS**				Subject Code: EC0301			Semester: **III**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

Students can design the basic digital systems or modules (Adder, Substructures, Counters, and Register etc.) This is required for Microcontroller/Microprocessor architectures.

Contents:

UNIT-I **[12]**

Binary Numbers

Introduction to Digital and Analog System, Octal, Decimal and Hexadecimal Numbering Systems, Binary Numbering System, Binary Conversion, Binary Operation, Gray Code, BCD code, Excess Three code

Boolean algebra

Axioms and Laws of Boolean Algebra De Morgan's Theorem, Duality and Dual Simplification of Boolean Algebra using K-map and Tabulation method

UNIT-II **[12]**

Logic Gates

Basic Gates: AND, OR, NOT, Universal gates: NAND, NOR, X-OR, X-NOR and BUFFER, Logic Operations, NAND and NOR implementation, Sum of product and product of sum representation

Logic Families

Introduction, Noise Margins, Fan-in and Fan-out, RTL and DTL logic, Integrated-Injection Logic Emitter-Coupled Logic, Complementary MOS

UNIT-III **[12]**

Combinational Logic

Introduction, Code Conversion, Multilevel NAND and NOR circuit, various types of Adders and Sub tractors, Magnitude Comparator, Decoders, Multiplexers, Programmable Logic Array

Sequential Logic

Introduction, Flip-Flops, Triggering of Flip-Flops, Conversion of Flip-Flops

UNIT-IV **[12]**

FSM, Counter and Shifters Design

FSM Design, Ripple Counter(Asynchronous Counter), Synchronous Counter, Serial-in, Serial-out Shift Register, Parallel-in, Serial -out Shift Register, Serial-in, Parallel-out Shift Register, Parallel-in, Parallel-out Shift Register, Universal Shift Register.

Text Books

1. Morris Mano, "Digital Logic and Computer Design", Pearson.

Reference Books

1. Ronald J. Tocci, Gregory L. Moss, "Digital Systems", 10 Ed, Pearson Mathew Sadiku, "Principles of Electromagnetics"4th Ed., Oxford University Press, 2009
2. D.C.Green, "Digital Electronics"5th Ed., Pearson, 2005
3. Fundamental of Digital Electronics by Anand Kumar, Prentice Hall of India
4. Digital Technology: Principles and Practice by Virendra Kumar, New Age International Publishers.
5. http://nptel.ac.in/ (Lectures note and Video Lectures)
6. http://ocw.mit.edu/index.htm (Lecture notes)

Digital Learning Resources & MOOCS

1. http://nptel.ac.in/ (Lectures note and Video Lectures)
2. http://ocw.mit.edu/index.htm (Lecture notes)

Subject: **Object Oriented concepts and Programming**								
Program: **B.Tech. CS**				Subject Code: CS0302			Semester: **III**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	2	0	4	60	60	40	40	200

Course Outcomes:

- Describe the important concepts of object oriented programming like object and class, Encapsulation, inheritance and polymorphism .
- Write the skeleton of C++ program.
- Write the simple C++ programs using the variables, operators, control structures, functions and I/O objects cin and cout .
- Write the simple object oriented programs in C++ using objects and classes. –
- Use features of C++ like type conversion, inheritance, polymorphism, I/O streams and files to develop programs for real life problems.
- Use advance features like temples and exception to make programs supporting reusability and sophistication.

Contents:

UNIT-I **[12]**

INTRODUCTION TO C++

Concepts of OOP: Introduction OOP, Procedural Vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP C++ Basics : Overview, Program structure, namespace, identifiers, variables, constants, enum, operators, typecasting, control structures C++ Functions : Simple functions, Call and Return by reference, Inline functions, Macro Vs. Inline functions, Overloading of functions, default arguments, friend functions

UNIT-II **[12]**

Objects and classes:

Basics of object and class in C++, Private, protected and public Members, static data and static function, **Constructors and their types**, Destructors, Arrays & Strings: A standard C++ string class**, Operator Overloading**: Overloading unary and binary operators, Operator Overloading with friend function, Data Conversion, type conversion ,class to class ,basic to class, class to basic

UNIT-III **[12]**

Inheritance:

Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class, constructor in derived classes

Polymorphism:

Pointers in C++, Pointes and Objects, this pointer, virtual and pure virtual functions, implementing polymorphism

I/O management:

Concept of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators

UNIT-IV **[12]**

File management:

File stream, C++ File stream classes, File management functions, File modes, Binary and random files

Templates, Exceptions:

What is template? Function templates and class templates, Introduction to exception, try-catch-throw, multiple catch, catch all, rethrowing exception, implementing user defined exceptions

Text Books

1. Object oriented Programming with C++ ,Balaguruswamy, Tata Mcgraw Hill Publication Co. Ltd 2000.
2. Object oriented programming in turbo C++ ,RobbetLofre, Galgotia Publication Pvt Ltd. 1994.

Reference Books

1. The Complete Reference C++ , Fourth Edition , Herbert Schildt , Tata Mcgraw Hill Publication.
2. The C++ programming language , BjarneStroustrup ,Addison

Online courses:

- https://www.youtube.com/watch?v=M9ArEaQIGpw&index=4&list=PL0gIV7t6l2iIsR55zsSgeiOw9Bd_IUTbY
- https://www.youtube.com/watch?v=tFYRTWFXSgY
- https://www.youtube.com/watch?v=8fDao3MBbwk
- https://www.youtube.com/watch?v=zagx5hdXBLw

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	Lab-1	**Basics of programming** **1.** Write a program to calculate the area of circle, rectangle and square using function. **2.** Write a program to demonstrate the use of default arguments in function **3.** Write a program to demonstrate the use of pass as reference variable and returning a reference variable.
2	Lab-2	1. Create a function power() to raise a number m to power n. the function takes a double value for m and int value for n, and returns the result correctly. Use the default value of 2 for n to make the function calculate squares when this argument is omitted. Write a main that gets the values of m and n from the user to test the function. 2. Write a basic program which shows the use of scope resolution operator. 3. Write a C++ program to swap the value of private data members from 2 different classes
3	Lab-3	Write a program to demonstrate the use of static variable and static function in class.
4	Lab-4	**1.** Create a class student which stores the detail about roll no, name, marks of 5 subjects, i.e. science, Mathematics, Dbms,English, C++. The class must have the following: • Get function to accept value of the data members. • Display function to display values of data members. • Total function to add marks of all 5 subjects and store it in the data members named total **2.** Using a friend function, find the average of three numbers from three different classes. Write all necessary member functions and constructor for the classes. **3.** Define currency class which contains rupees and paisa as data members. Write a friend function named AddCurrency ( ) which add 2 different Currency objects and returns a Currency object. Write parameterized constructor to initialize the values and use appropriate functions to get the details from the user and display it. **4.** Create Calendar class with day, month and year as data members. Include default and parameterized constructors to initialize a Calendar object with a valid date value. Define a function AddDays to add days to the Calendar object. Define a display function to show data in “dd/mm/yyyy” format.

5	Lab-5	**1.** Using friend function find the maximum number from given two numbers from two different classes. Write all necessary functions and constructors for the program. **2.** Create a class named 'String' with one data member of type char *, which stores a string. Include default, parameterized and copy constructor to initialize the data member. Write a program to test this class.
6	Lab-6	**1.** Create a class string with character array as a data member and write a program to add two strings with use of operator overloading concept. **2.** Define a class point which has x and y coordinates as its data members. Overload + for addition of two class object and overload – operators for Subtraction of two class object.
7	Lab-7	**1.** Create a class distance which contains feet and inch as a data member. Overhead = =, <and> operator for the same class. Create necessary functions and constructors too. **2.** Create a class MARIX of size mxn. Overload + and – operators for addition and subtraction of the MATRIX. **3.** Define a class Coord, which has x and y coordinates as its data members. Overload ++ and – –operators for the Coord class. Create both its prefix and postfix forms.
8	Lab-8	**1.** Write a program with use of inheritance: Define a class publisher that stores the name of the title. Derive two classes book and tape, which inherit publisher. Book class contains member data called page no and tape class contain time for playing. Define functions in the appropriate classes to get and print the details. **2.** Create a class account that stores customer name, account no, types of account. From this derive classes cur_acc and sav_acc to include necessary member function to do the following: • Accepts deposit from customer and update balance • Compute and Deposit interest • Permit withdrawal and Update balance. **3.** Create a class called scheme with scheme_id, scheme_name, outgoing_rate, and message charge. Derive customer class form scheme and include cust_id, name and mobile_nodata.Define necessary functions to read and display data. Create a menu driven program to read call and message information for a customer and display the detail bill.

9	Lab-9	**1.** Create a class vehicle which stores the vehicleno and chassisno as a member. Define another class for scooter, which inherits the data members of the class vehicle and has a data member for a storing wheels and company. Define another class for which inherits the data member of the class vehicle and has a data member for storing price and company. Display the data from derived class. Use virtual function. **2.** Create one class called Rupees, which has one member data to store amount in rupee and create another class called Paise which has member data to store amount in paise. Write a program to convert one amount to another amount with use of type conversion. **3.** Create two classes Celsius and Fahrenheit to store temperature in terms of Celsius and Fahrenheit respectively. Include necessary functions to read and display the values. Define conversion mechanism to convert Celsius object to Fahrenheit object and vice versa. Show both types of conversions in main function. **4.** Create a base class shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data() to initialize the base class data members and another member function display_area() to compute and display the area of figures. Make display_area() as a virtual function and redefine this function in the derived class to suit their requirements.
10	Lab-10	**This pointer, virtual function** 1. Write a program to illustrate the use of this pointer. 2. Write a program to call member functions of class in the main function using pointer to object and pointer to member function.
11	Lab-11	Write a program to illustrate the use of formatted **I/O function**.
12	Lab-12	Write a program to illustrate the use of **manipulators** in file handling
13	Lab-13	**File management**

		1. Write a program to illustrate the use of put(), get() and getline() functions for Text mode Input/output. **2.** Write a program to illustrate the use of read() and write() functions for Binary mode Input/output. **3.** Write down a program to Copy source file 'source.txt' to destination file
14	Lab-14	**Templates** **1.** Write Program of function template to Swap values of two variables (call function with two integer and two char data types. **2.** Write Program of function template to find maximum from two variables (call function with two integer and two char types data).
15	Lab-15	**Exception Handling** **1.** Write a program that demonstrates use of multiple catch. Add at least three catch blocks in your Program.

Subject: **Data Communication Engineering**								
Program: **B.Tech. CS**			Subject Code: CS0303			Semester: **III**		
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. Demonstrate understanding of the fundamental concepts of data communications.
2. Understand the basic concepts of LAN and WAN technologies and topologies.
3. Demonstrate understanding of the elements of a protocol, and the concept of layering.
4. Recognize the importance of networking standards, and their regulatory committees.
5. Develop understanding of the seven layers of the OSI model.
6. Understand signals and signal encoding methods to communication service methods and data transmission modes.
7. Demonstrate understanding of basic concepts of error detection and correction at the data link layer and below.

Contents:

UNIT-I **[10]**

Basics of communication: Communication System, Baseband and Carrier Communication, transmission modes, Baud rate, bit rate, SNR, Channel Bandwidth and rate of communication, Introduction to analog modulation techniques (AM, FM, PM, QAM) Bandwidth Requirements in analog modulation techniques Digital Continuous Wave Modulation techniques: Modems, ASK, FSK, PSK, BPSK, QPSK

UNIT-II **[10]**

Pulse modulation: Pulse amplitude modulation techniques: sampling theorem, Pulse modulation, PAM, Pulse time modulation, Pulse Transmission over Band Limited Channel, Effect of Gaussian Type Noise on Digital Transmission, Crosstalk Pulse digital modulation techniques: PCM, , Bandwidth requirement of digital modulation techniques, quantization noise Line Coding techniques: Bipolar, Unipolar, RZ, NRZ, Manchester, AMI, B8ZS, Block coding techniques.

UNIT-III **[06]**

Digital data transmission: digital communication system, line coding, pulse shaping, scrambling, digital receivers and regenerative repeaters, eye diagram, digital carrier system. Fundamentals of probability theory

UNIT-IV **[10]**

Information Theory and Coding : Information rate, Optimum Codes, Huffman Code, Code Efficiency, Error Control Coding, Methods of Controlling Errors, Types of Errors, Types of Codes, Linear Block Codes: Matrix Description of Linear Block Codes, Error detection and correction capabilities, Hamming Distance, Hamming Bound, Hamming Codes, CRC Block Codes, Syndrome Calculation, Error Detection and Correction, Handshaking Techniques, FEC, ARQ - Stop and Wait, Go Back N, Selective Repeat, Channel Throughput and Efficiency. Discrete Messages and Information Content, , Entropy, Shannon-Fano coding, Shannon's Theorem, Channel Capacity, Bandwidth- S/N trade-off, Mutual information and channel capacity, rate distortion theory, Lossy Source coding.

Text Books

1. Lathi, B.P, &Zhi Ding, "Modern Digital and Analog Communication Systems," Fourth Edition, Oxford Press.
2. Dennis Roddy & John Coolen – Electronic Communication (IV Ed.), Prentice Hall of India.
3. Fourauzan B., "Data Communications and Networking", 4th edition, Tata McGraw-Hill Publications.

Reference Books

1 Principles of Digital Communication – Robert G. Gallager Tata McGraw-Hill Publications.

2 "Principles of Digital Communication and Coding – Andrew J. Viterbi & Jim K. Omura" PHI

3 "Fundamentals of Communication Systems – John G. Proakis and MasoudSalehi" Tata McGraw-Hill Publications

Online courses:

- http://nptel.ac.in/courses/117101051/
- http://nptel.ac.in/courses/117101051/
- http://nptel.ac.in/courses/117101051/
- http://nptel.ac.in/courses/117101051/

Lab Plan

1. To understand sampling theorem and sample speech and audio signal
2. To generate and observe Pulse Amplitude Modulation, Pulse Width Modulation and Pulse position modulation waveforms
3. To observe effect of oversampling and under sampling in PCM systems
4. To transmit and receive digital signal using Amplitude shift keying
5. To transmit and receive digital signal using Frequency Shift Keying
6. To transmit and receive digital signal using Phase Shift Keying (BPSK and QPSK)
7. To understand Pulse Code Modulation to digitize speech signal
8. To understand time division multiplexing and de-multiplexing
9. To Implement Differential pulse code modulation and demodulation
10. To understand the concept of Delta Modulation and to achieve the Delta Modulation /De-Modulation.

11. To understand Error Detection and Correction codes
12. Simulation exercises on digital communication techniques

- Minimum Laboratory contact time : 15 weeks

- Lab / week : 2 hrs (0-0-2)

Week No	Subject content to be delivered
1	Basics of communication
2	Basics of communication
3	Basics of communication
4	Basics of communication
5	Pulse modulation
6	Pulse modulation
7	Pulse modulation
8	Pulse modulation
9	Digital data transmission:
10	Digital data transmission:
11	Information Theory and Coding
12	Information Theory and Coding
13	Information Theory and Coding
14	Information Theory and Coding
15	Mid semester Examination

Subject: **Web Design**								
Program: **B.Tech. CS**				Subject Code: CS0304			Semester: **III**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	100

Course Outcomes:

1. Be able to read and write basic HTML and CSS code
2. Create a full functioning website
3. Understand how to upload websites to a web server
4. Be familiar with different web design theories and understand web terminology

Contents:

UNIT-I **[12]**

Introduction to various HTML tags: Introduction to HTML, HTML Documents, HTML Structure tags.HTML Block level tags, HTML Text level tags, Different types of Lists, Nesting of lists, Linking HTML Documents, Frames, tables and forms.

UNIT-II **[12]**

Cascaded Style Sheets: What are style sheets, importance of CSS, Different approaches to style sheets, Using Multiple approaches, linking to style information in separate file, setting up style information using inline, internal and external style sheet

UNIT-III **[12]**

JavaScript: Introduction to JavaScript, JavaScript syntax, variables and their types, JavaScript operators, arrays and array methods, Control statements, built-in objects in JavaScript, Array, String, Math, Date objects, validation using JavaScript

UNIT-IV **[12]**

JQuery and Angular JS: Introduction to JQuery, Selectors, Events, Effects, Animation using JQuery, Validation.

Introduction to Angular JS, Working of Angular JS, Programming basics, Events, Scopes and MVC architecture

Text Books

1. DeitelDeitel Nieto, Internet and World Wide Web: How To Program
2. Scott Parker, Paperback, The Web Designer's 101 Most Important Decisions Professional Secrets for a Winning Website
3. Angular JS in Action, Wiley India by Lukas Ruebbelke

Reference Books

1. Scott Parker, Paperback, The Web Designer's 101 Most Important Decisions Professional Secrets for a Winning Website
2. Kogent Learning Solutions Inc., Html5 Black Book : Covers Css3,Javascript,Xml,Xhtml,Ajax,Php And Jquery, Dreamtech Press
3. Jon Duckett Publisher, Beginning Web Programming with Html, XHTML and CSS, Wiley

Online courses:

- https://www.w3schools.com/html/default.asp
- https://nptel.ac.in/courses/106105084/
- https://www.codecademy.com/learn/jquery
- https://www.codecademy.com/learn/learn-angularjs

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	LAB -1	Html Structure and Layout
2	LAB -2	Table based Layout
3	LAB-3	DIV based Layout
4	LAB-4	Text formatting tags
5	LAB-5	Form tags
6	LAB-6	Frameset and Frame based web UI design
7	LAB-7	CSS types and basic syntax
8	LAB-8	Border, Background, Color and other text formatting properties
9	LAB-9	Table related css properties
10	LAB-10	JavaScript Validation
11	LAB-11	JavaScript basic animation
12	LAB-12	JQuery and Angular based application development

Subject: **Human values & professional Ethics**								
Program: **B.Tech. CS**				Subject Code: SH0307			Semester: **III**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
1	0	0	0	60	00	40	00	100

Course Objectives:

1. To create an awareness on Engineering Ethics and Human Values.
2. To understand social responsibility of an engineer.
3. To appreciate ethical dilemma while discharging duties in professional life.

Contents:

Unit 1: Values and Self Development **04 hours**

Social Values and individual Attitudes, Work ethics, Indian vision of Humanism, Moral and non moral valuation, Standards and principles, Value judgments. Importance of cultivation of values, Sense of duty, Devotion, Self reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

Unit 2: Personality and Behavior Development **04 hours**

Soul and scientific attitude. Goad and scientific attitude, positive thinking, integrity and discipline, punctuality, love and kindness. Avoiding fault, finding. Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, True friendship, Happiness vs. suffering love for truth. Aware of self destructive habits, Association and cooperation, doing best, saving nature.

Unit 3: Character and Competence **04 hours**

Science vs. God, Holy books vs. Blind faith, Self management and good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of women, All religions and same message, Mind your mind, Self control, Honesty, Studying effectively.

Unit 4: Engineering Ethics **04 hours**

Senses of 'Engineering Ethics', variety of moral issues, types of inquiry, moral dilemmas, moral autonomy, Kohlberg's theory, Gilligan's theory, consensus and controversy, models of professional roles, theories about right action, self interest, customs and religions, uses of ethical theories, Valuing time, Co-operation and commitment, Code of ethics, Sample codes – IEEE, ASCE, ASME and CSI.

Text Books:

1. Chakraborty, S. K., Values and Ethics for Organization Theory and Practice, Oxford University Press, New Delhi, 2001

2. Gaur R. R., Sangal R., Bagaria G. P., *A foundation course in Value Education*, 2009.

3. Gaur R. R., Sangal R., Bagaria G. P*., Teacher's Manual*, 2009.

4. Mike Martin and RolandSchinzinger, *Ethics in Engineering*, Mc Graw Hill. New York, 1996.

Reference Books:

1. Govindrajan M., Natrajan S. and Senthil Kumar V. S., Engineering Ethics (including Human Values), Prentice hall of India Ltd., New Delhi, 2004.
2. Frankena, W. K., *Ethics*, Prentice Hall of India, New Delhi, 1990.
3. Dhar P. L., Gaur R. R., *Science and Humanism*, Commonwealth Publishers, 1990.
4. TripathyA. N., *Human Values*, New Age International Publishers, 2003.
5. Seebauer E. G. and Robert L. Berry, *Fundamentals of Ethics for Scientists andEngineers*, Oxford University Press, 2000.
6. Banerjee B. P., *Foundations of Ethics and Management*, Excel Books, 2005.
7. Bajpai B. L., *Indian Ethos and Modern Management*, New Royal Book Company, 2004.

4TH SEMESTER

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

B-TECH COMP. SCIENCE & ENGG., SEMESTER –IV TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017													
SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE		ESE	CIE	ESE	
			L	T	P			MID	IE				
1	SH0401	Complex Analysis and Numerical Methods	03	02	00	04	05	30	10	60	00	00	100
2	CS0401	Fundamentals of Data Structure	04	00	02	05	06	30	10	60	40	60	200
3	CS0402	Operating System	04	00	02	05	06	30	10	60	40	60	200
4	CS0403	Core Java Programming	04	00	02	05	06	30	10	60	40	60	200
5	CS0404	Computer Organization & Architecture	03	00	00	03	03	30	10	60	00	00	100
6	CS0405	Object Oriented Analysis & Design	03	00	00	03	03	30	10	60	00	00	100
7	CE0407	Cyber security & Intellectual Property Rights	01	00	00	00	01	00	00	00	00	00	100
TOTAL			**22**	**02**	**06**	**25**	**30**	**180**	**60**	**360**	**120**	**180**	**1000**

Subject: **Complex Analysis and Numerical Methods**								
Program: **B.Tech. CS**				Subject Code: SH0401			Semester: **IV**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	2	0	4	60	00	40	00	100

1. Course outcomes:

After completion of this course students will be able to gain knowledge about following

- To provide an ability to understand, interpret and use the basic concepts: complex number, analytic function, harmonic function, Taylor and Laurent series, singularity, residue, conformal mapping, meromorphic function.
- To provide an ability to prove certain fundamental theorems about analytic functions, e.g. Cauchy's integral formula
- To provide an ability to determine the images of curves under simple complex mappings.
- To provide an ability to determine the stability of certain dynamical systems using complex functions.
- To provide an ability to use conformal mapping to solve certain applied problems regarding heat conduction, electrical engineering and fluid mechanics.
- To provide an ability to use Taylor and Laurent expansions to derive properties of analytic and meromorphic functions.

2. Contents:

UNIT-I **[12 Hours]**

Complex Analytic Functions:

Complex Numbers, Demoivere's Theorem, Roots of Complex Numbers, Elementary complex functions, Complex planes, Curves in complex planes, Concept of neighborhood in The complex plane, Analytic function, Cauchy- Riemann equations (Cartesian and polar forms – without proof), Harmonic functions, conformal mappings, some standard conformal transformations.

UNIT-II **[12 Hours]**

Interpolation

Finite differences and Interpolation: Finite differences Forward, Backward & Central difference operators and difference tables. Interpolation, Interpolation Formulae with equal intervals: Newton's forward, Newton's backward, Central difference interpolation by Stirling's formulae

Interpolation Formulae with unequal intervals: Lagrange's & Newton's divided difference interpolation**Numerical Integration:** Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule.

Numerical differentiation: Using Newton's forward and backward interpolation formula

UNIT-III **[12 Hours]**

Numerical Methods: Basic Errors.
Solution of Algebraic and Transcendental Equations: Bisection method, Regula-Falsi method, Newton-Raphson method, Convergence condition for these methods.
Numerical methods in Linear Algebra: Gauss-Jacobi, Gauss-seidel method
Largest Eigen values and corresponding Eigen vectors: By power method
Numerical Solutions of ordinary differential equations: Taylor's Method, Euler's Method, Improved Euler Method (Heun's Method), Runge-Kutta method of order four

UNIT-IV **[12 Hours]**

Complex Integration: Complex integration, Cauchy's integral theorem and Cauchy's integral formula (without proof), Singularities, Taylor's and Laurent's series, Cauchy-Residue theorem, Residues & Contour integration, Applications of residue to evaluate real integrals.

3. Text books:

1) Erwin Kreyszig: Advanced Engineering Mathematics (8^{th} Edition) Wiley Eastern Ltd., New Delhi (1999).

4. Reference Books:

1) R. V. Churchill and J. W. Brown: Complex variables and applications (7^{th} Edition), McGraw-Hill (2003)
2) B. V. Ramana: Higher Engineering Mathematics, McGraw Hill, New Delhi (2008).
3) Merel C Potter, J L Goldberg: Advanced Engineering Mathematics (3rd Edition) Oxford India Publication (2005).
4) Dr. B.S. Growl: Higher Engineering Mathematics, Khanna Publishers, New Delhi (2000).
5) R K Jain, S R K Iyengar: Advanced Engineering Mathematics. Third Edition, Narosa Publishing House (Reprint2014).
6) Murray Spiegel: Advanced Mathematics for Engineering & Science: (Schaum's Outline Series), TataMcGraw Hill Publication (2009).

5. Digital learning resources :

http://freevideolectures.com/blog/2010/11/130-nptel-iit-online-courses/
http://nptel.ac.in/video.php?subjectId=122107036
http://ocw.mit.edu/index.htm
https://www.khanacademy.org/

Subject: **Fundamentals of Data Structure**								
Program: **B.Tech. CS**				Subject Code: CS0401			Semester: **IV**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	0	2	5	60	60	40	40	200

Course Outcomes:

- Student will be able to choose appropriate data structure as applied to specified problem definition.
- Student will be able to handle operations like searching, insertion, deletion, traversing mechanism.
- Students will be able to use linear and non-linear data structures like stacks, queues , linked list etc.

Contents

UNIT-I **[12]**

INTRODUCTION TO DATA STRUCTURE :

Definition, classification of data structure, Examples of data structure. Searching and Sorting: Various sorting techniques: Selection sort - bubble sort - Quick sort, Merge sorting. Sequential searching, Binary searching.

UNIT-II **[12]**

LINEAR DATA STRUCTURE:

Representation of arrays, Applications of arrays, Stack: Stack-Definitions & Concepts, Operations On Stacks, Applications of Stacks, Polish Expression, Reverse Polish Expression And Their Compilation, Recursion, Tower of Hanoi, Queue: Representation Of Queue, Operations On Queue, Circular Queue, Priority Queue, Arr, Double Ended Queue, Applications of Queue, Linked List: Singly Linked List, Doubly Linked list, Circular linked list ,Linked implementation of Stack, Linked implementation of Queue, Applications of linked list.

UNIT-III **[12]**

NONLINEAR DATA STRUCTURE:

Tree-Definitions and Concepts, Representation of binary tree, Binary tree traversal (Inorder, postorder, preorder), Threaded binary tree, Binary search trees, Applications of Trees-Some balanced tree mechanism, eg. AVL trees, 2-3 trees, Height Balanced, Weight Balance, Graph-Matrix Representation Of Graphs, Elementary Graph operations (Breadth First Search, Depth First Search, Spanning Trees, Shortest path, Minimal spanning tree)

UNIT-IV **[12]**

HASHING AND FILE STRUCTURES:

Hashing: The symbol table, Hashing Functions, Collision-Resolution Techniques, File Structure: Concepts of fields, records and files, Sequential, Indexed and Relative/Random File Organization, Indexing structure for index files, hashing for direct files, Multi-Key file organization and access methods

Text Books

1. An Introduction to Data Structures with Applications. by Jean-Paul Tremblay & Paul G. Sorenson Publisher-Tata McGraw Hill.

Reference Books

1. Data Structures using C & C++ -By Ten Baum Publisher – Prenctice-Hall International.
2. Fundamentals of Data Structures in C++-By SartajSahani.
3. Classical Data Structure by D.samantha. Pearson publication.

Online Courses:

- Inroduction to data structure http://nptel.ac.in/courses/106103069/
- Linear data structure http://nptel.ac.in/courses/106103069/7
- Non linear data structure http://nptel.ac.in/courses/106103069/21
- Hashing and file structure http://nptel.ac.in/courses/IIT-MADRAS/Intro_to_Database_Systems_Design/pdf/5_Data_Storage_and_Indexing.pdf

Subject: **Operating System**								
Program: **B.Tech. CS**				Subject Code: CS0402			Semester: I**V**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	0	2	5	60	60	40	40	200

Course Outcomes:

- Students will be able to describe the general architecture of computers
- Students will be able to describe, contrast and compare differing structures for operating systems.
- Students will be able to understand and analyze theory and implementation of: processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files.

Contents:

UNIT-I **[12]**

Introduction to Operating System

Architecture of OS (Ex. Monolithic, Microkernel, Layered , Exo kernel), Operating system objectives and functions, Virtual Computers, Interaction of O. S. & hardware architecture, Evolution of operating systems, Batch, multiprogramming. Multitasking, Multiuser, parallel, distributed & real –time O.S., System calls, O. S. Shell, Linux Shell commands, Shell programming.

Examples of O. S.: Linux, MS-Windows, Handheld OS.

Process Management

Process , Process description, Process states, Process control, Threads, Processes and Threads, Uniprocessor Scheduling: Types of scheduling, Scheduling algorithms: FCFS, SJF, Priority, Round Robin, UNIX Multi-level feedback queue scheduling, Thread Scheduling, Multiprocessor Scheduling concept, Real Time Scheduling concept.

UNIT-II **[12]**

Concurrency

Principles of Concurrency, Critical Section problem, Mutual Exclusion H/W Support, software approaches, Semaphores and Mutex, Message Passing, Monitors, Classical Problems Of Synchronization: Readers-Writers Problem, Producer Consumer Problem, Dining Philosopher problem

Deadlock: System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock.

UNIT-III **[12]**

Memory Management

Memory Management requirements, Memory partitioning: Fixed ,dynamic, partitioning, Contiguous memory allocation, Buddy System Memory allocation Strategies (First Fit, Best Fit, Worst Fit, Next Fit), Fragmentation, Swapping, Segmentation , Paging, Virtual Memory, Demand paging, Page Replacement Policies (FIFO, LRU, Optimal, clock) ,Thrashing.

I/O Management and Disk Scheduling

I/O Devices, Organization of I/O functions, Operating System Design issues, I/O Buffering, Disk Scheduling (FCFS, SCAN, C-SCAN, SSTF), Disk Caches.

UNIT-IV **[12]**

File Management

Overview, File Organization and access, File Directories, File Sharing, Security issues, Record Blocking, Secondary Storage Management**.**

Computer security & protection:

Security Threats, Attacks and assets, Intruders, Malicious software, Protection: Protection Policy and mechanisms, Authentications: Internal Access Authorizations, Implementations

Text Books

1. Silberschatz, Galvin, and Gagne, “Operating System Concepts”, By, Wiley India Pvt Ltd.
2. William Stallings, “Operating Systems Internals and Design Principles”, By, Pearson Education.

Reference Books

1. Andrew S. Tanenbaum, “Modern Operating Systems”, By, Pearson Education.
2. Gary Nutt, “Operating Systems”, By, Pearson Education.
3. Harvey M. Deital, “Operating Systems”, By, Pearson Education.
4. Das Sumitabha," Unix Concepts and Applications", Tata McGraw Hill.

Online Courses

- Introduction to OS https://www.youtube.com/watch?v=MaA0vFKt-ew&t=3s, http://nptel.ac.in/courses/106108101/1
- Process Concurancy , Deadlock https://www.youtube.com/watch?v=tfvOSqmg0vk, https://www.youtube.com/watch?v=CN9_YXGdQV8&t=2627s, http://nptel.ac.in/courses/106108101/3
- Memory Management https://www.youtube.com/watch?v=s-No7z1W0bY, http://nptel.ac.in/courses/106108101/4I/O
- File management https://www.youtube.com/watch?v=09jCRiVWsJw&t=1149s, http://nptel.ac.in/courses/106108101/2

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	LAB -1	Introduction to OS
2	LAB -2	Architecture of OS (Ex. Monolithic, Microkernel, Layered , Exokernel)
3	LAB-3	Virtual Computers, Interaction of O. S. & hardware architecture
4	LAB-4	Evolution of operating systems, Batch, multiprogramming. Multitasking, Multiuser, parallel, distributed & real –time O.S.
5	LAB-5	System calls
6	LAB-6	O. S. Shell, Linux Shell commands , Shell programming
7	LAB-7	Process , Process description, Process states
8	LAB-8	Process control , Threads, Processes and Threads
9	LAB-9	Thread Scheduling, Multiprocessor Scheduling concept
10	LAB-10	Scheduling algorithms: FCFS, SJF, Priority
11	LAB-11	Mutual Exclusion H/W Support, software approaches, Semaphores
12	LAB-12	Mutex, Message Passing, Monitors,
13	LAB-13	What is Classical Problems Of Synchronization, Readers-Writers Problem
14	LAB-14	Producer Consumer Problem, Dining Philosopher problem
15	LAB-15	Real Time Scheduling concept, Principles of Concurrency, Critical Section

Subject: **Core Java Programming**								
Program: **B.Tech. CS**				Subject Code: CS0403			Semester: **IV**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	2	0	5	60	60	40	40	200

Course Outcomes:

- Students will be able to Implement Object Oriented Programming Concepts .
- Students will be able to Use and create packages and interfaces in a Java program .
- Students will be able to Use graphical user interface in Java programs .
- Students will be able to Create Applets .
- Students will be able to Implement exception handling in Java .

Contents:

UNIT-I **[12 Hours]**

Basics of Java: Features of Java, Byte Code and Java Virtual Machine, JDK, Data types, Operator, Control Statements – If , else, nested if, if-else ladders, Switch, while, do-while, for, for-each, break, continue.

Array and String: Single and Multidimensional Array, String class, StringBuffer class, Operations on string, Command line argument, Use of Wrapper Class.

Classes, Objects and Methods: Class, Object, Object reference, Constructor, Constructor Overloading, Method Overloading, Recursion, Passing and Returning object form Method, new operator, this and static keyword, finalize() method, Access control, modifiers, Nested class, Inner class, Anonymous inner class, Abstract class.

UNIT-II **[12 Hours]**

Inheritance and Interfaces: Use of Inheritance, Inheriting Data members and Methods, constructor in inheritance, Multilevel Inheritance – method overriding Handle multilevel constructors – super keyword, Stop Inheritance - Final keywords, Creation and Implementation of an interface, Interface reference, instanceof operator, Interface inheritance, Dynamic method dispatch ,Understanding of Java Object Class, Comparison between Abstract Class and interface, Understanding of System.out.println –statement

Package: Use of Package, CLASSPATH, Import statement, Static import, Access control.

Exception Handling: Exception and Error, Use of try, catch, throw, throws and finally, Built in Exception, Custom exception, Throwable Class.

UNIT-III **[12 Hours]**

Networking with java.net: InetAddress class, Socket class, DatagramSocket class, DatagramPacket class.

IO Programming: Introduction to Stream, Byte Stream, Character stream, Readers and Writers, File Class, File InputStream, File Output Stream, InputStreamReader, OutputStreamWriter, FileReader, FileWriter, Buffered Reader.

Collection Classes: List, AbstractList, ArrayList, LinkedList, Enumeration, Vector, Properties, Introuduction to Java.util package.

UNIT-IV ` **[12 Hours]**

Multithreaded Programming: Use of Multithread programming, Thread class and Runnable interface, Thread priority, Thread synchronization, Thread communication, Deadlock.

Generics: Generics Fundamentals, Bounded Types, Using wildcard arguments & bounded wirldcards, Generic methods, constructors, class hierarchies & Interfaces.
Applets: Applet basics, complete skeleton, initialization & termination, repainting, Using status window & passing parameters to applets.

Reference Books:

1) Java Fundamentals A comprehensive introduction By Herbert Schildt, Dale Skrien, McGraw Hill Education.
2) Programming with Java A Primer – E.Balaguruswamy, McGrawhill
3) The Complete Reference, Java 2 (Fourth Edition),HerbertSchild, - TMH.
4) Core Java Volume-I Fundamentals Horstmann& Cornell, - Pearson Education. - Eight Edition
5) Object Oriented Modeling and Design with UML Michael Blaha and James Rambaugh – PEARSON second edition
6) UML Distilled: A Brief Guide to the Standard Object Modeling Language (3rd Edition) by Martin Fowle

Online Courses

- OOP, Basic of Java http://www.nptelvideos.com/java/java_video_lectures_tutorials.php
- Exceptions and Functions http://www.nptelvideos.com/java/java_video_lectures_tutorials.php?pn=1
- Multithreading http://www.learnerstv.com/Free-Computers-Video-lectures-ltv006-Page1.htm
- Networking basicshttp://nptel.ac.in/courses/106105084/

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class activity	Subject content to be covered
01	Lab 1	Steps to compile and run JAVA program, program to print “Hello” on the console (Command Prompt). object oriented concepts
02	Lab 2	user input as command line argument
03	Lab 3	Programs on Objects and classes
04	Lab 4	String operations using Java, difference between String and StringBuffer
05	Lab 5	constructor overloading and variable overriding
06	Lab 6	static keyword in java, Access Modifiers in Java
07	Lab 7	Programs on Inheritance
08	Lab 8	Programs on Interface
09	Lab 9	Package based application and need of package
10	Lab 10	Exception Handling and Exception generation in Java
11	Lab 11	Programs on Multithreading
12	Lab 12	BufferedReader, BufferedWriter, RandomAccessFile, Object I/O, Applications of File I/O
13	Lab 13	Programs on Collection classes
14	Lab 14	Generics
15	Lab 15	Applet Life Cycle, Graphics and Shapes in Applet using java.awt.* package classes

Subject: Computer Organization & Architecture								
Program: **B.Tech. CS**				Subject Code: CS0404			Semester: I**V**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	0	3	60	00	40	00	100

Course Outcomes:

After completion of the above course, student would be able to
1. Analyze the performance of a system.
2. Understand the memory system, its design and usage.
3. Understand the working of different peripheral devices of a computer system.
4. Learn about current trends in processor design.

Contents:

UNIT-I **[12]**

Introduction: review of basic computer architecture, quantitative techniques in computer design, measuring and reporting performance. CISC and RISC processors.

UNIT-II **[12]**

Pipelining: Basic concepts, instruction and arithmetic pipeline, data hazards, control hazards, and structural hazards, techniques for handling hazards. Exception handling. Pipeline optimization techniques. Compiler techniques for improving performance.

UNIT-III **[12]**

Hierarchical memory technology: Inclusion, Coherence and locality properties; Cache memory organizations, Techniques for reducing cache misses; Virtual memory organization, mapping and management techniques, memory replacement policies. Centralized shared-memory architecture: synchronization, memory consistency, interconnection networks. Distributed shared-memory architecture.

UNIT-IV **[12]**

Instruction-level parallelism: basic concepts, techniques for increasing ILP, superscalar, super-pipelined and VLIW processor architectures. Array and vector processors. Multiprocessor architecture: taxonomy of parallel architectures. Cluster computers. Non von Neumann architectures: data flow computers, reduction computer architectures, systolic architectures.

Text Books

1. John L. Hennessy and David A. Patterson, Computer Architecture: A Quantitative Approach, Morgan Kaufmann.

Reference Books

1. John Paul Shen and Mikko H. Lipasti, Modern Processor Design: Fundamentals of Superscalar Processors, Tata McGraw-Hill.
2. M. J. Flynn, Computer Architecture: Pipelined and Parallel Processor Design, Narosa Publishing House.
3. Kai Hwang, Advanced Computer Architecture: Parallelism, Scalability, Programmability, McGraw-Hill.

Online Courses

1. Computer Architecture Fundamentals https://www.youtube.com/watch?v=4TzMyXmzL8M
2. Instruction Set Architecture https://www.youtube.com/watch?v=HbsuwpJgKao
3. Pipelinig https://www.youtube.com/watch?v=evNEnrm2j98
4. Memory Hierarchy https://www.youtube.com/watch?v=_eAL-v5oNOw

Subject: **Object Oriented Analysis & Design**								
Program: **B.Tech. CS**				Subject Code: CS0405			Semester: I**V**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	0	3	60	00	40	00	100

Learning Objectives

- To teach the students a solid foundation on object-oriented principles
- To teach the student the essential and fundamental aspects of object-oriented analysis and design, in terms of "how to use" it for the purpose of specifying and developing software.
- Explore and analyze different analysis and design models, such OOModels, Structured Analysis and Design Models, etc.

Course Outcome:

After completion of the above course, student would be able to –

- They can make easily flow of the project.
- On the Basis of flow, they are getting the ideas for project development.
- Understand the system and draw the logical flow of the project.

Contents:

UNIT-I **[10 hours]**

- **Introduction**

About Object Orientated Technology, Development and OO Modeling History.

- **Modeling Concepts**

Modeling design Technique, Three models, Class Model, State model and Interaction model.

UNIT-II **[12 hours]**

- **Class Modeling**

Object and class concepts, link and association, Generalization and Inheritance, Advanced class modeling- aggregation, Abstract class metadata, constraints.

- **State Modeling**

Event, state, Transition and conditions, state diagram, state diagram behavior, concurrency, Relation of Class and State models.

UNIT-III **[12 hours]**

- **Interaction Modeling**

Use case Models, sequence models, activity models

- **Analysis and Design**

Development Life cycle, Development stages, Domain Analysis-Domain class model, domain state model, domain interaction model, Iterating and analysis. Application Interaction model, Application class model, Application state Model, Adding operation.

UNIT-IV **[10 hours]**

- **System Design**

Estimating Performance, Making a reuse plan, breaking system into subsystems ,identifying concurrency, allocation of subsystems, management of data storage, Handling Global resources, choosing a software control strategy, Handling boundary condition, common Architectural style.

- **Class design**

Overview of class design ,designing algorithms recursingdownward,refactoring, design optimization, Adjustment of Inheritance, Reification of Behavior.

Reference Books:

Oriented Modeling and Design wih UML - michaelBlaha and James Rambaugh

Online Courses

- Modeling Concepts https://www.youtube.com/watch?v=qiyMyyYqZVY
- Class Modeling, state model http://nptel.ac.in/courses/106105087/pdf/m07L16.pdf
- Interaction Modeling http://nptel.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Embedded%20systems/Pdf/Lesson-36.pdf
- System Design http://freevideolectures.com/Course/2687/Management-Information-System/27

Subject: **Cyber Security and Intellectual Property Rights**								
Program: **B.Tech. CS**				Subject Code: CE0407			Semester: **IV**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
01	00	00	00	60	00	10	00	100

Learning Objectives

- To facilitate understand & critical understanding about Cybercrimes, Ethical Hacking, cyber security, forensics and cyber laws
- Exploration of the legal and policy developments in various countries for cyber space
- To provide in-depth knowledge of Information Technology Act, 2000 including Information Technology Amendment Act, 2008
- Understanding e-Governance, Electronic Contracts, e-Banking & Secure electronic records

Contents

UNIT-I **[3 hours]**

Introduction:

Information Security Overview, Cyber security, Cyber security objectives and policies, Differences between Information Security & Cyber security, Cyber security Principles, Introduction of Cyber crime, Classifications of Cybercrimes.

UNIT-II **[3 hours]**

Security Threats and vulnerabilities:

Overview of Security threats, Hacking Techniques, Password Cracking, Insecure Network connections, Malicious Code, Programming Bugs, Cyber crime and Cyber terrorism, Information Warfare and Surveillance. Applicationsecurity(Database,E-mailandInternet).

UNIT-III **[3 hours]**

Overview of Security Management:

Overview of Security Management , Security Policy , Security Procedures and Guidelines , Risk Management , Security Laws**, System Security** (Desktop, email,web), Intrusion Detection Systems, SecurityTechnology-FirewallandVPNs ,Backup SecurityMeasures.

UNIT-IV **[3 hours]**

Cyber law- Intellectual property right:

Introduction, Objectives of Intellectual property law, Types of IPR, Advantages of IPR, IPR in India, Offences and Penalties.

Text Books

1. "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Nina Godbole, SunitBelapur, Wiley India Publications, April, 2011

Reference Books

1. CharlesP.Pfleeger,ShariLawerancePfleeger,"AnalysingComputerSecurity", PearsonEducationIndia.
2. .K.Pachghare,"CryptographyandinformationSecurity",PHI LearningPrivateLimited,DelhiIndia.
3. Dr.SuryaPrakashTripathi,RitendraGoyal,PraveenkumarShukla,"Introductionto InformationSecurityand CyberLaw"WilleyDreamtechPress.
4. Schou,Shoemaker,"InformationAssurancefortheEnterprise",TataMcGrawHill.
5. CHANDER,HARISH,"CyberLawsAndIt Protection",PHILearningPrivateLimited,Delhi,India

Online courses:

- https://www.youtube.com/watch?v=yjmQurhbVas
- https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-858-computer-systems-security-fall-2014/video-lectures/
- https://www.youtube.com/watch?v=mut5Z9Ajva4
- https://www.youtube.com/watch?v=MI5KxHookDs
- https://www.youtube.com/playlist?list=PLRkCJvWSrxbt-xBX5cjzTr4pE0SZ-pIOf

5TH SEMESTER

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

B-TECH COMP. SCIENCE & ENGG., SEMESTER –V TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017													
SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE		ESE	CIE	ESE	
			L	T	P			MID	IE				
1	CS0506	Microprocessor	03	02	00	04	05	30	10	60	00	00	100
2	CS0501	Computer Networks	03	00	02	04	05	30	10	60	40	60	200
3	CS0502	Design and Analysis of Algorithms	04	00	02	05	06	30	10	60	40	60	200
4	CS0503	Formal Languages and Automata Theory	04	00	00	04	04	30	10	60	00	00	100
5	CS0504	Web Technologies	03	00	02	04	05	30	10	60	40	60	200
6	CS0505	Software Engineering	03	02	00	04	05	30	10	60	00	00	100
7	SH0507	Technical Communication and Soft Skills	01	00	00	00	01	00	00	00	00	00	100
TOTAL			**21**	**04**	**06**	**25**	**31**	**180**	**60**	**360**	**120**	**180**	**1000**

.Subject: **Microprocessor**								
Program: **B.Tech. CS**				Subject Code: CS0506			Semester: **V**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	2	0	4	60	00	40	00	100

Course Outcome:

- To understand basic architecture of 16 bit and 32 bit microprocessors.
- To understand interfacing of 16 bit microprocessor with memory and peripheral chipsinvolving system design.
- To understand RISC and CISC based microprocessors.

Contents

UNIT-I **[12]**

Intel 8085 Microprocessor

Basic functions of the microprocessor, System bus, Architecture, Pin Functions, De-multiplexing Of Buses, Generation Of Control Signals, Instruction Cycle, Machine Cycles, T-States, Timing Diagram. Overview of the instruction groups of 8085 and the addressing modes. Assembly language programming of 8085 Microprocessor.

UNIT-II **[12]**

Intel 8086 Architecture

Major features of 8086 processor, 8086/88 CPU Architecture and the pipelined operation, Programmer's Model and Segmented Memory.

Designing the 8086 CPU module:

8086 pin description in details, Generating the 8086 System Clock and Reset Signals, 8086 Minimum and Maximum Mode CPU Modules, Minimum and Maximum Mode Timing Diagrams.

UNIT-III **[12]**

Interrupts of 8086

Interrupt Systems, Classification of Interrupts, Interrupts of 8086, Interrupt Processing and the Predefined interrupts in 8086 Processor.

Instruction Set of 8086 and Programming:

Instruction Set of 8086 microprocessor in details, Addressing modes of 8086/88, MASM Assembler, Assembler Directives, Programming the 8086 in assembly language

Programmable peripheral and Timer controller and System Design:
Functional Block Diagram and description, Control Word Formats, Operating Modes and Applications of the Peripheral Controller namely 8255-PPI, 8253-PIT.

UNIT-IV **[12]**

Interrupt and DMA controller and System Design:
Functional Block Diagram and description, Control Word Formats, Operating Modes and Applications of the Peripheral Controller namely 8259- PIC and 8237-DMAC. Memory Interfacing.

Multiprocessor Systems:

Study of Multiprocessor Configurations namely Tightly Coupled System (TCS) and Loosely Coupled System (LCS), TCS with the case study of the Coprocessor, Various System Bus Arbitration Schemes in LCS, and Role of the Bus Arbiter (Intel 8289) in the LCS.

Text Books

1. Microprocessor architecture and applications with 8085: By Ramesh Gaonkar (Penram International Publication).
2. Microprocessor 8086 Architecture, programming and Interfacing by Sunil Mathur, PHI Publication.

Reference Books

1. 8086/8088 family: Design Programming and Interfacing: By John Uffenbeck (Pearson Education).
2. 8086 Microprocessor Programming and Interfacing the PC: By Kenneth Ayala
3. NPTEL and MIT digital Video lectures

MOOC Resources:

- http://nptel.ac.in/courses/108107029/
- http://nptel.ac.in/courses/Webcourse-contents/IIT-KANPUR/microcontrollers/micro/ui/Course_home4_29.htm
- http://nptel.ac.in/courses/106103068/47
- http://nptel.ac.in/courses/106108100/pdf/Teacher_Slides/mod1/M1L3.pdf

Subject: **Computer Networks**								
Program: **B.Tech. CS**				Subject Code: CS0501			Semester: **V**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcome:

- To master the terminology and concepts of the OSI reference model and the TCP-IP reference model.
- To be familiar with wireless network concepts, issues in networking technologies, network tools

Contents

UNIT-I **[12]**

Introduction to Computer Networks:

Basics of Data Communication System and its components, Computer network and its goals, Types of computer networks: LAN, MAN, WAN, Wireless networks, Transmission media, Network software: concept of layers, protocols, interfaces and services, ISO-OSI reference model, TCP/IP reference model.

Data Link Layer:

Design issues, Framing, Error detection and correction codes: checksum, CRC, hamming code, Data link protocols for noisy and noiseless channels, Sliding Window Protocols: Stop & Wait ARQ, Go-back-N ARQ, Selective repeat ARQ.

UNIT-II **[12]**

Medium Access Sub-Layer:

Static and dynamic channel allocation, Random Access: ALOHA, CSMA protocols, Controlled Access: Polling, Token Passing, IEEE 802.3 frame format, Manchester encoding, collision detection in 802.3, Binary exponential back off algorithm.

UNIT-III **[12]**

Network Layer:

Design issues, IPv4 classful and classless addressing, sub netting, Protocols: IP, ARP, RARP, ICMP, Routing algorithms: distance vector and link state routing , shortest path algorithm, Routing protocols :IGMP, OSPF, RIP, BGP, flooding.

UNIT-IV **[12]**

Transport Layer:

Elements of transport protocols, introduction to TCP/UDP protocols and their comparison. The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window Congestion control: Principles of Congestion Control, Congestion prevention policies, Leaky bucket and token bucket algorithms.

Application Layer:

Hyper Text Transfer Protocol (HTTP), Domain Name System (DNS), File Transfer Protocol (FTP), Dynamic Host Configure Protocol (DHCP)

Text Books

1. Data Communications and Networking, Fourth Edition by Behrouza A. Forouzan,TMH.
2. Computer Networks, A.S.Tanenbaum,4thedition,Pearson education.

Reference Books

1. Computer Network, Natalia Olifer, Victor Olifer, Wiley-India edition.
2. Data and computer communication, William Stallings, Pearson
3. Local area Networks by Peter Hudson
4. Douglas Comer, Internetworking with TCP/IP, Volume 1, Prentice Hall of India

MOOC Resources:

- https://www.youtube.com/watch?v=UXMIxCYZu8o
- https://youtu.be/pVl1L1jrbFE
- https://youtu.be/AmlOSGYkKXc
- https://youtu.be/KCcdF4IVrQk

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	LAB -1	To study diff types of topologies.
2	LAB -2	To study diff category of networks.
3	LAB-3	To compare OSI and TCP/IP protocol model
4	LAB-4	To demonstrate Networking and Internetworking Devices.(NIC, Switch, Hub, Router, Gateway, Repeater, Bridge, Cables)
5	LAB-5	Write a program which demonstrates the concept of bit stuffing.

6	LAB-6	Write a program which demonstrates the concept of byte stuffing.
7	LAB-7	Write a program which demonstrates the concept of Error Detection Methods like VRC,LRC.
8	LAB-8	Configuration of router in packet tracer.
9	LAB-9	Simulation of RIP protocol in packet tracer.
10	LAB-10	Simulation of OSPF protocol in packet tracer.
11	LAB-11	Simulation of BGP protocol in packet tracer.
12	LAB-12	Write a program which demonstrates the concept of PARITY CHECKING
13	LAB-13	Study of packet sniffing tools. (Wireshark, tcpdump)
14	LAB-14	To study RS-232 standard.
15	LAB-15	Write a program which demonstrates the concept of Error Detection Method CRC.

Subject: **Design & Analysis of Algorithms**								
Program: **B.Tech. CS**				Subject Code: CS0502			Semester: **V**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	0	2	5	60	60	40	40	200

Course Outcome:

- Analyze the asymptotic performance of algorithms.
- Write rigorous correctness proofs for algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

Contents:

UNIT-I **[12]**

Basics of Algorithms and Mathematics

What is an algorithm?, Mathematics for Algorithmic Sets, Functions and Relations,Vectors and Matrices, Linear Inequalities and Linear Equations.

Analysis of Algorithm

The efficient algorithm, Average and worst case analysis, Elementary operation,Asymptotic Notation, Analyzing control statement, Amortized analysis, Sorting Algorithm,
Binary Tree Search.

UNIT-II **[12]**

Divide and Conquer Algorithm

Introduction, Multiplying large Integers Problem, Problem Solving using divide and conquer algorithm - Binary Search, Sorting (Merge Sort, Quick Sort), Matrix Multiplication,Exponential.

Greedy Algorithm

General Characteristics of greedy algorithms, Problem solving using Greedy Algorithm - Activity selection problem, Elements of Greedy Strategy, Minimum Spanning trees (Kruskal's algorithm, Prim's algorithm), Graphs: Shortest paths, The Knapsack Problem, Job Scheduling Problem.

UNIT-III **[12]**

Dynamic Programming

Introduction, The Principle of Optimality, Problem Solving using Dynamic Programming – Calculating the Binomial Coefficient, Making Change Problem, Assembly Line-Scheduling, Knapsack problem, Shortest path, Matrix chain multiplication, Longest Common Subsequence.

Exploring Graphs

An introduction using graphs and games, Traversing Trees – Preconditioning, Depth First Search - Undirected Graph, Directed Graph, Breath First Search, Backtracking and Branch & Bound– The Knapsack Problem, The Eight queens problem, General Template.

UNIT-IV **[12]**

String Matching

Introduction, The naive string matching algorithm, The Rabin-Karp algorithm, String Matching with finite automata.

Introduction to NP-Completeness

The class P and NP, Polynomial reduction, NP- Completeness Problem, NP-Hard Problems.

Text Books

1. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, PHI.

2. Fundamental of Algorithms by Gills Brassard, Paul Bratley.

Reference Books

1. Introduction to Design and Analysis of Algorithms, AnanyLevitin, Pearson.

MOOC resources:

- https://onlinecourses.nptel.ac.in/noc17_cs20/preview
- http://freevideolectures.com/Course/2281/Design-and-Analysis-of-Algorithms/6
  http://www.nptelvideos.in/2012/11/design-analysis-of-algorithms.html
- http://www.nptelvideos.com/video.php?id=1444
- https://www.youtube.com/watch?v=76n4BjlL1cs

Subject: **Formal Language & Automata Theory**								
Program: **B.Tech. CS**				Subject Code: CS0503			Semester: **V**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	0	0	4	60	00	40	00	100

Course Outcome:

- Master regular languages and finite automata.
- Master context free languages, push-down automata
- Be exposed to a broad overview of the theoretical foundation of computer science.

Contents:

UNIT-I **[12]**

Basics

Sets, Logic formulas, Functions and Relations, Basic mathematical notations, Basics of alphabet, string, languages and grammars, Mathematical induction and recursive definitions.

UNIT-II **[12]**

Regular Languages and Finite Automata

Regular language and regular expressions, Deterministic finite automata, Minimization of finite automata, Operations on Finite automata, Nondeterministic Finite Automata, Conversion of NFA to DFA, NFA-^, Conversion of NFA-^ to NFA and DFA, Kleene's Theorem, Pumping lemma for regular Languages.

UNIT-III **[12]**

Context Free Grammar (CFG)

Introduction to CFG, Derivation and Parse Tree, Ambiguity in CFG, Left factoring and Left Recursion, Simplification of CFG, Linear Grammar, Normal Forms (GNF and CNF), Applications of CFG

Push-Down Automata (PDA):

Introduction of PDA, DPDA and NPDA, Construction of PDA from CFG and vice versa, Parsing.

UNIT-IV **[12]**

Turing Machines (TM)

Introduction to TM, Variations of TM, Non deterministic TM, Universal TM, Two Stack PDA and Turing machine, Models of Computation and the Church-Turing Thesis, Recursive and Recursively enumerable language, Enumerating a language, Context Sensitive language and Chomsky Hierarchy

Recursive Functions and Computational Complexity:

Post Correspondence Problem, Initial Function, Recursive Function, Gödel Number, Types of complexity, Different Notations, Complexity Classes, P and NP problems, Polynomial time reducibility.

Text Books

1. Introduction to languages and Theory Of Computation by John C. Martin, Third Edition, TMH Publication.
2. Introduction to Automata theory, Formal Languages and Computations by ShyamalenduKandar, Pearson Publication.

Reference Books

1. Formal Languages and Automata Theory by C.K. Nagpal, Oxford Publication
2. Automata theory, Languages and computation by Hopcroft, Motwani, Ullman, Pearson Education.

MOOC Resources:

- https://youtu.be/al4AK6ruRek
- https://youtu.be/8luLfQdST2g
- https://youtu.be/7ZbDEfnYwAo
- https://youtu.be/BR6fHjKFqa0

Subject: **Web Technologies**								
Program: **B.Tech. CS**				Subject Code: CS0504			Semester: **V**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcome:

1. Implement the basic principles of Object Oriented Programming which includes inheritance, Polymorphism, encapsulation and abstraction and also Arrays, data and Text File Operations.
2. Implement the role of XML for the management and delivery of electronic information for given application.
3. Develop Web based applications by Servlet and JSP to have an interactive application such as Client Server Architecture.

Contents:

UNIT-I **[12]**

HTML: Basics of HTML, HTML5 features and standards

CSS: Need for CSS, introduction to CSS, Overview and features of CSS3

JavaScript: Client side scripting with JavaScript, variables, functions, conditions, loops and repetition, Pop up boxes, Advance JavaScript: Javascript and objects, JavaScript own objects, the DOM and web browser environments, Manipulation using DOM, forms and validations

UNIT-II **[12]**

DHTML : Combining HTML, CSS and Javascript, Events and buttons

XML Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Using XML with application. Transforming XML using XSL and XSLT

UNIT-III **[12]**

Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing, Files, Advance Features: Cookies and Sessions, Object Oriented Programming with PHP

UNIT-IV **[12]**

Basic commands 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 myadmin and database bugs

Text Books

1. Developing Web Application, Ralph Moseley, - Wiley India

Reference Books

1. Head First HTML with CSS & XHTML By Eric T Freeman, Elisabeth Freeman, Elisabeth Robson
2. Developing Web Applications in PHP and AJAX by Harwani, McGrawHill

MOOC resources:

- **https://www.w3schools.com/html/default.asp**
- **https://nptel.ac.in/courses/106105084/**
- **https://www.codecademy.com/learn/jquery**
- **https://www.codecademy.com/learn/php**

Lab Plan

- Minimum Laboratory contact time: 15 weeks
- Lab / week: 2 hrs. (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	LAB -1	Introduction to web 2.0, website, web portal, domain name, networking concepts. Introduction to internet, hosting of website, server configurations and maintenance.
2	LAB -2	Create a website layout using table structure which consist of space/locations for Logo, Search, News, Events, Content area, etc.
3	LAB-3	Write a program using HTML and CSS to introduce overlap multiple div tags and apply exact positioning to each. Introduction to CSS 3.0. Write a study practical to demonstrate and list all the newly introduced features of CSS 3.0
4	LAB-4	Write a study practical on client side scripting, what is Javascript, how to develop Javascript, simple Javascript, variables in JavaScript
5	LAB-5	forms and validations DHTML : Combining HTML, CSS and Javascript events and buttons, controlling your browser
6	LAB-6	Analyzing browser support and browser version, Understanding frameworks of JavaScript
7	LAB-7	PHP based web application to understand data retrieval on server side
8	LAB-8	File Uploading and Downloading using PHP
9	LAB-9	Include, require, date functions in php
10	LAB-10	Database application to store employee records in MySQL database
11	LAB-11	Create a login application using session and Database
12	LAB-12	
Subject: **Software Engineering**		

Program: **B.Tech. CS**	Subject Code: CS0505	Semester: **V**

Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Tota**
3	2	0	4	60	00	40	00	100

Course Outcome:

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to function on multi-disciplinary teams.
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Contents:

UNIT-I **[12]**

Introduction: Phases in Software development, software development process models, role of metrics and measurement. Software Requirement specification (SRS): Role of SRS, problem analysis, requirement specification, validation of SRS document, metrics, monitoring and control, Object-Oriented analysis.

UNIT-II **[12]**

Typing

Planning a software Project: Cost estimation, project scheduling, staffing and personnel planning, team structure, software configuration management, quality assurance plans, monitoring plans, management.

UNIT-III **[12]**

System Design: Objective, principles, module level concepts, coupling and cohesion, methodology- structured and object oriented, Design specification and verification, Metrics, Object-Oriented Design.

Detailed Design: Specification, design language, verification, Monitoring and control. Coding: Practice, documentation, verification, correctness proving, metrics, monitoring and control.

UNIT-IV **[12]**

Testing: Fundamentals, functional and structural testing, test plans, test case specifications, test case execution and analysis.

Text Books

1. Software Engineering Roger Pressman, McGraw-Hill Science
2. Fundamentals of Software Engineering, Rajeev mall, PHI
3. Software Engineering: Theory and Practice, 2 nd ed., S. L. P fleeger, Pearson Education.

Reference Books

1. SOFTWARE ENGINEERING CONCEPTS by Richard Fairley, McGraw-Hill Science
2. An Integrated Approach to Software Engineering, PankajJalote, Springer Science & Business Media.

MOOC Resource

https://www.youtube.com/watch?v=Z6f9ckEElsU&list=PL0A93F793E2371F15

Subject: **Technical Communication and Soft Skills**								
Program: **B.Tech. CS**			Subject Code: SH0507				Semester: **V**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
1	0	0	0	60	00	40	00	100

Course Objectives:

1. To enable students to interact with a degree of fluency and spontaneity that makes regular interaction with fluent English speakers quite possible without strain for either party.
2. To understand with ease virtually everything heard or read.
3. To express themselves spontaneously, very fluently and precisely, differentiating finer shades of meaning even in the most complex situations.
4. To understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment).
5. To communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters
6. To understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in their field of specialization.

Course Content:

	Sr. No.	**Content**
Listening	1	**Listening: Cloze test**
	2	**Listening to Talks (BBC, TED) 1**
	3	**Listening to Talks 2**

Speaking	**4**	**Phonetics: Sounds & Symbols & Accent Patterns**
	5	**Vocabulary Games: Intermediate Level**
	6	**Vocabulary Games: Intermediate Level**
	7	**Building Dialogues: Situational Conversation**
	8	**Role Play**
	9	**Group Discussion**

Reading	**10**	**How to Read effectively**
	11	**Reading to Remember : SQ3R**

Writing	**12**	**Grammar Intermediate: Sentence Transformation**
	13	**Common Errors in English**
	14	**Précis Writing**
	15	**Effective Paragraph Writing**

6TH SEMESTER

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

B-TECH COMP. SCIENCE & ENGG., SEMESTER –VI TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017													
SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	CS0601	Computer Graphics	03	00	02	04	05	30	10	60	40	60	200
2	CS0602	Python Programming	03	00	02	04	05	30	10	60	40	60	200
3	CS0603	Advance Java Technology	04	00	02	05	06	30	10	60	40	60	200
4	CS0604	System Programming	03	00	02	04	05	30	10	60	40	60	200
5	CS0605	Parallel Computing	03	00	02	04	05	30	10	60	40	60	200
	CS0606	Soft Computing											
	CS0607	Android Programming											
6	CS0608	Data Warehouse & Mining (Mooc)	03	00	02	04	05	30	10	60	40	60	200
	CS0609	Distributed Operating System											
	CS0610	Distributed Database Management System											
7	SH0607	Advanced Technical Communication And Soft Skills	01	00	00	00	01	00	00	00	00	00	100
TOTAL			**20**	**00**	**12**	**25**	**32**	**180**	**60**	**360**	**240**	**360**	**1300**

Subject: **Computer Graphics**								
Program: **B.Tech. CS**				Subject Code: CS0601			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcome:

1. Have a basic understanding of the core concepts of computer graphics.
2. How I/O device actually work.
3. How actually object is drawn.
4. How different algorithm are used to draw the quality picture.
5. Student will learn how 3D objects are displayed.
6. How 3D object scaled, rotate and translate.
7. Student will able to create his own small application using computer graphics.

Contents:

UNIT-I **[10]**

Introduction to Computer Graphics:

Introduction:

Applications, graphics input devices, display devices (CRT, Color CRT Monitors, DVST and Flat Panel Displays), Random scan & raster scan display, graphics s/w and standards.

Output primitives: point, line, circle, ellipse

Line drawing algorithm: DDA, Bresenham, Midpoint circle drawing algorithm, Midpoint ellipse drawing algorithm, Character Generation method, aliasing and ant aliasing.

Filled area primitives: polygon drawing, types of polygon, inside-outside test(odd-even rule, winding number), scan line polygon filling, Boundary fill, Flood fill.

UNIT-II **[10]**

2D transformation and viewing:

Basic Transformation: Translation, scaling, rotation, matrix representation, homogeneous co ordinates, composite transformations.

Other transformation: shear, reflection

Viewing and Clipping: viewing pipeline and coordinates system, window to viewport coordinate transformation, point clipping, line clipping:(cohen-sutherland, liang-barsky, NLN), polygon clipping: Sutherland-Hodgeman Polygon Clipping and Weiler Atherton Polygon Clipping

UNIT-III **[12]**

3D concepts, Transformation and viewing

3D display methods(parallel and perspective projection), polygon surfaces, tables, equations, meshes, curved lies and surfaces, quadric surfaces, spline representation, cubic spline interpolation methods, Bezier curves and surfaces, B-spline curves and surfaces

scaling, rotation and translation, composite transformation, viewing pipeline and coordinates, parallel and perspective transformation, view volume and general (parallel and perspective) projection transformations

UNIT-IV **[12]**

Advance topics :

Visible surface detection method: back-face detection, depth buffer Method, scan line, depth sorting

Light, color, shading: illumination methods (ambient, diffuse reflection, specular reflection), Color models: XYZ, RGB, YIQ and CMY color models

Text Books

Donald Hearn and M. Pauline Baker, Computer Graphics- C Version, PHI/Pearson Education

Reference Books

1. J. D. Foley, S. K Feiner, A Van Dam F. H John, Computer Graphics: Principles & Practice in C, Pearson Education

Online Courses:

- https://youtu.be/fwzYuhduME4
- https://youtu.be/0plNDJj4UPY
- https://youtu.be/0xVl2_qvj1I
- https://youtu.be/gmoC8xC4MGw
- http://nptel.ac.in/courses/106106090/

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered

1	Lab 1/Lab2/Lab3	Study of various C graphics functions. (initgraph, line, circle, drawpoly etc.)
2	Lab 1/Lab2/Lab3	Use mouse for interactive C program in DOS mode.
3	Lab 1/Lab2/Lab3	Implement DDA line drawing algorithm.
4	Lab 1/Lab2/Lab3	Implement Bresenham line drawing algorithm.
5	Lab 1/Lab2/Lab3	Implement Mid-point circle drawing algorithm.
6	Lab 1/Lab2/Lab3	Implement Mid-point ellipse drawing algorithm.
7	Lab 1/Lab2/Lab3	A. Implement Boundary-Fill algorithm to fill a polygon.
8	Lab 1/Lab2/Lab3	Implement Flood-Fill algorithm to fill a polygon.
9	Lab 1/Lab2/Lab3	Implement algorithm for Character generation.
10	Lab 1/Lab2/Lab3	Implement algorithm for 2D Transformation of an object.
11	Lab 1/Lab2/Lab3	Implement Cohen-Sutherland line clipping algorithm.

Subject: **Python Programming**								
Program: **B.Tech. Computer Engineering**				Subject Code: CS0602			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. Master the principles of object-oriented programming and the interplay of algorithms and data structures in well-written modular code.
2. Solve problems requiring the writing of well-documented programs in the Python language, including use of the logical constructs of that language.
3. Demonstrate significant experience with the Python program development environment.

Contents:

UNIT-I **[10]**

Introduction to Python

- The basic elements of python
- Branching Programs
- Control Structures
- Strings and Input
- Iteration

Functions, Scoping and Abstraction

- Functions and scoping
- Specifications
- Recursion
- Global variables
- Modules
- Files
- System Functions and Parameters

UNIT-II **[10]**

Structured Types, Mutability and Higher-Order Functions

- Strings, Tuples, Lists and Dictionaries
- Lists and Mutability
- Functions as Objects

Testing, Debugging, Exceptions and Assertions

- Types of testing – Black-box and Glass-box
- Debugging
  Handling Exceptions
- Assertion

UNIT-III **[12]**

Classes and Object-Oriented Programming

- Abstract Data Types and Classes
- Inheritance
- Encapsulation and Information Hiding

Simple Algorithms and Data structures

- Search Algorithms
- Sorting Algorithms
- Hash Tables

UNIT-IV **[12]**

Advanced Topics I

- Regular Expressions – REs and Python
- Plotting using PyLab
- Networking and Multithreaded Programming – Sockets, Threads and Processes, Chat Application

Advance Topics II

- Security – Encryption and Decryption , Classical Cyphers
- Graphics and GUI Programming – Drawing using Turtle, Tkinter and Python, Other GUIs

Reference Books:

1. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
2. R. Nageswara Rao, "Core Python Programming", dreamtech
3. Wesley J. Chun. "Core Python Programming - Second Edition", Prentice Hall
4. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, "Data Structures and Algorithms in Pyhon", Wiley
5. Kenneth A. Lambert, "Fundamentals of Python – First Programs", CENGAGE Publication
6. Luke Sneeringer, "Professional Python", Wrox
7. "Hacking Secret Ciphers with Python", Al Sweigart, URL- https://inventwithpython.com/hacking/chapters

Online Courses:

- **https://www.youtube.com/watch?v=N4mEzFDjqtA**
- **https://www.youtube.com/watch?v=hnxIRVZ0EyU**
- **https://www.youtube.com/watch?v=tKTZoB2Vjuk**

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	Lab1	Develop programs to understand the control structures of python
2	Lab 2	Develop programs to learn different types of structures (list, dictionary, tuples) in python
3	Lab 3	Develop programs to learn concept of functions scoping, recursion and list mutability
4	Lab 4	Develop programs to understand working of exception handling and assertions
5	Lab 5	Develop programs for data structure algorithms using python – searching, sorting and hash tables
6	Lab 6	Develop programs to learn regular expressions using python
7	Lab 7	Develop chat room application using multithreading.
8	Lab 8	Learn to plot different types of graphs using PyPlot
9	Lab 9	Implement classical ciphers using python
10	Lab 10	Draw graphics using Turtle
11	Lab 11	Develop programs to learn GUI programming using Tkinter

Subject: **Advance Java Technology**								
Program: **B.Tech. CS**				Subject Code: CS0603			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	0	2	5	60	60	40	40	200

Course Outcome:-

1. Demonstrate the working of web applications.
2. Understanding various java frameworks and its applications
3. Learning difference between client side programming vs server side programming

Contents:

UNIT-I **[12]**

Architecture of Web and Server side programming: Introduction to http protocol, web architecture and networking, Server side programming with Java Servlet, HTTP and Servlet, Servlet API, life cycle, configuration and context, Request and Response objects, Servlet Annotations, Session handling and event handling, Filters and its application, JSP architecture, JSP page life cycle, JSP elements, Expression Language, Tag Extensions, Tag Extension API, Tag handlers, JSP Fragments, Tag Files, JSTL, Core, XML, Formatting Tag library, SQL Tag library and Functions Tag library, Custom tag development.

UNIT-II **[12]**

Database integrations and Frameworks: Java database Programming, java.sql Package, JDBC driver types, java beans, Database connectivity in JSP and Servlets, Web based MVC Architecture, Introduction to Hibernate, Architecture, Object Relational Mapping in Hibernate, Hibernate annotations.

UNIT-III **[12]**

Network Programming: Network Programming With java.net Package, Client Programs And Server Programs, Content And Protocol Handlers, RMI architecture, RMI registry, Distributed application with RMI, Naming services, Directory Services, Applications of JNDI, Object serialization and Internationalization in java application.

UNIT-IV **[12]**

Swing and GUI based applications: Introduction To Swing, MVC Architecture, Applets, Applications and Pluggable Look and Feel, Swing components, Swing event handling, Layouts, Database connectivity in Swing application, Custom component Development.

Text Books

1. Java 6 Programming, Black Book, dreamtech
2. Java Server Programming, Java EE6 (J2EE 1.6), Black Book, dreamtech
3. Java Programming Advance Topics, Joe Wigglesworth and Paula McMillan,Cengage

Reference Books

1. Professional Java Server Programming, a! Apress
2. Core Java, Volume II – Advanced Features, Eight Edition, Pearson
3. Unleashed Java 2 Platform, SamsTechmedia
4. The Complete Reference J2EE, Keogh, McGrawHill
5. Java EE 5 for beginners, Bayross and Shah, SPD
6. JDBC 3 Java Database Connectivity, Bernand Van Haecke, Wiley-dreamtech
7. Java Server Pages for Beginners, Bayross and Shah, SPD
8. Java Servlet Programming, Jason Hunter, SPD (O'Reilly)

Online Courses:

- http://courses.coreservlets.com/Course-Materials/csajsp2.html
- https://javabrains.io/topics/hibernate
- https://www.javatpoint.com/RMI
- https://www.udemy.com/java-swing-complete/

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	Lab	Understanding web server, application server and database server.
1	Lab	Write a program using JSP to demonstrate dynamic generation of HTML table tag.
2	Lab	Write a program using HTML, CSS and JavaScript to understand flow of data using manual form submission and html form submission.
2	Lab	CRUD operation using Cookie, Cookie management tool (Cookie table with delete and update button)
3	Lab	Demonstrating five methods of session, Shopping cart using session
3	Lab	Login using session (static username & password), Create Registration form using type-1 db connectivity

4	Lab	List all the records of a table using type-2 db connectivity driver, Search engine using type-2 database connectivity
4	Lab	Introduction to servlet(folder structure-generic servlet-http servlet-lifecycle-deployment descriptor file)
5	Lab	Create a browser specific page hit counter using servlet, Using single HTTPServlet create a form and insert a record into db.
5	Lab	Parameter passing in servlet, Create an application specific page hit counter in which the counter value should remain as it is even though we restart the server
6	Lab	Demonstrate web base MVC architecture using JSP,Servlet and JavaBean
6	Lab	Implementing internationalization in java, Learning hibernate configuration and architecture
7	Lab	CRUD using Hibernate
8	Lab	Hibernate Relationships
8	Lab	Learning TCP connection using java, Learning UDP connection using java
9	Lab	Demonstrating the use and architecture of RMI app
9	Lab	Introduction to swing, Swing Components
10	Lab	Swing Event Handling
10	Lab	Project
11	Lab	Project
12	Lab	Project
13	Lab	Project
14	Lab	Project

Subject: **System Programming**								
Program: **B.Tech. CS**				Subject Code: CS0604			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. Design, implement, test, debug, and document programs in C and C++.
2. grasp the concepts and principles, and be familiar with the approaches and methods of developing system - level software (e.g., compiler, and networking software)
3. organize the functionalities and components of a computer system into different layers, and have a good understanding of the role of system programming and the scope of duties and tasks of a system programmer.

Contents:

UNIT-I **[10]**

Overview of System Software

Introduction, Software, Software Hierarchy, Systems Programming, Machine Structure, Interfaces, Address Space, Computer Languages, Tools, Life Cycle of a Source Program, Different Views on the Meaning of a Program, System Software Development, Recent Trends in Software Development, Levels of System Software

Overview of Language Processors

Programming Languages and Language Processors, Language Processing Activities, Program Execution, Fundamental of Language Processing, Symbol Tables ,Data Structures for Language Processing: Search Data structures, Allocation Data Structures..

UNIT-II **[10]**

Assemblers

Elements of Assembly Language Programming, Design of the Assembler, Assembler Design Criteria, Types of Assemblers, Two-Pass Assemblers, One-Pass Assemblers, Single pass Assembler for Intel x86 , Algorithm of Single Pass Assembler, Multi-Pass Assemblers, Advanced Assembly Process, Variants of Assemblers Design of two pass assembler,

Macro and Macro Processors

Introduction, Macro Definition and Call, Macro Expansion, Nested Macro Calls, Advanced Macro Facilities, Design Of a Macro Pre-processor, Design of a Macro Assembler, Functions of a Macro

Processor, Basic Tasks of a Macro Processor, Design Issues of Macro Processors, Features, Macro Processor Design Options, Two-Pass Macro Processors, One-Pass Macro Processors

UNIT-III **[12]**

Linkers and Loaders

Introduction, Relocation of Linking Concept, Design of a Linker, Self-Relocating Programs, Linking in MSDOS, Linking of Overlay Structured Programs, Dynamic Linking, Loaders, Different Loading Schemes, Sequential and Direct Loaders, Compile-and-Go Loaders, General Loader Schemes, Absolute Loaders, Relocating Loaders, Practical Relocating Loaders, Linking Loaders, Relocating Linking Loaders, Linkers v/s Loaders.

Scanning and Parsing

Programming Language Grammars, Classification of Grammar, Ambiguity in Grammatical Specification, Scanning, Parsing, Top down Parsing, Bottom up Parsing, Language Processor Development Tools, LEX, YACC

UNIT-IV **[12]**

Compilers

Causes of Large Semantic Gap, Binding and Binding Times, Data Structure used in Compiling, Scope Rules, Memory Allocation, Compilation of Expression, Compilation of Control Structure, Code Optimization

Interpreters & Debuggers

Benefits of Interpretation, Overview of Interpretation, the Java Language Environment, Java Virtual Machine, Types of Errors, Debugging Procedures, Classification of Debuggers, Dynamic/Interactive Debugger

Text Books

1. "System Programming" by D M Dhamdhere McGraw Hill Publication

Reference Books

1. System Programming by Srimanta Pal OXFORD Publication
2. System Programming and Compiler Construction by R.K. Maurya & A. Godbole.
3. System Software – An Introduction to Systems Programming by Leland L. Beck, 3rd Edition, Pearson Education Asia, 2000
4. System Software by Santanu Chattopadhyay, Prentice-Hall India,2007

Online Outcomes:

- https://www.youtube.com/watch?v=WhJLdBjE_9E
- https://youtu.be/1qOMlqE6LhU
- https://www.youtube.com/watch?v=bTkRvSUBkcA
- https://www.youtube.com/watch?v=OaMGK3gED9M&list=PLALP0uQI7IaHlx1voRaTAYQu2m8FY4pS_

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	Lab 1/Lab2/Lab3	Write a program to implement the lexical analyzer
2	Lab 1/Lab2/Lab3	Write a Lexical Analyzer (using lex utility for UNIX).
3	Lab 1/Lab2/Lab3	Write a program to left factor the given grammar.
4	Lab 1/Lab2/Lab3	Write a program to remove the Left Recursion from a given grammar.
5	Lab 1/Lab2/Lab3	Implement Recursive Descendent Parsing for the given Grammar. E -> T + E / T T -> F * T / F F -> (E) / i
6	Lab 1/Lab2/Lab3	Implement Predictive Parser for the given grammar. E -> T + E / T T -> F * T / F F -> (E) / i
7	Lab 1/Lab2/Lab3	Write a SAL program in text file and generate SYMTAB and LITTAB
8	Lab 1/Lab2/Lab3	Use macro features of C language
9	Lab 1/Lab2/Lab3	Write a program which generates Quadruple Table for the given postfix String
10	Lab 1/Lab2/Lab3	Write a C program to parse a given string using Predictive parsing for given grammar. type . simple | .id | array [simple] of type simple . integer | char | numdotdotnum

Subject**: Parallel Computing**								
Program: **B.Tech. CS**				Subject Code: CS0605			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Tota**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. Understand and apply parallel in problem solving .
2. Describe and implement industry-standard task parallel and data-parallel algorithms
3. Develop parallel solutions for shared memory systems using share function
4. Develop Chat application using RMI,echo client ,echo server

Contents:

UNIT-I **[12]**

Introduction of Processes &Shared memory Programming.

Parallel Processing, Shared Memory Multiprocessing, Distributed Shared Memory, Message Passing Parallel Computers, Using Parallelism, Utilizing Temporal Parallelism, Utilizing Data Parallelism, Comparison Of Temporal And Data Parallel Processing, Data Parallel Processing With Specialized Processors, Tools And Languages. Processes,

UNIT-II **[12]**

Processes & Shared Memory Programming

Processes - Shared Memory Programming – General Model Of Shared Memory Programming – Forking-Creating Processes – Joining Processes - Process Model Under UNIX.

Basic Parallel Programming Techniques.

Loop Splitting – Ideal Speedup – Spin-Locks, Contention And Self-Scheduling.

Scheduling.

Loop Scheduling – Variations On Loop Scheduling – Expression Scheduling – Self-Scheduling – Variations On Self-Scheduling – Indirect Scheduling – Block Scheduling – Special Scheduling.

Barriers and Race Conditions.

The Barrier Calls – Expression Splitting.

UNIT-III **[12]**

Programmability Issues.

The Barrier Calls, Expression Splitting, Operating System Support, Types of Operating Systems, Parallel Programming Models, Software Tools.

Algorithms for Parallel Machines.

Models of Computation, Analysis Of Parallel Algorithms, Prefix Computation, Histogram Computation, Parallel Reduction, Quadrature Problem, Sorting, Searching, Matrix Multiplication, Parallel Sorting Algorithms, Solving Linear Systems, Probabilistic Algorithms

UNIT-IV **[12]**

Thread-Based Implementation.

Thread Management – Example With Threads – Attributes Of Threads – Mutual Exclusion With Threads – Mutex Usage Of Threads – Thread Implementation – Events And Condition Variables – Deviation Computation With Threads – Java Threads

Distributed Computing – I:

Remote Communication And Synchronization: Introduction, RPC basics, RPC implementation, RPC Communication and Other issues, Sun RPC, RMI basics, RMI Implementation, Java RMI ,Clock synchronization, Logical clocks, Global state, Mutual exclusion, Election algorithms: Bully algorithm, Ring algorithm, Leader election in rings, anonymous rings, Asynchronous rings, synchronous rings, election in wireless networks, Deadlocks in Distributed systems, Deadlocks in Message communication

Text Books

1. Parallel Computers – Architecture And Programming – By V. Rajaraman And C. Siva Ram Murthy .
2. Introduction To Parallel Processing – By M.Sasikumar, Dinesh Shikhare And P. Ravi Prakash
3. Distributed Computing, Sunita Mahajan and Seema Shah, Oxford University Press

Reference Books

1. Introduction To Parallel Programming - By Steven Brawer
2. Distributed Systems: Principles and Paradigms, Taunenbaum.
3. Distributed Systems: Concepts and Design, G. Coulouris, J. Dollimore, and T. Kindberg,Pearson Education

Online Courses:

- https://www.youtube.com/watch?v=F620ommtjqk&list=PLAwxTw4SYaPnFKojVQrmyOGFCqHTxfdv2
- https://www.youtube.com/watch?v=BAXY0tEizTQ
- https://www.youtube.com/watch?v=ufEjcTjXtpM
- https://www.youtube.com/watch?v=gr7oaiUsxSU

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	Lab-1	Demonstrate a system call ‘fork()’ in linux and write comments to describe the functionality of the program.
2	Lab-2	Write a header file ‘header.h’ containing two user defined functions ‘process_fork’ and ‘process_join’.
3	Lab-3	Write a program to demonstrate that process_join () is kill for child and wait for parent process.
4	Lab-4	Write a parallel program to calculate sum of all the elements of integer array of size 100. Use two processes for this. Parent will calculate sum of all even indexed elements into sum1, and child will calculate sum of all odd indexed elements into sum2. Then parent will calculate final sum which will be addition of sum1 and sum2. Explain output of the program with reasons(without share)
5	Lab-5	Write a parallel program to copy data from one array to another one. Size of both the array is 100. Use total four processes for this task. The destination array must be displayed by the parent after join. Explain output of the program with reasons(without share)
6	Lab-6	Write the user define function ‘share’
7	Lab-7	Write a parallel program to calculate sum of all the elements of an array of size 100. Use total of four processes for this with shared variable(loop splitting)
8	Lab-8	Write a parallel program to calculate max from all the elements of an array of size 100. Use total of four processes for this with shared variable(loop splitting)
9	Lab-9	Develop a program to add constant value in array(self scheduling/loop splitting)
10	Lab-10	Develop a program that performs matrix multiplication(self scheduling)
11	Lab-11	Develop a program for sorting array(self scheduling)
12	Lab-12	Develop a program print id and value of variable(after increment) before barrier then decrement variable and print value of variable and id of process after barrier.

13	Lab-13	Develop a program that calculates standard deviation(self scheduling).
14	Lab-14	Develop a program to copy array into another array (self scheduling)
15	Lab-15	1. Develop a program print id and value of variable(after increment) before barrier then decrement variable and print value of variable and id of process after barrier 2. Develop a program that calculates standard deviation (self scheduling).

Subject: **Soft Computing**								
Program: **B.Tech. CS**				Subject Code: CS0606			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcome:

- Identify and describe soft computing techniques and their roles in building intelligent machines.
- Recognize the feasibility of applying a soft computing methodology for a particular problem.
- Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems .
- Apply genetic algorithms to combinatorial optimization problems .
- Apply neural networks to pattern classification and regression problems .
- Effectively use existing software tools to solve real problems using a soft computing approach.
- Evaluate and compare solutions by various soft computing approaches for a given problem.

Contents:

UNIT-I **[12]**

Artificial Neural Network

Introduction , Fundamental concept , Evolution of Neural Networks , Basic Models of Artificial Neural Networks , Important Terminologies of ANNs , McCulloch-Pitts Neuron Linear Separability , Hebb Network. Supervised Learning Network: Perceptron Networks Adaline , Multiple Adaptive Linear Neurons , Back-Propagation Network , Radial Basis

Function Network.

UNIT-II **[12]**

Associative Memory Networks

Training Algorithms for Pattern Association ,Autoassociative Memory Network , Heteroassociative Memory Network , Bidirectional Associative Memory , Hopfield Networks , Iterative Autoassociative Memory Networks , Temporal Associative Memory Network. Unsupervised Learning Networks: Fixed weight Competitive Nets ,Kohonen Self-Organizing Feature Maps , Learning Vector Quantization , Counter propagation Networks , Adaptive Resonance Theory Networks , Special Networks.

UNIT-III **[12]**

Fuzzy Set Theory

Introduction to Classical Sets and Fuzzy sets , Classical Relations and Fuzzy Relations, Tolerance and Equivalence Relations , Noninteractive Fuzzy sets , Membership Functions: Fuzzification , Methods of Membership Value Assignments , Defuzzification , Lambda-Cuts for Fuzzy sets and Fuzzy Relations , Defuzzification Methods.

Fuzzy Arithmetic and Fuzzy Measures: Fuzzy Rule Base and Approximate Reasoning: Truth values and Tables in Fuzzy logic , Fuzzy Propositions , Formation of Rules , Decomposition and Aggregation of rules , Fuzzy Reasoning , Fuzzy Inference Systems (FIS) , Fuzzy Decision Making , Fuzzy Logic Control Systems.

UNIT-IV **[12]**

Genetic Algorithm

Introduction – Basic Operators and Terminologies in GAs – Traditional Algorithm vs. Genetic Algorithm – Simple GA – General Genetic Algorithm – The Scheme Theorem – Classification of Genetic Algorithm – Holland Classifier Systems – Genetic Programming. Applications of Soft Computing: A Fusion Approach of Multispectral Images with SAR Image for Flood Area Analysis – Optimization of Travelling Salesman Problem using Genetic Algorithm Approach –Genetic Algorithm based Internet Search Technique – Soft Computing based Hybrid Fuzzy Controllers – Soft Computing based Rocket Engine – Control.

Text Books

1. S.N. Sivanandan and S.N. Deepa, Principles of Soft Computing, Wiley India, 2007. ISBN: 10: 81-265-1075-7.

Reference Books

1. S. Rajasekaran and G.A.V.Pai, Neural Networks, Fuzzy Logic and Genetic Algorithms, PHI, 2003.
2. Timothy J.Ross, Fuzzy Logic with Engineering Applications, McGraw-Hill, 1997.
3. J.S.R.Jang, C.T.Sun and E.Mizutani, Neuro-Fuzzy and Soft Computing, PHI, 2004, Pearson Education.

Online Courses:

- https://www.youtube.com/watch?v=aYf3MKzExzI
- https://www.youtube.com/watch?v=0kgEjAAjxM8
- https://www.youtube.com/watch?v=HfdZE1dogfA
- https://www.youtube.com/watch?v=Z_8MpZeMdD4

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	LAB -1	Implement OR, AND Using Perceptron in C
2	LAB -2	Implement OR, AND Using Perceptron in MATLAB Command-line Argument
3	LAB-3	Implement OR, AND Using Perceptron in MATLAB GUI

4	LAB-4	Implement OR, AND, X-OR gate, Using back propagation algorithm in MATLAB using Command-line Argument as well as GUI.
5	LAB-5	Solve a given problem-1 (Operatons) using Fuzzy Logic in MATLAB.
6	LAB-6	Solve a given problem-1 (Max-Min Composition) using Fuzzy Logic in MATLAB.
7	LAB-7	To find the solution of the function Maximize, given the constraints using GA approach in C
8	LAB-8	Solve a given problem-1using using Fuzzy Logic in MATLB GUI
9	LAB-9	Study GA tool in MATLAB.

Subject: **Android Programming**								
Program: **B.Tech. CS**				Subject Code: CS0607			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. Understand the existing state of mobile app development via researching existing apps, meeting with industry professionals, and formulating new ideas.
2. Understand the limitations and features of developing for mobile devices.
3. Create a complete Mobile app with a significant programming component, involving the sensors and hardware features of the phone.

Contents:

UNIT-I **[12]**

The Basics:

- **Hello World**: Intro to Android, Why develop appsor Android?, Flavors of Android operating, systems, Challenges of developing for Android(multiple OS, need backwards compatibility, need to consider performance and offline capability)

- **Concept: Create Your First Android App**: Overview of the development process - Java, Android Studio ,Project layout in Android Studio, Target and minimum SDKs, Android Virtual Device (AVD) Monitor, Viewing logs in logcat and AVD, Android manifest file , App Architecture: An app consists of one or more activities. For an activity, write Java code and layout xml, and hook them together, and register the activity in the manifest file.

- **Concept: Layouts, Views and Resources**: Layout elements can be viewed and edited in Layout Editor and XML, Introduction to the range of UI elements, Resources (layouts, strings, styles, themes), Identifying resources with IDs, Programmatically referencing, resources using resource IDs, on Click attribute, Getting user input from a view, Programmatically changing UI elements, Layout Managers, Defining layouts for activities, inflating the layout

- **Concept: Scrolling Views:** How to make activities scrollable: compare ScrollView, ListView, RecyclerView , Getting the resource ID for a UI element by inflating a layout (needed for RecyclerView) , How to implement RecyclerView (requires layout managers and ViewHolders) , Performance impications of different kinds of scrolling UI elements

- **Concept: Resources to Help You Learn:**Resources to help you learn: Samples that ship with the SDK, Templates for projects, developer.android.com, Android developer blog , Android developer YouTube channel, Source code and samples in github, Stack overflow, Google search!

- **Activities and Intents :**About activities, Defining Activities , Activity Lifecycle , Activity navigation , About intents ,Explicit vs Implicit intents ,Passing info to new activity ,Returning data from activity

- **The Activity Lifecycle and Managing State:**Activity lifecycle , Activity lifecycle callback methods , Activity instance state.

- **Starting Activities with Implicit Intents:** Starting activities by sending implicit intents, Intent filters and enabling your activities to receive intents, ShareCompat.

- **Testing and Debugging, and Backwards Compatibility:** Debugging your apps, Testing your app, Support libraries

UNIT-II **[12]**

User Interface:

- **User Input Controls:** Getting user input , Changing keyboards , Buttons , Dialogs and pickers , Spinners, checkboxes, and radio buttons , Gestures , Speech recognition (not done), Sensors (not done).

- **Menus:** Options menu, contextual menus (floating and action bar), and popup menu, Adding menu items. 10 Handling on Clicks from menus.

- **Screen Navigation:** Terminology, Different ways a user can navigate through an app, Action bar, Settings menu, Navigation drawer, Directed workflow (funnels), Best practices for navigation

- **Themes and Styles:** Best practices for themes and styles, Performance benefits for themes, When and how to use drawables, best practices for drawable, When and how to use nine-patches, best practices for nine-patches, Tools for creating drawables.

- **Material Design:** What is material design? Material design best practices. Material Design guidelines, Implementing Material Design look and feel, with compatibility with previous versions, Support library for Material Design design, Transitions and Animations

- **Adapt layouts for multiple devices and orientations:**Why we need to consider different screen sizes and orientations , Screen density (dip or dp), How to create adaptive layouts using resources folders , Different ways to create images that scale nicely, Images and image formats and how they affect performance (download speeds).

- **Accessibility:** Why accessibility matters, Accessibility considerations: Color blindness, poor vision, poor hearing, physical limitations, Accessibility guidelines , Testing for

accessibility , Screen readers, Making your app more accessible: Color and Contrast, button size --> Material Design guidelines, considerate layouts and navigation

- **Localization:** How to prep your app for localization, LTR and RTL (eg Arabic) text.
- **Testing the User Interface:** Automated testing of UIs, User testing your UI with real users, Using the Espresso and UI Automator frameworks for testing UIs

UNIT-III **[12]**

Background Tasks:

- **Connect to the Internet: Background Tasks**

Synchronous versus async tasks, what is the UI thread and when should you use it? , Example of a background task - retrieving data over the internet, Creating background tasks. (Schedule, send data, etc.) , Implementing AsyncTask (doInBackground(), callbacks) , Limitations of AsyncTask , Passing info to background tasks, Initiating background tasks, Scheduling background tasks (intro only, more later).

- **Connecting to the Internet:**

Permissions, Building URIs,Opening and closing Internet connections, Parsing JSON in Android. (Because it's common.) , Sending requests and parsing response.

- **AsyncTaskLoade:**

Intro to AsyncTaskLoader , loadInBackground() , AsyncTaskLoader callbacks , Benefits of loaders

- **Broadcast Receivers:**

What is a Broadcast Receiver and a Broadcast Intent? , Broadcast Receiver Security and Lifecycle

- **Services:**

What is a service? Long running task without a UI, Difference between Activity and Service , Start and stop services, Lifecycle methods, Foreground services, IntentService class, App priority (critical, high, low), How to create a new Service.

- **Notifications:**

What is a Notification? , Notification Design Guidelines.

- **Triggering, Scheduling, and Optimizing Background**: AlarmManager
- **Transferring Data Efficiently:**

Less data, less often! Cell radio life cycle, Job Scheduler. Why to use Job Scheduler instead of SyncManager/SyncAdapter, Difference between alarms and job schedulers.

UNIT-IV **[12]**

• **Storing Data in your app:**

Internal versus external storage, Privacy, sharing, security, encryption of your data , Shared Preferences: Store private primitive data in key-value pairs , SQLite Databases: Store structured data in a private database , Store data on the web with your own network server, Firebase for storing and sharing data in the cloud, Concept: Preferences , What are Settings and Preferences? , Settings best practices (harder to take away settings than to add, for usability reasons, Storing and retrieving preferences as key/value pairs using SharedPreference, Different Settings types, Settings menu, Using Activity and PreferenceFragments to allow users to set preferences

● **Store data using SQLite database:**
Overview of SQLite, OpenHelper Android class , Querying (dev) Searching (user) databases , Best practices for using databases in Android , Best practices for testing your database

● **Using Content Resolvers to access data:** Content Providers and Content Resolvers work together, what is a content provider? , What is a content resolver? , How do they work together? , How to implement and use Content Resolvers

● **Content Providers:** When to implement content providers , How to implement content providers (overview), Content URIs , UriMatcher, Content Provider authorities , Required methods on ContentProvider (query, insert, delete, update) , MIME types , Contracts , Making content provider data accessible to other apps by modifying manifest, and protecting data with permissions.

● **Using Loaders to Load and Display Data:** Using loaders to asynchronously load data into an activity or fragment, Benefits of Loaders -- why use them? , Loader states (started, stopped, reset) , LoaderManager , Methods & callbacks to implement in Loaders: loadInBackground(), deliverResult() onStart/StopLoading(), onReset/Cancelled()),Registering listeners , Using CursorLoader with ContentProviders

Reference Books:

1. Android Programming (Big Nerd Ranch Guide), by Phillips, Stewart, Hardy and Marsicano.
2. Android Programming – Pushing the limits by Hellman
3. Programming Android: Java Programming for the New Generation of Mobile Devices 2nd, Kindle eBook by Zigurd Mednieks (Author), G. Blake Meike (Author), Laird Dornin (Author).
4. Professional Android 4 Application Development Paperback – 2012 by Reto Meier
5. Learning Android Paperback – 2014 by Gargenta Marko

Online Courses:

- https://www.youtube.com/watch?v=SLNTnJkg6EE
- https://www.youtube.com/watch?v=taSwS5rhtmc
- https://www.youtube.com/watch?v=myjSxtAk9XM
- https://www.youtube.com/watch?v=odqACn2Vgic

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	Lab-1	Install Android Studio, Hello World, Logging
2	Lab-2	Practical: Make Your First Interactive UI
3	Lab-3	Practical: Working with TextView Elements
4	Lab-4	Practical: Learning Resources
5	Lab-5	Practical: Create and Start Activities
6	Lab-6	Practical: Lifecycle and State Callbacks
7	Lab-7	Practical: Start Activities with Implicit Intents
8	Lab-8	Practical: Using the Debugger
9	Lab-9	Practical: Testing your code
10	Lab-10	Practical: Use support library
11	Lab-11	Practical: Use Keyboards, Input Controls, Alerts, and Pickers
12	Lab-12	Practical: Use an Options Menu and Radio Buttons
13	Lab-13	Practical: Create a Recycler View
14	Lab-14	Practical: Theme, Custom Styles, Drawables
15	Lab-15	Practical: Add a FAB and Cards

Subject: **Data Warehouse & Mining**								
Program: **B.Tech. CS**			Subject Code: CS0608				Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. A good understanding of the basic concepts, principles and techniques of data mining.
2. The data mining process and important issues around data cleaning, pre-processing and integration
3. The main concepts of data warehousing .
4. The principle algorithms and techniques used in data mining, such as clustering, association mining, classification and prediction
5. The various application and current research areas in data mining, such as Web and text mining, stream data mining.

Contents:

UNIT-I **[10]**

1. **Introduction to Data Mining**

Importance of Data Mining, Data Mining functionalities, Classification of Data mining systems, Data mining architecture, Major Issues in Data Mining, Applications of Data Mining, Social impacts of data mining.

2. **Introduction to Data Warehouse and OLAP Technology for Data Mining**

Multidimensional data Model, Data warehouse Data Model, Data warehouse Architecture, Data warehouse Implementation, Development of Data Cube Technology, From Data warehousing to Data Mining.

UNIT-II **[10]**

3. **Data Pre-processing**

Data cleaning, Data Integration and Transformation, Data reduction, Discretization and Concept Hierarchy Generation. Data Mining primitives, Languages and System Architectures, Concept description: Characterization and Comparison, Analytical Characterization, Mining Class Comparison.

UNIT-III **[12]**

4. **Mining Frequent Patterns, Associations, Correlations**

Association Rule Mining, Mining of Single dimensional Boolean association rules, multilevel association rules and Multidimensional association rules, Correlation Analysis, Constraint based association mining.

5. **Classification and Prediction**

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

UNIT-IV **[12]**

6. **Cluster Analysis**

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

7. **Mining complex Types of data**

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

Text books:

1. Data Mining concepts and Techniques by Jiawei Han, MichelineKamber –Elsevier.

Reference Books:

1. Data Mining by Arun K. Pujari – University Press.
2. Mordern Data Warehousing, Data Mining and Visualization by George M. Marakas –Pearson.
3. Data Mining by VikramPuriAndP.RadhaKrishana –Oxfrod Press.
4. Data Warehousing by ReemaTheraja –Oxford Press

Online Course:

- https://www.youtube.com/watch?v=-dT4n-ODDzg
- https://www.youtube.com/watch?v=jEUUqjTqPVg
- https://www.youtube.com/watch?v=pijarrYUvhU
- https://www.youtube.com/watch?v=StoWu2A8Ufs

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered

1	Lab1	Overview of Microsoft SQL Server 2005 Analysis Services (SSAS) and Business Intelligence Development Studio (BIDS)
2	Lab 2	Design and create cube by identifying measures and dimensions for “Star Schema” and “Snowflake Schema”.
3	Lab 3	Design and create data mining model using analysis service of SQL server 2005.
4	Lab 4	Design and Create cube by identifying measures and dimensions for Design storage for cube using storage mode MOLAP, ROLAP and HOLAP.
5	Lab 5	To study about WEKA tool.
6	Lab 6	Perform the preprocessing on dataset student.arff.
7	Lab 7	Perform Data Processing on any other customized dataset
8	Lab 8	Perform the Association rule process on dataset test.arff using apriori algorithm
9	Lab 9	Perform the classification rule process on dataset student.arff using j48 algorithm.
10	Lab 10	Perform the classification rule process on dataset employee.arff using ID3 Algorithm.
11	Lab 11	Perform the classification rule process on dataset employee.arff using NaiveBayes Algorithm.
12	Lab 12	To study about DB Miner Tool.
13	Lab 13	To study about DTREG DM Tool.
14	Lab 14	To study about HADOOP.
15	Lab 15	Explore other Data Mining Tools

Subject: **Distributed Operating System**								
Program: **B.Tech. CS**				Subject Code: CS0609			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. To make the students familiar with architecture of UNIX and windows operating system along with internal representation of files.
2. To provide the students knowledge of process control and memory management policies.
3. At the end of the course, students will be able to implement different algorithms used for representation, scheduling, allocation and management in operating system.

Contents:

UNIT-I **[12]**

1. Overview of Operating System:

Operating System - concept, need and requirements of operating system, Processor, Memory, Device and File management, Virtual memory, Pipes, Deadlocks and Protection issues, Comparitive study of Various/ types of operating systems.

2. Introduction to Distributed system:

Goal,Hardware Concepts, Software concepts, Design issues

UNIT-II **[12]**

3. Communication in distributed system:

Layered protocols, client server model, remote procedure call, group communication, Comparison of Client Server Vs. Distributed operating system

4. Synchronization in distributed system:

Clock synchronization, mutual exclusion, election algorithms, automatic transaction, deadlocks in distributed systems.

5. Processes and processors in distributed systems:

Threads, system model, processor allocation, scheduling in distributed systems: Load balancing and sharing approach, fault tolerance, Real time distributed systems, Process migration and related issues

UNIT-III **[12]**

6. Distributed file system:

Distributed file system, Design and Implemetation trends in distributed file system.

7.Distributed Shared Memory:

Introduction, general architecture of DSM systems, design and implementation issues of DSM,

granularity, structure of shared memory space, consistency models, replacement strategy, thrashing

UNIT-IV **[12]**

8. Naming

Overview, Features, Basic concepts, System oriented names, Object locating mechanisms, Issues in designing human oriented names, Name caches, Naming and security, DNS

9. Distributed Web-based Systems

Architecture, Processes, Communication, Naming, Synchronization, Consistency and Replication: Web Proxy Caching, Replication for Web Hosting Systems, Replication of Web Applications

10. Security

Introduction of Security in Distributed OS, Overview of security techniques, features, Need, Access Control, Security Management

Text Books

1. "Distributed Operating Systems Concepts and Design" , Pradeep K. Sinha ,Publisher : PHI
2. "Distributed Systems: Concepts and Design ",George Coulouris, Jean Dollimore,TimKindberg,Publisher : Pearson

Reference Books

1. Andrew S. Tanenbaum, "Modern Operating Systems", Pearson Education.
2. "Distributed Computing, Fundamentals, Simulations and Advanced topics" , HagitAttiya and Jennifer Welch ,**Publisher** : Wiley India

Online Courses:

- https://www.youtube.com/watch?v=Ve4iFhCdX_M&index=1&list=PLacuG5pysFbCrt5Eac46S3lbAaZLal57k&t=23s
- https://www.youtube.com/watch?v=lcRqHwIn5Dk
- https://www.youtube.com/watch?v=zFb0PBA633M
- https://www.youtube.com/watch?v=DdsDB1XCgQI

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	LAB -1	Write a Program to implement Concurrent Echo Client Server Application.
2	LAB -2	Write the Programs for Remote Procedure call.
3	LAB-3	Write the Programs for Remote Method Invocation.
4	LAB-4	Write the Programs for Thread Programming in JAVA.
5	LAB-5	Implement CORBA file.
6	LAB-6	Write a Program to Increment a Counter in Shared Memory.
7	LAB-7	Implement Network File System (NFS).
8	LAB-8	Creation of a BPEL(Business Process Execution Language) Module and a Composite Application.
9	LAB-9	Study of Web Service Programming.
10	LAB-10	Study of Grid Services using various Tools.

Subject: **Distributed Database Management System**								
Program: **B.Tech. CS**				Subject Code: CS0610			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

1. Evaluate simple strategies for executing a distributed query to select the strategy that minimizes the amount of data transfer.
2. Describe distributed concurrency control based on the distinguished copy techniques and the voting methods

Contents:

UNIT-I **[10]**

Introduction: Distributed Data Processing, Distributed Database Systems, Promises of DDBSs, Complicating factors, Problem areas
Overview of RDBMS: Concepts, Integrity, Normalization
Distributed DBMS Architecture: Models- Autonomy, Distribution, Heterogeneity DDBMS Architecture – Client/Server, Peer to peer, MDBS

UNIT-II **[10]**

Data Distribution Alternatives: Design Alternatives – localized data, distributed data Fragmentation – Vertical, Horizontal (primary & derived), hybrid, general guidelines, correctness rules Distribution transparency – location, fragmentation, replication Impact of distribution on user queries – No Global Data Dictionary(GDD), GDD containing location information, Example on fragmentation
Semantic Data Control: View Management, Authentication – database authentication, OS authentication, Access Rights, Semantic Integrity Control – Centralized & Distributed, and Cost of enforcing semantic integrity

UNIT-III **[12]**

Query Processing : Query Processing Problem, Layers of Query Processing Query Processing in Centralized Systems – Parsing & Translation, Optimization, Code generation, Example Query Processing in Distributed Systems – Mapping global query to local, Optimization,
Optimization of Distributed Queries: Query Optimization, Centralized Query Optimization, Join Ordering Distributed Query Optimization Algorithms

UNIT-IV **[12]**

Distributed Transaction Management & Concurrency Control: Transaction concept, ACID property, Objectives of transaction management, Types of transactions, Objectives of Distributed Concurrency Control, Concurrency Control anomalies, Methods of concurrency control, Serializability and

recoverability, Distributed Serializability, Enhanced lock based and timestamp based protocols, Multiple granularity, Multi version schemes, Optimistic Concurrency Control techniques

Distributed Deadlock & Recovery Deadlock concept, Deadlock in Centralized systems, Deadlock in Distributed Systems – Detection, Prevention, Avoidance, Wait-Die Algorithm, Wound-Wait algorithm Recovery in DBMS - Types of Failure, Methods to control failure, Different techniques of recoverability, Write- Ahead logging Protocol, Advanced recovery techniques- Shadow Paging, Fuzzy checkpoint, ARIES, RAID levels, Two Phase and Three Phase commit protocols

Reference Books

1. Principles of Distributed Database Systems, Ozsu, Pearson Publication
2. Distributed Database Mangement Systems, Rahimi&Haug, Wiley
3. Distributed Database Systems, Chanda Ray, Pearson Publication
4. Distributed Databases, Sachin Deshpande, Dreamtech

Online Courses:

- https://www.youtube.com/watch?v=e_pGyzJrmqU
- https://www.youtube.com/watch?v=9GtoDxCQGvk
- https://www.youtube.com/watch?v=Y-QTBX1nN80
- https://www.youtube.com/watch?v=fmJvYjSQuUY

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	Lab 1	Create two databases on two different computer systems and create database view to generate single DDB.
2	Lab 2	Create two databases on two different computer systems and create database view to generate single DDB.
3	Lab 3	Create various views using any one of examples of database and Design various constraints
4	Lab 4	Create various views using any one of examples of database and Design various constraints
5	Lab 5	Write and Implement algorithm for query processing using any of Example in C /C++ /Java / .NET
6	Lab 6	Write and Implement algorithm for query processing using any of Example in C /C++ /Java / .NET
7	Lab 7	Using any of example, write various Transaction statement and show the information about concurrency control [i.e. various lock's from dictionary] by executing multiple update and queries
8	Lab 8	Using any of example, write various Transaction statement and show the information about concurrency control [i.e. various lock's from dictionary] by executing multiple update and queries

9	Lab 9	Using any of example, write various Transaction statement and show the information about concurrency control [i.e. various lock's from dictionary] by executing multiple update and queries
10	Lab 10	Using Transaction /commit rollback, Show the transaction ACID properties
11	Lab 11	Write java JDBC program and use JTA to show various isolation level's in transaction.
12	Lab 12	Write java JDBC program and use JTA to show various isolation level's in transaction
13	Lab 13	Implement Two Phase Commit Protocol
14	Lab 14	Case study on noSQL
15	Lab 15	Case study on Hadoop

Subject: **Advanced Technical Communication And Soft Skills**								
Program: **B.Tech. CS**				Subject Code: SH0607			Semester: **VI**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
1	0	0	0	60	00	40	00	100

	Sr. No.	Content
Speaking	1	Vocabulary Games: Advanced Level
	2	Role Play 1
	3	Role Play 2
	4	Role Play 3
	5	Selected speeches & Songs: Declamation 1
	6	Selected speeches & Songs: Declamation 1
	7	Report Presentation Seminar
	8	Report Presentation Seminar
	9	Report Presentation Seminar
	10	Interview Skills (Mock Interview Sessions 2)

Writing	11	Writing Reports
	12	Making Proposals
	13	Resume Building
	14	Letter, Email application

Reference Books:

1. Fred Luthans, Organizational Behaviour, McGraw Hill
2. Lesikar and petit, Report writing for Business
3. M. Ashraf Rizvi, Effective Technical Communication, McGraw Hill
4. Wallace and masters, Personal Development for Life and Work, Thomson Learning
5. Hartman Lemay, Presentation Success, Thomson Learning
6. Malcolm Goodale, Professional Presentations
7. Farhathullah, T. M. Communication skills for Technical Students
8. Michael Muckian, John Woods, The Business letters Handbook
9. Herta A. Murphy, Effective Business Communication
10. Lehman, Dufrene, Sinha BCOM, Cengage Learning

Web resources/ MOOCs:

Introduction to English Language & Literature Mod-1 Lec-1
https://www.youtube.com/watch?v=xC3M9EqduyI

The English Language Mod-1 Lec-
https://www.youtube.com/watch?v=HsR4jFszFdw#action=share

International English Mod-1 Lec-4
https://www.youtube.com/watch?v=FT4cQkXCc8g

Effortless EnglishRule-1 English Phrases:
https://www.youtube.com/watch?v=r5z-lilm-gg

Pronunciation Training Techniques:
https://www.youtube.com/watch?v=wB8mr4iViy0

Make Body Language Your Superpower:
https://www.youtube.com/watch?v=wB8mr4iViy0

English Job Interviews | Best Answers to Questions:
https://www.youtube.com/watch?v=wB8mr4iViy0

7TH SEMESTER

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

B-TECH COMP. SCIENCE & ENGG., SEMESTER –VII TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017													
SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME					
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	CS0701	Mobile Computing	04	00	02	05	06	30	10	60	40	60	200
2	CS0702	Compiler Design	03	00	00	03	03	30	10	60	00	00	100
3	CS0703	Big Data Analytics	03	00	02	04	05	30	10	60	40	60	200
4	CS0704	Advanced. Net Framework	04	00	02	05	06	30	10	60	40	60	200
5	CS0705	Cryptography & Network Security	03	00	02	04	05	30	10	60	40	60	200
6	CS0706	Iot & Applications	03	00	02	04	05	30	10	60	40	60	200
	CS0707	High Performance Computing											
	CS0708	Web Data Management											
7	CV0712	Disaster Management	01	00	00	00	01	00	00	00	00	00	100
TOTAL			**21**	**00**	**10**	**25**	**31**	**180**	**60**	**360**	**200**	**300**	**1200**

Subject: **Mobile Computing**								
Program: **B.Tech. CS**				Subject Code: CS0701			Semester: **VII**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	0	2	5	60	60	40	40	200

Course Outcome:

On successful completion of this subject content, the student should:

- Have knowledge and understanding of basic mobile network architecture
- Have knowledge and understanding of some basic technologies that are in use
- Be able to make critical assessment of mobile systems
- Be able to analyse and propose broad solutions for a range of mobile scenarios

Contents:

UNIT-I **[12]**

Mobile Computing Introduction:

History of Wireless Communications, Types, propagation modes Wireless network architecture, Applications, Benefits, Future. What mobile users need, SOC and AOC client, Architecture for mobile computing, Three tier architecture, design considerations for mobile computing.

UNIT-II **[12]**

Mobile Technologies Part I

Bluetooth, Wireless Broadband, Mobile IP:Introduction, Advertisement, Registration, TCP connections, two level addressing, performance issue, routing in mobile host, Adhoc networks, Mobile transport layer: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, transaction oriented TCP. IPv6. Short message services, Mobile computing over SMS, SMS, value added services through SMS, accessing the SMS bearer.

UNIT-III **[12]**

Mobile technologies Part II

Global system for mobile communication, Global system for mobile communication, GSM architecture, GSM entities, call routing in GSM,PLMN interface, GSM addresses and identifiers, network aspects in GSM,GSM frequency allocation, authentication and security,GPRS and packet data network, GPRS network architecture, GPRS network operation,data services in GPRS, Applications of GPRS, Billing and charging in GPRS.

UNIT-IV **[12]**

Wireless Application Protocol (WAP) WAP,MMS,GPRS application CDMA and 3G

Spread-spectrum Technology, CDMA versus GSM, Wireless data, third generation networks, applications in 3G Wireless LAN, Wireless LAN advantages,IEEE802.11 standards ,Wireless LAN architecture, Mobility in Wireless LAN, Deploying Wireless LAN, Deploying Wireless LAN, Mobile adhoc networks and sensor networks, wireless LAN security, WiFi v/s 3G Voice over Internet protocol and convergence, Voice over IP,H.323 framework for voice over IP,SIP, comparison between H.323 and SIP, Real time protocols, convergence technologies, call routing, call routing, voice over IP applications, IMS, Mobile VoIP, Security issues in mobile Information security, security techniques and algorithms, security framework for mobile environment.

Text Books

1. Mobile Computing ,Asoke K Telukder, Roopa R Yavagal, TMH.
2. Mobile Communications, Jochen Schiller, Pearson.

Reference Books

1. Principles of Mobile Computing, - Hansmann, Merk, Nicklous and Stober, Springer.
2. Mobile Computing, Raj Kamal, Oxford.
3. Mobile Computing, Wandra&Wandra, Akshat Pub.
4. Android Wireless Application Development, Shane Conder, Lauren Darcey,Pearson.
5. Professional Android 2 Application development, Reto Meier, Wrox, Wiley India.

Online Courses

- Mobile Computing Introduction:https://www.youtube.com/watch?v=LZuzO0FKd0A
- Mobile Technologies:http://www.nptel.ac.in/courses/106105080/pdf/M5L9.pdf
- General packet radio service(GPRS): http://nptel.ac.in/courses/126104006/LectureNotes/Week-2_Mobile%20Wireless%20Communication%20(Module-2).pdf
- CDMA and 3G:http://nptel.ac.in/courses/Webcourse-contents/IIT Kharagpur/Digi Comm/pdf-m-7/m7l40.pdf

Subject: **Compiler Design**								
Program: **B.Tech. CS**				Subject Code: CS0702			Semester: **VII**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	0	3	60	00	40	00	100

Course Outcome:

On successful completion of this subject content, the student should:

- To study the design and implementation of assemblers.
- To study the design and implementation of compilers.
- To know the design and implementation of linkers and loaders.
- To have an understanding of macro preprocessors.
- To have an understanding of system software tools.

Contents:

UNIT-I **[10]**

Introduction

Overview of the Translation Process, A Simple Compiler, Difference between interpreter, assembler and compiler. Overview and use of linker and loader, types of Compiler, Analysis of the Source Program, The Phases of a Compiler, Cousins of the Compiler, The Grouping of Phases, Lexical Analysis, Hard Coding and Automatic Generation Lexical Analyzers, Front-end and Back-end of compiler, pass structure

Lexical Analyzer

Introduction to Lexical Analyzer, Input Buffering, Specification of Tokens, Recognition of Tokens, A Language for Specifying Lexical Analyzers, Finite Automata From a Regular Expression, Design of a Lexical Analyzer Generator, Optimization of DFA

UNIT-II **[10]**

Parsing Theory

Top Down and Bottom up Parsing Algorithms, Top-Down Parsing,Bottom-Up Parsing, Operator-Precedence Parsing, LR Parsers, Using Ambiguous Grammars, Parser Generators, Automatic Generation of Parsers. Syntax-Directed Definitions, Construction of Syntax Trees, Bottom-Up Evaluation of S-Attributed Definitions, L-Attributed Definitions, syntax directed definitions and translation schemes

Error Recovery
Error Detection & Recovery, Ad-Hoc and Systematic Methods

UNIT-III **[12]**
Intermediate Code Generation
Different Intermediate Forms, Syntax Directed Translation Mechanisms And Attributed Mechanisms And Attributed Definition.

Run Time Memory Management
Source Language Issues, Storage Organization, Storage-Allocation Strategies, and Access to Non local Names, Parameter Passing, Symbol Tables, and Language Facilities for Dynamic Storage Allocation, Dynamic Storage Allocation Techniques.

UNIT-IV **[12]** **Code Optimization**
Global Data Flow Analysis, A Few Selected Optimizations like Command Sub Expression Removal, Loop Invariant Code Motion, Strength Reduction etc.

Code Generation
Issues in the Design of a Code Generator, The Target Machine, Run-Time Storage Management, Basic Blocks and Flow Graphs, Next-Use Information, A Simple Code Generator, Register Allocation and Assignment, The DAG Representation of Basic Blocks, Peephole Optimization, Generating Code from DAGs, Dynamic Programming Code-Generation Algorithm, Code-Generator Generators.

Text Books

1. Compilers: Principles, Techniques and Tools ByAho, Lam, Sethi, and Ullman, Second Edition, Pearson, 2014

Reference Books

1. Compiler Design in C By Allen I. Holub, Prentice-Hall/Pearson.
2. Advanced Compiler Design and Implementation ByMuchnick, Morgan and Kaufmann, 1998.

Online Courses

https://youtu.be/yxnbvS2t_QA

http://nptel.ac.in/courses/106108113

https://youtu.be/1qOMlqE6LhU

https://youtu.be/EpAzj7zXrbk

Subject: **Big Data Analytics**								
Program: **B.Tech. CS**				Subject Code: CS0703			Semester: **VII**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcome:

On successful completion of this subject content, the student should:

- To study the background of Data Handling and Big Data.
- To understand processing and storage of Big Data
- To understand various techniques to prepare analytics out of Big Data

Contents:

UNIT-I **[12]**

INTRODUCTION TO BIG DATA

Introduction– distributed file system–Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, and Big data applications. Algorithms using mapreduce.

UNIT-II **[12]**

INTRODUCTION TO HADOOP AND HADOOP ARCHITECTURE

Big Data – Apache Hadoop&HadoopEcoSystem– Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

UNIT-III **[12]**

HDFS, HIVE AND HIVEQL, HBASE

HDFS-Overview, Installation and Shell, Java API; Hive Architecture and Installation, Comparison with Traditional Database, HiveQLQuerying Data- Sorting And Aggregating, Map ReduceScripts, Joins &Subqueries, HBase concepts- AdvancedUsage, SchemaDesign, AdvanceIndexing- PIG,Zookeeper- how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

UNIT-IV **[12]**

SPARK

Introduction to Data Analysis with Spark, Downloading Spark and Getting Started, Programming with RDDs, Machine Learning with MLlib. Oozie; Pig-Introduction, Joining datasets and other advanced topics; Hive

Text Books

1. Boris lublinsky, Kevin t. Smith, AlexeyYakubovich, “Professional Hadoop Solutions”, Wiley, ISBN: 9788126551071, 2015

Reference Books

1. Chris Eaton,Dirkderooset al. , “Understanding Big data ”, McGraw Hill, 2012.
2. Tom White, “HADOOP: The definitive Guide”, O Reilly 2012.
3. VigneshPrajapati, “Big Data Analyticswith R and Haoop”, Packet Publishing 2013.
4. Learning Spark: Lightning-Fast Big Data Analysis Paperback by Holden Karau

Online Courses

- Introduction https://onlinecourses.nptel.ac.in/noc16_cs12/preview
- Analytics http://nptel.ac.in/courses/106106142/
- Hadoop https://www.edureka.co/big-data-and-hadoop
- Spark https://www.coursera.org/courses?query=apache spark

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	Lab 1/Lab2/Lab3	Study of Hadoop ecosystem
2	Lab 1/Lab2/Lab3	Programming exercises on Hadoop
3	Lab 1/Lab2/Lab3	Programming exercises in No SQL
4	Lab 1/Lab2/Lab3	Implementing simple algorithms in Map- Reduce (3) - Matrix multiplication,Aggregates, joins, sorting, searching etc.
5	Lab 1/Lab2/Lab3	Implementing any one Frequent Itemset algorithm using Map-Reduce
6	Lab 1/Lab2/Lab3	Implementing any one Clustering algorithm using Map-Reduce.
7	Lab 1/Lab2/Lab3	Implementing any one data streaming algorithm using Map-Reduce.
8	Lab 1/Lab2/Lab3	Mini Project: One real life large data application to be implemented
9	Lab 1/Lab2/Lab3	Twitter data analysis
10	Lab 1/Lab2/Lab3	Fraud Detection and Text Mining

Subject: Advance Net Technology								
Program: **B.Tech. CS**				Subject Code: CS0704			Semester: **VII**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
4	0	2	5	60	60	40	40	200

Course Outcome:

On successful completion of this subject content, the student should:

- Design and develop complex concurrent programs using the .NET framework.
- Describe, identify and debug issues related to the development of concurrent programs.
- Create custom controls with the .NET framework. This includes custom drawn controls and design time support.
- Using the .NET framework in relation to advanced areas of interest covered. This includes cryptography, regular expressions, multi-language development, memory management and interoperability with the Window's API.

Contents:

UNIT-I **[12]**

Introduction, Programming and application development, Types of application – Windows application, Web application, Console application, Windows service, Web service, Components and objects. OOPS with C#, Framework, Introduction to C#, Exception handling, Defining classes and class members. Assembly, Components of Assembly, Private and Shared Assembly, Garbage Collector, JIT compiler, Namespaces, Collections.

UNIT-II **[12]**

Application Development using Controls: web based control,ASP.Net page life cycle, Validations, Master page, Themes, Skin, and Introduction to CSS. ASP.NET server controls-Types of control, ASP.NET state management engine, Web.config and global.asax files, Caching, Navigation controls, Introduction to user control.

UNIT-III **[12]**

Introduction to Database, Using SQL to work with database, Retrieving and manipulating, data with SQL, ADO.Net architecture, ASP.Net data controls, Data Architecture(Two,Three,Ntier),Security Authentication(None,Passport,Windows,Form), Linq, Advanced Linq, reporting with CSV, Word and pdf, WCF Services.

UNIT-IV **[12]**

Introdiction to "MVC", Design Engine, Defining Model, Controller and View, Html Helper Classes, MVC Master page, Theme and Design, ViewBag, Viewdata, tempData, MVC state management with Windows and Forms authentication, Actionresult, Jsonresult, Httpresponse, Web API, two model Concept, EDMX, web grid concept

Text Books

1. Beginning ASP.NET 4 in C# and VB by ImarSpaanjaars
2. Beginning ASP.NET 4.5.1 and Professional ASP.NET MVC 5 ImarSpaanjaars, Jon Galloway, Brad Wilson, David Matson

Reference Books

1. ASP.Net 4 Unleashed by Stephen Walther, Kevin Hoffman, Nate Dudek, SAMS Publishing.
2. ASP.Net 4.0 Programming 6-in-1 Blackbook, DreamTech Publication.
3. ASP.Net 4.0 programming, J. Kanjilal, Tata McGraw-Hill (Unit III to IV).
4. Programming ASP.Net, D.Esposito, Microsoft Press (Dreamtech), Reprint 2011.
5. ASP.Net Visual C#.NET, Vijay Nicoel, TMH
6. Advanced .Net Technology, Patel, Dreamtech

Online Courses

- VB .NET: https://www.tutorialspoint.com/vb.net/
- ASP .NET: https://www.tutorialspoint.com/asp.net/
- C# .NET: https://www.tutorialspoint.com/csharp/

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
Week 1	C# Programming – variables, operations, conditional logics, functions	1. Write a Program in C# to Check whether a number is Palindrome or not. 2. Write a Program in C# to demonstrate Command line arguments Processing 3. Write a Program in C# to implement Stack operations
Week 2	C# Programming – arrays, classes, inheritance, polymorphism	4. Write a program to demonstrate Operator overloading 5. Write a Program in C# to find the second largest element in array 6. Write a Program in C# to multiply to matrices using Rectangular arrays

Week 3	Web forms and Server Controls	7. Create a login page user control that allows the user to enter user id and password. 8. Creating and Using a menu Control In this exercise, you will create a menu selection control that passes the selected item back to the calling page, in the URL query string. The control displays information categories in a menu control. It gets the categories and populates the menu dynamically from a data source. The first step involves creating the user control. Then you will expose the properties of the user control and embed the control in a Web Forms page. You finally view it in a Web browser.
Week 4	State Management(Client Side)	9. Create an application with the use of Query String, Cookies and Hidden Fields. 10. Create an application to manage Cookies at client machine.
Week 5	Validation and rich controls	11. Design a Registration form Default.aspx page with fields Username, choose password, confirm password, age, email id, contact number and a submit button. Display message "Successfully Submitted" after Clicking Submit button i.e. after successful validation of registration page. Use: a) Required Field Validator - for Username, Choose password, Age, Email Id fields. b) CompareValidator - for Confirm password field. c) RangeValidator - for Age field. d) RegularExpressionValidator - for Email field. e) CustomValidator - for contact number field. 12. Create an ASP.NET form that displays two advertisements alternately. When the user clicks on one of the advertisements, he/she is redirected to "www.amazon.com", and the other advertisement redirects the user to "www.fabmart.com". The weightage of the amazon advertisement is 50 and that of the other one is 40. The advertisement should be centered horizontally and should cover 60% of the width of the screen. Its height should be 80 units. The width of the border should be 5 units 13. Create an ASP.NET page using Wizard control and which has 3 steps. The idea here is if we click on 'My Websites' link, it should show the list of web sites. When 'My Schedule' is clicked, a calendar control should be seen and display the selected date, and when we click on 'Upload Photo' link, provision to upload a photo should be given. Create a similar ASP.NET page with Panel controls.
Week 6	Styles and Master Pages	14. Develop a Web Application using C#.NET and ASP.NET for an E-Commerce firm. The master page should consist of name of the firm, Logo and contact details. Also, it should provide hyperlinks to Electronics, Baggages and Offers zone. These three pages should be designed as static pages. The hyperlinks should navigate to these static pages in the form of Content Pages associated with Master Page designed. The Electronics page

		should display the categories namely mobiles, laptops and printers. Also display the vendor names for all the categories in DropDownList controls. The Baggages page can have images of laptop bags, trolley bags and backpacks. In the Offers zone page use AdRotator to display atleast 2 offer advertisements.
Week 7	Themes	15. Create two themes: Summer and Monsoon. For each theme, add the CSS layout, which is applied to the site automatically. Configure the application to use one of the themes and then switch to the other to see the differences. Extend the above created themes by adding suitable images and in created ASP.NET form add a Drop DownList control which contains the available themes so a user can choose dynamically switch between the themes.
Week 8	Ado.net	16. Create an application for performing CRUD operation with database. 17. Demonstrate the showcase data using grid view, details view and nested grid View.
Week 9	Linq	18. Create an application for performing CRUD operation using LINQ.
Week 10	MVC	19. Design a page with the use of RAZOR and ASPX design pattern for MVC. 20. Demonstrate application with the MVC and Linq architecture.
Week 11	EDMX	21. Create application to perform crud operation with the use of antiforgery method.
Week 12	EDMX	22. Create DQRS concept with the use of MVC and EDMX framework.
Week 13	Mini project	
Week 14	Review	

Subject: CRYPTOGRAPHY & NETWORK SECURITY								
Program: **B.Tech. CS**				Subject Code: CS0705			Semester: **VII**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcome:

On successful completion of this subject content, the student should:

1. Describe the fundamental concepts of information system security.
2. Understand the following terms: security policy, host based security, firewall, and packet filtering and intrusion detection.
3. Differentiate threats to information systems from attacks against information systems
4. Know the concepts of authentication and authorization, intrusion detection and information security techniques

Contents:

UNIT-I **[10]**

1. **Fundamentals:**
   Basic objectives of cryptography, Security mechanisms, OSI Security Architecture, Classical Encryption techniques, Cipher principles, cryptanalysis, attack models, steganography.
2. **Block ciphers:**Block cipher design principles and modes of operation, Feistel cipher structure, Overview on S-Box Design Principles, DES and its variants, RC5, IDEA, Blowfish, Evaluation criteria for AES ,AES Cipher ,Triple DES.

UNIT-II **[10]**

3. **Public Key Cryptography:**

Overview of Asymmetric Key Cryptography, Key Management, Diffie-Hellman key Exchange ,Elliptic Curve Architecture and Cryptography, Introduction to number theory ,Knapsack Algorithm ,RSA algorithm, KDC, Authentication Protocols , Digital Certificates.

UNIT-III **[12]**

4. **Hash Function:**

Message Authentication Codes, Hash Functions, Security of Hash Functions, MD5 message Digest algorithm, Secure Hash Algorithm, RIPEMD, HMAC, Digital Signatures standards. Digital certificate.

5. **Network Security:**

Authentication Applications: Kerberos, X.509 Authentication Service, PGP, S/MIME

UNIT-IV **[12]**

6. **IP Security** :

IPSec architecture, Applications of IPSec, Benefits of IPSec, IPSec protocols, Web Security threats, Secure Socket Layer, Secure Electronic Transaction.

7. **System Level Security:**

Intrusion detection, Viruses and related Threats - Virus Counter measures, Firewall Design Principles, Trusted Systems.

Text Books

1. William Stallings, "Cryptography And Network Security - Principles and Practices", Prentice Hall of India, Third Edition, 2003.

Reference Books

1. BehrouZ A. *ForouZan*. Tata McGraw-Hill Publishing Company Limited. NEW DELH
2. AtulKahate, "Cryptography and Network Security", Tata McGraw-Hill, 2003.
3. Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2001.
4. A. Das and C. E. VeniMadhavan, Public-Key Cryptography: Theory and Practice, Pearson Education Asia.
5. Johannes A. Buchmann, Introduction to Cryptography, Undergraduate Text in Mathematics, Springer.

Online Courses

- http://nptel.ac.in/courses/106105031/
- https://www.youtube.com/watch?v=rA_ZmWPormM
- http://www.nptelvideos.in/2012/11/cryptography-and-network-security.html

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class activity	Subject content to be covered
01	Lab 1	To implement Caesar Cipher Encryption - Decryption.
02	Lab 2	To implement Mono-alphabetic Cipher Encryption – Decryption.
03	Lab 3	To implement Hill Cipher Encryption
04	Lab 4	To implement Poly-alphabetic Cipher (Vigener Cipher) Technique
05	Lab 5	To implement Play-Fair Cipher Technique.
06	Lab 6	Write a program to implement Rail-Fence Encryption Technique.
07	Lab 7	To implement S-DES algorithm for data encryption.
08	Lab 8	Write a program to implement RSA asymmetric (public key and private key)-Encryption.
09	Lab 9	Write a program to generate digital signature using Hash code.
10	Lab 10	Case Study on Kerberos.
11	Lab 11	Case Study on Firewalls.
12	Lab 12	Study of MD5 hash function and implement the hash code using MD5.
13	Lab 13	Study of SHA-1 hash function and implement the hash code using SHA-1.
14	Lab 14	Write a program to implement transposition Encryption Technique
15	Lab 15	

Subject: **IOT & Applications**								
Program: **B.Tech. CS**				Subject Code: CS0706			Semester: **VII**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcome:

On successful completion of this subject content, the student should:

1. Describe the fundamental concepts of Internet of Things
2. Understand working of IOT applications
3. Defining communications between multiple nodes

Contents:

UNIT-I **[12]**

IoT& Web Technology

The Internet of Things Today, Time for Convergence, Towards the IoT Universe, Internet of Things Vision, IoT Strategic Research and Innovation Directions, IoT Applications, Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Security, Privacy & Trust, Device Level Energy Issues, IoT Related Standardization, Recommendations on Research Topics.

UNIT-II **[12]**

M2M to IoT – A Basic Perspective

Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

UNIT-III **[12]**

IoT Architecture

Introduction, State of the art, Architecture Reference Model- Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, eHealth.

UNIT-IV **[12]**

Internet of Things Privacy, Security and Governance

Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security

Text Books

Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)", 1 st Edition, VPT, 2014

Reference Books

1. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1 st Edition, Apress Publications, 2013
2. CunoPfister, Getting Started with the Internet of Things, O"Reilly Media, 2011, ISBN: 978-1-4493- 9357-1

Online Courses

- Introduction https://www.youtube.com/watch?v=uEsKZGOxNKw
- Example of IOT https://www.youtube.com/watch?v=G4-CtKkrOmc
- IOT and Augmented Reality https://www.coursera.org/learn/iot-augmented-reality-technologies/lecture/dYMzh/iot-introduction
- Security in IOT https://sayan.ee/iot-security-lecture/

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	LAB -1	Define and Explain Eclipse IoT Project
2	LAB -2	List and summarize few Eclipse IoT Projects.
3	LAB-3	Sketch the architecture of IoT Toolkit and explain each entity in brief
4	LAB-4	Demonstrate a smart object API gateway service reference implementation in IoT toolkit.
5	LAB-5	Write and explain working of an HTTP- to-CoAP semantic mapping proxy in IoT toolkit.
6	LAB-6	Describe gateway-as-a-service deployment in IoT toolkit.
7	LAB-7	Explain application framework and embedded software agents for IoT toolkit.
8	LAB-8	Explain working of Raspberry Pi.
9	LAB-9	Connect Raspberry Pi with your existing system components
10	LAB-10	Give overview of Zetta.

Subject: High Performance Computing

Program: **B.Tech. CS**			Subject Code: CS0707			Semester: **VII**		
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcome:

- Should provide students with a good understanding of high performance computing and a systematic knowledge of the fundamental technologies, architectures and computing.
- To provide students with the comprehensive and in-depth knowledge of high performance computing concepts, technologies, architecture and applications and to expose the students to frontier areas of high performance computing while providing sufficient foundations to enable further study and research.

Contents:

UNIT-I **[12]**

GRID Computing – 1:

a. **Introduction:** Data Center, The Grid and the Distributed/ High Performance Computing, Cluster Computing and Grid Computing, Metacomputing – the Precursor of Grid Computing, Scientific, Business and e-Governance Grids, Web services and Grid Computing, Business Computing and the Grid – a Potential Win win Situation, e-Governance and the Grid.

b. **Technologies and Architectures for Grid Computing:** Clustering and Grid Computing, Issues in Data Grids, Key Functional Requirements in Grid Computing, Standards for Grid Computing , Recent Technological Trends in Large Data Grids.

c. **Web Services and the Service Oriented Architecture (SOA)**: History and Background, Service Oriented Architecture, How a Web Service Works, SOAP and WSDL, Description, Creating Web Services, Server Side.

d. **OGSA and WSRF:** OGSA for Resource Distribution, Stateful Web Services in OGSA, WSRF (Web Services Resource Framework), Resource Approach to Stateful Services, WSRF Specification.

e. **Globus Toolkit:** History, Version, Applications, GT4-Approaches & Benefits, Infrastructure Management, Monitoring, Security, Data, GT4 Architecture, GT4 Command Line Programming

f. **The Grid and The Databases**: Issues in Database Integration with the Grid, The Requirements of a Grid enabled database, Storage Request Broker (SRB), Integration of the Database with the Grid, The Architecture of OGSA- DAI for Offering Grid Database Services.

UNIT-II **[12]**

Cluster Computing 1:-

a. **Introduction:** What is Cluster Computing, Approaches to Parallel Computing, How to Achieve Low Cost Parallel Computing through Clusters, Definition and Architecture of a Cluster, What is the Functionality a Cluster can offer?

b. **Cluster Middleware and Cluster Architecture:** Levels and Layers of Single System Image (SSI), Cluster Middleware Design Objectives, Resource Management and Scheduling, Cluster Programming Environment and Tools. Early Cluster Architectures, High Throughput Computing Clusters, Condor.

c. **Setting up and administering a Cluster: How to set up a Simple Cluster?** Design considerations for the Front End of a Cluster, Setting up nodes, Clusters of Clusters or Metaclusters, System Monitoring, Directory Services inside the Clusters & DCE, Global Clocks Sync, Administering heterogeneous Clusters.

UNIT-III **[12]**

Cluster Computing 2:-

a. Cluster Technology for High Availability: Highly Available Clusters, High Availability Parallel Computing, Mission Critical (or Business Critical or Business Continuity) Applications, Types of Failures and Errors, Cluster Architectures and Configurations for High Availability, Faults and Error Detection, Failure Recovery, Failover / Recovery Clusters.

b. Performance Model and Simulation: Performance Measures and Metrics, Profit Effectiveness of Parallel Computing through Clusters. Process Scheduling

c. Process Scheduling and Load Sharing & Load Balancing: Job Management System (JMS) Resource Management System (RMS), Queues, Hosts, Resources, Jobs and Policies, Policies for Resource Utilization, Scheduling Policies Load Sharing and Load Balancing, Strategies for Load Balancing.

UNIT-IV **[12]**

CLOUD COMPUTING:-

a. FUNDAMENTAL CLOUD COMPUTING

Understanding Cloud Computing: Origin and Influences, Basic Concepts and terminologies, Goals & Benefits, Risks & Challenges, **Fundamental Concepts and Models** : Roles & Boundaries, Cloud Characteristics, Cloud Delivery Models, Cloud Deployment Models, **Cloud-Enabling Technology**: Broadband Network and Internet Architecture, Data Center Technology, Virtualization Technology, Web Technology,

Multitenant Technology, Service Technology, **Fundamental Cloud Security**: Basic terms and Concepts, Threat Agents, Cloud Security Threats.

b. CLOUD COMPUTING MECHANISMS

Cloud Infrastructure Mechanisms: Logical network perimeter, virtual server, and cloud storage device, cloud usage monitor, Resource Replication, Readymade Environment, Specialized Cloud Mechanisms, Cloud Management Mechanisms, and Cloud Security Mechanisms

c. **Cloud Computing Architecture:** Workload Distribution Architecture, Resource Pooling Architecture, Dynamic Scalability Architecture, Elastic Resource Capacity Architecture, Service Load Balancing Architecture, Cloud Bursting Architecture, Elastic Disk Provisioning Architecture , Redundant Storage Architecture.

Text books:

2. Cloud Computing: Concepts, Technology & Architecture by Thomas Erl, Ricardo Puttini, ZaighamMahmood, Prentice Hall, 02-May-2013
3. C.S.R PRABHU: Grid & Cluster Computing, PHI Publication, India.

Reference Books:

1. High performance cluster computing: Architecture & Systems by RajkumarBuyya, Prentice Hall.
2. Grid Computing – Making the Global Infrastructure A Reality, Edited by Berman, Fox and Hey, Wiley India
3. Cloud Computing for Dummies, Hurwitz, Bllor, Kaufman, Halper, Wiley India.
4. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter: Cloud Computing, A Practical Approach, McGraw Fill, 2010.
5. Virtualization for Dummies – Bernand Golden, Wiley India
6. Cloud Computing – Bible, BerrieSonsisky, Wiley (India)
7. Cloud Security – Ronald Krutz, Wiley (India)

Online Courses:

- Grid Computing: Introduction https://www.youtube.com/watch?v=THMuVkaCVjw
- INTRODUCTION TO CLUSTER COMPUTING https://www.youtube.com/watch?v=iNkixV_INy0
- Cluster Configuration https://www.youtube.com/watch?v=-AnoLFwBWHg
- Cloud Computing Fundamentals https://www.youtube.com/watch?v=uroryFU78gM

Lab Plan

- Minimum Laboratory contact time : 15 weeks

- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	Lab-1	To study and practice on Beowulf cluster project URL: http://www.beowulf.org/overview/index.html
2	Lab-2	To study Berkely NOW project URL: http://now.cs.berkeley.edu/
3	Lab-3	Create a client and server program using socket programming in linux using C and JAVA.
4	Lab-4	Study and Configure Cloud Simulator (Linux /Windows).
5	Lab-5	Perform 2 examples on Cloud Simulator.
6	Lab-6	Study of Virtualization using VmWare Toolkit.
7	Lab-7	Collaborating on online groupware using cloud computing
8	Lab-8	Collaborate on online database using cloud computing
9	Lab-9	Study and Configure Grid Simulator (Linux / Windows).
10	Lab-10	Perform 2 examples on grid simulator.
11	Lab-11	To Study about Grid RPC.
12	Lab-12	To Study about Sun Grid Engine.
13	Lab-13	Study and installation of Alchemy Grid Middleware.
14	Lab-14	Perform 2 examples using Alchemy Grid Middleware.
15	Lab-15	Install and configure GTK 4.0.

Subject: **Web Data Management**								
Program: **B.Tech. CS**			Subject Code: CS0708				Semester: **VII**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
3	0	2	4	60	60	40	40	200

Course Outcomes:

- Understanding ways to store data for querying
- Defining strategies to transfer data from one node to another in effective way
- Understanding XML Query Language.
- Learning Ontologies

Contents:

UNIT-I **[12]**

Data Model

Introduction to Modeling Web Data, Semistructured data, XML, Web Data Management with XML, XML Standards, XML and syntax, XML Data Model, XLink, and XPointer.

XPath and XQuery

Introduction, Basics of XPath and XQuery, XPath: Steps and path expressions, Evaluation of path expressions, Generalities on axes and node tests, Axes, Node tests and abbreviations, Predicates, XPath 2.0; FLWOR expressions in XQuery: Defining variables - the for and let clauses, Filtering - the where clause, The return clause, Advanced features of XQuery; XPath foundations.

UNIT-II **[12]**

Typing

Motivating Typing, Automata, Schema Languages for XML, Typing Graph Data: Graph Semistructured Data, Graph Bisimulation, Data guides.

XML Query Evaluation

XML fragmentation, XML identifiers: Region-based identifiers, Dewey-based identifiers, Structural identifiers and updates; XML evaluation techniques: Structural join, Optimizing structural join queries, Holistic twig joins.

UNIT-III **[12]**

Ontologies, RDF, and OWL

Introduction, Ontologies by example, Web resources, URI, namespaces, RDF, RDFS: RDF Schema, OWL, Ontologies and (Description) Logics.

Querying Data through Ontologies

Introduction, Querying RDF data: notation and semantics, Querying through RDFS ontologies, Answering queries through DL-LITE ontologies

UNIT-IV **[12]**

Data Integration

Introduction, Containment of conjunctive queries, Global-as-view mediation, Local-as-view mediation, Ontology-based mediators, Peer-to-Peer Data Management Systems.

Building Web scale applications

Web search, web crawlers, web information retrieval, Web graph mining and hot topics in web search, Distributed systems, failure management, Required properties of a distributed system, P2P networks, Hash-based structures, distributed indexing, Distributed computing with MapReduce

Text Books

1. Serge Abiteboul, IoanaManolescu, Philippe Rigaux, Marie-Christine Rousset and Pierre Senellart, "Web Data Management", Cambridge University Press, 2011
2. BhavaniThuraisingham, "Web Data Management and Electronic Commerce", CRC Press, 2000

Reference Books

1. BhavaniThuraisingham, "XML Databases and the Semantic Web", CRC Press, 2002
2. Athena Vakali and George Pallis, "Web Data Management Practices: Emerging Techniques and Technologies", IGI Publishing, 2007, ISBN-10: 1599042282; ISBN-13: 978-1599042282

Online Courses:

- XPath and XQuery https://lagunita.stanford.edu/courses/DB/XPath/SelfPaced/about
- XML https://www.w3schools.com/xml/xml_xpath.asp
- Ontologies, RDF, and OWL http://www.linkeddatatools.com/introducing-rdfs-owl
- Map Reduce https://www.tutorialspoint.com/hadoop/hadoop_mapreduce.htm

Lab Plan

- Minimum Laboratory contact time : 15 weeks
- Lab / week : 2 hrs (0-0-2)

Week No	Class Activity	Subject content to be delivered
1	LAB -1	Create an XML file defining an article in newspaper.

2	LAB -2	Create an XML file containing list of students. Also create stylesheet file to display list in an HTML format.
3	LAB-3	Create an XML file containing list of students. Using XPath display following information • Information of a student with ID No : 101 • All the student in the sorted order according to their CGPA
4	LAB-4	Create an XForm to collect information from staff member regarding their publications. Details like Year of Publication, National/International, Title, Conference/Journal etc.
5	LAB-5	From the above gathered information, using XQuery find out the number of publication in a specific year
6	LAB-6	Demonstrate Data Transfer using AJAX technology.
7	LAB-7	XMLSPY
8	LAB-8	Create RSS Feed to promote your website.
9	LAB-9	Create a RSS Reader to read any popular news channel website.
10	LAB-10	Resource Description Framework
11	LAB-11	Data Storage and Web service integration
12	LAB-12	Exploring large data sending mechanisms over the web.

Subject: **Disaster Management**								
Program: **B.Tech. CS**				Subject Code: CV0712			Semester: **VII**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
1	0	0	0	24/60	0	16/40	0	100

Course Objectives:

1. To explain students the conceptual applications and principles of management to mitigate various disasters.

Course Outcome:

1. Understand disasters, disaster preparedness and mitigation measures.
2. Understand role of IT, remote sensing, GIS in risk reduction.
3. Understand disaster management acts and guidelines along with the role of various stack-holders during disasters.

COURSE CONTENTS:

UNIT-I **[03]**

Introduction

Concepts and definitions: disaster, hazard, vulnerability, risk, capacity, impact, prevention, mitigation)

UNIT-II **[04]**

Disasters classification

Natural disasters (floods, drought, cyclones, volcanoes, earthquakes, tsunami, landslides, coastal erosion, soil erosion, forest fires etc.); manmade disasters (industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills etc); hazard and vulnerability profile of India, mountain and coastal areas, ecological fragility

UNIT-III **[06]**

Disaster Impacts

Disaster Impacts (environmental, physical, social, ecological, economic, political, etc.); health, psycho-social issues; demographic aspects (gender, age, special needs); hazard locations; global and national disaster trends; climate-change and urban disasters. Disaster Risk Reduction **Disaster management cycle**

Phases; prevention, mitigation, preparedness, relief and recovery; structural and non-structural measures; risk analysis, vulnerability and capacity assessment; early warning systems, Post-disaster environmental response (water, sanitation, food safety, waste management, disease control); Roles and responsibilities of government, community, local institutions, NGOs and other stakeholders; Policies and legislation for disaster risk reduction, DRR programmes in India and the activities of National Disaster Management Authority.

UNIT-IV **[02]**

Applications of Science and Technology for Disaster Management and Mitigation

Geo-informatics in Disaster Management (RS, GIS and GPS), Disaster Communication System (Early Warning and Its Dissemination), Land use planning and development regulations, Disaster safe designs and Development Regulations, Disaster safe designs and Construction structural and Non structural Mitigation of Disasters. Science and Technology Institutions for Disaster Management in India.

Text Books:

1. Ghosh G.K., 2006, Disaster management, APH Publishing Corporation.

Reference Books:

2. Pradeep Sahni, 2004, Disaster Risk Reduction in South Asia, Prentice Hall.
3. Singh B. K., 2008, Handbook of Disaster Management: techniques and guidelines, Rajat Publications

Web resources:

1. http://nidm.gov.in/PDF/Disaster_about.pdf
2. https://www.slideshare.net/Jyothi19587/disaster-ppt
3. https://www.slideshare.net/SayefAmin1/natural-disaster-its-causes-effects
4. https://www.slideshare.net/rahulp4/man-made-disasters-23947076

5. https://www.slideshare.net/urveshprajapati3990/disaster-management-in-india-56546805
6. www.ndmindia.nic.in/presentation/Presentation%20by%20JS%20(DM)%20(1).ppt
7. https://www.geospatialworld.net/article/information-technology-and-natural-disaster-management-in-india/
8. http://www.bvicam.ac.in/news/NRSC%202007/pdfs/papers/st_230_03_02_07.pdf
9. http://eagri.tnau.ac.in/eagri50/ENVS302/pdf/lec13.pdf
10. http://nptel.ac.in/courses/105105104/pdf/m16l39.pdf
11. https://www.unisdr.org/we/inform/events/50220

MOOCs:

1. https://www.mooc-list.com/tags/disaster-management

8TH SEMESTER

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

B-TECH COMP. SCIENCE & ENGG., SEMESTER –VII TEACHING & EXAMINATION SCHEME WITH EFFECT FROM JULY 2017														
SR NO	CODE	SUBJECTS	TEACHING SCHEME			CREDITS	HOURS	EXAMINATION SCHEME						
								THEORY			PRACT		TOTAL
								CIE					
			L	T	P			MID	IE	ESE	CIE	ESE	
1	CS0801	Project	00	00	40	20	40	00	00	00	40	60	100
TOTAL			**00**	**00**	**40**	**20**	**40**	00	00	00	40	60	**100**

Subject: **Project**								
Program: **B.Tech. CS**			Subject Code: CS0801				Semester: **VIII**	
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal Evaluation (CIE)- Theory**	**Continuous Internal Evaluation (CIE)- Practical**	**Total**
0	0	40	20	00	60	00	40	100