UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATIONS TO BE HELD FOR BATCH 2014 &ONWARDS

COURSE OF STUDY FOR BE IST SEMESTER ENGINEERING
BRANCH: COMMON TO ALL BRANCHES

Course No.	Course Name	Lecture	Tutorial	Pract.	**Marks**			
					Theory	Sessional	Practical	Total
MTH -101	Engg. Math-1	3	2	-	100	25	-	125
PHY -102	Engg. Phy-I	3	1		100	25	-	125
CHM -103	Engg. Chem-I	3	1		100	25	-	125
M -104	Engg. Mech	3	1		100	25	-	125
HUM -105	Comm. Skills	3	1	-	100	25	-	125
M-106	Engg. Graphics	1	-	3	100	-	50	150
PHY -107	Engg. Physics Lab.	-	-	2	-	-	50	50
CHM -108	Engg. Chemistry Lab	-	-	2	-	-	50	50
M -109	Engg. Mech. Lab.	-	-	2	-	-	50	50
M -110	WS Technology	1	-	3	-	-	75	75
Total		17	6	12	600	125	275	1000

CLASS: B.E. IST SEMESTER
BRANCH: COMMON TO ALL
COURSE TITLE: ENGINEERING MATHEMATICS-I
COURSE NO.MTH-101
DURATION OF EXAM: 3 HOURS

L	T	MARKS	
3	2	Theory	Sessional
		100	25

SECTION-A

1. **Differential Calculus:** Successive differentiation, Leibnitz theorem (without proof), Partial differentiation with errors and approximations, Eular's theorem on homogeneous functions, Taylor's and Maclaurin's series of two variables, Maxima and Minima of functions of two variables, Asymptotes, Double points, curvature, Curve tracing in Cartesian, polar and parametric forms**.**

2. **Integral Calculus:** -Definite integrals with important properties, differentiation under the integral sign, Gamma, Beta and error functions with simple problems, applications of definite integrals to find length, area, volume and surface area of revolutions, transformation of coordinates, double and triple integrals with simple problems.

SECTION-B

1. **Complex Trigonometry:** Hyperbolic functions of a complex variable, Inverse Hyperbolic functions, Logarithmic function of a complex variable, Summation of series by C+ iS method.

2. **Ordinary Differential Equations:** Differential equations of first order and first degree: Exact and non-exact differential equations, Linear and Bernoulli's differential equations. Higher order linear differential equations: Complementary solution, particular integral and general solution of these equations, variation of parameters technique to find particular integral of second order differential equations, Cauchy's and Lagrange's differential equations. Applications of Ordinary Differential Equations to simple Electrical and Mechanical Engg. problems.

3. **Solid Geometry:** Sphere, Intersection of sphere and plane, tangent plane property, cone and cylinder, related problems to right circular cone and cylinder.

BOOKS RECOMMENDED:

1. Engineering Mathematics — B.S. Grewal, Khanna Publications, New Delhi
2. Calculus and Analytic Geometry — Thomas and Finney, AddisionWeslay, Narosa.
3. Differential Calculus — S. Narayan, New Delhi
4. Integral Calculus — S. Narayan, New Delhi.

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions will have to be attempted, selecting at least two from each section. Use of calculator is allowed.

COURSE OUTCOMES

COURSE NAME- ENGG. MATHEMATICS – I
COURSE CODE-MTH – 101

After learning this course students will be able to:

CO101.1	Learn the rules of nth derivative, to find maximum and minimum value of any function, to trace the curves.
CO101.2	Understand the concept of definite integrals and find arc length, area, surface area and volume of various curves.
CO101.3	Solve the differential equations of first order and higher order.
CO101.4	Differentiate the concept of finding the equations of sphere, cone and cylinderand evaluate the complex no. in polar form and understand the idea of hyperbolic functions.

B.E IST SEMESTER

BRANCH: COMMON TO ALL					**MAXIMUM MARKS:125**
SUBJECT: ENGINEERING PHYSICS-I	**L**	**T**	**P**	**THEORY**	**SESSIONAL**
COURSE NO.PHY-102	**3**	**1**	**2**	**100**	**25**

DURATION OF EXAM: 03 HOURS

SECTION-A

UNIT-I: MATHEMATICAL PHYSICS

Review of Vector Algebra, Scalar and Vector fields, Gradient of a Scalar field, Divergence and curl of a vector field and their physical significance, solenoidal fields, Guass Divergence theorem, Stokes theorem and their applications, Vector Identities

No of Lectures – 10, Weightage = 25%

UNIT-II: ELECTROMAGNETIC FIELDS AND WAVES

Guass's law in vector notation (differential and integral forms), Applications of Guass's law to find electric fields due to a long straight charged wire, Cylindrical and Spherical charge distributions.

Derivation of Ampere's Circuital law, Application of Ampere's circuital law to find magnetic intensity due to long cylindrical wire, due to a long solenoid. Differential & Integral form of Faraday's law of electromagnetic induction, Equation of continuity, Displacement current and its significance, Maxwell's field equations (differential and integral forms), Betaron,

Electromagnetic wave propagation in free space (e.m wave equations for $\xrightarrow[E]{}$ & $\xrightarrow[B]{}$ fields for free space and their solutions (plane wave solution), velocity of e.m. waves, Relation between E_o& B_o . Definition of PoyntingVetor, Poynting theorem.

No of Lectures – 16, Weightage = 25%

SECTION-B

UNIT-III: APPLIED OPTICS

Interference in thin films (by reflection and transmission of light), Theory of Newton's rings by reflected light, Determination of wave length and refractive index of monochromatic light by Newton's theory.

Fraunhoffer& Fresnel's diffractions Fresnel's half period zones and rectilinear propagation of light, Fraunhoffer diffraction due to a single slit, plane diffraction grating & its theory for secondary maxima and minima.

Unpolarized and polarized light, Nicol Prism, Mathematical representation of polarization of different types, Quarter & half wave plates.

No of Lectures – 12, Weightage = 20%

UNIT-IV: OSCILLATIONS

Free damped and forced oscillations and their differential equations, Logarithmic decrement, power dissipation & Quality factor, ultrasonic waves and their production by Piezoelectric method and applications (General)

No of Lectures – 05, Weightage = 15%

UNIT-V: FIBRE OPTICS

Propagation of light in fibres, numerical aperture, Single mode and multimode fibres, General applications*No of Lectures – 05, Weightage = 15%*

TUTORIALS

S.NO.	TOPICS	UNIT NO.
T-1	Numerical problems based on vector analysis	I
T-2	Numerical problems on Gradient of Scalar fields	I
T-3	Numerical problems on Divergence of Vector fields	I
T-4	Numerical problems on Curl of vector fields	I
T-5	Numerical problems based on Guass divergence theorem and Stokes Theorem	I
T-6	Numerical problems based on the applications of Guass's Law	II
T-7	Numerical problems based on the applications of Ampere's law	II
T-8	Numerical problems pertaining to the applications of Faraday's law	II
T-9	Numerical problems pertaining to the applications of Interference phenomenon, Formation of Newton's rings	III
T-10	Numerical problems pertaining to the applications of diffraction and polarization phenomenon	III
T-11	Numerical problems based on the applications of SHM, damped and forced motion of bodies and applications of ultrasonic	IV
T-12	Numerical problems based on the applications of Fibre optics	V

NOTE: SETTING OF QUESTION PAPER (Instructions for examiners)

i) The question paper will consist of two sections\
   a) Section-1
   &
   b) Section-II

ii) Section-I Comprises of Unit-I and Unit-II
Section-II Comprises of Unit-III, Unit-IV and Unit-V

iii) Number of questions to be set in the paper =8 (eight)
(Four from each section) as per weightage

iv) Number of questions to be attempted =5 (five)
(Selecting at least two from each section)

BOOKS RECOMMENDED:

S.NO.	TITLE	AUTHOR
1.	Vector Analysis	Spiegal
2.	Mathematical Physics	Rajput & Gupta
3.	Physics	Reisnick&Hatliday
4.	Optics	Brijlal&Subramaniam
5.	Sound	Subramaniam
6.	Sound	Khanna &Bedi
7.	Fibre Optics	Ghatak, Tyagrajan

COURSE OUTCOMES

COURSE NAME- ENGG. PHYSICS I
COURSE CODE- PHY-102

After learning this course students will be able to:

CO102.1	Students should be able to understand the mathematical concepts required to understand physics.
CO102.2	Students should be able to derive the Maxwell's equations and understand the basis electromagnetic theory.
CO102.3	Students should be able to assimilate the basic concepts of interference in thin films, diffraction, polarisation and the characteristics of different types of waves.
CO102.4	Students should be able to gain the knowledge about lasers, their characteristic's & properties and the basics of optical fibres

CLASS: B.E. IST SEMESTER
BRANCH: COMMON TO ALL
COURSE TITLE: ENGG. CHEMISTRY
COURSE NO.:CHM-103
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS		
3	1	2	Theory	Sessional	Practical
			100	25	50

SECTION - A

1. **SPECTROSCOPY:** UV Spectroscopy –Electronic transitions, spectrum, shift of bonds with solvents for double bonds, carbonyl compounds and aromatic compounds.

IR-Spectroscopy –Introduction, brief idea about instrumentation, applications and interpretation of IR Spectra, characterization of functional groups and frequency shift associated with structural changes.

'H-NMR Spectroscopy –Theory of 'H-NMR Spectroscopy, equivalent and non-equivalent protons, chemical shift, spin-spin coupling, spin-spin splitting, H'-NMR spectrum of a few organic compounds.

2. **EXPLOSIVES:** Introduction, classification and types of explosives, requirement for good explosives, preparation and uses of following explosives – Nitrocellulose, TNT, Dinitrobenzene, Picric Acid, Nitroglycerine and Dynamite, Gun Power, RDX, Tetracene.

SECTION - B

1. **STEREOCHEMISTRY:** Optical isomerism, recemization, asymmetric synthesis, methods for resolution of racemic mixture, enantiomerism and diasteroisomerism.

2. **ALLOYS:**Introduction, purpose of making alloys, preparation of alloys, classification of alloys. (Ferrous and non-ferrous alloys), alloy steels & copper alloys.

3. **LUBRICANTS: DEFINITIONS**, functions of lubricants, mechanism of lubrication, classification of lubricants (Lubricating oils, semi solid lubricants and solid lubricants) synthetic lubricants, flash and fire points, oiliness, cloud and pour points.

4. **DYES AND DRUGS:**Classification of dyes and its applications. Define drug and give the applications of following drugs**.**

a) Narcotics b) Tranquilizers c) Antipyretics d) Antibiotics

FORMAT OF QUESTION PAPER

Total No. of Questions = 08

Questions to be attempted = 05

(Minimum Two from Each Section A & B)

BOOKS RECOMMENDED:

1.	Engineering Chemistry	Jain & Jain
2.	Engineering Chemistry	Sharma, B.K.
3.	Engineering Chemistry	Dara, S.S.
4.	Organic Chemistry	Bahl, B.S.
5.	Organic Chemistry	Soni, P.L.
6.	Organic Chemistry	Jain, M.K.
7.	Spectroscopy of Organic Compounds	Silverstain
8.	Spectroscopy of Organic Compounds	Kalsi, P.S.
9.	Engineering Chemistry	Dr. Rajinder Kumar

COURSE OUTCOMES

COURSE NAME: ENGG. CHEMISTRY
COURSE NO: CHM-103
After learning this course students will be able to:

CO103.1	One could acquire Knowledge about the identification of newly synthesized products.
CO103.2	Know the New drug development process.
CO103.3	Ability to design and perform in – vitro dissolution studies for various drugs as per the standards of official monographs Combine Dyeing Process and Colorants design – quality systems, develop manufacturing procedures.
CO103.4	know how to approach the problem of choosing an alloy for a particular application,
CO103.5	Know the importance of stereochemistry in organic compound and apply the knowledge gain in this course to the variety of chemical compounds.

CLASS: B.E. IST SEMESTER
BRANCH: COMMON TO ALL
COURSE TITLE: ENGINEERING MECHANICS
COURSE NO.M-104
DURATION OF EXAM: 3 HOURS

L	T	P		MARKS	
3	1	2	Theory	Sessional	Practical
			100	25	50

SECTION-A (STATICS)

Scope and basic concepts (Rigid body, force, units, etc.), concept of free body diagram, Resultant of Co-planar concurrent forces in a plane and space, moment of force, Principle of Moments, Coplanar and spatial applications. Virtual work method and its applications.

Equilibrium and its equations for a planar and spatial systems, Analysis of trusses, Method of joints and sections.

Theory of friction, its laws and applications (inclined plane). Square threaded screws, Bolt friction, Centroids and center of gravity, centroids of lines and composite areas, centroids determined by integration.

Moment of inertia, Area M.O.I, Transfer theorems, Polar M.O.I, Product of inertia, Principal M.O.I, Mohr's circle for area M.O.I, Transfer theorems and axes M.O.I of composite bodies.

SECTION-B (DYNAMICS)

Kinematics of a particle rectilinear motion, motion curves, Rectangular components of curvilinear motion, Flight of Projectile, Normal and tangential components of acceleration, Radial and transverse components, Newton's Laws. D'Alembert's Principle.

Kinematics of rigid bodies: Types of rigid body motion, Angular motion, fixed axis rotation, Analysis of plane motion and its applications, Instantaneous center and Instantaneous axis of rotation.

Kinetics of Particle: Translation, Analysis of a particle as a rigid body.

Kinetics of rigid bodies: Equations of plane motion, fixed axis rotation, Rolling bodies, General plane motion, Impulse and momentum in plane motion, Angular momentum.

RECOMMENDED BOOKS:

1.	Engineering Mechanics (Statics & Dynamics)	Beer and Johnson
2.	Engineering Mechanics (Statics & Dynamics)	Mariam and Kraige
3.	Engineering Mechanics (Statics and Dynamics)	Timoshenko and Young
4.	Engineering Mechanics (Statics and Dynamics)	Ferdinand L Singer.

NOTE: There shall be total eight questions, four from each section. Five questions will have to be attempted selecting at least two from each section. Use of calculator is allowed.

COURSE OUTCOMES

COURSE NAME: ENGINEERING MECHANICS
COURSE NO: M-104
After learning this course students will be able to:

CO104.1	Analyze the system of units and the conversion of units from one to another.
CO104.2	Demonstrate knowledge on basic calculation of forces and their resultant and resolution.
CO104.3	Approach to a conclusion of forces causing equilibrium.
CO104.4	Be proficient in the use of integral and moment methods for calculating centre of gravity.
CO104.5	Develop a stable, environment friendly structure for various engineering purpose using various modern tools.

B.E IST SEMESTER
BRANCH: COMMON TO ALL
TITLE: COMMUNICATION SKILLS
COURSE NO: HUM-105
DURATION: 3 HOURS

L	T	P	MARKS	
			Theory	Sessionals
3	1	-	100	25

Exercises in comprehension, grammar vocabulary, usage, pronunciation, spelling and composition based on the following texts:

i. Contemporary English Prose
Edited by Menon
Oxford University Press

ii. Developing English Skills
Edited by Thanker, Desai and Purani
Oxford University Press

Or

English through Reading-II
Edited by Bhasker and Prabhu

Note: Test-I carries 50% weightage in the question paper and Text-II carries 50% weightage

Question Paper:

1.	Six short answer questions on comprehension to be set from Text-I. Students expected to answer any three in about 150 words each	(30 marks)
2.	Phrases and idioms from text I to be used in sentences. Hundred percent choices to be given	(20 marks)
3.	Completing a paragraph of which the first two or three short Sentences are given	(10 marks)
4.	Exercise on tenses from Text II	(5 marks)
5.	Exercises on active/passive transformation from Text-II	(5 marks)
6.	Forming verbs or adjectives or nouns from the given words-text-II	(5 marks)
7.	Propositions from text-II	(5 marks)
8.	Matching words and their meanings Text-II	(5 marks)
9.	Forming words ending in-ify,-ize,-tion, ec. From Text-II	(5 marks)
10.	Filling in the blanks with a given set of words in Brackets-Text-II	(5 marks)
11.	Questions on miscellaneous exercises from Text-II such as Question tags - articles etc. or Marking Stress or Syllable in given words.	(5 marks)

COURSE OUTCOMES

COURSE NAME- COMMUNICATION SKILLS
COURSE CODE- HUM-105
After learning this course students will be able to:

CO105.1	Prepare, organize, and deliver engaging oral presentations and thus increase confidence in speaking publicly.
CO105.2	Write effectively for a variety of professional and social settings.
CO105.3	Become active readers who can articulate their thoughts, views etc. and built curiosity for other perspectives and shall be able to understand the importance of communication with others.
CO105.4	Interpret texts with an awareness of and curiosity for other viewpoints.
CO105.5	Enhance his/her vocabulary.

CLASS: B.E. IST SEMESTER
BRANCH: COMMON TO ALL
COURSE TITLE: ENGINEERING GRAPHICS
COURSE NO. M-106
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS		
			Theory	Sessional	Practical
1	0	3	100	0	50

UNIT-1

Introduction: Conventional lines and signs used in Engineering Drawing, Printing and Lettering, Curves used in Engineering Practice: Cycloidals, Involutes, Spirals and Hellices, Locus of a point on simple mechanisms.

Theory and practice of Orthographic projections.

Projection of points and Lines: Projections of points and lines in different quadrants w.r.t principle reference planes, Finding of true length, True inclinations and traces of lines.

Projection of Planes: Projections of a plane w.r.t. the principle planes in simple and inclined positions. Rotation method and the Auxiliary plane method. Space relation of a plane and a line. To locate a point on a plane given its projections. Parallel relation of lines and planes. Shortest distance between a line and a plane.

UNIT-2

Projection of Solids: Classification and main features-Prisms and Pyramids. Projection of solids inclined to both the reference planes by (1) Rotation Method, and (II) Auxiliary plane method. Projection of solids in combination (Co-axial) in simple and inclined positions.

Sectioning of Solids: Object of sectioning, Types of cutting planes, True shape of section, Auxiliary views of sections of multiple co-axial solids in simple and titled conditions.

UNIT-3

Interpenetration of Solids and Intersection of Surface: Intersection of geometrical solids/hollow sections, Tracing of lines of intersection by line method and by section method.

Development of Surfaces: Classification of surfaces, Methods of Development-Straight line method and Radial line method, Development of solids and hollow sections in full or part development of transition pieces. To draw projections from given development.

UNIT-4

Isometric Projection: Isometric scale, Isometric axes and Isometric planes, Isometric projection of solids and simple machine blocks**.**

Orthographic Projections: Orthographic projection of simple blocks (First & Third angles), to draw the third view from given two views. Missing lines in projection.

RECOMMENDED BOOKS:

1.	Engineering Drawing	N.D Bhatt
2.	Practical Geometry	V. Laxminarayan& GEV
3.	Engineering Graphics	K.L. Narayanan & P. Kamaish
4.	Principles of Engineering Graphics	P.E Giesecks
5.	Engineering Graphics	Frederic & Michelle.

NOTE: At least two questions to be attempted from Unit-I and at least one question from each of the Units-II, III and IV in the theory examination paper.

COURSE OUTCOMES

COURSE NAME- ENGINEERING GRAPHICS
COURSE CODE- M-106
After learning this course students will be able to:

CO106.1	Draw orthographic projections of sections
CO106.2	Use architectural and engineering scales with accuracy.
CO106.3	Work with zeal of office practices and standards.
CO106.4	Convert sketches to engineered drawing.
CO106.5	Perform auto cad two dimensional drawing.

B.E IST SEMESTER	**P**	**MAXIMUM MARKS**
SUBJECT: ENGINEERING PHYSICS LAB-I	**2**	**SESSIONAL**
COURSE NO.: PHY-107		**50**

S.No.	Experiment No.	Title of Experiment
1.	Exp-I	To plot a graph between the distance of the knife edges from the center of gravity and the time period of a compound pendulum. From the graph, find a) Acceleration due to gravity b) Radius of gyration and the moment of inertia of the bar about an axis through the center of gravity.
2.	Exp-II	To find the dispersive power of a given prism using a spectrometer.
3.	Exp-III	To find the refractive index of a given liquid using a hollow prism
4.	Exp-IV	To find the focal lengths of a convex mirror and a concave lens using a convex lens and a concave mirror respectively.
5.	Exp-V	To find the frequency of A.C mains using an electrical vibrator.
6.	Exp-VI	To draw the V-I characteristics of a forward and reverse bias P-N junction diode.
7.	Exp-VII	To study the common base characteristics of PNP junction transistor.
8.	Exp-VIII	To study the common emitter characteristics of PNP junction transistor.
9.	Exp-IX	To study the common base characteristics of NPN junction transistor.
10.	Exp-X	To study the common Emitter characteristics of NPN junction transistor.
11.	Exp-XI	To evaluate the value of Planck's constant.
12	Exp-XII	To study the characteristics of a Solar Cell.

NOTE: A minimum of six experiments is to be performed in a semester.

BOOKS RECOMMENDED:

	TITLE	AUTHOR
1.	Practical Physics	Warsnop& Flint
2.	Practical Physics	Chauhan & Singh (Vol. I & Vol. II)
3.	B.Sc. Practical Physics	C.L Arora

COURSE OUTCOMES **COURSE NAME- ENGINEERING PHYSICS LAB-I** **COURSE CODE- PHY-107** After learning this course students will be able to:	
CO106.1	calculate the value of Plank's constant by using Photoelectric effect and thereby verify the Einstein's photoelectric equation
CO106.2	Understand the concepts of semiconductor diodes by studying their characteristics in forward and reverse bias modes.
CO106.3	Understand the concepts of stationary waves and hence find the value for frequency of A.C Mains by using Sonometer.
CO106.4	Equip themselves with concepts of acceleration due to gravity, moment of inertia & radius of gyration and verify the same by using compound pendulum.
CO106.5	Calculate the angle of prism by using spectrometer and thereby verify the laws of reflection &refraction. To verify the laws of dispersion of light and calculate the minimum deviation and hence find the Refractive Index of a Prism by using Spectrometer

"Practical performance pertaining to the above topics will be useful for the students to acquaint them with handling of instruments and experimentation".

B.E IST SEMESTER	**P**	**MAXIMUM MARKS**
SUBJECT: ENGINEERING CHEMISTRY LAB	**2**	**SESSIONAL**
COURSE NO.: CHM – 108		**50**

CHEMISTRY PRACTICAL:

1. Determine the percentage of $CaCO_3$ in precipitated chalk. You are provided with IN HCl and 0.IN NaOH.
2. To analyse the given antacid tablets.
3. Determine Volumetrically the %age purity of given sample of Ferrous sulphate, x gms of which have been dissolved per litre provided N/10 $KMnO_4$
4. Determine Volumetrically the number of molecules of water of crystallization present in the given sample of Mohr's salt, x gms. of which have been dissolved per litre provided N/10 $K_2Cr_2O_7$ (using an external indicator).
5. Determine Volumetrically the percentage of Cu in a sample of $CuSO_4$ crystals, Z gms of which have been dissolved per litre, provided 0.IN $Na_2S_20_3$.
6. To determine the coefficient of viscosity of an unknown liquid using Ostwald Viscometer.
7. Determine the surface tension of a unknown liquid using Stalagmometer.
8. To prepare a pure and dry sample of Aspirin
9. To prepare a pure and dry sample of Glucosazone
10. Determine the method of purification of organic compounds by coloumn chromatography.
11. Determine the aniline point of a given lubricating oil.

BOOKS RECOMMENDED:

1. Experimental Engineering Chemistry — Shashi Chawla
2. Lab. Manual on Engg. Chemistry — Basin, S K &Sudha Rani
3. A Manual of Practical Engineering Chemistry — Dr. Rajinder Kumar

COURSE OUTCOMES

COURSE NAME: ENGINEERING CHEMISTRY LAB-I
COURSE CODE: **CHM-108**
After learning this course students will be able to:

CO108.1	Capability to visualize and understand chemical engineering unit, operations related to fluid and practical mechanics and mass transfer.
CO108.2	To provide an overview of preparation and identification of organic compound.
CO108.3	This course relies on quantitative analysis and makes use of simple equation to illustrate the concept involved.
CO108.4	Handling different types of instruments for analysis of materials, using small quantity of material involved for quick and accurate results.

B.E IST SEMESTER	**P**	**MAXIMUM MARKS**
SUBJECT: ENGG. MECHANICS LAB	**2**	**SESSIONAL**
COURSE NO.: M – 109		**50**

Lab work shall be based on theory course of Engineering Mechanics Paper

COURSE OUTCOMES

COURSE NAME: ENGINEERINGMECHANICS LAB
COURSE CODE:**M-109**
After learning this course students will be able to:

CO109.1	Apply the fundamentals of statics and motion principles of various engineering problems related to statics and motion.
CO109.2	Have the knowledge of finding the stable structures of various engineering purposes and bending of beams by using bending moment apparatus.
CO109.3	Solve engineering problems related to motion.
CO109.4	Demonstrate the knowledge on basic calculation of forces and their resultant and resolution.
CO109.5	Solve the engineering problems related to friction and analyze it in real life situation.

CLASS: B.E. IST SEMESTER
BRANCH: COMPUTER ENGG., CIVIL ENGG., MECH. ENGG., ELECTRICAL ENGG., ELECTRONICS & COMM. ENGG.
COURSE TITLE: WORKSHOP TECHNOLOGY
COURSE NO.WS-110

L	T	P	MARKS		
			Theory	Sessional	Practical
1	0	3	0	0	75

COURSE CONTENT:

Introduction to workshop as a fabrication unit. Information regarding various material of construction i.e Ferrous and Non-Ferrous, wood, plastics, etc. Basic fabrication process i.e. castings, Mechanical working, welding and machining.

Wood working and pattern making practice, Information about working hand and wood working machines, various methods of joining of wooden parts for the fabrication of patterns, Pattern materials and allowances, pattern construction procedures, preservation of patterns.

Moulding and casting practice. Sand Moulding, Natural foundry sands and synthetic sands, preparation of moulding sands, mould making procedure, cast iron and aluminum and pouring, melting crucible process, Extraction of Castings.

Cold and hot working processes, basic tools and equipment used in mechanical working. Forging furnace operation, Smith forgoing operations.

BOOKS:

1. Manufacturing process and materials by Campbell.
2. Manufacturing Process by P.N. Rao
3. Workshop Technology by Hajra and ChowdharyVol.I

SHOP PRACTICE:

Unit-1 Pattern Making:

i) Baring block pattern
ii) Split pattern of "bench Vice" (Sliding Jaw).

Unit-II Moulding and Casting

Moulding and Castings of Patterns at Unit I.

Unit-III Hand forging of:

i) Hexagonal headed bolt from a cylindrical rod.
ii) Cubical Block from a Cylindrical section.

COURSE OUTCOMES

COURSE TITLE: WORKSHOP TECHNOLOGY
COURSE NO.WS-110
After learning this course students will be able to:

CO110.1	Prepare pattern making of open bearing block
CO110.2	Prepare pattern making of bench vice (Sliding Jaw).
CO110.3	Perform moulding and casting of open bearing block and bench vice .
CO110.4	Perform forging of hexagonal headed bolt from a cylindrical rod.
CO110.5	Perform forging of cubical block from a cylindrical section.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATIONS TO BE HELD FOR BATCH 2014 & ONWARDS

COURSE OF STUDY FOR BE 2ND SEMESTER ENGINEERING
BRANCH: COMMON TO ALL BRANCHES

Course No.	Course Name	Lecture	Tutorial	Pract	**Marks**			
					Theory	Sess.	Pract	Total
MTH –201	Engineering Math-1I	4	2	-	100	25	-	125
PHY -202	Engineering Phy-II	3	1	-	100	25	-	125
CHM -203	Engineering Chem-II	3	1	-	100	25	-	125
COM -204	Computer Programming	3	1	-	100	25	-	125
HUM-205	Engineering Economics	3	1	-	100	25	-	125
M -206	Machine Drawing-I	1	-	3	100	25	-	125
M -207	Workshop Technology-II	1	-	3	-	-	75	75
PHY –208	Engineering Physics II Lab	-	-	2	-	-	50	50
CHM –209	Engineering Chemistry II Lab	-	-	2	-	-	50	50
COM –210	Computer Programming Lab	-	-	2	-	-	75	75
Total		18	6	12	600	150	250	1000

B.E 2ND SEMESTER **MAXIMUM MARKS:125**

COURSE NO: MTH-201	**L**	**T**	**THEORY**	**SESSIONAL**
COURSE TITLE: ENGG. MATH-II	**4**	**2**	**100**	**25**

BRANCH : COMMON TO ALL

DURATION OF EXAM: 3 HOURS

SECTION-A

1. **Introduction to infinite series &sequences: -** Convergence and divergence of a series, Leibnitz test, p-test, comparison test, Cauchy's root test, D' Alembert Ratio Test, Raabe's Test, Logarithmic test, alternating series.
2. **Fourier Series:** Introduction, Euler's formulae, sufficient conditions for a Fourier expansion, functions having points of discontinuity, change of intervals. Odd and even functions, Fourier expansion of Odd and even periodic functions, half range series, typical wave forms, Parseval's formula, complex form of Fourier -series.
3. **Power Series Solutions of Second order O.d.e:** Analytic function, ordinary point, singular point, regular and irregular singular points of o.d.e. Y " +P(x)Y' + Q(x)Y=0, Series solution of such differential equations about an ordinary point, Frobenius series solution about a regular singular point.

SECTION-B

2. **First Order partial differential equations: -**

   Formation of p.d.e, First order linear p.d.e, Non-Linear p.d.e. of Ist order, solution by Charpit's method, Four Standard forms of non-linear p.d.e with reference to Charpit's technique.

3. **Higher Order Linear p.d.e:** Homogenous and Non-homogenous higher order linear partial differential with constant coefficient inverse operator I/f (D,D'), Rules for finding P.I and C.F, Non-Linear equations of 2nd order. Application of p.d.e, method of separation of variables to solve equations of vibrations of strings (or one dim wave equation), one dim and two dim heat flow equations, Laplace equations, transmission line).
4. **Matrices & determinants:** Introduction, Rank of matrix, Elementary transformations, Elementary matrices, Inverse using elementary transformation, Normal form of a matrix, Vector spaces, Linear dependence and independence of vectors, consistency of linear system of equations, linear and orthogonal transformations, Eigen values and Eigen vector, Properties of Eigen value, Cayley Hamilton Theorem, Reduction to diagonal form, Reduction of quadratic form to canonical form, complex matrices.

BOOKS RECOMMENDED:

1. Advanced Engineering Mathematics by R.K. Jain, S.R.K Iyenger, 2nd edition, Narosa, New Delhi.
2. Higher Engineering Mathematics Dr. B.S. Grewal
3. Engineering Mathematics Dr. Bhopinder Singh
4. Engineering Mathematics B.S. Grewal Khanna Publication, New Delhi.
5. Partial differential equations Singhania

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions will have to be attempted, selecting at least two from each section. Use of calculator is allowed.

COURSE OUTCOMES

COURSE NAME- ENGG. MATHEMATICS – II
COURSE CODE-MTH – 201
After learning this course students will be able to:

CO201.1	Learn the concept of linear and non- linear partial differential equations.
CO201.2	Understand the concept of Fourier series of any function
CO201.3	Apply the concept of analyticity of functions for the expansions of second order differential equations.
CO201.4	Find the rank, Eigen values/ vectors of matrices, solve simultaneous linear equations, find inverse of matrices using normal forms and evaluate the convergence and divergence of a given sequence of series

B.E IIND SEMESTER (COMMON COURSE) **MAXIMUM MARKS:125**

COURSE NO. PHY-202	**L**	**T**	**THEORY**	**SESSIONAL**
COURSE TITLE : ENGINEERING PHYSICS-II	**3**	**1**	**100**	**25**

BRANCH : COMMON TO ALL

DURATION OF EXAM: 3 HOURS

UNIT-1	**RELATIVISTIC DYNAMICS**	**NO. OF LECTURES**	**WEIGHTAGE**
	Concept of Relativity, Frames of reference, Galilean Transformations, Michelson and Morley's experiment, Postulates of Special Theory of relativity, lorentz transformations, Length Contraction, Time dilation, variation of mass with velocity (Velocity addition), mass energy equivalence ($E^2=P^2c^2+m_o^2c^{4)}$.	10	25%
UNIT-II	**WAVE-PARTICLE DUALITY**		
	Black Body radiation spectrum (Characteristics & Energy distribution), Wien's laws, Rayleigh Jeans Law excluding mathematical derivations, ultraviolet Catastrophe, Planck's hypothesis and Planck's radiation law, Explanation of black body radiation characteristics on the basis of Planck's law, photon concept. Compton effect, derivation of the direction of emission and the change in wavelength of scattered photons, direction of recoil electron and discussion of observed results. Debroglie's hypothesis, concept of matter waves, Davisson &Germer's experiment, wavepacket, Phase and Group velocity, Heisenberg's uncertainty principle. Experimental illustration of uncertainty principle using single slit.	12	25%
UNIT – III	**QUANTUM MECHANICS**		
	Wave function definition, interpretation and significance of wave function, Schrodinger's wave equations (Steady-State and time dependent) for 1-dim case, concept of operators and expectation values, Applications of Schrodinger's equation (Time independent) to a) Particle in a 1-dimensional box of infinite height, b) single step potential barrier, c) Tunnel effect, d) Quantum Mechanical harmonic oscillator with concept of Zero point energy.	14	25%
UNIT-IV	**SOLID STATE PHYSICS**		
	Intrinsic & extrinsic semi-conductors, Fermi & impurity levels, Impurity compensation, charge neutrality equation and semi-conductor conductivity. Einstein's relation, drift and diffusion current. Introductory concepts of advanced materials viz; conducting polymers dielectric materials, Nanomaterials, Smart materials and High T_c materials.	7	15%
UNIT-V	**LASERS**		
	Principle of Laser action, population Inversion, Einstein's Coefficients, He-Ne & Ruby Lasers, Holography	5	10%

TUTORIALS

B.E IIND SEMESTER
SUBJECT: ENGG: PHYSICS-II
COURSE NO.PHY-202

S.NO.	TOPICS	UNIT NO.
T-1	Numerical problems based on Length contraction & time dilation	I
T-2	Numerical problems based on variation of mass, energy mass equivalence etc.	I
T-3	Numerical problems pertaining to energy spectrum of Black body radiations, Wien's displacement/R-J laws, Planck's law	II
T-4	Numerical problems based on photo-electric effect, work functions	II
T-5	Numerical problems based on Compton effect, recoil energy of electron etc.	II
T-6	Numerical problems based on the characteristics of De-broglie waves, Davisson-Germer's Expt.	II
T-7	Numerical problems related to Heisenberg's uncertainty principle	II
T-8	Numerical problems based on Schrodinger's wave equation, expectation values of certain physical quantities and operators	III
T-9	Numerical problems to find the Eigen function and Eigen values for particle in a box	III
T-10	Numerical problems to find the reflection and transmission co-efficients for a particle penetrating a potential barrier	III
T-11	Simple numerical problems based on finding the bandgaps in semi-conductor materials etc.	IV
T-12	Simple numerical problems based on finding the energy level difference in Lasers etc.	V

NOTE: SETTING OF QUESTION PAPER (Instructions for Examiners)

i) The question paper will consist of two sections

a) Section-I
&
b) Section-II

ii) Section-I Comprises of Unit-I and Unit-II
Section-II Comprises of Unit-III, Unit-IV and Unit-V

iii) Number of questions to be set in the paper =8 (eight)
(Four from each section as per weightage)

iv) Number of questions to be attempted =5 (five)
(Selecting at least two from each section)

BOOKS RECOMMENDED:

TITLE	AUTHOR
1) Modern Physics	Beiser
2) Modern Physics	Blatt
3) Modern Physics	Gupta & Gupta
4) Basic Electronics	Millman&Halkias
5) Material Science	S.L. Kakani, Amit Kakani

COURSE OUTCOMES

COURSE NAME: PHYSICS-II
COURSE NO: PHY-202
After learning this course students will be able to:

CO202.1	Understand the mathematical concepts required to understand physics.
CO202.2	Derive the Maxwell's equations and understand the basis electromagnetic theory.
CO202.3	Assimilate the basic concepts of interference in thin films, diffraction, polarization and the characteristics of different types of waves.
CO202.4	Gain the knowledge about lasers, their characteristic's & properties and the basics of optical fibers.

B.E 2ND SEMESTER **MAXIMUM MARKS:125**

COURSE NO: CHM-203	**L**	**T**	**THEORY**	**SESSIONAL**
COURSE TITLE: ENGG. CHEM-II	**3**	**1**	**100**	**25**

BRANCH : COMMON TO ALL

DURATION OF EXAM: 3 HOURS

SECTION-A

1. **ENVIRONMENTAL CHEMISTRY:**

Concept of Environmental chemistry, segments of environment (a brief idea about atmosphere, hydrosphere and lithosphere)

AIR POLLUTION –Introduction, Types of air pollution and control of air pollution.

WATER POLLUTION: Introduction, Sources of water pollution and methods of controlling water pollution.

CHEMICALS AND METAL TOXICOLOGY (Biochemical effects of Pb, Hg, As, Zn, Cd, Ni, Se, CN, O_3 and pesticides in brief on man).

2. **INORGANIC CEMENTING MATERIALS**:

Cement and Lime – Introduction, classification of lime, manufacture and properties of lime, setting and hardening of lime.
Cement, types of cement, manufacture of Portland cement, setting and hardening of cement.

3. **WATER TREATMENT**

Introduction, types of water, softening of water by different processes, chemical

methods and sterilization, priming and foaming, sludge and scale formation, determination of hardness of water by soap titration method and EDTA method. Radioactivity of water, numericals on hardness and softening of water.

SECTION-B

1. **PLASTICS:**

Introduction, importance of plastics and uses, classification of plastics, moulding constituents of a plastic, moulding of plastics into articles (compression moulding, injection moulding, transfer moulding and extrusion moulding) Preparation, properties and uses of following plastic materials:
a) Polymethyl methacrylate b) Epoxy resins c) Alkyd resins.

2. **RUBBER**

Introduction, types of rubber, treatment of latex, vulcanization of rubber, preparation, properties and uses of following synthetic rubber: Buna-S, Buna-N & Butyl rubber.

3. **PAINTS**

Introduction, requisites of a good paint, constituents of a paint, manufacture of a paint, properties and uses of important white pigments such as white lead, Zinc oxide and Lithophone.

BOOKS RECOMMENDED:

1.	Engineering Chemistry	Jain & Jain
2.	Engineering Chemistry	Sharma, B.K.
3.	Engineering Chemistry	Dara, S.S.
4.	Engineering Chemistry	Shashi, Chawla
5.	Organic Chemistry	Bahl, B.S.
6.	Environmental Chemistry	De, A.K.
7.	Textbook of Environmental Chemistry	Tyagi&Mehra
8.	Polymer Science	Gowrikar, V.R. etal.
9.	Engineering Chemistry	Dr. Rajinder Kumar

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions will have to be attempted, selecting at least two from each section. Use of calculator is allowed.

COURSE OUTCOMES

COURSE NAME: ENGG. CHEM II
COURSE CODE: CHM-203
After learning this course students will be able to:

CO203.1	Explain the air quality, emission, pollution control and Environmental. Health.
CO203.2	Analyze different polymerization processes used to make thermoplastic and thermosetting plastics.
CO203.3	Recognize the common physical, chemical process encountered in treatment process of water.
CO203.4	Define basic knowledge on cement, its production, characteristics, properties etc.
CO203.5	Summarize the chemical structure, molecular properties, vulcanization process and application of major type of rubber.

CLASS: B.E 2nd SEMESTER
BRANCH: COMMON FOR ALL
COURSE TITLE: COMPUTER PROGRAMMING USING C
COURSE NO: COM –204
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			Theory	Sessionals
3	1	-	100	25

SECTION-A

1. Basic structure of Computer, Stored Program Concept, Binary Arithmetic – Addition, Subtraction, Multiplication, Data Representation – Fixed and Floating Point, Semiconductor Memories.

2. Introduction to C, Data Types, Constants, Variables, Expressions, Statements, Operators, Data Input and Output.

3. Control Statements, Arrays, Recursion, Storage Classes, Library Functions.

SECTION-B

4. Functions, User Defined Data Types, Structures, Unions, Passing Structure to Functions.

5. Pointers, Operation on Pointers, Passing Pointers to Functions, Data Files – Opening, Closing, Creating Data Files

BOOKS RECOMMENDED:

1. Programming With C - Byron Gottfried.
2. Programming With C - E. Balaguruswamy.
3. C The CompleteReferance - Herbert Schildt.
4. Let us C - YashwantKanitkar.
5. Digital Computer Fundamentals - Thomas C. Bartee.
6. Digital Computer Design - V. Rajaraman.

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions will have to be attempted, selecting at least two from each section. Use of calculator is allowed.

COURSE OUTCOMES

COURSE TITLE: COMPUTER PROGRAMMING USING C
COURSE NO: COM –204
After learning this course students will be able to:

CO110.1	Remember the fundamentals of C programming.
CO110.2	Understand the use of loops and decision making statements to solve the problems.
CO110.3	Apply different operations on arrays and user-defined functions to solve real-time problems.
CO110.4	Analyze the operation of pointers, structures and unions.
CO110.5	Implement file operations in C programming for a given application.

B.E. 2ND SEMESTER **MAXIMUM MARKS: 125**

COURSE NO. HUM-205			**THEORY**	**SESSIONAL**
COURSE TITLE: ENGINEERING ECONOMICS	**L**	**T**	**100**	**25**
BRANCH: COMMON TO ALL	**3**	**1**		

DURATION OF EXAM : 3 HOURS

SECTION-A

UNIT-1

Definitions of Economics

a) Science of Wealth

b) Science of Material Welfare

c) Science of Scarcity

Economic System

a) Features of Capitalism

b) Features of Socialism

c) Features of Mixed Economy

UNIT-II

Consumer Behaviour

a) Cardinal Utility Analysis: The Concept and Utility Maximisation: Laws of Diminishing Marginal Utility and Equi-Marginal Utility.

b) Ordinal Utility Analysis: Meaning and Properties of Indifference Curves and Utility Maximization.

Demand Theory:

a) Meaning of Demand and law of Demand

b) Factors Affecting Demand

c) Elasticity of Demand (Price Elasticity, Income Elasticity and Cross Elasticity)

d) Demand Forescasting

SECTION-B

UNIT-III

Theory of Production:

a) Factors of Production and Production Function.

b) Isoquants : Meaning & Properties

c) Law of Variable Proportions & Returns to scale

Costs and Cost Analysis

a) The Concept of Marginal, Average, Fixed and Variable Costs.

b) The Shape of Fixed, Average and Marginal Cost Curves (short run)

Market and Market Structures

a) Meaning and Feature of Perfect Competition, Monopolistic Competition, Oligopoly and Monopoly.

b) Price Determination Under Perfect competition and monopoly.

UNIT-IV

Some commonly used Economic Concepts

a) Meaning, Types and Methods to Control Inflation.

b) Concept of Stock Market

c) Meaning & Concept of National Income

d) Functions of Commercial Bank & Central Bank

e) Features of Development and Under Development

f) Meaning & Phases of Trade/Business Cycle

g) Index Number : Construction and difficulties in measurement of Index Number.

BOOKS RECOMMENDED :

1. K.K.Dewett : Modern Economic Theory
2. H.L Ahuja : Advanced Economic Theory
3. M.L. Jhingan : Macro Economics
4. P.N Chopra : Business Economics/Advanced Eco. Theory

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions will have to be attempted, selecting at least two from each section. Use of calculator is allowed.

COURSE OUTCOMES

COURSE NAME- ECONOMICS
COURSE CODE- HUM-205
After learning this course students will be able to:

CO205.1	Understand difference between classical and modern economic views.
CO205.2	Understand business environment of a country of which every business manager has to be aware in order to execute successfully.
CO205.3	Apply the laws in daily routine and be able to become a rational consumer and purchaser
CO205.4	Suggest producing the products at minimum cost by studying in detail about the cost curves and market structures.
CO205.5	Apply the knowledge of macroeconomics such as national income, index numbers, business cycle etc.

B.E. 2ND SEMESTER **MAXIMUM MARKS: 125**

COURSE NO. M-206			**THEORY**	**SESSIONAL**
COURSE TITLE: MACHINE DRAWING-I	**L**	**P**	**100**	**25**
BRANCH: COMMON TO ALL	**1**	**3**		

DURATION OF EXAM : 3 HOURS

SECTION-A

1. I.S. Code for Machine Drawing.
2. Types of Sections and Recommended Scale, Dimensioning and Sectioning of Machine elements.
3. Drawing and sketching of machine elements in Orthographic Projections.
4. Different types of Joints: Riveted joints, Threaded fasteners, Knuckle joint, Cotter Joints: Gib and Cotter, Sleeve and Spigot.
5. Stud assembly, Pipe joints including expansion joint.
6. Shaft pulley, cone pulley, Fast and loose pulley, etc.

SECTION-B

1. Simple assemblies: Shaft couplings and Clutches, Muff Coupling, Split muff, Flange Couplings: Solid and Flexible, Protected and Unprotected, Universal Coupling.
2. Bearings: Pedestal bearing including Hanger bearings, Pivot bearing and Swivel bearing.

RECOMMENDED BOOKS:

1.	Machine Drawing	P.S. Gill
2.	Machine Drawing	Sidheshwar and Kannaih
3.	Machine Drawing	N.D. Bhatt

NOTE: -

1. **There will be Six questions in all, five from Section- A (each of 15 marks) and one Compulsory question of 55 marks from Section - B.**
2. **Students are required to attempt Four questions in all, three form Section-A and one compulsory question involving assembly from Sections–B.**

COURSE OUTCOMES

COURSE TITLE: MACHINE DRAWING
COURSE NO: M-206
After learning this course students will be able to:

CO206.1	Helping the student in drafting their technical ideas.
CO206.2	Creating knowledge about the various practices with regard to the dimensioning, sectioning and development of views.
CO206.3	Understanding the importance of the linking functional and visualization aspects in the preparation of the part drawing.
CO206.4	Preparation of the part or assembly drawings as per the conventions.
CO206.5	Interpretation of machine drawings that in turn helps the students in the preparation of the production drawings Machine Drawing Conventions.

B.E 2ND SEMESTER **MAXIMUM MARKS : 75**

COURSE NO: M-207	**L**	**P**	**PRAC/LAB**
COURSE TITLE: WORKSHOP TECHNOLOGY-II	**1**	**3**	**75**

BRANCH : COMMON TO ALL
DURATION OF EXAM : 3 HOURS

WELDING SHOP

1. Introduction to Welding as a fabrication process, Welding application and general safety precautions.
2. Introduction to Gas and Arc welding processes.
3. Preparation of single V-butt joint by Gas and Arc welding processes.
4. Preparation of double V-butt joint, Lap joint, Tee joint and Corner joint by Gas and Arc welding processes.

FITTING SHOP

1. Assembly of Snap fitting of flat pieces (Male, Female).
2. Assembly and fitting of two L-shaped rectangular flat pieces.

SHEET METAL SHOP

1. Introduction to sheet metal tools.
2. Practice of making regular geometrical and traditional shapes in sheet metal, which includes:
   a) Square elbow
   b) Tee joint
   c) Funnel making
   d) Tray and riveted handle.

COURSE OUTCOMES

Course Name: Workshop Technology-II
Course code: M-207
After learning this course students will be able to:

CO207.1	Perform welding process like Arc and Gas welding .
CO207.2	Prepare single V butt joint, double V butt joint, Lap joint, Tee joint and corner joint.
CO207.3	Perform Assembly of Snap fitting of flat pieces.
CO207.4	Perform Assembly and fitting of two L shaped flat piece.
CO207.5	Perform various sheet metal process like square elbow, funnel making and tray and riveted handle.

B.E 2ND SEMESTER **MAXIMUM MARKS : 50**

COURSE NO: PHY-208	**P**	**PRAC/LAB**
COURSE TITLE: ENGINEERING PHYSICS LAB-II	**2**	**50**

BRANCH : COMMON TO ALL

DURATION OF EXAM : 3 HOURS

S.NO.	EXPERIMENT NO.	TITLE OF EXPERIMENT
1.	Exp-1	To determine the wavelength of sodium light using a plane diffraction grating.
2.	Exp-II	To find the wavelength of a monochromatic source of light using Fresnel's Biprism.
3.	Exp-III	To determine the specific rotation of sugar using laurent's half shade polarimeter.
4.	Exp-IV	Verification of Faraday's laws.
5.	Exp-V	To find the wavelength of monochromatic light using Newton's rings Apparatus.
6.	Exp-VI	To find the co-efficient of self-induction of a coil by Anderson's bridge using head phone.
7.	Exp-VII	To determine the value of e/m for electron by a long solenoid (Helical method).
8.	Exp-VIII	To find the impedance of LCR series and parallel circuits.
9.	Exp-IX	To study the Zener diode characteristics.
10.	Exp-X	To find the specific resistance of given wire by using carry Foster's Bridge.
11.	Exp-XI	To find the wavelength of He-Ne gas laser.
12.	Exp-XII	To find the diameter of a thin wire using He-Ne gas laser.

NOTE: AT LEAST A MINIMUM OF SIX EXPERIMENTS IS TO BE PERFORMED IN A SEMESTER.

BOOKS RECOMMENDED:

	TITLE	AUTHOR
1.	B.Sc Practical physics	C.L. Arora
2.	Practical Physics	Worsnop& Flint
3.	Practical Physics	Chauhan & Singh (Vol.I& Vol. II)

COURSE OUTCOMES

COURSE TITLE: ENGG. PHYSICS LAB II
COURSE NO.: PHY-208
After learning this course students will be able to:

CO208.1	Insight about the working principle of LCR circuit and measurement of its impedance parameter.
CO208.2	Understand the concept of interference by using thin films and enable them to calculate the Wavelength of monochromatic light.
CO208.3	Understand the concept of diffraction of light using a transmission grating and thus find out the wavelength of monochromatic light. The students will also be able to understand the concepts of polarization of light and its rotation through optically active solutions by using Laurent's half shade polarimeter.
CO208.4	Work on the principles of wheat stone bridge and thereby calculate the self-induction of a given coil by Anderson's method using a headphone. The students will be able to verify Biot's Savart's Law by calculating the variation of magnetic field with distance along the axis of a circular coil.
CO208.5	Understand the functioning of PNP transistors for various combinations in forward and reverse bias.

B.E 2ND SEMESTER **MAXIMUM MARKS : 50**
COURSE NO: CHM-209 **P** **PRAC/LAB**
COURSE TITLE: ENGINEERING CHEMISTRY LAB-II **2** **50**
BRANCH : COMMON TO ALL
DURATION OF EXAM : 3 HOURS

EXPERIMENTS

1. Determine the total hardness of a sample of water by complexometric method (using EDTA).
2. Determine the chloride content in supplied water sample using Mohr's method (Argentometric method).
3. Determine dissolved oxygen in the given sample of water (winkler's method).
4. Determine the free chlorine in the given sample of water.
5. Determine the acidity of a given water sample.
6. Determine the alkalinity of a given water sample.
7. Determine the percentage of calcium oxide in cement.
8. Organic Analysis: Identify the following organic compounds (preparation of at least one derivative).
    a) Carboxylic acids
    b) Compounds containing alcoholic and phenolic OH groups
    c) Aldehydes & Ketones
    d) Carbohydrates
    e) Amides, amines, anilides and nitro compounds
    f) Hydrocarbons
    g) Compounds containing sulphur or halogen

LIST OF BOOKS RECOMMENDED

1. Experimental Engineering Chemistry — Shashi Chawla
2. Lab. Manual on Engineering Chemistry — Basin, S K &Sudha Rani
3. A Manual of Practical Engineering Chemistry — Dr. Rajinder Kumar

COURSE OUTCOMES

COURSE TITLE: ENGINEERING CHEMISTRY LAB-II
COURSE NO: CHM-209
After learning this course students will be able to:

CO209.1	Capable to visualize and understand chemical engineering unit, operations related to fluid and practical mechanics and mass transfer.
CO209.2	Provide an overview of preparation and identification of organic compound.
CO209.3	Relies on quantitative analysis and make use of simple equation to illustrate the concept involved.
CO209.4	Handle different types of instruments for analysis of materials, using small quantity of material involved for quick and accurate results.

B.E 2ND SEMESTER **MAXIMUM MARKS : 75**

COURSE NO: COM-210	**P**	**PRAC/LAB**
COURSE TITLE: COMPUTER PROGRAMMING USING C LAB.	**2**	**75**

BRANCH : COMMON TO ALL
DURATION OF EXAM : 3 HOURS

The practicals will be based on the topics covered under Theory Syllabus. The Students are required to perform at least 15 Programs.

COURSE OUTCOMES

COURSE TITLE: COMPUTER PROGRAMMING USING C LAB.
COURSE NO: COM-210
After learning this course students will be able to:

CO210.1	Read, understand and trace the execution of programs written in C language.
CO210.2	Exercise conditional and iterative statements to write C programs.
CO210.3	Implement Programs using operators, arrays and pointers to access functions.
CO210.4	Write programs that perform operations using derived data types and files.

UNIVERSITY OF JAMMU, JAMMU
COURSE SCHEME
FOR B.E. 3RD SEMESTER COMPUTER ENGINEERING
FOR EXAMINATIONS TO BE HELDFOR BATCH 2014 & ONWARDS

Course		Curriculum Hrs./week			Marks			
Code	**Course Name**	**L**	**T**	**P**	**Theory**	**Sess**	**Pract**	**Total**
COM-301	Object Oriented Programming using C++	3	2	-	100	40	-	140
COM-302	PC Hardware and Maintenance	2	2		100	40	-	140
MTH-311	Engg. Mathematics – III.	3	2	-	100	40	-	140
MTH-312	Numerical Methods using C-Programming.	2	2	-	100	40	-	140
EE-317	Elements of Electrical Engg.	3	2	-	100	40	-	140
ECE-311	Analog Electronics	3	2	-	100	40	-	140
COM-311	Object Oriented Programming Lab	-	-	2	-	-	40	40
COM-312	PC Hardware and Maintenance Lab.	-	-	2	-	-	40	40
COM-313	Numerical Methods using C-Programming.	-	-	2	-	-	40	40
ECE-312	Analog Electronics Lab.	-	-	2	-	-	40	40
	TOTAL	**16**	**12**	**8**	**600**	**240**	**160**	**1000**

CLASS: B.E. 3RD SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: OBJECT ORIENTED PROGRAMMING USING C++
COURSE NO.: COM –301
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

Review of Pointers: Passing parameters, Array of Pointers, Character Pointers.

Programming Techniques: Unstructured, Procedural, Modular. Introduction to objects, object & cohesion

Overview of C++, Object Oriented programming, Encapsulation, Polymorphism, Inheritance, Console I/O, C++ Comments.

Classes, Metaclass, Abstract class, Public and private variables, Constructor and Destructor Functions, Constructors taking parameters, Object pointers, In-Line Functions, Automatic Inlining, Friend Functions, This Pointer, New & Delete, Array of Objects.

SECTION B

Function Overloading, Overloading Constructor Functions, Operator overloading, Overloading Binary and Unary Operators, Overloading Relational & logical Operators.

Inheritance, Using Protected Members, multiple inheritance, Virtual Base Classes, Introduction to Virtual Functions.

C++, I/O Basics, Ifstream, Ofstream, Fstream, Open(), Close(), EOF(), Binary I/O, Get(), Put(), Read(), Write(), Random Access, Seekg(), Seekp(), Tellg(), Tellp().

BOOKS RECOMMENDEDCOURSE:

1. Programming in C++ — Balaguruswamy
2. C++ the Complete Referance — Herbert Schildt.
3. Mastering C++ — K.R. Venugopal& T. Ravishankar& Raj Kumar**.**
4. Turbo C++ — Robert Lafore**.**

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: OOPS Using C++
COURSE CODE: COM-301

After learning this course Students will be able to:

CO301.1	Understand the difference between structured programming approach and object oriented programming approach.
CO301.2	Acquire Knowledge in developing object oriented solutions to problems by learning the usage of data abstraction, encapsulation, and inheritance.
CO301.3	Design and implement programs using classes and objects.
CO301.4	Understand the concept of inheritance, polymorphism and file related operations.
CO301.5	Apply the concepts of OOPS real-time application development.

CLASS: B.E. 3RD SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-302
COURSE TITLE: PC HARDWARE AND MAINTAINANCE
DURATION OF EXAM: 3 HOURS

L	T	MARKS	
2	2	THEORY	SESSIONALS
		100	40

SECTION-A

1. **INTRODUCTION TO PC – MOTHERBOARD & CHIPSETS** :-Introduction, Motherboard Functions, Types, Motherboard Form Factors, Modern PC – Motherboard, Socket, I/O Slots & Connectors, Types of Buses, Selecting Criteria of a M/Board, Basics of Chipsets, its Functions, Pentium **4** Chipsets (Intel840, 845), CMOS Battery.

2. **MEMORY DEVICES &ORGANIZATION:** -Role of Memory, Types, Memory Modules (SIMM, DIMM), Synchronous Vs. Asynchronous DRAM, SDRAM, DDR- SDRAM, Concept of Cache Memory, L1, L2, L3 Cache. Memory Errors & Parity Checking Issues. Logical Memory Organizations (Conventional memory, Upper memory & extended memory area.)

3. **ROM BIOS & DEVICE DRIVERS: BIOS**, How BIOS works, Principle Functions of BIOS, BIOS Interrupts, Device Drivers (I/O device drivers, Sound driver, LAN Driver etc.), Role of device drivers in a PC.

SECTION- B

4. **I/O PERIPHERALS &INTERFACES: Input** Devices (Keyboard, Mouse, Touchpad, Scanner), Types, Principle Working, Output Devices (Monitor, Printer), their Classifications, Principle Working, Serial Interfaces like RS232C, Parallel Interfaces, USBs, Floppy Disk, Hard disk, Pen Drive, Optical Disks, I/O Interfaces (IDE, SCSI), Display Adapters (CGA, VGA, SVGA)

5. **PC POWER SUPPLIES: SMPS**, its Types, Principle working, SMPS Form Factor, CVT, UPS, its Types & Working, Criteria for Selecting Right UPS for PCs.

6. **PC FAULT DETECTION, CORRECTION &MAINTENANCE: Types** of PC Faults, Safety &Security in a Computer Room (i.e. Fire Fighting Equipment, Leak/ Water Detection Systems, Alarm & Security Systems), Software & Hardware Diagnostic Tools, Anti-Virus Scanner, PC-Tools, Preventive Maintenance(PM), its Types & Tools, Why PM is necessary in a PC.

BOOKS RECOMMENDED:-

1. IBM PC & Clones: Hardware, Troubleshooting & Maintenance — Govindarajalu.
2. Computer Installation & Troubleshooting — M. Radhakrishan& D. Balasubramanian

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: PC Hardware and Maintenance
COURSE CODE: COM-302

After learning this course Students will be able to:

CO302.1	Understand about the latest development in PC Hardware & its Peripherals.
CO302.2	Know about memory devices and its implementation in PC.
CO302.3	Acquire knowledge about the significance of device drivers in PC.
CO302.4	Analyze PC Fault Detection, Correction & Maintenance.
CO302.5	Implement various tools for Virus scanning & Pc diagnostic.

CLASS: B.E. 3RD SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: ENGINEERING MATHEMATICS – III
COURSE NO. MTH-311
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION - A

LAPLACE TRANSFORMS: Laplace Transforms, Inverse Laplace Transforms, Properties of Laplace Transforms, LT of unit step function, Impulse function, Periodic function, Initial value theorem, Final value theorem, Convolution theorem, Application of LT to solve linear differential equations and convolution type integral equations.

INTEGRAL TRANSFORMS AND FOURIER INTEGRALS: Integral transforms and Fourier Integrals Fourier integral theorem, Fourier sine and cosine Integrals, and their inverses.

SECTION - B

SPECIAL FUNCTIONS: Special Functions Legendre polynomials, Rodgrigue's formula, Recurrence formulae, generating function, Orthogonality of Legendre polynomials, Bessel function of Ist kind. Recurrence formulae, generating function, Orthoganality of Bessel function.

BOOLEAN ALGEBRAS: Boolean Algebras, Lattices, Finite Boolean algebra, C.N.F and D.N.F, Application of Boolean algebra to switching theory.

BOOKS RECOMMENDED:

01.	Higher Engineering Mathematics	B.S. Grewal
02.	Boolean Lattices	V.K. Khanna
03.	Engineering Mathematics-III	Bhopinder Singh

NOTE: There shall be total Eight Questions of 20 marks each, four questions from each section and students have to attempt Five questions selecting at least Two from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: ENGG. MATHEMATICS III
COURSE CODE: MTH-311
After learning this course Students will be able to:

CO311.1	Acquire the concept of Laplace Transform, inverse Laplace transform of various function and its applications.
CO311.2	Learn the idea of Fourier transform, Fourier sine and cosine transform and their practical applications.
CO311.3	Understand concept of special functions such as Bessel's functions and Legendre's polynomial and their relations.
CO311.4	Learn to implement the logic of complex circuits using properties of Boolean algebra.

CLASS: B.E. 3RD SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: NUMERICAL METHODS USING C- PROGRAMMING.
COURSE NO. MTH-312
DURATION OF EXAM: 3 HOURS

L	T	MARKS	
2	2	THEORY	SESSIONALS
		100	40

SECTION A

1. **C Programming**: Introduction to data types, Constants, variables, Expressions, Statements, Operators, Control Statements, Array, Functions and Sub-routines. (20)

2. **Errors and significant digits**: - Computer representation of numbers, accuracy of numbers, Errors, Errors in approximation. Roots of algebraic equations: - Bisection methods, Secant methods, Newton Raphson Method, Integrated synthetic division with quadratic factors, method for finding complex roots, Graeffe's Root squaring method. (30)
3. **Solution of simultaneous algebraic equations**: - Gauss Elimination, Gauss Jordan, Partition

   method for linear system of equations, Power method for finding Eigen values, properties & bounds for Eigen values & Eigen vectors. (30)

SECTION – B

1. **Interpolation**: - Newton's Forward, Backward & Divided difference interpolation, Central difference interpolation formula, Stirling's& Bessel's formula, Langrange's interpolation formula. (20)
2. **Numerical Differentiation &Integration: -** Derivatives using Forward Difference Formula,

   Backward difference formula & Central difference formula, Numerical Integration using Trapezoidal Rule & Simpson's Rule (30)
3. **Difference equations & their solutions**: - Taylor's series method, Euler's method, Rangakutta

   method, Predictor – Corrector method, Adams –Bashforth method (30)

BOOKS RECOMMENDED:

Elementary Numerical Analysis	S.D. Conte & Carl De Boor., Macgraw hill
Numerical Method for Scientists & Engineers	M.R. Jain, S.R.K.Iynegar& R.K Jain.,Wiley Eastern
Elementary Numerical Methods	B.S. Grewal, KnannaPublishion.

NOTE: There shall be total Eight Questions of 20 marks each, four questions from each section and students have to attempt Five questions selecting at least Two from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: Numerical Methods Using C
COURSE CODE: MTH-312
After learning this course Students will be able to:

CO312.1	Understand the basics of Operators and their types.
CO312.2	Obtain the values of function at a given point within the given data by using certain method of Interpolation.
CO312.3	Find out the exact real root of algebraic and transcendental equations.
CO312.4	Calculate a definite integral using an appropriate numerical method.

CLASS: B.E. 3RD SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: ELEMENTS OF ELECTRICAL ENGINEEERING
COURSE NO.: EE-317
DURATION OF EXAM: 3 HOUR

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

UNIT – I

Electric circuit laws & energy sources: Basic electric circuit Terminology, Ohm's law, Kirchoff's current law (KCL) &Kirchoff's Voltage law (KVL), Circuit parameters, (Resistance, Inductance & Capacitance), series & parallel combination of resistance, Inductance & Capacitance, Ideal & practical voltage and Current sources and their transformation, Dependent voltage sources & Dependent current Sources.

UNIT – II

D.C Circuit Analysis: - power & energy relations, analysis of series Parallel D.C Circuit, delta –Star transformation, Superposition theorem, Loop & Nodal Methods, Thevenin's theorem, Norton's Theorem, Maximum Power Transfer Theorem

SECTION B

UNIT – III

A.C. Circuit Analysis: basic terminology and definition, Phasor and Complex Number Representation, Solution of Sinusoidally Excited RLC circuits, Formulation of N/W Equation,
Laplace transform equation, Power and energy relations in AC ckts, Applications of N/W theorem to AC ckts. , Resonance in series and parallel ckts., quality factor .

UNIT –IV

Steady state AC 3 phase ckts.:- Concept of 3 phase voltage , Wye (Y) circuits , Delta circuits , current and voltage relations in Wye and delta ckts , Transformer: Construction, Operating principles of Phasor Diagrams.

BOOKS RECOMMENDED:

1. Basic Electrical Engg. - Fitzgerald
2. Principles of Electrical Engg - Vincent Del Toro
3. Engg. Circuits and Analysis - Hayt , Kimmerly

NOTE: There will be eight questions of 20 marks each, two from each unit. Students are required to attempt five questions selecting at least one question from each unit. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: ELEMENTS OF ELECTRICAL ENGINEERING
COURSE CODE: EE-317
After learning this course Students will be able to:

CO317.1	Define concepts of electric circuit terminology, circuit parameters, Kirchhoff's and Ohm's laws.
CO317.2	Solve circuits using nodal analysis, mesh analysis and electrical theorems for dependent and independent sources.
CO317.3	Understand the concept of basic terminologies in AC circuit along with the concept of active, reactive and apparent powers, power factor and resonance in series and parallel circuits.
CO317.4	Apply Laplace transformation to solve network equations.
CO317.5	Attain knowledge about construction, operating principle, and working of transformer.

CLASS: B. E 3RD SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: ANALOG ELECTRONICS
COURSE NO. ECE-311
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

UNIT – I

Semiconductor devices: Introduction, Intrinsic and extrinsic Semiconductors, PN- Junction Diodes, Mass Action Law, Diffusion and Drift with derivation, Zener Diode, Tunnel diode, Schottky Diode, Photo diode, LED's – Their characteristics and analysis, Hall effect.

UNIT – II

Transistors: Transistor and its characteristics in CE, CB & CC mode, Ebber's Moll Model, Generalized transistor Equation, Base width modulation, Biasing Ckt.., for transistors, CB,CC & CE configuration, FET's and their analysis, Operating point and load line, Characteristics and Equivalent Ckts. of JFET, MOSFET, UJT, PNPN Devices (Thyristor Family).

SECTION B

UNIT – III

Amplifiers: principle of Operation and classification of Amplifiers, H- Parameters, BJT & FET, Analysis and Frequency Response of Amplifiers, Multistage Amplifiers RC, LC, DC and transformer coupled.

UNIT – IV

Hybrid II Model: Gain band width product, Emitter follower at High Frequency Response of CE Amplifiers, Miller effect, Common Drain Amplifier at high frequencies.

BOOKS RECOMMENDED:

1. Electronic Principles — Malvin;Tata McGraw Hill
2. Integrated Electronics — Millman&Halkias;Tata McGraw Hill

NOTE: There shall be total Eight Questions of 20 marks each, two from each Unit and students have to attempt Five questions selecting at least One from each Unit. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: ANALOG ELECTRONICS
COURSE CODE: ECE-311
After learning this course Students will be able to:

CO311.1	Attain basic knowledge in solid state devices including diodes, BJT and MOSFET.
CO311.2	Design and analyze bias circuits for BJT's and amplifiers for the different configurations.
CO311.3	Perform analysis on DC and AC load line to locate the operating point.
CO311.4	Define input and output characteristics of different configurations of transistors.
CO311.5	Perform analysis at AC of amplifiers based on BJT's and FET's using small signal models.

CLASS: B.E. 3RD SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: OBJECT ORIENTED PROGRAMMING LAB
COURSE NO.: COM–311
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
		2	40

The Practical will be based on Computer Languages Theory Syllabus. The students are required to submit at least 10 Programs covering at least 2 programs from each unit.

COURSE OUTCOMES

COURSE NAME: OBJECT ORIENTED PROGRAMMING LAB
COURSE CODE: COM–311
After learning this course Students will be able to:

CO311.1	Develop solutions for a range of problems using objects and classes.
CO311.2	Write code for implementation of constructors, destructors and operator overloading.
CO311.3	Apply fundamental algorithmic problems including type casting, inheritance.
CO311.4	Write code for achieving run time polymorphism using virtual functions.
CO311.5	Implement the concepts of generic programming, templates, file handling using C++.

CLASS: B.E. 3RD SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-312
COURSE TITLE: PC HARDWARE AND MAINTAINANCE LAB.
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
		2	40

List of Practical: -

1. Study of Keyboards – Mechanical Keyboards, Membrane Keyboards,
2. Study of Printers – Dot Matrix, Inkjet Printers.
3. Study of SMPS.
4. Assembling the units of Computer,
5. Fault Finding in the various units of Computer, fault finding Codes and Beeps.
6. Software loading at different Platforms such as DOS, Windows –95 /98 2000.
7. Use of Antivirus Software.
8. Preparation of user Manuals/ Service Manuals for various Computer Blocks.

COURSE OUTCOMES

COURSE NAME: PC HARDWARE AND MAINTAINANCE LAB.
COURSE CODE: COM-312
After learning this course Students will be able to:

CO312.1	Install, configure, optimize and upgrade the portable personal computer.
CO312.2	Perform routine maintenance and upgrade of the computer system.
CO312.3	Identify the existing configuration of the computers and peripherals.
CO312.4	Define input and output characteristics of different configurations of transistors.
CO312.5	Perform diagnostic procedures and troubleshooting techniques to personal computer.

CLASS: B.E. 3RD SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: NUMERICAL METHODS USING C-PROGRAMMING LAB
COURSE NO. COM-313
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
		2	40

The Practical's will be based on Theory Course in Numerical methods. The students are required to submit/perform at least Ten Programs.

COURSE OUTCOMES

COURSE NAME: NUMERICAL METHODS USING C-PROGRAMMING LAB
COURSE CODE: COM-313
After learning this course Students will be able to:

CO313.1	Implement Jordan Elimination Method using C.
CO313.2	Implement Newton-Raphson Method using C.
CO313.3	Implement Simpson's Rule using C.
CO313.4	Implement Gauss Elimination method using C.
CO313.5	Implement Newton's forward and backward interpolation using C.

CLASS: B.E. 3RD SEMESTER
BRANCH: COMPUTER ENGG
COURSE TITLE: ANALOG ELECTRONICS LAB.
COURSE NO. ECE-312
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
		2	40

List of Practicals

1) Familiarization with various Electronic components – resistors, Capacitors, Transistors, Diodes, IC, Transformers.

2) Diode characteristics (Forward & Reverse)

3) Diode as a Rectifier with capacitor Filter (Half & Full Bridge)

4) Zener diode Characteristics &Zener diode as voltage regulator.

5) Characteristics of Tunnel Diode, LED's, Photo -diode.

6) Characteristics of transistors in CB, CE & CC mode.

7) Biasing of CE-configuration with Load line characteristics.

8) Characteristics of JFET, MOSFET.

9) Characteristics of UJT and its working as relaxation oscillator.

10) Characteristic of SCR

COURSE OUTCOMES

COURSE NAME: ANALOG ELECTRONICS LAB
COURSE CODE: ECE-312
After learning this course Students will be able to:

CO312.1	Plot forward and reverse characteristics of silicon and zener diodes.
CO312.2	Fabricate half and full wave rectifiers and evaluate their performance parameters.
CO312.3	Plot the characteristics of FET using trainer kits.
CO312.4	Plot V-I characteristics of transistor for various configurations using trainer kit.

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COURSE SCHEME
FOR B.E. 4TH SEMESTER COMPUTER ENGINEERING.
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course		Curriculum Hrs/week			Marks			
Code	**Name**	**L**	**T**	**P**	**Thry**	**Sess**	**Pract**	**Total**
COM-401	Digital Electronics.	3	2		100	40	-	140
COM-402	Principles of Programming Languages	3	2		100	40	-	140
COM-403	System Programming.	2	2		100	40	-	140
COM-404	Java Programming	3	2	-	100	40	-	140
MTH-413	Discrete Mathematics.	3	2		100	40		140
ECE-412	Communication Engg.	2	2		100	40		140
COM-411	Digital Electronics Lab.			2			40	40
COM-412	Java Programming Lab.			2			40	40
ECE-414	Communication Engg. Lab.			2			40	40
EE-415	Basic Electrical Engg. Lab.	-	-	2	-	-	40	40
	Total	**16**	**12**	**8**	**600**	**240**	**160**	**1000**

CLASS: B.E. 4TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-401
COURSE TITLE: DIGITAL ELECTRONICS
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

Digital Systems and Binary Numbers
Binary numbers, Number –Base Conversions, Arithmetic operations using number system, Data Representation - fixed and floating, Complements (1's and 2's), Binary codes – weighted/non-weighted codes, BCD codes, Excess- 3-code, Grey codes, Conversion between codes, Code convertors Codes for error detection and correction (Hamming code).

Boolean algebra and Logic Simplification:
Boolean Algebra, Logical gates, Simplification of Boolean function using Boolean algebra, Karnaughmap (up to five variables), QuineMccluskyMethods, Combinational Logic design -Half and Full adders, Half and full Subtractor, BCD Adder, Comparators.

SECTION B

Combinational circuits: Decoders, Encoders, Multiplexers, De-Multiplexers, Programmed logic devices– Read only memory, Programmable Read only Memories (PROM) and Programmable Logic Arrays (PLA), Programmable Array Logic (PAL).

Sequential logic design: Latches and Flip flops, conversion between flip flops, Shift Registers, Analysis of synchronous and asynchronous counters, Design of Sequential logic circuits, State Reduction and Assignment, ASM Charts.

BOOKS RECOMMENDED:

1.	Digital Design	Morris Mano
2.	Digital Electronics	R.P Jain
3	Digital Logic Design	J.P. Hayes
4.	Digital Logic Design	Brain Holdsworth
5.	Digital Electronics & Circuits Design	Thomas Mac calla
	Digital Electronics	R.K Gour

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: DIGITAL ELECTRONICS
COURSE CODE: COM-401
After learning this course Students will be able to:

CO401.1	Understand the basics of number systems, logic Gates, Boolean laws & theorems.
CO401.2	Apply methods to simplify the Boolean functions to the minimum number of literals.
CO401.3	Design different types of combinational logic circuits using Logic gates.
CO401.4	Implement different types of sequential logic circuits using Flip Flops.
CO401.5	Construct different types of Counters and registers.

CLASS: B.E.4TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: PRINCIPLES OF PROGRAMMING LANGUAGES.
COURSE NO. C0M-402
DURATION OF EXAM: 3 HOURS

SECTION A

Programming language concepts: - History, Structure and operation of a Computer, translators and software simulated Computers, Hardware, Software, firmware and virtual Computers, Hierarchies.

Data types: - Elementary data types, Specification and implementation, declaration, type checking and type conversion, Assignment and initialization, structured data types, specification and implementation, declaration, Type checking, vectors, Arrays, Character strings, pointers & files.

Data and Sequence Control: - Static and dynamic scope, Local data, parameters, Parameter transmission, task shared data, implicit, explicit sequence central, subprogram sequence control, recursive subprograms, exceptions and exception handlers, co-routines, task and concurrent execution.

SECTION B

Object Oriented Programming and Operating Environment: - Definition of OOP, difference between procedural and OOP, data encapsulation, data abstraction, information hiding, classes in C++, inheritance and polymorphism in C++, batch processing, interactive, embedded system and programming environment.

Storage, Syntax and Translation: - Programmer and system control, storage management phases, static storage management, stack storage management, heap/storage management in case of fixed and variable size, syntactic criteria, elements of language, stages in translation, formal definition of syntax.

Introduction to Lisp & Prolog.

BOOKS RECOMMENDED:

1.	Programming Languages	:	Pratt
2.	Programming Languages	:	Pratt &Zelkawitz
1.	Programming Languages	:	E.Horowitz
2.	Programming Languages	:	M.Jazayeri
3.	Principles of Programming Language	:	D.Tennett.

NOTE: There will be eight question of 20 Marks each as per weight age indicated against each Unit. Students have to attempt Five Questions in all.

COURSE OUTCOMES

COURSE NAME: Principals of programming Languages
COURSE CODE: COM-402
After learning this course Students will be able to:

CO402.1	Understand syntax related concepts and semantic issues associated with function implementations.
CO402.2	Apply various languages to develop different applications.
CO402.3	Analyze operational and notational definitions for basic programming language constructs.
CO402.4	Evaluate the programming languages to make a better choice.
CO402.5	Design new language and develop effective algorithms.

CLASS: B.E. 4TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: SYSTEM PROGRAMMING
COURSE NO.: C0M-403
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
2	2	-	100	40

SECTION A

Introduction to Software Processors: -What is system software? Components of system software, Evolution of system software, General Machine Structure, Machine Language, Translators, Loaders, Interpreters.

Assemblers: -Element of Assembly language programming overview of assembly process, Design of Two-pass Assembler. A single pass Assembler, Macros and Macro processors, Macro Instructions, Features of Macro, Macro calls within Macros.

Software processors for interactive Environment: - Interactive Computing and program Development, Interpreters. Incremental compilers.

Software tools: -Spectrum of software Tools, Text Editors, Debug Monitors, programming Environments.

SECTION-B

Loaders and Linkage Editors: -General loader scheme, Compile and go loader, Absolute loader, relocating loader, direct linking loader, Loading, Linking and relocation, design of absolute loader and direct linking loader. .

Features of Higher level languages (HLL): - Importance and features of HLL, Extensive datatypes and structures, Scope rules, Storage Allocation, Functional Modularity.

Compilers: -General Model, Introduction to various phases of compiler, passes of a compiler, Introduction to Parser and Parsing Techniques.

BOOKS RECOMMENDED:

1.	System programming and operating systems	Dharmdhere. D.M. TMH
2.	Introduction of systems software	D. Dhere —TMH
3.	Systems programming	J.J. Donavan—McGraw Hill.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: System Programming
COURSE CODE: COM-403
After learning this course Students will be able to:

CO403.1	Understand the basics of system programs like editors, compiler, assembler, linker, loader, interpreter and debugger.
CO403.2	Apply the concepts of assemblers and Macro-processors.
CO403.3	Analyze the various phases of compiler and compare its working with assembler.
CO403.4	Evaluate an executable program from an object module created by assembler and compiler.
CO403.5	Create a GUI application by using various editors and debugging techniques.

CLASS: B.E. 4TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: JAVA PROGRAMMING
COURSE NO: COM-404
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION – A

Java Evolution, And Overview of Java Language: Java History–Features of java, how java different from C and C++, Java and World Wide Web, Web Browser. Java Environment: Java Development kit (JDK), Application Programming Interface (API). Java Programming Structure, Java Tokens, Constants, Variables, Expressions, Decision Making Statements and Looping, Java Statements, Overview of arrays and strings, Machine Neutral, Java Virtual Machine (JVM), Command Line Arguments

Arrays and Strings: Arrays, One-Dimensional arrays, creating an array, declaration of arrays, initialization of arrays, Two-Dimensional arrays, String arrays, String methods, String Buffer class, Vectors, Wrapper classes.

Classes, Objects and Methods: Introduction, defining a class, creating objects, accessing class members, constructors, methods overloading, static members.

Inheritance: Defining a sub class, sub class constructor, multilevel variables, Final classes, and Finalize methods, Abstract methods and classes, visibility control.

Managing Errors andExceptions: Introduction, Types of Errors-Compile time and Run time errors, Exceptions, Types of Exceptions, Syntax of Exception handling code, Multiple catch statements, using finally statement, Throwing our own exceptions.

Multithreaded Programming: Introduction to threads, Creating Threads, Extending the Thread Class, Implementing the Runnable interface, life cycle of a thread, priority of a thread, synchronization, Deadlock.

SECTION – B

Interfaces and Applet Programming: Introduction, defining interfaces, extending interfaces, implementing interfaces. Introduction, how applet differ from applications, building applet code, applet life cycle, About HTML, designing a web page, passing parameters to applets**,**getting input from the User.

Graphics Programming: Introduction, the Abstract Windowing Toolkit (AWT), frames, event-driven programming, layout managers, panels, canvasses, drawing geometric figures. Creating User Interface: Introduction, describe various user interface Components: button, label, text field, text area, choice, list, check box check box group.

BOOKS RECOMMENDED:

1. Programming with JAVA — Balagurusamy TMH
2. An Introduction to JAVA Programming — Y.DanielLiangTMH
3. The Complete Reference JAVA 2 — Herbert Schield TMH

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: JAVA PROGRAMMING
COURSE CODE: COM-404
After learning this course Students will be able to:

CO403.1	Understand the concepts of Object-oriented programming paradigm and platform portability in Java.
CO403.2	Apply concepts of Classes, Objects and Methods to tackle real world problems.
CO403.3	Analyze errors and exceptions by using exception handling mechanism.
CO403.4	Examine the Multithreading techniques by extending Thread class and develop interface, applets and web pages
CO403.5	Create Graphic User Interface using Abstract Window Toolkit

CLASS: B.E.4TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: DISCRETE MATHEMATICS.
COURSE NO. MTH-413
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION – A

SETS, RELATIONS, MATHEMATICAL LOGIC

1. Finite and infinite sets, countable and uncountable sets,
2. Principle of inclusion and exclusion, Mathematical Induction, Pigeon-Hole principle.
3. Logical operators, truth tables, Law of inferences and prepositional calculus.

ALGEBRAIC SYSTEM

1. Relations and functions, types of functions, Lattice, chains, Anti chains
2. Groups and sub groups, Related theorems, cosets, normal subgroups and group Homomorphism
3. Rings, integral domains and fields; examples and related results.

SECTION – B

GRAPH THEORY

1. Basic terminology, multi graphs and weighted graphs, connectivity; walk, trail and path, circuits & Cycles, shortest path in weighted graphs, Algorithm of shortest path,
2. Hamiltonian and Eulerian paths and circuits, Eulerian trail & circuit, Eulerian graphs, Hamiltonian cycle, Hamiltonian graph, Konisberg Bridge problem, Chineese Postman problem, Traveling Sales Person problem, Planar graph and Euler's formula.
3. Trees and cut sets: - Trees, Rooted Trees, path lengths in rooted trees, prefix codes binary search trees, spanning trees and cut sets.

BOOKS RECOMMENDED:

1.	Discrete Mathematics	C.L. Liu.
2.	Graph Theory	NarsinghDeo
3.	Discrete Mathematical structure with applications to computer science	Trembley and Manohar.

NOTE: There shall be total Eight questions of 20 Marks each, Four from each Section. Students shall have to attempt Five questions selecting at least two from each Section. Use of calculator is allowed.

COURSE OUTCOMES

COURSE NAME: Discrete Mathematics
COURSE CODE: MTH-413
After learning this course Students will be able to:

CO413.1	Understand basic principles of sets and operations in sets.
CO413.2	Apply logical notation to describe an argument.
CO413.3	Analyze relations and functions and be able to determine their properties.
CO413.4	Evaluate the basics concepts of groups, its examples and related results.
CO413.5	Create trees and graphs using different transversal methods.

CLASS: B.E. 4TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: - ECE-412
COURSE TITLE: - COMMUNICATION ENGG.
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
2	2	-	100	40

SECTION - A

Introduction to Elect. Comm. System, Concept & need for modulation, Definition of signal to noise ratio & noise figure, Representation of signal & system (periodic non-periodic etc.), Spectral analysis of signal (Fourier series &Fourier Transforms),

Representation of AM. Frequency spectrum of AM wave, Power relation in Am wave, Modulation & demodulation of AM, SSB techniques, Balanced modulator, Type of SSB, Modulation & demodulation of SSB signals.

Theory of FM, Representation & frequency spectrum of FM, Pre-Emphasis De-Emphasis, Wide band & narrow band FM, Generation & detection of FM signal, Comparison with PM & AM.

SECTION – B

Pulse modulation techniques, Sampling & sampling theorem & its proof, Aliasing effect, Natural & flat top sampling principle generation & detection of PAM, PPM, PWM, PCM, DM, ADM, Time division multiplexing, Frequency division multiplexing.

Digital modulation Techniques: Generation & detection of ASK, FSK, BPSK.

Information Theory: Information, information rate, Entropy, Source-coding & coding Efficiency, Shannon – Fano coding, huff-man coding, Channel capacity theorem.

BOOKS RECOMMENDED:

1.	Electronics Comm. System	G. Kennedy
2.	Principles of Comm. System	Taub& Schilling
3.	Communication System	Simon Haykins

NOTE: There shall be Eight Questions of 20 Marks each, Four from Each Section. Five questions have to be attempted in all selecting at least two from each Section.

COURSE OUTCOMES

COURSE NAME: COMMUNICATION ENGG
COURSE CODE: ECE-412
After learning this course Students will be able to:

CO412.1	Understand different types of noise and predict its effects on various analog systems
CO412.2	Analyze energy and power spectral density of the signal.
CO412.3	Express the basic concepts of analog modulation schemes.
CO412.4	Evaluate analog modulated waveforms in time/frequency domain and also find modulation index.
CO412.5	Calculate bandwidth and power requirements for analog systems.

CLASS: B.E.4TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: DIGITAL ELECTRONICS LAB.
COURSE NO. COM-411
DURATION OF EXAMS: 3 HOURS

L	T	P	MARKS
-	-	2	40

List of Practicals: -

1. Verification of truth table of basic gates.
2. Verification of truth tables of ADDER/SUBTRACTER using IC-7483
3. Verification of truth tables of MULTIPLEXER/DEMULTIPLEXER
4. Verification of truth tables of BCD –7- Segment Display
5. Verification of truth tables of Code Conversion.
6. Design of Flip-Flops using IC chips.
7. Design of Two's complementckts using shift registers.
8. Design and Implementation of Asynchronous MOD-12 counters.
9. Design of a sequential ckt
10. Study of PLA'S and PAL's.

COURSE OUTCOMES

COURSE NAME: DIGITAL ELECTRONICS LAB.
COURSE CODE: COM-411
After learning this course Students will be able to:

CO411.1	Implement logic gates and realization of OR, AND, NOT AND XOR Functions using universal gates.
CO411.2	Design and implement combinational circuits like half adder/full adder, half subtractor/full subtraction, code converters, comparators, MUX/DEMUX.
CO411.3	Design and implement sequential circuits like flip-flops, counters and shift registers.

CLASS: B.E. 4TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-412
COURSE TITLE: JAVA PROGRAMMING LAB.
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS Theory	Sessional	Practical
-	-	2	-	-	40

All lab work shall be based on the theory syllabus.

COURSE OUTCOMES

COURSE NAME: JAVA PROGRAMMING LAB.
COURSE CODE: COM-412
After learning this course Students will be able to:

CO412.1	Understand various Java Tokens, Constants, Variables, Expressions, Decision Making and Looping Statements in java.
CO412.2	Write code for creating Arrays and Strings objects in java.
CO412.3	Implement the concept of constructor, Destructor, Static members method overloading and multithreading in java.
CO412.4	Manage Errors and Exceptions using Exception handling mechanism and code to implement interfaces and applets.
CO412.5	Design window frame using various GUI components like Buttons, Text fields, menu, check list and check boxes.

CLASS: B.E.4TH SEMESTER
BRANCH: COMPUTER ENGG
COURSE TITLE: COMMUNICATION ENGG. LAB.
COURSE NO. ECE-414
DURATION OF EXAM :3 HOURS

	L	T	P	MARKS
	-	-	2	40

LIST OF PRACTICALS: -

1. To plot the response of RF Tuned amplifier.
2. To find the modulation index of AM signal.
3. Hardware realization of AM demodulator circuit.
4. Hardware realization of FM modulation circuit using 8038.
5. Hardware realization of Sample & Hold circuit.
6. Hardware realization of Ask modulator.
7. Study of PCM & TDM signals.

COURSE OUTCOMES

COURSE NAME: COMMUNICATION ENGG. LAB
COURSE CODE: ECE-414
After learning this course Students will be able to:

CO414.1	Plot frequency response of RF Tuned Amplifier and IFT by calculating gain at different range of frequencies.
CO414.2	Understand the significance of modulation index in communication system by observing maximum and minimum value in AM modulated wave
CO414.3	Design frequency modulation circuit using IC 8038
CO414.4	Design sampler using IC-LF398, ASK modulation circuit using transistor BC547.
CO414.5	Design window frame using various GUI components like Buttons, Text fields, menu, check list and check boxes.

CLASS: B.E. 4TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: BASIC ELECTRICAL ENGG. LAB
COURSE NO. EE- 415
DURATION OF EXAM: 3 HOURS

	L	T	P	MARKS
	-	-	2	40

LIST OF PRACTICALS: -

(1) Study of wires and cables

(2) Study of various types of wiring.

(3) Methods of Earthing& Measurement of Earth resistance.

(4) Electric Shocks- Precaution & treatment.

(5) Verification of Kirchhoff's Law.

(6) Verification of Superposition Theorem.

(7) Study of voltage current relationship of a series RLC circuit & obtain Series Resonance.

(8) Study of three phase

(9) AC circuit with

i) Star connection Load.

ii) Delta connected load.

(10) Study of Single Phase Transformer. Determination of voltage Ratio, Turn ratio and Polarity test.

COURSE OUTCOMES

COURSE NAME: BASIC ELECTRICAL ENGG. LAB
COURSE CODE: EE-415
After learning this course Students will be able to:

CO415.1	Identify various types of wires, cables and wirings.
CO415.2	Study methods of Earthing.
CO415.3	Experiment the verification of Kirchhoff's Law.
CO415.4	Study of voltage current relationship of a series RLC circuit.
CO415.5	Study of Single Phase Transformer. Determination of voltage Ratio, Turn ratio and Polarity test.

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COURSE SCHEME
FOR B.E. 5TH SEMESTER COMPUTER ENGINEERING
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course		Curriculum Hrs/week			Marks			
Code	**Name**	**L**	**T**	**P**	**Theory**	**Sessional**	**Practical**	**Total**
COM-501	Internet & Web Technology.	3	2		100	40	-	140
COM-502	Data Structures.	3	2		100	40	-	140
COM-503	Microprocessor – 8085.	3	2		100	40	-	140
COM-504	Automata & Formal Languages	2	2		100	40	-	140
COM-505	Computer Networks.	3	2		100	40	-	140
COM-506	Computer Organization & Architecture.	3	1		100	40	-	140
COM-511	Web Tech. Lab	-	-	2	-	-	40	40
COM-512	Data Structures Lab.	-	-	2	-	-	40	40
COM-513	Microprocessor Lab.	-	-	2	-	-	40	40
COM-514	Computer Networks Lab.	-	-	2	-	-	40	40
Total		**16**	**12**	**8**	**600**	**240**	**160**	**1000**

CLASS: B.E. 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO. COM-501
COURSE TITLE: INTERNET AND WEB TECHNOLOGY
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION – A

Introduction to internet, History, Working of internet, Internet Applications, Internet Protocols, Internet Service Provider, Internet Addresses, CGI, CGI applications, CGI methods, Interface specifications.

Overview HTML, HTML tag, HTML forms, Introduction to DHTML, Frames
Style sheets, Cascading Style sheets (CSS), Document Object Model, Positioning HTML content, Absolute and Relative positioning.

JavaScript, Its uses, operators, statements, object manipulation, function, event handler, events, form validation, browser detection.
Session tracking methods like cookies, URL writing and hidden fields

SECTION – B

XML –Attributes in XML, Entity, well formedness & Validation of XML–Name spaces–building blocks of DTD – DOM methods, XML schema, Order, Restriction, and Pattern

Server side programming: Servlet -Servlet Overview Architecture- life cycle of servlet–deployment descriptor, Handling HTTP Request – Get and post request – redirecting request

JSP (java server pages) –Overview–Objects–scripting–Standard Actions–Directives- Error handling in JSP. Include, forward Redirecting.

Java Beans, Java beans component specification, Development phases, EJB, ASP (Active Server Pages)

BOOKS RECOMMENDED:

1. Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp 2001, TMH.
2. Internet & World Wide Programming, Deitel, Deitel& Nieto, 2000, Pearson Education.
3. HTML & XHTML: The Definitive Guide Chuck Musciano, Bill Kennedy, 2000, 4th Edition.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: Internet & Web Technology
COURSE CODE: COM-501
After learning this course Students will be able to:

CO501.1	Remember the knowledge of history of the internet and related internet concepts that are vital in understanding web development.
CO501.2	Understand the insights of internet programming and implement complete application over the web.
CO501.3	Apply the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
CO501.4	Analyze the concepts of JavaScript and Java in designing web pages.
CO501.5	Create web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites.

CLASS: B.E. 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: DATA STRUCTURES
COURSE NO. COM-502
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

Introduction to data structures: - Concepts of data and algorithm, Relation between Data structure& algorithm, Introduction to Time & Space complexity, Data types, Data Structures & Abstract data types, Representation of Arrays, Sparse matrices.

Stacks and Queues: - Concept of stacks, Operation on stacks, Multiple stacks, Application of stacks in Infix, Postfix, Prefix, Recursion, Concept of Queues, Operation on Queues, Multiple Queues, Priority Queues, Circular Queues.

Linked Lists: - Insertion, Deletion and traversal on Linear Linked Lists, Doubly Linked List, circular Linked List, Linked List as data structure, Header nodes, Stacks & Queues using linked list, Dynamic memory management, Garbage Collection

SECTION B

Trees: -Binary trees and it's representation using Linked list, Operations on Binary Trees, Traversal Algorithms, Applications, Threaded Binary Trees and its traversal algorithms, Heterogeneous binary trees, List representation using binary trees, Optimum search trees, AVL trees.

Graphs: -Representation of Graphs, traversal methods, Applications undirected graphs, Directed Graph& their traversal, Depth first, Breadth First, Shortest path algorithms, Minimum Cost Spanning tree.

Sorting & Searching:

1. Exchange Sort (Bubble, Quicksort)
2. Selection & Tree Sorting.
3. Insertion sort, Shell Sort, Address Calculation Sort
4. Merge & Radix Sort.
5. Sequential Searching, searching an Ordered Table, Index sequential search, Binary search, Interpolation search, Tree searching.

BOOKS RECOMMENDED:

1. Data Structure using C — Tenenbaum, Langsam, Augenstein
2. Fundamentals of data structures — Horowiz E. and Sahni S.
3. Data structures and Program Design — Robert L. Kruse.
4. Data Structures & Algorithm — Aho, Hopcraft and Ullman.
5. Data Structure with Applications — Sorenson.

Note: There shall be eight questions of 20 marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section.

COURSE OUTCOMES

COURSE NAME: Data Structures
COURSE CODE: COM-502
After learning this course Students will be able to:

CO502.1	Remember basic terminology, Asymptotic Notation and its application in understanding the complexity of an algorithm.
CO502.2	Understand the representation and use of primitive data types, built in data structure and allocation, use in memory.
CO502.3	Apply the concept of stack, link list, Memory allocation & garbage collection and applications of Data Structures.
CO502.4	Create tree and graph using basic data structure & algorithms.

CLASS: B.E. 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: MICROPROCESSOR-8085
COURSE NO. COM-503
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

Microprocessor Architecture, Pin Description of 8085, Instruction Set and Instruction Format, Data Transfer Instructions, Arithmetic Operations, Logic and Branch Operations, Programming Techniques with Additional Instructions, Looping, Counting and Indexing, Logic Operations, Rotate Compare. 8085 Interrupts.

Counters and Time Delay Programs, Stack and Subroutines, Conditional Call and Return Instructions & Code Conversions, BCD to Binary, Binary to BCD, BCD to Seven Segment L.E.D, ASCII to Binary, BCD Addition, BCD Subtraction, Introduction to Advanced Instructions and Applications, Multiplication, Subtraction with carry.

SECTION B

Parallel Input/output& Interfacing: - Basic Interfacing Concepts, Interfacing Output Displays, Interfacing Input Keyboards, Memory Mapped I/O, Interfacing Memory.

Programmable Interface Devices: - Basics of Programmable I/O, General Purpose Programmable Peripheral Devices – 8255A, 8259A, Direct Memory Access Controller – 8237, 8279, 8253, 8155.

BOOKS RECOMMENDED:

1. Microprocessor Architecture, Programming and Applications with 8085/8080 — Ramesh S. Gaonkar.
2. Introduction to Microprocessors — Aditya Mathur

Note: There shall be eight questions of 20 marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section.

COURSE OUTCOMES

COURSE NAME: Microprocessor 8085
COURSE CODE: COM-503
After learning this course Students will be able to:

CO503.1	Remember the knowledge of general architecture of a microcomputer system and architecture & organization of 8085
CO503.2	Understand the basic idea about the data transfer schemes and its applications
CO503.3	Classify and apply the instruction set of 8085 microprocessor and distinguish the use of different instructions.
CO503.4	Analyze architecture and operation of Programmable Interface Devices and realize the assembly language programming.
CO503.5	Create the Interfacing of memory and various I/O devices with 8085 microprocessor.

CLASS: B.E. 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: AUTOMATA AND FORMAL LANGUAGES
COURSE NO. COM-504
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

Introduction: -Symbols, string Concatenation, alphabet, Language, Tree, Mathematical Induction Proofs, States, Transition Tables, Finite Automata, Regular Expressions, Push- down Automata, Turing Machine, Context Free grammars.

Finite Automata: - Deterministic Finite Automata (DFA), Designing, Non- deterministic finite Automata(NFA) without E-moves, Conversions, Equivalence, NFA with E-moves, Regular expression designing, Finite machine with output assigned, Moore and mealy machines, Conversion and Equivalence.

SECTION B

Turing Machines: -Turing Hypothesis, Turing Computability, Non- deterministic, Multitapeand other versions of Turing machines, Churches Hypothesis, Primitive Recursive functions, Universal Turing machines, decidability, Halting problem, Stack Automata.

Regular Grammar & Context free Languages: -Context Free Grammar, Context free Languages, reduced form of Grammar, Ambiguous and Non- Ambiguous grammar, acceptors and generators, Relations between Classes of Languages, Pumping lemma of regular sets, Chomsky's hierarchy of languages, derivation Trees.

BOOKS RECOMMENDED:

1. Introduction to Automata Languages & Computation — A.V. AHO, J. E. Hopcreft& J.D. Ullman
2. Introduction Theory of Computer Science — E. V. Krishna Moorthy

Note:There shall be eight questions of 20 marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section.

COURSE OUTCOMES

COURSE NAME: Automata & Formal Languages
COURSE CODE: COM-504
After learning this course Students will be able to:

CO504.1	To Gain the knowledge of basic concepts of formal languages and finite automata techniques
CO504.2	Understand regular expressions and various problems to minimize FA.
CO504.3	Apply various languages to construct context free grammar.
CO504.4	Evaluate problems relating to Push down automata and Turing Machines.

CLASS: B.E. 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: COMPUTER NETWORKS
COURSE NO. COM-505
DURATION OF EXAM: 3 HOURS

L	T	MARKS	
3	2	THEORY 100	SESSIONAL 40

SECTION A

Introduction: Data Communication-communication system, synchronous and asynchronous systems, serial and parallel systems, dataflow-simplex, half-duplex, full-duplex, computer network-uses of computer network, categories of computer networks, protocol and standards, Reference Model-OSI and TCP/IP reference model, their comparison and critique, Network Topologies

Physical Layer: Data Transmission-Digital to Digital Conversion-Line Coding Scheme, Transmission Media, RS-232 Interface, Switching mechanisms and Comparison –circuit, packet, message, Modem and its types

Data Link Layer: Design Issues, Error Detection and Correction, Flow Control-Elementary of datalink protocol, Sliding Window Protocol, Example of Data Link Protocol (HDLC).

Medium Access Control Sub layer: Channel Allocation Problems, Multiple Access Protocol-ALOHA, Carrier Sense Multiple Access Protocols, Collision Free Protocols, IEEE standards-802.3, 802.4, 802.5.

SECTION B

Network Layer : Design Issues, Routing Algorithms–the optimality principle, shortest path algorithm, flooding, distance vector routing, link state routing and hierarchical routing, Congestion Control- principles prevention policies, congestion control in virtual circuit subnet and datagram subnets, Traffic shaping algorithm - leaky bucket algorithm, token bucket algorithm, QOS, IP protocol, IP addresses, Internet Multicasting, Introduction to IPV6 ,IPV4 vs. IPV6, Internetworking devices –concept of Internetworking, Repeaters, Hub, Bridges, Switches, Routers, Gateways.

Transport Layer: Transport Layer Services, Primitives, Issues, elements of transport protocol, Introduction to TCP and UDP

Session and Presentation Layer: Design Issues

Application Layer: FTP, DNS, E-Mail, Introduction to WWW, Firewalls.

BOOKS RECOMMENDED:

1. Data Communication - William L. Schweber.
2. Computer Networks - Andrew S. TanenBaum.
3. Communication Network System for Computer - Davies &Barbq

Note: There shall be eight questions of 20 marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section.

COURSE OUTCOMES

COURSE NAME: Computer Networks
COURSE CODE: COM-505
After learning this course Students will be able to:

CO505.1	Acquire the knowledge about various technologies used in data communication system
CO505.2	Understand the structure of network models (OSI and TCP/IP) their comparison and critique.
CO505.3	Apply the knowledge of different network topologies for designing a robust and efficient network.
CO505.4	Analyze the adeptness of functions of different layers of OSI network models.
CO505.5	Use concepts of networking in developing networks for real time engineering and scientific situations.

CLASS: B. E 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: COMPUTER ORGANISATION AND ARCHITECTURE.
COURSE NO. COM-506
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	1	-	100	40

SECTION A

Introduction: - Basic structure of Computers, stored programme concept, Basic Operational concepts, Functional Units, Machine language, concept of memory locations, addresses, addressing modes, instruction format, comparison between mainframe, mini Computer, microcomputer.

Processing and execution: - Processing unit, execution of instructions, control step sequence, different types of instruction, ALU Design, Arithmetic Processes, Control Unit Design, Hardwired & Micro programmed Control Unit.

Input output organization: - I/O Systems–Programmed Control, Interrupt controlled & DMAData Transfer Schemes, I/O Processors.

SECTION B

Memory Management: - Memory organization, Characteristics of memory size, Access time,Read/write cycle time, Sequential and Random access semiconductor memories, Virtual memory, Cache memory, Memory Hierarchy, Secondary storage devices- Magnetic Disks, Magnetic Tapes, CD ROM's.

Parallel processing – Basic Concepts, Types of parallel Processors, Pipelined processors, Pipelined Structures,

Introduction to SAP Machines.

BOOKS RECOMMENDED:

1. Computer Architecture &Organisation : John P. Hayes (Mc Graw Hill)
2. Computer System Architecture : Morris Mano
3. Computer System Architecture : V.K. Jain
3. Computer Organisation : Carl V. Hamacher.
4. Digital Electronic : Malvino Brown.

Note:There shall be eight questions of 20 marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section.

COURSE OUTCOMES

COURSE NAME: Computer Organization and Architecture
COURSE CODE: COM-506
After learning this course Students will be able to:

CO506.1	Understand the organization basic architecture and design of CPU.
CO506.2	Describe address sequencing and microprogramming concepts.
CO506.3	Understand Register transfer and various micro operations
CO506.4	Compute computer arithmetic operations and show the procedures for implementing them with digital hardware.
CO506.5	Differentiate different kinds of memories and to know their performance

CLASS: B.E. 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO. COM-511
COURSE TITLE: WEB TECHNOLOGY LAB.
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
-	-	2	PRACTICAL 40

All lab work shall be based on the theory syllabus.

COURSE OUTCOMES

COURSE NAME: Web Technology Lab
COURSE CODE: COM-511
After learning this course Students will be able to:

CO511.1	Remember the role of languages like HTML, DHTML, CSS, JavaScript and PHP.
CO511.2	Analyze a web page and identify its elements and attributes.
CO511.3	Implement web pages using HTML, DHTML and Cascading Style Sheets.
CO511.4	Analyze dynamic web pages using JavaScript, XML.
CO511.5	Develop web applications using PHP.

CLASS: B.E. 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: DATA STRUCTURES LAB
COURSE NO: COM-512
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
-	-	2	PRACTICAL 40

All practicals shall be based on theory syllabus. Students will be required to implement Algorithms using C and submit at least 10 practicals.

COURSE OUTCOMES

COURSE NAME: DATA STRUCTURES LAB
COURSE CODE: COM-512
After learning this course Students will be able to:

CO512.1	Remember various operations on arrays, linked list, stack and queues.
CO512.2	Understand various searching and sorting algorithms.
CO512.3	Implement fundamental algorithmic problems including Tree Traversals, Graph traversals, and shortest paths.

CLASS: B. E 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: MICROPROCESSOR LAB
COURSE NO: COM-513
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
			PRACTICAL
-	-	2	40

LIST OF PRACTICALS: -

1. Block Transfer: - Data bytes are stored in memory locations from XX50H to XX5FH to insert an additional five bytes of data, it is necessary to shift the data string by five memory location. Write a program to store a data string from XX55H to XX64H. Use any 16 bytes of data to verify your program.

2. Addition with Carry: Six bytes of data are stored in memory locations starting at XX50H. dd all the data bytes. Use register B to save any carry generated while adding the data bytes. Store the sum at two consecutive memory locations XX70H and XX71H

3. Checking for a particular data byte: A set of eight readings is stored in memory location starting at XX50H. Write a program to check whether a byte 40H exists in the set. If it does, stop checking, and display its memory location, otherwise output FFH

4. Write a program for BCD to Seven Segment LED code conversion
.
5. Write a program for Binary to ASCII code conversion.

6. Write a program for BCD addition.

7. Write a program for multiplication of Two 8 bit unsigned nos.

Interfacing experiments

1) Study of 8255 interfacing card.

2) Study of 8279-interface card.

3) Study of 8257 DMA controller interface card.

4) Study of 8253 PIC Interface card.

5) Interfacing of 8085 with Stepper Motor.

6) Interfacing of 8085 with ADC and DAC.

COURSE OUTCOMES

COURSE NAME: MICROPROCESSOR LAB
COURSE CODE: COM-513
After learning this course Students will be able to:

CO513.1	Solve basic binary math operations using the instructions of microprocessor 8085.
CO513.2	Apply programming knowledge using the capabilities of the stack, the program counter.
CO513.3	Design, code and debugs Assembly Language programs to implement simple programs.
CO513.4	Execute a machine code program on the training boards.

CLASS: B. E 5TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: COMPUTER NETWORKS LAB.
COURSE NO: COM-514
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
-	-	2	PRACTICAL 40

Case Study of LAN
Students shall be exposed to the designing & working of a LAN, along with suitable Software.

COURSE OUTCOMES

COURSE NAME: Computer Networks LAB
COURSE CODE: COM-514
After learning this course Students will be able to:

CO514.1	Study about various networking devices.
CO514.2	Study about various types of networking cables.
CO514.3	Study network Interface cards.
CO514.4	Study IP sub-netting (Classful &Classless).
CO514.5	Implementation of Bit stuffing and Character Stuffing.

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COURSE SCHEME
FOR B.E. 6TH SEMESTER COMPUTER ENGINEERING
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course		Curriculum Hrs/week			Marks			
Code	**Title**	**L**	**T**	**P**	**Theory**	**Sessional**	**Practical**	**TOTAL**
COM-601	Advanced Microprocessor.	3	2	-	100	40	-	140
COM-602	Analysis & Design of Algorithms	3	2	-	100	40	-	140
COM-603	RDBMS	3	2	-	100	40	-	140
COM-604	Multimedia	3	2	-	100	40	-	140
COM-605	Operating System.	3	2	-	100	40	-	140
COM-606	Software Engg	3	2	-	100	40	-	140
COM-611	Advanced Microprocessor Lab.	-	-	2	-	-	40	40
COM-612	RDBMS Lab	-	-	2	-	-	40	40
COM-613	Multimedia Lab	-	-	2/2	-	-	40	40
COM-614	Operating System Lab.	-	-	2/2	-	-	40	40
Total		**18**	**12**	**6**	**600**	**240**	**160**	**1000**

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CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER ENGINEERING.
COURSE TITLE: ADVANCED MICROPROCESSOR.
COURSE NO. COM-601
DURATION OF EXAM: 3 HOURS

L	T	MARKS	
3	2	THEORY	SESSIONAL
		100	40

SECTION A

Introduction to 16-bit Microprocessor: 8086/8088 architecture, Concept of segmented Memory, Addressing Modes, Instruction Set.

8086 Family Assembly Language Programming and Techniques: Simple Sequence programs. Flags, Jumps, While- Do, Repeat-Until Implementations, Programs using Procedures.

8086 CPU Hardware Design:8086 Signals, Minimum and Maximum Mode of CPU model, System Bus Timing, 8086 Interrupt Vector Table, Interrupt Service Subroutine, Applications, Addressing Memory and Ports in Micro Computer System.

SECTION B

Numerical Data Processor (8087): NDP's data types, Processor Architecture, Instruction set interfacing with 8086/88.

Digital Interfacing: Programmable Parallel Ports, Handshake I/P & O/P Interfacing a microprocessor to keyboard/alphanumeric displays, interfacing with printer, Lathe.

Multiprocessor Configuration: **-** Queue Status, lock facility, 8086/88 based Multiprocessor system, Coprocessor configuration, Introduction to 80186, 80286, 80386**,**
Introduction: Pentium IV, closely and loosely coupled configuration.

BOOKS RECOMMENDED:

1. Microprocessor & Interfacing - Douglas V. Hall
2. Programming & Design - LIU & Gibson
3. IBM PC Programming - Peter Afzel

Note: There shall be eight questions of 20 marks each, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of Calculator is allowed

COURSE OUTCOMES

COURSE NAME: ADVANCED MICROPROCESSOR.
COURSE NO. COM-601
After learning this course Students will be able to:

CO601.1	Understand 8086 microprocessor based systems.
CO601.2	Comprehend system using memory chips and peripheral chips for 16 bit 8086 microprocessor.
CO601.3	Analyze and design the architecture and working of 32-bit microprocessors.
CO601.4	Devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
CO601.5	Evaluate the difference between RISC and CISC processors and appraise multi-core processor and its advantages.

CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER/I.T. ENGG.
COURSE TITLE: ANALYSIS AND DESIGN ALGORITHMS.
COURSE NO. COM-602
DURATION OF EXAM: 3 HOURS

L	T	MARKS	
		THEORY	SESSIONAL
3	2	100	40

SECTION A

Introduction to Algorithms, Analyzing the Performance of an Algorithm, Space/Time complexity, Asymptotic Notation, Recurrence Relations, Performance measurement, write Algorithms in SPARK's.

Heap & Hash Tables: - Representing a Heap, Operations on Heaps, Applications, buildinga Heap, Hash Table, Hashing Functions, Resolving Collision by separate Chaining, Open Addressing, Quadratic Probing, Double Hashing, Rehashing.

Lower Bound Theory: - Comparison Trees for searching & Sorting, Parallel Comparison trees, Oracle& Adversary Arguments, Lower Bounds through Reduction.
NP-Hard and NP-Complete Problems: -Basic concepts, Non-Deterministic Algorithms, Polynomial Time

Algorithms,NP-hard & NP –complete classes, Look's Theorem, Introduction to Approximation Algorithms.

SECTION B

Design Techniques: -
Divide and Conquer: - General methods, Binary Search, Finding the Maximum & Minimum, Merge sort, Quick Sort & Selection sort, Strassen's Matrix, Multiplication.

Greedy Method: - General Methods, Optimal Storage on Tapes, Knapsack Problem, Job Sequencing with Deadlines, Optimal Merge Patterns, Single Source, shortest path.

Dynamic Programming: - General Methods, Multistage Graphs, I/O Knapsack, Reliability Design, Traveling Salesperson problem.

Back Tracking: - General Method, The 8- Queens Problem, Hamiltonian Cycles, Knapsack Problem.

Branch &Bound: - The method, I/O Knapsack Problem, Traveling Salesperson Problem.

BOOKS RECOMMENDED:

Fundamentals of Computer Algorithms. Ellis Horowitz, SartajSahni.
Data Structure & Algorithm J.M. Hopcraft , Ullman.

Note: **There shall be eight questions of 20 marks each, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of Calculator is allowed**

COURSE OUTCOMES

COURSE NAME: ANALYSIS AND DESIGN ALGORITHMS.
COURSE NO. COM-602
After learning this course Students will be able to:

CO602.1	Gain knowledge about the techniques for effective problem solving in computing.
CO602.2	Implement various design and analysis techniques such as greedy algorithms, dynamic programming.
CO602.3	Interpret the techniques used for designing different graph algorithms.
CO602.4	Apply backtracking, branch and bound techniques for real time problems.
CO602.5	Evaluate the concepts of P, NP and NP-Complete problems and synthesize algorithm in common engineering designing situations.

CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: RDBMS
COURSE NO. COM-603
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	1	-	100	40

SECTION A

Basic Concepts: - Data Modeling-Records and Files-Abstraction and data Integration-Views-Data independence-Components of DBMS-Advantages and disadvantages.

Data Models: - Data associations, Data models classification, Entity-relationship model,Relational,Network and Hierarchical models, Comparison of these models.

File Organization: - Introduction, Serial Files, Sequential files, Index Sequential files, Direct Files, Indexing using tree structure, Logical and physical pointers, Record placement.

SECTION B

Relational Model and Relational Data-base Design: - Attributes and domains, Tuples, Relations and schemas, relation representation, keys, Integrity rules, Relational algebra, Relational Calculus. Data Manipulation using SQL. Normalization using functional dependency, Normalization using join dependencies, Normalization using join dependencies, Domain key normal form.

Crash Recovery: - Reliability, Transactions, Recovery in a centralized DBMS, Reflecting updates to the database and recovery, Buffer management, Virtual memory, Disaster recovery.

Distributed Databases:-Introduction, Advantages and disadvantages of DBMS, Networks Data distribution, Object naming, distributed query processing.

BOOKS RECOMMENDE:

Database System Concepts	:	Korth,Silberchatz–TMH
An introduction to Database Systems	:	Bipin C. Desai
Principles of Data Base Management Systems	:	Aho Ullman
Oracle	:	Ivan Bayross.

Note: There shall be eight questions of 20 marks each, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: RDBMS
COURSE NO. COM-603
After learning this course Students will be able to:

CO603.1	Understand DBMS architecture, physical and logical database designs, database modeling, relational, hierarchical and network models.
CO603.2	Identify basic database storage structures and access techniques such as file organizations, indexing methods.
CO603.3	Apply Structured query language (SQL) for database definition and database manipulation.
CO603.4	Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
CO603.5	Write application programs dealing with issues like concurrency control and database protection mechanisms.

CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: MULTI MEDIA.
COURSE NO. COM-604
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

Introduction to Multimedia,
Multimedia, Multimedia Networks, Multimedia Information Representation, Media & Data Streams, Image, documents, Video & Audio File Formats & their representation, Audio & Video Compression, Text & Image Compression.

Multimedia Communications, Networks & Standards
Multimedia Communications, Networks & Standards relating to Interpersonal Communication, Interactive Applications over the Internet, Standard for Entertainment applications, Reference Models.

SECTION B

ATM Networks & Protocols
Introduction to ATM N/w, ATM Protocol Architecture, Broadband ATM Networks - ATM LANs, ATM MAN's, High Speed PSTN, Access Technologies – ADSL, VDSL.

Multimedia Applications & Architecture
Multimedia Applications, Architecture, Multimedia Databases. Multimedia Operating System, Multimedia Protocols.

BOOKS RECOMMENDED:

1. Multimedia Computing, Communication & Application — Steinmetz R & K. Nahrstedt.
2. Multimedia in Practice - Technology & Application — Jeffcoate J.
3. Multimedia Communication — Fred Halsall.

Note: There shall be eight questions of 20 marks each, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of Calculator is allowed

COURSE OUTCOMES

COURSE NAME: MULTI MEDIA.
COURSE NO. COM-604
After learning this course Students will be able to:

CO604.1	Understand about multimedia, multimedia systems and their representation.
CO604.2	Gain knowledge about the Basic Terminologies in Multimedia Communications, Networks & Standards
CO604.3	Acquire knowledge about Interactive/Entertainment application over Internet.
CO604.4	Analyze High Speed Digital Access Technologies like ADSL/VDSL
CO604.5	Evaluate Multimedia Databases & Protocols.

CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER ENGG.
COURSE TITLE: OPERATING SYSTEM.
COURSE NO. COM-605
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

Introduction Concepts: -Operating System functions & Characteristics, Historical Evolution ofO.S., O.S. Services, User O.S. Interface, Computer System Architecture, O.S. Design and Implementation and structure, System calls, System Programs, Virtual Machines, Spooling.

Process Management: -Study of state models, process Scheduling, Job Scheduling, Scheduling Criteria, Scheduling Algorithms, Multiple Process Scheduling.

Process Coordination: -Synchronization: Race-Conditions, critical–Section problems, semaphores, Bounded-Buffer Problem, Readers-writers Problem, Dining –Philosophers Problem

SECTION B

Deadlocks: Characteristics, Deadlock Prevention, Avoidance, Detection, Recovery.

Memory Management: Logical & Physical Address space, Contiguous & Non-Contiguous Memory Allocation, Paging, Structure of Page Table, Segmentation, Demand paged memory management, Page replacement, Allocation of Frames, Thrashing, Swapping & Overlays, Cache Memory.

CASE STUDY:
Introduction to UNIX, UNIX File System, Visual Editor, Essential Unix Commands, system Administration, Bourne Shell, C Shell, Process Creation, Trapping Signals, Process Termination, Inter Process Communication, shared Memory, Pipe Lines, Semaphores, Messages.

BOOKS RECOMMENDED:

1. Operating System — Stuart E. Madnik, Jhon J. Donovan.
2. Operating System — J.L. Peterson &Silberschtz .
3. Operating System Principle — H.D. Deitel.
4. Design of UNIX Operating system — Aurice J. Bach.

Note: There shall be eight questions of 20 marks each, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of Calculator is allowed

COURSE OUTCOMES

COURSE NAME: OPERATING SYSTEM.
COURSE NO. COM-605
After learning this course Students will be able to:

CO605.1	Understand the structure and functionalities of an Operating System and the concept of process.
CO605.2	Apply CPU Scheduling algorithms and differentiate problems related to process synchronization.
CO605.3	Apply deadlock prevention and deadlock detection algorithms
CO605.4	Describe the concepts of paging and segmentation for memory management and apply different page replacement algorithms.
CO605.5	Describe different disk space allocation methods and free space management techniques along with different aspects of Linux.

CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER/I.T. ENGINEERING.
COURSE TITLE: SOFTWARE ENGINEERING.
COURSE NO. COM-606
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	40

SECTION A

Introduction to Software Engineering: -Software: The Process and the Product, Software characteristics, Legacy Software and Software crisis, Software myths, Software Engineering: A layered Technology, Process Framework, and Software Engg. Paradigms**:** Sequential, Incremental, Evolutionary and Specialized Process Models.

Software Planning and Project management: -Software project management Process: Software scope, Resources, Software Metrics, Software project estimation, Decomposition techniques, Empirical estimation model: COCOMO, Software project scheduling, Risk Analysis, Software acquisition.

Software Requirements Analysis: Requirement analysis, Analysis Principles, Analysis Modeling**.** Design Engineering, The design process and Concepts, Effective modular design, Data design, Architectural design, procedural design, Interface Design.

SECTION B

Data flow oriented Design: Data Flow Diagrams transform analysis, transaction analysis, Transform and Transaction Mapping.

Software Quality Assurance: -Software quality and software quality assurance, Formal Technical Reviews, Software quality metrics: McCall's Quality Factors, Software Reliability.

Software Testing: - Software Testing Fundamentals, White box Testing, Basic Path Testing, Control Structure Testing, Black Box Testing**.** Software Testing Strategies, Unit Testing, Integration Testing, Validation Testing, System Testing.

Software maintenance: Definition, Maintenance characteristics, Reverse Engineering,Re-engineering.

BOOKS RECOMMENDED:

Software Engineering, A practitioner's approach:	R.S. Pressman.
Integrated approach to Software Engineering	Pankaj Jalote
Software Engineering:	M.L. Shooman.

Note: **There shall be eight questions of 20 marks each, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of Calculator is allowed**

COURSE OUTCOMES

COURSE NAME: SOFTWARE ENGINEERING.
COURSE NO. COM-606
After learning this course Students will be able to:

CO606.1	Understand the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction and deployment.
CO606.2	Comprehend the process involved in Design, implement, and evaluate software based systems, components or programs of varying complexity that meet desired needs, satisfy realistic constraint, and design and development principles.
CO606.3	Apply knowledge of computing, mathematics, science and engineering appropriate to the discipline, particularly in the modelling and design of software system and in the analysis of tradeoffs inherent in design decisions.
CO606.4	Use the techniques and tools necessary for engineering practice, Work as an individual and as part of a multidisciplinary team to develop and deliver quality software.
CO606.5	Engage in life-long maintenance and continuing software development

CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: ADVANCED MICROPROCESSOR LAB.
COURSE NO: COM-611
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
			PRACTICAL
-	-	2	40

LIST OF PRACTICALS: -

1. Write a program for comparison of two strings.
2. Write a program for converting BCD to binary (hex) number.
3. Write a program for multiplying two 8-bit numbers and display their 16-bit product.
4. Write a program for addition of 2 numbers.
5. Write a program for division of two numbers.
6. Write a program to display a message on monitor.
7. Write a program to perform subtraction using 2's complement.
8. Write a program to count the number of words in a string.
9. Write a program to calculate the factorial of n number.
10. Write a program to multiply nos. without using MUL instruction.

COURSE OUTCOMES

COURSE NAME: ADVANCED MICROPROCESSOR LAB.
COURSE NO: COM-611
After learning this course Students will be able to:

CO611.1	Develop ALP for fixed point and floating point and arithmetic operations using 8086 microprocessor.
CO611.2	Use different I/O interfacing with 8086 microprocessor.
CO611.3	Construct different waveforms using 8086 microprocessor.
CO611.4	Model serial and parallel interfacing of 8086 microprocessor.

CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: RDBMS LAB.
COURSE NO: COM-612
DURATION OF EXAM: 3 HRS

L	T	P	MARKS
			PRACTICAL
-	-	2	40

Database creation, Operation on the RDBMS, Normalization of Database, Relational Database SQL Commands, Data Definition, Data Manipulation, Data Control, Use of Odd set of Operators, Security in Database, Using PL-SQL/MYSQL

COURSE OUTCOMES

COURSE NAME: RDBMS LAB.
COURSE NO: COM-612
After learning this course Students will be able to:

CO612.1	Code and implement queries regarding basic DDL,DML and DCL commands.
CO612.2	Use Aggregate and group functions to summarize data
CO612.3	Join multiple tables using different types of joins.
CO612.4	Analyze the PL/SQL architecture and write PL/SQL code for procedures, triggers, cursors, exception handling etc.

CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: MULTIMEDIA LAB
COURSE NO: 613
DURATION OF EXAM: 3 HOURS

	L	T	P	MARKS
LIST OF PRACTICALS: -	**-**	**-**	**2**	**PRACTICAL 40**

1. Study of Multimedia Databases Application Tools.
2. Study of Text, Image, Audio, and Video File Formats
3. Study of Audio& Video File Compression

COURSE OUTCOMES

COURSE NAME: MULTIMEDIA LAB
COURSE NO: 613
After learning this course Students will be able to:

CO613.1	Understand Multimedia information representation
CO613.2	Gain knowledge about various audio and video formats.
CO613.3	Effectively use various Multimedia Database tools
CO613.4	Work with various Multimedia Applications like Flash, Picasa.

CLASS: B.E. 6TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: OPERATING SYSTEM LAB.
COURSE NO: COM-614
DURATION OF EXAM: 3 HOURS

	L	T	P	MARKS
				PRACTICAL
LIST OF PRACTICALS: -	-	-	2	40

All lab work shall be based on the theory syllabus.

COURSE OUTCOMES

COURSE NAME: Operating System LAB
COURSE NO: 614
After learning this course Students will be able to:

CO614.1	Implementation of UNIX and DOS Commands.
CO614.2	Designing Programs using the concept of Shell Programming.
CO614.3	Usage of Vi Editor of UNIX.

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME
FOR B.E. 7TH SEMESTER COMPUTER ENGINEERING.
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course No.	Name of the Course	Hours Per Week			Marks			
		L	T	P	Theory	Sess.	Practical	Total
HUM-711	Industrial Management.	3	2	-	100	50	-	150
ELECTIVE-I COM-701	A) Soft Computing B) Network Security C) Mobile computing(for Computer Engg)	3	2	-	100	50	--	150
COM-702	Distributed Systems	3	2	-	100	50	-	150
ELECTIVE-II COM -703	A) Computer Graphics B) Digital Image Processing	3	2	-	100	50	-	150
COM-711	A) Soft Computing Lab B) Network Security Lab C) Mobile computing lab	-	-	2	-	-	50	50
COM-712	Computer Graphics Lab/ DIP	-	-	2	-	-	50	50
COM-713	Seminar	-	-	6	-	-	100	100
COM-714	Industrial Training	-	-	-	-	-	50	50
COM-715	Minor Project	-	-	6	-	-	150	150
Total		**12**	**8**	**16**	**400**	**200**	**400**	**1000**

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING/ECE
COURSE NO: HUM-711
COURSE TITLE: INDUSTRIAL MANAGEMENT
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Unit 1:

Entrepreneurship: Definition and types, Difference Between Intrapreneur&Entrepreneur, Qualities of good Entrepreneurs-Role of Entrepreneurs in the economic development of a country, Functions of entrepreneur, Factors affecting entrepreneurship, Entrepreneurship as a career option for technocrats in India, Schemes and policies for entrepreneurship development. Women Entrepreneur: Classification of Women Entrepreneur in India, Problems of Women Entrepreneur, steps for promoting women entrepreneurship.

Unit 2:

Legal Forms of Industrial Ownership: Sole Proprietorship. Partnership. Joint Stock Company Unit 3:

Industrial Development in India after Independence: Industrial Policy of the Five-Year Plans, Industrial Policy (1956, 1977, 1991), Need for Economic Reforms and their Assessment, Multi-National Corporations (MNCs) - Concept, Merits & Demerits of MNCs

Unit 4:

Industrial Relations: Workers participation in management: Meaning, Objectives & Forms, Trade Union: Objectives, Functions, Present Position, and Weakness Industrial Conflict: Sources and managing conflict, Collective Bargaining: Meaning, Process, Essential conditions for effective bargaining

SECTION B

Unit 5:

Management: Meaning, definition, Characteristics, Importance & Functions of Management, Management Theories – Taylor's Scientific Management Theory & Henry Fayol's Administrative Management Theory. MBO – Definition, Features, Process, Advantages & Limitations of MBO.

Unit 6:

Departmentation & Delegation of Authority: Meaning, Importance, Basis or pattern ofDepartmentation, Delegation of Authority: Meaning, Characteristics, Importance, Process, Obstacles/ Barriers to effective delegation of authority, Authority Relationships - Line Organization, Line & Staff **Organization, Functional Organization.**

Unit 7:

Personnel Management & Decision Making: Meaning, Objectives, Characteristics, Principles &Functions of Personal department. Decision making- Meaning, Importance & Steps in Decision Making.

Unit 8:

Wage Administration & Job Enrolment: Concept of Wages, Characteristics of good wage, Factors affecting wages, Methods of wage payments. Job Evaluation-Objectives, Principles &Methods of job evaluation.

BOOKS RECOMMENDED:

1. George Terry & Stephen G. Franklin –Principles of Management.
2. Harold Koontz & Heinz –Essentials of Management
3. Sherlekar –Principles of Business Management
4. M. Mahajan –Industrial Engineering & Production Management
5. Dr. NeeruVasisth –Principles of Management
6. Dr. B. P. Singh & Dr. T. N. Chhabra –Business Organisation& Management

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: INDUSTRIAL MANAGEMENT
COURSE NO: HUM-711
After learning this course Students will be able to:

CO711.1	Acquire qualities of a good entrepreneur and opt entrepreneurship as a career option.
CO711.2	Work as a sole proprietor as well as in partnership and in joint stock companies.
CO711.3	Analyze management problems and finding solutions to resolve conflicts emerging while working in groups within the organizations.
CO711.4	Work as a good manager in companies.
CO711.5	Become a rational decision maker.

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-701(A) (ELECTIVE-I)
COURSE TITLE: SOFT COMPUTING
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Artificial Neural Networks: Basic concepts - Single LayerPerception-Multilayer Perception-Supervised and Unsupervised learning–Back propagation Networks-Kohen'sself-organizingNetworks-Hopfield network, Feed forward network, Hopfield network

Neural network models: neural network models, layers in neural network and their connections. Instar, outstar, weights on connections, threshold function, application-Adaline and Madaline

Back propagation: feed forward back propagation network-mapping, layout, training, BPN applications

Learning and training: objectives of learning, Hebb's rule, delta rule, learning vector quantizer, associative memory models, one-shot learning, resonance, stability, training and convergence

SECTION B

Fuzzy Systems: Fuzzy sets and Fuzzy Reasoning-Fuzzy Matrices-Fuzzy Functions-Decomposition-Fuzzy automata and languages - Fuzzy ControlMethods-Fuzzy decision making.

BAM- Bidirectional associative memory, inputs and outputs, weights and training. FAM-fuzzy associative memory, association.

Neuro - Fuzzy Modeling: Adaptive networks based Fuzzy interface systems - Classification and Regression Trees -Data clustering algorithms - Rule based structure identification - Neuro-Fuzzy controls -Simulated annealing – Evolutionary computation.

Genetic Algorithms: Survival of the Fittest - Fitness Computations - Cross over - Mutation -Reproduction - Rank method - Rank space method.

BOOKS RECOMMENDED:

1. Neuro-Fuzzy and Soft computing — Jang J.S.R., Sun C.T. and Mizutani E
2. Fundamentals of Neural Networks — LaureneFausett.
3. Artificial Intelligence - A New Synthesis — N. J. Nelsson

NOTE: There shall be total Eight Questions of 20 marks each, four questions from each section and students have to attempt Five questions selecting at least two from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: SOFT COMPUTING
COURSE NO: COM-701(A)
After learning this course Students will be able to:

CO701(A).1	Acquire knowledge about Artificial Neural Networks and learning mechanisms.
CO701(A).2	Master basic neural network models and their training using BPN.
CO701(A).3	Implement Fuzzy reasoning in developing Fussy Associative Memory (FAM).
CO701(A).4	Understand the concept of Neuro-Fuzzy modelling by its implementation in classification and regression trees.
CO701(A).5	Acquire the knowledge of evolutionary computation and genetic algorithm to tackle real world problems.

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-701(B) (ELECTIVE-I)
COURSE TITLE: NETWORK SECURITY
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Introduction

Introduction to N/w Security, Security Approaches, Security Policies, Principle of Security, Introduction to common attacks, IP-Spoofing, Model for N/w Security, Encryption & Decryption.

Cryptography: Concepts & Techniques

Introduction to Cryptography, Private/Public Key Cryptography, Plain Text, Cipher Text, Substitution and Transposition techniques, Steganography.

Symmetric & Asymmetric Key Cryptography

Overview, Algorithm Types & Modes, DES Scheme, RC5, Blowfish, AES Scheme, Differential and Linear Crypto analysis, Key Distribution and Management. Overview, Key Management basics, RSA Algorithm, Digital Signatures, Message Digest, Hash Function(SHA), Message Authentication Code (MAC), Authentication protocols**.**

SECTION B

IP Security

Architecture, Authentication Header, Encapsulating, Security Payload, Security Associations, Key Management, E-mail Security, Web Security, Viruses & related threats.

Firewalls & Intrusions

Design Principles, Characteristics, Types of Firewalls, Intruders, Audit Records, Intrusion Detection Systems

Information Security & Cyber Laws

Information Security & Laws, IPR, Patent Law, Copyright Law, Overview of Cyber Crimes, Security Metrics – Classification, Benefits, Security Tools–Attack & Penetration Tools, Defensive Tools.

BOOKS RECOMMENDED:

1. Cryptography & Network Security — AtulKahate
2. Cryptography & Network Security — William Stallings
3. Computer Networks (Latest Edition) — Andrew S. TanenBaum

Note: There shall be eight questions of 20 marks each, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of Calculator is allowed

COURSE OUTCOMES

COURSE NAME: NETWORK SECURITY
COURSE NO: COM-701(B)
After learning this course Students will be able to:

CO701(B).1	Understand about the significance of Network Security.
CO701(B).2	Know about key principles/policies of Cyber Security.
CO701(B).3	Acquire knowledge about the Latest Concepts & Techniques in Cryptography.
CO701(B).4	Analyze Private/Public Key Management Basics.
CO701(B).5	Implement Digital Signature, MD5 & Authentication Protocols.

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-701(C) (ELECTIVE-I)
COURSE TITLE: MOBILE COMPUTING (FOR COMPUTER ENGG.)
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Wireless communication fundamentals: Introduction–ITU-T, Wireless transmission, Frequencies for radio transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulations, Spread spectrum, MAC, Space Division Multiple Access (SDMA), Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA), Cellular Wireless Networks.

Telecommunication networks: Telecommunication systems–Global System for Mobile Communication (GSM), General Packet Radio Service (GPRS), Digital Enhanced Cordless Telecommunications (DECT), Universal Mobile Telecommunications System (UMTS), International Mobile Telecommunications 2000 (IMT2000).

Wireless LAN: Wireless LAN - IEEE 802.11 Family of Standards, Architecture, Services. HiperLAN. Bluetooth Protocol Stack

SECTION B

Mobile Network Layer: Mobile IP, Dynamic Host Configuration Protocol (DHCP), Routing Protocols – Destination Sequenced Distance Vector (DSDV), Dynamic Source Routing (DSR).

Transport and Application Layers:TCP in Wireless Mobile Networks–Indirect TCP, SnoopingTCP, Mobile TCP, Fast Retransmit/Recovery, Freezing, Selective Retransmission, Wireless Application Protocol (WAP), WAP 2.0, Wireless Transport Layer Security (WTLS)

Mobile Communication Issues: Security Issues, Health Issues, Mobile E-Commerce Issues

BOOKS RECOMMENDED:

1. Mobile Communications — Jochen Schiller
2. Wireless Communications and Networks — William Stallings
3. GSM System Engineering. — A. Mehrotra.
4. Mobile IP. — Charles Perkins.
5. Adhoc Networks. — Charles Perkins (ed.)

NOTE: There shall be total Eight Questions of 20 marks each; four questions from each section and students have to attempt five questions selecting at least two from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: MOBILE COMPUTING
COURSE NO: COM-701(C)
After learning this course Students will be able to:

CO701(C).1	Understand the concept of radio propagation and interference in multipath propagation and channel model description.
CO701(C).2	Compare different modulation and multiplexing techniques.
CO701(C).3	Recognize the basics of Bluetooth, WLAN, WiMAX emerging wireless transmission technologies and analyze the difference between GSM and GPRS mobile technologies
CO701(C).4	Analyze Wireless Application Protocol (WAP) for internet access and advanced telephony services from the mobile phones.
CO701(C).5	Evaluate the performance of the security techniques which include symmetric key cryptography and public key cryptography algorithms.

CLASS: B. E 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING.
COURSE TITLE: DISTRIBUTED SYSTEMS
COURSE NO. COM-702
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Introduction: - Definition, Goals; Hardware Concepts: Multiprocessors and Multicomputer; Software Concepts: DOS, NOS, Middleware, The Client Server Model: Application Layering: Two-tiered and Multi-Tiered Architectures.

Remote Procedure Call, Asynchronous RPC, Remote Object Invocation: Distributed Objects and their forms; Message oriented Communication: Transient and persistent Communication.

Processes: - Threads in a Distributed System, Multithreaded Servers, Clients, Servers, Code Migration: Reasons and Models, Software Agents in Distributed Systems.

Synchronization: Clock Synchronization Algorithms: Cristian's Algorithm and Berkeley Algorithm Logical Clocks: Lamport Timestamp, Global State, and Election Algorithms: The Bully Algorithm, Ring Algorithm.

SECTION B

Consistency & Replication: Reasons for Replication, Object Replication, Replication as a scaling technique, Data Centric Consistency Models: Strict, Sequential, Causal, Weak, Release and Entry Consistency models, Client Centric Consistency Models: Eventual Consistency, Monotonic Read and Write, read your Writes and Writes Follow Reads, Distribution Protocols: Replica Placement, Permanent, Server-Initiated and Client Initiated Replicas, Update Propagation Protocols, Consistency Protocols: Primary Based, Replicated – Write, Quorum- based Protocols.

Fault Tolerance: Basic Concepts, Process Resilience: Design Issues, Group Membership, Failure Masking and Redundancy, Byzantine Generals Problem. **Security:** Design issues, Secure Channel, SUN NFS

BOOKS RECOMMENDED:

1. Distributed Systems: "Principles & Paradigms" — Andrew S. TanenBaum, Martin Ransteen.
2. Distributed Systems: "Concepts & Design" — Couloris G. , Dollimore and Kindberg T, P.K.Sinha
3. Distributed Operating System — PHI, and IEEE Press.

Note: There will be eight questions of 20 marks each spread over the whole syllabus; students have to attempt five questions selecting at least two questions from each section.

COURSE OUTCOMES

COURSE NAME: DISTRIBUTED SYSTEM
COURSE NO: COM-702
After learning this course Students will be able to:

CO702.1	Acquire Knowledge of basic elements and concepts related to distributed system technologies.
CO702.2	Understand the details of main underlying components of distributed systems.
CO702.3	Understand basic concepts of process migration, synchronization and various consistency models used in implementing real time distributed systems.
CO702.4	Analyze and apply important methods in distributed systems to support scalability and fault tolerance.
CO702.5	Analyze various security issues related to distributed systems.

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-703(A) (ELECTIVE-II)
COURSE TITLE: COMPUTER GRAPHICS
DURATION OF EXAM: 3 HOURS.

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Computer Graphic Systems: - Video display devices, Raster scan displays, Video controller, Display Processors, Random Scan displays, Color CRT monitors, Graphics monitors and workstations, Direct View storage tubes, Flat Panel Displays. Three-dimensional viewing devices. Input devices: -Keyboards, Mouse, Trackball and space ball, Joysticks, Data glove, digitizers, image scanners, touch panels, Light pens, Voice systems, Hard copy Devices. Graphic software, Co-ordinate representations, Functions standards, PHIGS WORKSTATIONS.

Graphic Output primitives & their Attributes: - Points and lines, lines drawing algorithms: DD Algorithm, Bresenham's line algorithm, Parallel line, Line Attributes, type, width, pen and brush options, line color, circle generation algorithm, properties of circle, Midpoint circle Algorithm

Geometric Transformations: - 2-D and 3-D Transformation: Translation, Scaling, Rotation, Matrix Arithmetic and Matrix Composition, Three dimensional viewing

SECTION B

Two Dimensional Viewing: - The viewing pipeline, viewing coordinate reference frame, Window to Viewport coordinate transformations, 2-D viewing functions, Clipping Operations, point clipping, line clipping procedures like Cohen -Sutherland line clipping, line clipping using non rectangular clip windows. Polygon clipping procedures: Sutherland Hodgeman polygon clipping, polygon filling Algorithms

Parallel and Perspective Projections: -Parallel projections, Perspective projections, Shading, Shadows, Shading modes

BOOKS RECOMMENDED:

1. Computer Graphics — Donald Hearn,M.pauline Baker-phi
2. Interactive Computer graphics — Newman and Sprowll-Tmh
3. Computer Graphics :A Programming approach — Stevan Harrington
4. Fundamentals of ICG — J.D Foley+andA.vDam,AdditionWesle
5. Schaum series

NOTE: There shall be total Eight Questions of 20 marks each; four questions from each section and students have to attempt five questions selecting at least two from each section. Use of Calculator is allowed

COURSE OUTCOMES

COURSE NAME: COMPUTER GRAPHICS
COURSE NO: COM-703(A)
After learning this course Students will be able to:

CO703(A).1	Acquire the knowledge regarding Computer Graphics display technologies.
CO703(A).2	Understand the basic output primitive drawing algorithms along with 2D and 3D transformation concepts to display the objects.
CO703(A).3	Apply the polygon filling algorithms to fill polygons with required color.
CO703(A).4	Evaluate the Line clipping and Polygon Clipping techniques.
CO703(A).5	Implement projection transformations and 3D object representation models

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE TITLE: DIGITAL IMAGE PROCESSING
COURSE NO. COM-703(B) (ELECTIVE II)
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Introduction and Fundamentals to Digital Image Processing: What is Digital Image Processing, Origin of Digital Image processing, Examples that use Digital Image Processing, Fundamentals steps in Digital Image Processing, Components of Digital Image Processing System, Image sensing and acquisition, Image sampling and quantization and representation, Basic relationship between pixels

Image Enhancement in the Spatial Domain and Frequency Domain: Background, Basic Intensity transformation functions, Basic grey level transformation, Histogram processing, Basics of spatial filtering: Smoothing, sharpening filters (Convolution and Order Statistics). Introduction to Fourier transform, Frequency domain filters: Smoothing, Sharpening filters (Band pass and Homomorphic)

Image Restoration: Noise models, Image Restoration-Mean Filters (Arithmetic Mean, Contra Harmonic Mean, Geometric Mean, Harmonic Mean)Order statistics filters (Median, Maximum, Minimum, Midpoint, Alpha-Trimmed), Restoration techniques (Constrained method-Inverse filtering, Unconstrained method-Weiner filtering)

SECTION B

Color Image Processing: Color fundamentals, color models (RGB, CMY and CMYK, HSI and conversions), Psuedocolor image processing, Full color image processing, color transformations (Formulation, Intensity modification, Color negative, Color slicing, Smoothing, Sharpening, Segmentation)

Image Compression: **Redundancies** (Coding, Psychovisual, and Inter-Pixel), Encoding-Mapping, Quantizer, Coder, and Compression (Lossless compression: Variable length coding – Run Length coding, LZW coding, Arithmetic coding, Huffman encoding)

Lossy Compression (Lossy predictive, Bit allocation), JPEG, MPEG.

Image Segmentation & Representation: Erosion, Dilation, Opening and closing, Thickening, Thinning, Pruning, Detection of discontinuities, Edge detection operators, Region based segmentation, Signatures, Boundary segments, Skeleton of a region.

BOOKS RECOMMENDED:

1. Digital Image Processing — Rafael C. Gonzalez And Richard E. Wood
2. Digital Image Processing — Pratt N.K.
3. Digital Picture Processing — Rosenfeld And Kak.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME: DIGITAL IMAGE PROCESSING
COURSE NO. COM-703(B) (ELECTIVE II)
After learning this course Students will be able to:

CO703(B).1	Remember the fundamental knowledge of Digital Image Processing.
CO703(B).2	Understand frequency domain filters and spatial filters for image enhancement.
CO703(B).3	Describe the image degradation models which include linear, position-invariant models.
CO703(B).4	Apply various filtering techniques used to restore the image and analyze multi resolution view of wavelet transformation functions in 1D and 2D.
CO703(B).5	Evaluate image compression and segmentation techniques.

CLASS: BE 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-711
COURSE TITLE: A) SOFT COMPUTING LAB.
B) NETWORK SECURITY LAB.
C) MOBILE COMPUTING LAB.
DURATION OF EXAM: 3 HOURS.

L	T	P	MARKS
L -			PRACTICAL
-	-	2	50

COM-711 (A): There shall be 6 to 8practical'sbased upon the theory course.

COURSE OUTCOMES

COURSE NAME: SOFT COMPUTING LAB
COURSE NO. COM-711(A)
After learning this course Students will be able to:

CO711(A).1	Install MATLAB and its working environment.
CO711(A).2	Implement single layer and multilayer Perceptron Models using NN .
CO711(A).3	Understand the implementation of KSOM,BPNN and Associative memory.
CO711(A).4	Implement Fuzzy associative memory(FAM).
CO711(A).5	Acquire the knowledge of evolutionary computation and genetic algorithms.

COURSE CODE: COM-711(B)
COURSE TITLE: NETWORK SECURITY LAB.

L	T	P	MARKS
			PRACTICAL
-	-	2	50

COURSE OUTCOMES

COURSE NAME: NETWORK SECURITY LAB.
COURSE NO. COM-711(B)
After learning this course Students will be able to:

CO711(B).1	Implementation of Encryption /Decryption Algorithm using **C/C++**.
CO711(B).2	Implementation of Symmetric Cryptography Algorithm using **C/C++.**
CO711(B).3	Implementation of Asymmetric Cryptography Algorithm using **C/C++.**
CO711(B).4	Implementation of Firewalls.
CO711(B).5	Study of Information Security Tool.

COM-711(C): MOBILE COMPUTING LAB.

L	T	P	MARKS
			PRACTICAL
-	-	2	50

COURSE OUTCOMES

COURSE NAME: MOBILE COMPUTING LAB.
COURSE NO. COM-711(C)
After learning this course Students will be able to:

CO711(C).1	Understand the basics of Bluetooth, WLAN, Wi-MAX emerging wireless transmission technologies.
CO711(C).2	Evaluate the performance of the security techniques which include symmetric key cryptography and public key cryptography algorithms.
CO711(C).3	Experiment the process radio propagation and interference in multipath propagation and channel model description.
CO711(C).4	Understand the functioning of Base Station of a Cellular Network.
CO711(C).5	the working of various radio frequency channels

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CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-712(A)
COURSE TITLE: COMPUTER GRAPHICS LAB.
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS
			PRACTICAL
-	-	2	50

The practicals will be based on theory Syllabus. The students are required to submit at least following 10 programs

(Implement using C/C++)

1. Simple DDA line drawing program
2. Shaded simple DDA line drawing program.
3. Bresenham's line drawing program.
4. Draw a given scene on a given viewport.
5. Draw and fill shapes.
6. Animation of picture.
7. Bresenham's circle drawing algorithm.
8. Cohen Sutherland line clipping program.
9. Mouse interfacing program.
10. Create a mirror image of a polygon & scale it.

COURSE OUTCOMES

COURSE NAME: Computer Graphics Lab
COURSE NO. COM-712(A)
After learning this course Students will be able to:

CO712(A)1	Implement various line drawing Algorithms.
CO712(A).2	Write program to draw 2-D shapes also fill them.
CO712(A).3	Understand the working of Cohen Sutherland line clipping Algorithm.
CO712(A).4	Create a mirror image of a polygon and perform various transformations on it.

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-712(B)
COURSE TITLE: DIGITAL IMAGE PROCESSING LAB.
DURATION OF EXAM: 3 HOURS.

L	T	P	MARKS
			PRACTICAL
-	-	2	50

The practical's will be based on theory Syllabus. The students need to submit at least 10 programs.

COURSE OUTCOMES

COURSE NAME:DIGITAL IMAGE PROCESSING LAB.
COURSE NO. COM-712(B)
After learning this course Students will be able to:

CO712(B)1	Install MATLAB and its working environment.
CO712(B).2	Understand load and save operations on an image.
CO712(B).3	Demonstrate conversion of RGB to CMY and RGB TO HIS.
CO712(B).4	Create Histogram, negative, contrast enhancement and binary image from an image file.
CO712(B).5	Implement various Filters on image.

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-713
COURSE TITLE: SEMINAR

L	T	P	MARKS
-	-	6	100

This will involve a detailed study of a topic of interest reproduced in the candidate's own style. For this, a student has to prepare a seminar by doing proper survey of literature, compilation of information so gathered and then presentation of the same followed by question-answer session. The report of which has to be submitted by the student well before the conduct of seminar. The handout submitted by the student will be in accordance with the standards of technical papers.

Guidelines and evaluation of Seminar in 7th semester:
The topic of the Seminar is to be finalized and approved by the departmental committee by the end of 6th Semester. The committee shall have a convener and at least two members.

Distribution of Marks:

Total Marks for Seminar Evaluation = 100 marks

1) Project Report = 30 marks
2) Presentation = 50 marks
3) Attendance = 20 marks.

Award of Marks:

Marks Under (1) will be awarded by the Seminar In charge.
Marks Under (2) and (3) will be awarded by the Departmental committee constituted for the purpose.

COURSE OUTCOMES

COURSE NAME:SEMINAR
COURSE NO. COM-713
After learning this course Students will be able to:

CO713.1	Select a topic relevant to the field of Computer engineering.
CO713.1	Undertake a review of the literature on the chosen topic.
CO713.1	Prepare and present a technical report.

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-714
COURSE TITLE: INDUSTRIAL TRAINING

L	T	P	MARKS
-	-	-	**50**

Students are required to undertake 4 to 6 weeks Practical Training during the summer vacations in the field of Computer Engineering and applications in Govt./Semi-Govt./Private sector. Thereafter, each student shall be required to submit a report on the practical training to the concern HOD for evaluation.

Guidelines for evaluation of Practical Training:

The evaluation shall be done by the departmental committee by the end of 7th semester. The committee shall have a convener and at least two members.

Distribution of Marks as per the University statues:

Total Marks for Evaluation		= 50 marks	
i)	Report	= 20	40%
ii)	Viva-Voce	= 15	30%
iii)	Miscellaneous Marks	= 15	30%

Due weightage will be given to those who have opted for Industrial Training outside the State as well as keeping in view the profile of that Industry.

Award of the Marks:

Marks under (i), (ii) & (iii) will be awarded by the departmental committee constituted for the purpose.

COURSE OUTCOMES

COURSE NAME:INDUSTRIAL TRAINNING
COURSE NO. COM-714
After learning this course Students will be able to:

CO714.1	Interact and study with a range of students and to practice multiple management skills, including communication, independent action and teamwork.
CO714.2	Understand the engineering code of ethics and be able to apply them as necessary.
CO714.3	Demonstrate knowledge of practical application of training.
CO714.4	Submit a training report along with the certificate issued by the concerned department.

CLASS: B.E. 7TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-715
COURSE TITLE: MINOR PROJECT

L	T	P	MARKS
-	-	6	150

The project will be assigned to the students towards the end of 6th semester and will start working on those projects at the commencement of their 7th semester. The topic of the project will be decided as per the developments taking place in the field of Computer Engineering.
This may require complete literature survey, design, fabrication, simulation of some models and/or some preliminary laboratory experiments etc. The same project shall be extended to 8th semester.

Distribution of Marks as per University statues:

Total Marks for End semester Evaluation		= 150 marks	
1)	Presentation/ Demonstration	= 45 marks	30%
2)	Viva-voce	= 45 marks	30%
3)	Actual work done	= 60marks	40%

Award of Marks
Marks under (1) and (2) will be awarded by the Departmental committee constituted comprises of convener and at least two members.
Marks under (3) will be awarded by the Project Guide/supervisor concern.

COURSE OUTCOMES

COURSE NAME:MINOR PROJECT
COURSE NO. COM-715
After learning this course Students will be able to:

CO715.1	Work in a team to select a topic for project work
CO715.2	Review the available literature on the selected topic.
CO715.3	Understand the concept of project and work in a team to develop project.
CO715.4	Design, implement or simulate the project model.
CO715.5	Apply the methods and techniques to solve the problems and can be extended for major project also.

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME
FOR B.E. 8TH SEMESTER COMPUTER ENGINEERING.
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course No.	Name of the Course	Hours Per Week			Marks			
		L	T	P	Theory	Sessional	Practical	Total
(ELECTIVE-I) **HUM-812**	A) Organizational Behavior. B) Business Policy and Strategy management	3	2	--	100	50	--	150
(ELECTIVE-II) **COM- 801**	A) Advanced Computer Architecture B) Data Warehousing & Data Mining	3	2	--	100	50	--	150
COM-802	Artificial Intelligence (for Computer Engg.)	3	2	--	100	50	--	150
(ELECTIVE-III) **COM-803**	A) Compiler Design B) Distributed Databases	3	2	--	100	50	--	150
COM-804	Major Project.	--	--	12		--	400	400
Total		**12**	**8**	**12**	**400**	**200**	**400**	**1000**

CLASS: B.E. 8TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: HUM-812(A) (ELECTIVE- I)
COURSE TITLE: ORGANIZATIONAL BEHAVIOUR
DURATION OF EXAM: 3 HOURS.

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Unit 1: **Organizational Behavior**: Fundamental Concepts, Nature of people, Nature of organization, Features, need to study O.B, Models of organizational behavior. Motivation-Concept & Importance, Theories of motivation – Maslow's Need Hierarchy Theory & Herzberg's Motivation-Hygiene Theory.

Unit 2: **Individual behavior and its determinants**: Personality-Concept & Determinants; Perception-Meaning, Definition, Perceptual Process, internal & external factors in perceptual selectivity; Attitude–Features, Components, Formation of Attitudes; OB Modification: Steps in OB Mod & Utility of OB Mod

Unit 3: **Communication**: Characteristics, Process, Types, Barriers & Breakdowns in Communication, Overcoming Communication Barriers, Guidelines for Effective Communication.

SECTION B

Unit 4: **Organization as a Social system**: Concept, Characteristics & Objectives of Organization Development, Organization Development Process. Organizational Change: Nature of Organizational Change, Forces to Change, Causes of Resistance to Change, Techniques of overcoming Resistance to Change, Response & Reactions to Change

Unit 5: **Leadership and Organization Development: Leadership**–Characteristics and Functions of Leader, Qualities of a good Leader, Importance of leadership, Styles of Leadership; Dynamics of Conflict – Nature of Conflict, Types of Conflict, Stages in conflict, Resolution of conflicts.

Unit 6: **Culture & Management with Indian reference**: Meaning, definition & Elements of culture, Characteristics of organizational culture, Functions of Culture in Management, Basic Foundations of Indian Culture and its linkage with the practice of management in India.

BOOKS RECOMMENDED:

Organisational Behaviour	- John W. Newstrom& Keith Davis
Organisational Behaviour	- Robbins
Management	- G. S. Sudha
Principles of Management	- Dr. NeeruVaisisth
Organisational Behaviour	- L. M. Prasad

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES **COURSE NAME:ORGANIZATIONAL BEHAVIOUR** **COURSE NO. HUM-812A** After learning this course Students will be able to:	
CO812A.1	Remember and understand work in organizations by gaining proper knowledge about concepts, models, and theories of O.B and detail knowledge about personality, perception etc.
CO812A.2	Apply and transmit their ideas, facts, thoughts, feelings, and values effectively through effective communication tools.
CO812A.3	Analyze and cope up with the organizational changes in future.
CO812A.4	Evaluate the work for development of the organizations.
CO812A.5	create to work as an effective leader for organizational development and organizational change

CLASS: B.E. 8TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: HUM-812(B) (ELECTIVE-I)
COURSE TITLE: BUSINESS POLICY AND STRATEGIC MANAGEMENT
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Introduction to business policy, the corporate strategy – concepts and objectives, formulation of corporate strategy, environmental scanning opportunity and threats.

Corporate profile strategies and weakness strategic alterations, concepts of distinction competence, strategy and personnel values, strategy and social values, strategy and technological change of choice or strategy and corporate planning in India.

SECTION B

Implementation of strategy, strategy and organizations design, mobilization of physical and human resources management information and control.

Role of motivation, corporate culture and organizational commitment, mergers and acquisitions, Performance appraisal.

Leadership and its various styles, stress, evaluation of strategy, strategic management in the non-profit organizations, strategic management in international environment.

BOOKS RECOMMENDED:

1. Strategic Management and Business Policy — Gluck, William F
.
2. Policy Formulation and Strategy Management — Sehellenberger, Rober& Bozeman, F. Glenn .
3. Business Policy for Indian Industries. — Chopra, K.S.
4. Business Policy and Planning — Rogers, David C.D.
5. Strategy and Policy — Thompson, Arthur A & Strickland, A.J.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME:BUSINESS POLICY AND STRATEGIC MANAGEMENT
COURSE NO. HUM-812B

After learning this course Students will be able to:

CO812B.1	Remember and motivate themselves and other employees and thus work efficiently and effectively
CO812B.2	Understand and recognise the various levels at which strategic decision making happens in an organization.
CO812B.3	Apply the factors that shape the strategies formulations of a firm and environment scanning that will lead to formulation of strategic plans.
CO812B.4	Analyze the suitability of strategies that firms have developed in the real world scenario to achieve valuable outcomes.
CO812B.5	Evaluate best leadership styles according to the work environment

CLASS: B.E. 8TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-801(A) (ELECTIVE-II)
COURSE TITLE: ADVANCED COMPUTER ARCHITECTURE
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Introduction to Parallel Processing: Parallel Processing, Architectural classification schemes, Parallelism in Uniprocessor systems, Types of Parallelism

Pipelining Processing: Introduction to pipelining, Classification of Pipeline Processors, General pipelines and reservation tables, Principles of Designing pipeline processors, Pipeline hazards and conflicts.

Vector and SIMD Array Processing: Introduction to Vector Processing, Classification of vector Processing, Vector computing process, Characteristics of vector Processing. Array Processors, Classification of Array Processors, Masking and Data Routing Mechanisms.

SECTION B

Multiprocessor Systems: Introduction to multi processors, Classification of multi processors systems, Processor characteristics for multiprocessing, Multi-processor execution modes, Multi-processor operating system, Interconnected Networks for multiprocessors and Multi-computer, Performance evaluation methods.

Parallel Memory Organization: Memory organization in multi-processor systems, Interleaved Memory Organization, Characterization and organization of cache memory, Multicache Problems, Virtual memory concepts and techniques, input- output organization, Characteristics of input-output systems, input- output processor.

Parallel computer models and Program Parallelism: Models of parallel computers, Introduction to Parallel Algorithms, Parallel Programming Paradigms, Issues in implementing algorithms on Parallel Computers.

BOOKS RECOMMENDED:

1. Computer Architecture: A Qualitative Approach — Hennessey & D.A. Patterson.
2. Computer Architecture: Pipelined & Parallel Processor Design — Michael J. Flynn.
3. Advanced Computer Architecture — Kai Hwang & Briggs.
4. Foundations of Parallel Processing — R.K.Ghose, RajanMoona and Phalguni Gupta.

Note: There will be eight questions of 20 marks each spread over the whole syllabus, students have to attempt five questions selecting at least two questions from each sections.

COURSE OUTCOMES

COURSE NAME:ADVANCED COMPUTER ARCHITECTURE
COURSE NO. COM-801(A)
After learning this course Students will be able to:

CO801(A).1	Remember the Latest development in computer architecture.
CO801(A).2	Understand parallel processing/computing basic terminologies.
CO801(A).3	Apply and Acquire knowledge about the latest concepts & techniques in pipelining processing & hazards.
CO801(A).4	Analyze performance evaluation methods in multiprocessor & multicomputer.
CO801(A).5	Create virtual memory & memory interleaving in PC.

CLASS: BE 8TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-801(B) (ELECTIVE-II)
COURSE TITLE: DATA WAREHOUSING & DATA MINING
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Introduction to Data Warehousing & Data Mining: Need for data Warehousing & Data Mining, Data Mining on different kinds of Data, Data Mining Functionalities - Characterization and Discrimination, Association Analysis, Classification and Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis, Classification of Data Mining System, Data Mining Applications.

Data Warehouse and OLAP Technology for Data Mining: Differences between Operational database systems and Data warehouse, Multidimensional Data Model- Data Cubes, Star, Snowflakes & Fact Constellations Schemes, Concept Hierarchies, OLAP Operations, Starnet
Query Model, Data Warehouse,3-Tier Architecture, Types of OLAP Servers: ROLAP, MOLAP, HOLAP, Data Warehouse Usage, On-Line Analytical Processing to On-Line Analytical Mining, Data Marts, Meta Data.

SECTION B

Data Preprocessing and Mining: Data Cleaning, Data Integration & Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

Kinds of Knowledge to be Mined, Concept Hierarchies, Interesting measures, Presentation & Visualization of Discovered Patterns.

Concept Description and Association Rules Mining: Concept Description, Data Generalization and Summarization based Characterization, Analytical Characterization, Attribute Relevance Analysis.
Association Rules Mining Basic Concepts, Mining Single Dimensional Boolean Association Rules from Transactional databases- Apriori Algorithm

Introduction to classification and Prediction: Basic Concepts, Classification by Decision Tree Induction, Linear and multiple Regression, Non Linear Regression

BOOKS RECOMMENDED:

1. Data Mining: Concepts & Techniques — Jiawei Hun, MichelineKamber
2. Modern Data Warehousing Mining & Visualization Core Concept — George M. Marakas
3. Data Mining — Pieter Adrians
4. Data Mining with Microsoft SQL Server — Seidman

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME:DATA WAREHOUSING & DATA MINING
COURSE NO. COM-801(B)
After learning this course Students will be able to:

CO801(B).1	Remember the importance of pre-processing the given datasets
CO801(B).2	Understand the concepts of data warehouse and data mining
CO801(B).3	Apply data pre-processing techniques to build data warehouse
CO801(B).4	Analyze transaction databases for association rules.
CO801(B).5	Evaluate methods for outlier analysis and develop skills to design data warehouse for an enterprise.

CLASS: B.E. 8TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-802
COURSE TITLE: ARTIFICIAL INTELLIGENCE
DURATION OF EXAM: 3 HOURS.

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Artificial Intelligence: - The AI problems, AI techniques, The level of the model, criteria forsuccess, AI tasks. Problems, problem spaces &Research: - Defining the problem as a space, search, production system problem characteristics, Production system characteristics, Issues in the design of search programs, two path problems.
Symbolic reasoning under uncertainty: - Introduction to non - monotonic Reasoning,Logicsfor non-monotonic reasoning, Implementation Issues, Augmenting a ProblemSolver.Implementation by:a) Depth - First Search b) Breadth - First Search

Statistical reasoning: - Probability & Bayes Theorem, Certainty Factors & Rules Based Systems,Bayesian networks, Dempster Shafer Theory, Fuzzy logic, Introduction to Expert System development.

SECTION B

Using Predicate Logic: -Representing simple facts, its logic representing instances and its Functions and Relationships, Computable Predicates, Resolution, Natural Deduction, Conversion to Clause Form.

Representing knowledge using rules: -Procedural Vs Declarative Knowledge, LogicProgramming Forward Vs Backward Searching, Matching, Control Knowledge.Heuristic Search Techniques: - Generate & test, Hill Climbing, Best First Search, Problem reduction, Constraint, Satisfaction, Means and analysis.

Knowledge Representation Issues: - Representation and mappings, approaches to knowledgerepresentation, Issues of knowledge representation, the frame problem, Semantic networks.

BOOKS RECOMMENDED:

1. Artificial Intelligence — Elaine Rich Kevin Knight
2. Principles of A.I Expert system development — David W. Rolston.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME:ARTIFICIAL INTELLIGENCE
COURSE NO. COM-802
After learning this course Students will be able to:

CO802.1	Remember and understand the concept and fundamental methods of AI.
CO802.2	Apply basic AI algorithms to solve the problems.
CO802.3	Analyses how uncertainty is being tackled in knowledge representation and reasoning process.
CO802.4	Evaluate the concept of structural representation of knowledge using rules.
CO802.5	Create fuzzy logic to implement expert systems.

CLASS: BE 8TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-803(A) (ELECTIVE-III)
COURSE TITLE: COMPILER DESIGN
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Introduction–Languages Processors, the typical structure of a Complier.

Programming Language –High level programming languages, definition of programming languages, the syntax and semantics of basic data and control structures in high level programming languages.

Lexical analysis –Role of Lexical Analyzer, input buffering, a simple approach to Design of Lexical Analyzers, Regular Expressions, Finite Automata, Regular expression to Finite Automata, Conversion of NFA to DFA, Minimizing the number of states of a DFA.

The Syntactic Specification of Programming Languages –Definition of Grammars (Context free grammar), derivation, parse tree, ambiguity, non-context free language constructs.

Basics Parsing Techniques –Parsers- Shift reduce parsing, Operator precedence parsing, top -down parsing, Predicative parsers, LR parsers.

SECTION B

Syntax directed translation- Syntax directed translation schemes. Implementation of syntaxdirected translators.

Intermediate code Generation - Intermediate code, postfix notation, three address code-quadruples triples, translation of Assignment statement, Boolean Expression, Statements that alter the flow of control.

Symbol Table Organization –The content of symbol table, Data structure of symbol table **Run- Time memory Allocation-**Static and Dynamic memory allocation, Static allocation of space – Activation trees, activation records, Procedure calls, parameter passing.

Error Detection and Recovery-Errors, lexical phase errors, syntactic phase errors, semantic errors.

Code optimization- Loop optimization, DAG Representation of basic blocks, Global data flowAnalysis.
Code generation- Issues in the design of code generator, Peephole optimization, a simple code generator Register Allocation & Assignment.

BOOKS RECOMMENDED:

1. Principles of compiler design — Alfred V.Aho, Jeffrey D Ullman
2. Principles of compiler design — Aho v. Ullman, Sethi
3. Theory of parsing Translation & Compiling — Aho. ullman
4. Compiler construction — MunishJha
5. Compilers Principles, Techniques & Tools — Alfred V. Aho, Monika S Lam, Ravi Sethi, Jeffrey D Ullman

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME:COMPILER DESIGN
COURSE NO. COM- 803(A)
After learning this course Students will be able to:

CO803(A).1	Remember the functionality of each phase involved in Compilation process and understand intermediate code representations .
CO803(A).2	Apply the parsing techniques including Bottom-up and Top-down parsing for the given programming construct described in Context Free Grammar.
CO803(A).3	Analyze the concepts of storage administration for different programming environments.
CO803(A).4	Evaluate different error recovery routines to recover the errors seen at different phases of compilation.
CO803(A).5	Create the machine code by considering all the functionalities involved in different phases of the compilation process.

CLASS: B.E. 8TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO: COM-803(B) (ELECTIVE-III)
COURSE TITLE: DISTRIBUTED DATABASE
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	-	100	50

SECTION A

Transaction and schedules, concurrent execution of transaction, conflict and views serializability, testing for serializability, concepts in recoverable and cascadeless schedules.

Lock based protocols, time stamp based protocols, multiple granularity and multiversion techniques, enforcing serializability for locks, locking system with multiple lock modes, architecture for locking scheduler.

Distributed transaction management, data distribution, fragmentation and replication techniques, distributed commit, distributed locking schemes, long duration transactions, moss concurrency protocol.

SECTION B

Issues of recovery and atomicity in distributed database, traditional recovery technique, log based recovery, recovery with concurrent transactions, recovery in message passing systems, checkpoints, algorithm for recovery line, concepts in orphan and inconsistent messages.

Distributed query processing, multiway joins, semi joins, cost based query, optimization for distributed database, updating replicated data, protocols for distributed deadlocks detection, eager and lazy replication techniques.

BOOKS RECOMMENDED:

1. Principles of distributed database systems — M Tamer Ozsu Patrick Valdureiz.
2. Distributed database system — David A. Bell,JaneB.Grimson
3. Managing Distributed Database — Donald K.Burleson
4. Advanced Distributed Systems — Felix F.Romas

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

COURSE OUTCOMES

COURSE NAME:DISTRIBUTED DATABASE
COURSE NO. COM-803(B)
After learning this course Students will be able to:

CO803(B).1	Remember conceptual understanding of Distributed Systems
CO803(B).2	Understand different techniques for data fragmentation, replication, and allocation during the distributed database design process.
CO803(B).3	Analyze simple strategies for executing a distributed query to select the strategy that minimizes the amount of data transfer.
CO803(B).4	Evaluate how two-phase commit protocol is used to deal with committing a transaction that accesses databases stored on multiple nodes
CO803(B).5	Design distributed concurrency control system based on the distinguished copy techniques and the voting methods.

CLASS: B.E. 8TH SEMESTER
BRANCH: COMPUTER ENGINEERING
COURSE NO. COM–804
COURSE TITLE: MAJOR PROJECT

L	T	P	MARKS
-	-	6	400

The student will complete their assigned project work initiated in 7th semester under course No.COM-708 and submit a detailed project report individually to the Head of the department.

Guidelines for evaluation of Project work in 8th semester:
There shall be a mid-semester evaluation, followed by an End Semester (Final) Evaluation
Sub-distribution of marks:

- For External Examiner : 100
- For Internal Examiner : 300

Sub-distribution of internal Marks:

- Mark distribution of internal Project work as per the University statues shall be based on:

a.	Viva-Voce	=	90	30%
b.	Presentation	=	90	30%
c.	Report	=	120	40%
	Total	=	300	

COURSE OUTCOMES

COURSE NAME:MAJOR PROJECT
COURSE NO. COM-804
After learning this course Students will be able to:

CO804.1	Complete their assigned project work initiated in minor project.
CO804.2.	Demonstrate the project work followed by question-answer session
CO804.3.	Present and submit the detailed projectreport.