JK Lakshmipat University

LaliyaKa Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2013-17

Course Structure, Detailed Syllabus

&

Scheme of Examination

JK Lakshmipat University, Jaipur
Institute of Engineering and Technology
Department of Computer Science & Engineering
Course Structure for the Batch 2013-17

Semester	Courses								(L T P) Credits Hrs/ Week
I	English Communication Skills	Engineering Mathematics - I	Engineering Physics –I	Engineering Chemistry -I	Computer Programming & IT	Environmental Studies	Workshop Practice	Engineering Graphics	(17 4 11) 36
	LA101 (1 1 0) 2.5	MA101 (3 1 0) 5.5	PH101 (3 1 2) 7	CH101 (3 1 2) 7	CSE101 (3 0 2) 5.5	ID101 (3 0 0) 4	ME141 (0 0 3) 2	CE101 (1 0 2) 2.5	32
II	Professional Communication Skills	Engineering Mathematics - II	Engineering Physics – II	Engineering Chemistry –II	Electrical & Electronics Engineering	Engineering Mechanics	Machine Drawing		(16 3 11) 38
	LA201 (1 1 2) 4	MA201 (3 1 0) 5.5	PH201 (3 0 2) 7	CH201 (3 0 2) 7	EE201 (3 0 2) 7	ME201 (3 1 0) 5.5	ME241 (0 0 3) 2		30
III	Data Structures	Object Oriented Programming	Electronic Device & Circuits	Principles of Programming Languages	Engineering Mathematics – III	Principles of Management for Engineers			(17 2 10) 24
	CSE301 (3 0 4) 5	CSE302 (3 0 4) 5	ECE301 (3 1 2) 5	CSE303 (3 0 0) 3	MA301 (3 1 0) 4	HS302 (2 0 0) 2			29
IV	Digital Electronics	Discrete Structures	Foundations of Computer Graphics	Database Management Systems	Numerical & Statistical Methods	Computer Architecture & Organization			(18 4 8) 26
	ECE402 (3 1 2) 5	CSE402 (3 1 0) 4	CSE404 (3 0 2) 4	CSE401 (3 1 2) 5	MA402 (3 0 2) 4	CSE403 (3 1 0) 4			30
V	**Practice School - I (PS 501) – (4 to 6 Weeks Duration) - 4 Credits**								
	Operating System	Computer Networks	Theory of Computation	Web Technologies	Optimization Techniques	Elective – I			(18 3 8) 25+4
	CSE501 (3 1 2) 5	CSE503 (3 0 2) 4	CSE504 (3 1 0) 4	CSE505 (3 0 4) 5	MA502 (3 1 0) 4	(3 0 0) 3			29
VI	Distributed Systems	Design & Analysis of Algorithms	Compiler Design	Software Engineering	Information Security	Elective – II			(18 0 12) 24
	CSE601 (3 0 4) 5	CSE602 (3 0 2) 4	CSE603 (3 0 2) 4	CSE604 (3 0 2) 4	CSE609 (3 0 0) 3	(3 0 2) 4			30
VII	Data Warehousing & Data Mining	Mobile Computing	Artificial Intelligence	Seminar	Elective – III	Elective – IV	Principles of Economics		(18 0 12) 24
	CSE701 (3 0 2) 4	CSE702 (3 0 4) 5	CSE703 (3 0 2) 4	SEM701 (0 0 4) 2	(3 0 0) 3	(3 0 0) 3	HS701 (3 0 0) 3		30
VIII	**Practice School - II (PS 801) – (16 Weeks Duration) - 16 Credits**								16

List of Elective Courses

Elective I	Management Information System (CSE521)	Information Technology & Project Management (CSE522)	Data Compression & Encryption (CSE523)	Graph Theory (CSE524)					
Elective II	Microprocessors & Interfacing (ECE622)	Soft Computing (CSE623)	Modeling & Simulation Technologies (CSE624)						
Elective III/IV	Digital Image Processing (CSE728)	Cyber Laws and Intellectual Property Rights (CSE730)	Object Oriented Analysis and Design (CSE731)	Network Management (CSE724)	Wireless Networks (CSE725)	Real Time Systems (CSE735)	Parallel Processing (CSE732)	Information Theory & Coding (ECE729)	

Total Credits: 217

JK Lakshmipat University

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Common to all Branches)

Batch 2013-2017

SEMESTER-FIRST

Detailed Syllabus

&

Scheme of Examination

ENGLISH COMMUNICATION SKILLS

Course Code	**:**	**LA 101**
Course Title	**:**	**English Communication Skills**
Course Credits	**:**	**2.5**
Total Hours Per Week	**:**	**1+1+0**

Course Syllabi:

- Introduction to the course, Characteristic Features of Effective Communication and Ways to Overcome Barriers to Communication
- Vocabulary Extension: Roots, Prefixes and Suffixes
- Vocabulary Extension: Synonyms, Antonyms, Homophones, One Word Substitution
- Vocabulary Extension: Learning words through Situations
- Basics of English Grammar, Applied English Grammar
- Standard English Usage, Listening Skills
- Phonetics and Spoken English: Sounds of English
- Introducing students to the rules of Word Accent and Weak Forms in English
- Reading Comprehension, Paragraph Writing
- Art of Condensation,Essay Writing

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Text Books:

Sanjay Kumar and PushpLata, *Communication Skills*, New Delhi: OUP, 2011

Reference Books:

R1 Meenakshi Raman and Sangeeta Sharma, *Technical Communication: Principles and Practice,* Second Edition, New Delhi: OUP, 2011.

R2 Krishna Mohan and Meenakshi Raman, *Effective English Communication,* New Delhi: Tata-McGraw Hill, 2000.

R3 Krishna Mohan and N.P.Singh, *Speaking English Effectively,* New Delhi: Macmillan,1994.

R4 V. Sasikumar and P.V. Dhamija, *Spoken English*: A Self-Learning Guide to Conversation Practice, Tata-McGraw Hill, 2007.

R5 Norman Lewis, *Word Power Made Easy,* Delhi: GoyalSaab Publishers and Distributors, 1994.

R6 A.J.Thomson and A.V.Martinet, *A Practical English Grammar,* 4th Edition, New Delhi: OUP, 1999.

R7 AshaKaul, *Business Communication,* Second Edition, New Delhi: PHI, 2010.

R8 Edgar Thorpe and Showick Thorpe, *Objective English,* 2nd Edition, New Delhi: Pearson Education, 2008.

ENGINEERING MATHEMATICS-I

Course Code	**:**	**MA101**
Course Title	**:**	**Engineering Mathematics – I**
Course Credits	**:**	**5.5**
Total Hours per week (L+T+P)	**:**	**3+1+0**

Course Syllabi:

- **Calculus of several variables**: Functions of two or more variables, Partial Derivatives, Total derivative, chain Rule, Euler's Theorem, Jacobian and transformation, Applications to errors, Optimization using derivatives - Maxima-Minima of functions of two variables, Lagrange's method.

- **Curve Sketching**: Asymptotes, Double and Triple Points, Cartesian, parametric and polar curve sketching

- **Vector function and its derivatives**: Vector functions, their derivatives and integration, Arc length and unit tangent vector, Curvature and unit normal vector, Torsion and unit Bi-normal vector, Directional derivative and gradient vectors, Tangent plane, Divergence and curl of a vector field

- **Integral Calculus**: Definite Integral - Integral calculus, Line integral, Arc length, Solids of revolution: Surface and volume, Multiple Integrals - Double integral: Area, change of order of integration, changing to polar coordinates, Triple integral, Volume integral, Improper Integrals - Gamma and Beta functions

- **Vector Integration**: Line integral, flux, work done, circulation, Path independence, potential function and conservative fields, Surface area and surface integral, Green's theorem in the plane, Stoke's theorem, Divergence theorem,

- **Sequence and Series**: Sequence, Series, Orthogonal function, Fourier Series

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hours	40
4.	Class Participation	Day to day	10

5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	--	10

Text books and Reference books

1. G.B. Thomas, Jr., *Thomas' calculus*, 11th edition (Indian), Pearson education, Delhi, 2008
2. Dennis G. Zill and Warren S. Wright, *Advanced Engineering Mathematics*, Fourth Edition (Student Edition), Jones &Barlett, Viba, New Delhi, 2011
3. RoberWrede, Spiegel M. R., *Schaum's outline of advanced calculus*, 3rd edition, Tata Mc-GrawHill, NewYork, 2011
4. Peter V. O'Neil,*Advanced Engineering Mathematics*, Seventh Indian Reprint, Cengage Learning, New Delhi, 2011.
5. Kreyszig, E., *Advanced Engineering Mathematics*, John Willey, Delhi (2011).
6. Potter M.C., Goldberg J.L., Edward F.A., *Advanced Engineering Mathematics*, 3rd Edition, Oxford University Press, 2005.

ENGINEERING PHYSICS-I

Course Code	**:**	**PH101**
Course Title	**:**	**Engineering Physics-I**
Course Credits	**:**	**7**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi (Theory):

- **Coherence, Interference and Optical Technology**
  - Introduction to optics, Spatial Coherence, Temporal coherence, Coherence length, Coherence time and 'Q' factor for light
  - Formation of Newton's rings, Measurement of wavelength of light, Diameter of Newton's rings
  - Michelson's Interferometer: Production of circular & straight line fringes, Determination of wavelength of light, Determination of wavelength separation of two nearby wavelengths
  - Elementary idea of anti-reflection coating and interference filters
- **Diffraction**
  - Single slit diffraction, position of maxima / minima and width of central maximum, intensity variation.
  - Construction and theory. Formation of spectra by plane transmission grating, Determination of wavelength of light using plane transmission grating
  - Introduction, Raleigh criterion, Resolving power of diffraction grating.
- **Polarization**
  - Plane, circular and elliptically polarized light on the basis of electric (light) vector
  - Malus law, Qualitative description of double refraction
  - Quarter and half wave plates, construction, working and use of these in production and detection of plane, circular and elliptically polarized light.
  - Introduction and law of optical rotation, specific rotation and its measurement using the half-shade and bi-quartz device.
- **Quantum Mechanics**
  - Heisenberg's Uncertainty Principle, Wave and Particle Duality of Radiation, De-Broglie's Concept of Matter waves, Quantum Nature of Light
  - Photoelectric Effect and Compton Effect
  - Concept of Wave Function, Physical interpretation of wave function and its properties
  - Schrödinger's Wave Equation: Time dependent and time independent cases
  - Particle in one-dimensional box

- **Nanotechnology**
    - Introduction of Nanotechnology, Effect on physical properties due to Nano scale
    - Methods of Nano material construction, Size determination by XRD, Applications of Nano materials
- **Solar Cell and Applications**
    - Introduction to Photovoltaic Cell/Solar Cell and It's Principles
    - Theory of Solar Cells, Types of Solar Cells, and Applications

Course Syllabi (Practical):

1. To determine the wave length of monochromatic light with the help of Fresnel's Biprism
2. To determine the wave length of sodium light by Newton's Ring
3. To determine the specific rotation of Glucose (Sugar) solution using a Polarimeter
4. To measure the Numerical Aperture of an Optical Fibre.
5. To determine the wavelength of sodium light by Michelson Interferometer
6. To determine coherent length and coherent time of laser using He-Ne Laser
7. To determine the height of object with the help of a Sextant.
8. To determine the dispersive power of material of a Prism for Violet Red and Yellow colours of Mercury light with the help of a spectrometer.
9. To determine the wave length of prominent lines of mercury by plane diffraction Grating with the help of spectrometer.
10. To verify the expression for the resolving power of a Telescope.
11. To study characteristics of photocell and determination of Planck's constant
12. To study diffraction pattern of single slit using laser

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test	2 hour	20
2.	End Term Test	2 hour	40
3.	Class Participation and/or Attendance	Day to day	15
4.	Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce)	Day to day	25

***Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)**

Text Books:

T1. G.D. Ladiwala and S. S. Sharma, "Engineering Physics-I" New Age International Publication, New Delhi, I edn. 2010.

T2. G.D. Ladiwala and S. S. Sharma, "Engineering Physics-II" New Age International Publication, New Delhi, I edn. 2010.

T3: Lab Manuals for Physics

Reference Books:

R1 ArtherBeiser, "Concept of Modern Physics" Tata McGrawHill, New Delhi, 5th edn. 1997.

R2 AjoyGhatak, "Optics", Tata McGraw Hill, 4th edn

R3 Eyvind H Wichman, "Quantum Physics" Tata McGraw Hill, Volume 4

R4 Neeraj Mehta, "Applied Physics for Engineers", PHI, I edn. 2011

R5: Dattu R Joshi, "Engineering Physics", Tata McGraw Hill Education Pvt. Ltd. New Delhi, I edn. 2010

ENGINEERING CHEMISTRY-I

Course Code	**:**	**CH101**
Course Title	**:**	**Engineering Chemistry-I**
Course Credits	**:**	**7**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi (Theory):

Water

Introduction and common Impurities in water, Hardness of water, Determination of hardness by Clark's test and complex metric (EDTA) method.Removal of hardness by Lime Soda, Zeolite and Ion exchange process.

Boiler feed water: troubles their causes, disadvantages and prevention, Scale & Sludge Carry over (Priming and Foaming), Boiler Corrosion and Caustic embrittlement.

Numerical based on EDTA method, LS process and Zeolite softening methods.

Polymers

Introduction to Polymer, Classification and constitutions of polymers. Methods of Polymerisation, Plastics: Thermosets and Thermoplastic. Preparation, properties and uses of Vinyl resins, Bakelite, Polyesters and Nylons. Rubbers: Natural rubber, vulcanization, synthetic rubbers e.g. Buna-S, Buna-N, Butyl, Thiocol and Neoprene rubbers.

Lubricants

Introduction, classification and uses of lubricants.Types of lubrication. Viscosity & viscosity index, Flash point and Fire point, cloud and pour point, steam emulsification number, precipitation number and neutralization number.

Organic Chemistry

Inductive, ElectromericMesomeric and Hyperconjugative effects. Stability of reaction intermediates (carbocation, carbanion and free radicals). Mechanism of nucleophilic substitutions. Mechanism of the following reactions:

(i) Aldol condensation
(ii) Cannizaro reaction
(iii) Beckman rearrangement
(iv) Hoffmann rearrangement and
(v) Diels-Alder reaction.

Stereochemistry: E-Z nomenclature, R.S. configuration, optical isomerism, chirality and its implications, Conformations of butene.

Engineering Materials

Cement: Definition, Composition basic constituents and their significance, manufacturing of Portland cement by Rotary Kiln technology. Chemistry of setting and hardening of cement and role of gypsum.

Glass: Definitions, properties, Manufacturing of glass. Types of silicates glasses and their commercial uses.Importance of annealing in glass making.

Course Syllabi (Practical):

1. To determine the hardness of water by complex metric method using EDTA.
2. To determine the hardness of water by HCl method.
3. To determine the amount of free chlorine in given sample.
4. Determination of total residual chlorine in a water sample.
5. Determination of free carbon dioxide in a given sample.
6. To determine the viscosity of a given sample of lubricant oil at various temperature.
7. To determine flash and fire point of a given lubricant using Pensky-Martin's apparatus.
8. To determine cloud and pour point of a given sample of lubricating oil using Cloud and Pour point apparatus.
9. Measurement of Nitrate in water sample.
10. Measurement of Oxygen in water sample.

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test	2 hour	20
2.	End Term Test	2 hour	40
3.	Class Participation and/or Attendance	Day to day	15
4.	Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce)	Day to day	25

***Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)**

Text Books:

1. Engineering Chemistry by Jain & Jain, **Dhanpatrai publication**

Reference Books:

1- Engineering Chemistry by B Sivasankar, (Mc-Graw Hill publication).
2- Engineering Chemistry by O.G. Palanna, (Mc-Graw Hill publication).
3- Organic Chemistry by Smith, (Mc-Graw Hill publication).
4- Organic Chemistry by IL Finar, (Pearson)
5- Engineering Chemistry (Wiely India publication).
6- Polymer Chemistry by Malcolm P. Stevens (Oxford University press)
7- Fundamentals of Polymers by NiranjanKarak (PHI India)
8- Polymer Chemistry by Gowariker (New Age International)

COMPUTER PROGRAMMING & IT

Course Code	**:**	**CSE101**
Course Title	**:**	**Computer Programing & IT**
Course Credits	**:**	**5.5**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 2**

Course Syllabi (Theory):

- Introduction: Stored Program Architecture of Computers, Evolution of Processors (In terms of word length & Speed only), Storage Device- Primary Memory and Secondary Storage, Working Principle of Primary Storage devices- RAM, ROM, PROM, EPROM, EEPROM, Random, Direct, Sequential access methods. Language Translators – Concept of High-Level, Assembly and Low Level programming languages. Working of Assembler, Interpreter and compiler. Representing Algorithms through flow chart, pseudo code, step by step etc.
- Number System: Data Representation, Concept of radix and representation of numbers in radix r with special cases of r=2, 8, 10 and 16 with conversion from radix r1 to radix r2. R's and (r-1)'s complement. Representation of Integer in sign-magnitude, signed 1's and 2's complement, Floating point representation. Concept of bias and normalization. Representation of alphabets, Binary Codes: Binary arithmetic, Addition and subtraction of Integers and floating point Numbers.
- Programming in C: Structure of C Program, Concept of Preprocessor, Macro Substitution, Intermediate code, Object Code, Executable Code. Compilation Process, Basic Data types, Importance of braces ({ }) in C Program, enumerated data type, Identifiers, Scope of Variable, Storage Class, Constants, Expressions in C, Type Casting, Control Statements, printf( ), scanf ( ), reading single character, Command Line arguments.
- Functions in C, Passing Parameters (By value & Reference), using returned data, Passing arrays, structures, array of structures, pointer to structures etc., passing characters and strings, The void pointer.
- Arrays in C, Pointers, Using pointers to represent arrays, Dynamic Memory allocation, structures, using typedef,
- Pointers: What is a Pointer? - How do you Define a Pointer? - Pointer Indexing - Pointer
- Arithmetic - Function data return with a Pointer - A pointer to a Function, Arrays of Structures & pointers,
- File Handling (Opening in different modes & closing of file, fscanf&fprintf only).

Course Syllabi (Practical):

1. Simple OS Commands, compiling program, compiler options, linking libraries.
2. Simple input output program integer, real character and string. (Formatted & Unformatted)
3. Conditional statement programs (if, if-else-if, switch-case)
4. Looping Program. (for, while, do-while)

5. Program based on array (one, two and three dimensions)
6. Program using Function (with and without recursion)
7. Simple programs using pointers.
8. File handling.Program using Structure and Union

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test	2 hour	20
2.	End Term Test	2 hour	40
3.	Class Participation and/or Attendance	Day to day	15
4.	Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce)	Day to day	25

***Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)**

Text Books:

T1. ReemaThareja "*Computer Fundamentals and Programming in C*" Oxford Education, first.2012

T2. Balagurusamy, "*Programming in ANSI C*" Tata Mcgraw Hill, sixth, 2012.

Reference Books:

R1 YashwantKanetkar, "Let us C" BPB publication, fifth, 2012.

ENVIRONMENTAL STUDIES

Course Code	**:**	**ID 101**
Course Title	**:**	**Environmental Studies**
Course Credits	**:**	**4**
Total Hours per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (Theory):

- Understanding environment, The global crisis, Basic Concepts
- Forest and Grassland ecosystems, Desert Ecosystems, Aquatic Ecosystems
- Introduction to Biodiversity, Biodiversity Conservation
- Water Resources, Energy Resources, Forest Resources
- Land, Food, and Mineral Resources
- Air and Noise Pollution, Water, Soil, and Marine Pollution
- Solid Waste Management and Disaster Management
- Population Growth, Environment and Human Health, Sustainable Development
- Global Warming, Acid Rain, and Ozone Depletion
- Different types of laws and regulations

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Text Books:

T-1. Rajagopalan, R., "Environmental Studies: From Crisis to Cure", Oxford University Press, New Delhi, 2e, 2011

Reference Books:

R1 Ranjit Daniels & J. Krishnaswamy "Environmental Studies", Wiley India

R2 Davis & Cornwell "Environmental Engineering", McGraw Hill

WORKSHOP PRACTICE

Course Code	**:**	**ME 141**
Course Title	**:**	**Workshop Practice**
Course Credits	**:**	**2**
Total Hours per Week (L+T+P)	**:**	**0+0+3**

Course Syllabi (Practical):

- Basics of manufacturing, types of production systems, ethics, safety in workshop.
- Metrology, quality, Least Count of a measuring Instrument, measurement with Varnier Caliper or Micrometer.
- Machining – Demonstration of Turning, Step Turning, Facing, etc.
- Casting – Demonstration of sand casting process
- Forging – Demonstration of forging operations
- Sheet metal working applications.
- Hands on practice of Sheet metal working operations using hand tools- Preparation of Funnel.
- Gas Welding, Demonstration of Gas Welding
- Hands on practice of Joining of metal parts by Arc Welding- Preparation of a Lap Joint model.
- Mechanical joining processes, Arc Welding
- Hands on practice of Joining of metal parts by Arc Welding- Preparation of a Butt Joint model.
- Introduction to wood working, Wood working Tools, Types of wood, Types of joints.
- Hands on practice of Wood working operations using hand tools- preparation of Lap Tee Joint, Mechanical joining processes, Soldering, Brazing.
- Machining – Demonstration of Shaping operations
- Hands on practice of Fitting operations using hand tools- Prepare a job in fitting shop.

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test	2 hour	20
2.	End Term Test	2 hour	40
3.	Class Participation and/or Attendance	Day to day	15
4.	Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce)	Day to day	25

Text Books:

T1. H S Bawa, "Workshop Practice", TMH, New Delhi, 2nd Edition, 2011

T2. B S NagendraParashar and R K Mittal, "Elements of Manufacturing Process", Prentice Hall of India, New Delhi, 2010 print

T3. B S Raghuwanshi, "A Course in Workshop Technology", DhanpatRai& Co., New Delhi, Volume I & II, 2011 reprint,

T4. SeropeKalpakjian and Steven R. Schmid, "Manufactuirng Engineering and Technology," Pearson Education (Low Cost Indian Edition), New Delhi, 4th Edition, 2005

Reference Books:

R1 K. Venkata Reddy, "Workshop Practice Manual", BS Publications, Hyderabad,6th Edition, 2011 print

R2 P. kannaiah and K. L. Narayana, "Engineering Practices Laboratory", SciTech Publications, Chennai, 2006

ENGINEERING GRAPHICS

Course Code	**:**	**CE101**
Course Title	**:**	**Engineering Graphics**
Course Credits	**:**	**2.5**
Total Hours per Week (L+T+P)	**:**	**1 + 0 + 2**

Course Syllabi (Theory &Practical):

- Introduction to Engineering Drawing & AutoCAD
- Drawing Setup, formatting, Basic Commands, Draw Toolbar
- Advanced Command, Object & Modify toolbar
- Orthographic Projection-I, Dimensioning
- Orthographic Projection-II, Orthographic Projection-III
- Isometric Projection-I, Isometric Projection-II, Isometric Projection-III

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test	2 hour	20
2.	End Term Test	2 hour	40
3.	Class Participation and/or Attendance	Day to day	15
4.	Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce)	Day to day	25

***Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)**

Text Books:

T1. Kulkarni D M, Rastogi A P, Sarkar A K, Engineering Graphics with AutoCAD, PHI Learning Pvt. Ltd., New Delhi, India, Fourth Printing (Revised Edition), 2012.

T2. Bhatt N D, Engineering Drawing, Charotar Book Stall, Anand, India.

Reference Books:

R1 Jolhe D A, Engineering Drawing with an introduction to AutoCAD, TMH, New Delhi, India.

R2 Gill P S, Engineering Drawing (Geometrical Drawing), S K Kataria& Sons, Delhi, India.

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Common to all Branches)

Batch 2013-2017

SEMESTER-SECOND

Detailed Syllabus

&

Scheme of Examination

PROFESSIONAL COMMUNICATION SKILLS

Course Code	**:**	**LA 201**
Course Title	**:**	**Professional Communication Skills**
Course Credits	**:**	**4**
Total Hours per Week	**:**	**1+1+2**

Course Syllabi (Theory):

- Introduction to the course. Characteristic Features of Effective Communication and Ways to Overcome Barriers to Communication.
- Importance of Non-Verbal Communication. Importance of Paralinguistic Features and Vocal Cues.
- Group Discussion. Job Interviews.
- Public Speaking.
- Business Letters and Resume.
- Business Reports, Technical Proposals.
- E-mail Writing, Other Business Writings.
- Editing and Proofreading.

Course Syllabi (Practical):

- Sounds of English
- Accent and Intonation
- Listening Skills
- Reading Comprehension
- Vocabulary Extension
- Professional Presentations
- Group Discussions
- Job Interviews

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test	2 hour	20
2.	End Term Test	2 hour	40
3.	Class Participation and/or Attendance	Day to day	15
4.	Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce)	Day to day	25

***Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)**

Text Book: Sanjay Kumar and PushpLata, Communication Skills, New Delhi: OUP, 2011.

Reference Books:

1. Meenakshi Raman and Sangeeta Sharma, Technical Communication: Principles and Practice, Second Edition, New Delhi: OUP, 2011.
2. Krishna Mohan and Meenakshi Raman, Effective English Communication, New Delhi: Tata-McGraw Hill, 2000.
3. Krishna Mohan and N.P.Singh, Speaking English Effectively, New Delhi: Macmillan,1994.

4. V. Sasikumar and P.V. Dhamija, Spoken English: A Self-Learning Guide to Conversation Practice, Tata-McGraw Hill, 2007.
5. Norman Lewis, Word Power Made Easy, Delhi: GoyalSaab Publishers and Distributors, 1994.
6. A.J.Thomson and A.V.Martinet, A Practical English Grammar, 4th Edition, New Delhi: OUP, 1999.
7. AshaKaul, Business Communication, Second Edition, New Delhi: PHI, 2010.
8. Edgar Thorpe and Showick Thorpe, Objective English, 2nd Edition, New Delhi: Pearson Education, 2008.

ENGINEERING MATHEMATICS-II

Course Code	**:**	**MA201**
Course Title	**:**	**Engineering Mathematics - II**
Course Credits	**:**	**5.5**
Total Hours per Week (L+T+P)	**:**	**3+1+0**

Course Syllabus:

- **Ordinary Differential equation**: Differential equation of first order, Differential equation of higher order with constant coefficients, Differential equation of second order with variable coefficients, Solution in series, Strum- Liouville Problem
- **Partial differential equation**: Partial Differential Equations of First Order, , Variable separable technique for solving PDE, Boundary value problems: Heat equation, wave equation, Laplace equation
- **Matrix Algebra**: Matrices, Rank of a Matrix, System of Linear Algebraic Equations, Linear Independence and Dependence, Eigen Values and Eigen Vectors, Diagonalization, Cayley Hamilton Theorem
- **Linear Algebra**: Unit Vector Space, Subspaces, Bases and Dimensions, Coordinates, Row Equivalence and Computations concerning Subspaces, Linear Transformations, The Algebra of Linear Transformations, Representation by matrices
- **3-Dimensional Geometry**: Equation of a sphere, Intersection of a sphere and a plane, tangent plane, Intersection of two spheres, orthogonality of two spheres, Right circular cone, Right circular cylinder

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	---	10

TEXT AND REFERENCE BOOKS

1. Dennis G. Zill and Warren S. Wright, *Advanced Engineering Mathematics*, Fourth Edition (Student Edition), Jones &Barlett, Viba, New Delhi, 2011.
2. B.V.Ramana, *Higher Engineering Mathematics*, Tata Mc-graw Hill.
3. Peter V. O'Neil,*Advanced Engineering Mathematics*, Seventh Indian Reprint, Cengage Learning, New Delhi, 2011.
4. Kreyszig, E., *Advanced Engineering Mathematics*, John Willey, Delhi (2011).
5. Potter M.C., Goldberg J.L., Edward F.A., *Advanced Engineering Mathematics*, 3rd Edition, Oxford University Press, 2005.
6. G.B. Thomas, Jr., *Thomas' calculus*, 11th edition (Indian), Pearson education, Delhi, 2008.

ENGINEERING PHYSICS-II

Course Code	**:**	**PH201**
Course Title	**:**	**Engineering Physics - II**
Course Credits	**:**	**7**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi (Theory):

Application of Schrodinger Equations and Band Theory of Solids

- Particle in three-dimensional boxes, Degeneracy.
- Barrier penetration and tunnel effect, Tunneling probability, Alpha Decay.
- Distinction between Insulators, Semiconductors and Conductors, Intrinsic and Extrinsic Semiconductors.

Statistical Mechanics (No derivation required)

- Introduction, Macroscopic and Microscopic Systems, Phase Space.
- Maxwell-Boltzman Statistics, Bose-Einstein Statistics, Fermi-Dirac Statistics.
- Sommerfeld Free Electron Gas Model of Solids.

Laser and Fibre Optics

- Theory of Laser Action, Einstein's Coefficients, Threshold Conditions for Laser Action.
- Theory, Design, and Applications of He-Ne Laser.
- Theory of Semiconductor Lasers.
- Optical Fibre, Numerical Aperture, and Maximum Angle of Acceptance.

Special Theory of Relativity

- Postulates of Special Theory of Relativity, Lorentz Transformations, Relativistic Velocity Addition.
- Relativity of Length, Mass, and Time, Mass-Energy Relation, Relativistic Energy and Momentum.

Nuclear Radiation Detectors

- Characteristics of Gas Filled Detectors, Constructions, Working, and Properties of Ionization Chamber.

- Proportional Counter, G.M. Counter, Paralysis Time, Quenching.
- Scintillation Counter.

Electro Dynamics

- Scalar and Vector fields, Definitions of Gradient, Divergence and Curl.
- Maxwell's Equations, Poynting vector.

Course Syllabi (Practical):

1. To determine the ferromagnetic constants retentivity, permeability and susceptibility by tracing I-H curve using C.R.O.
2. To study the Charge & Discharge of a condenser and hence determine time constant (Both current and voltage graphs are to be plotted).
3. To determine the high resistance by method of leakage, using a Ballistic Galvanometer.
4. To determine dielectric constant of a material using moving coil Ballistic Galvanometer.
5. To study characteristics of G.M. Counting System.
6. To determine the absorption coefficient of lead using lead sheet by G.M. Counting System.
7. To determine the specific resistance of the material of a wire by Carey Fosters Bridge.
8. To convert a Galvanometer in to an ammeter of range 1.5/3 amp and calibrate it.
9. To convert a Galvanometer in to a Volt of range 1.5/3 volt and calibrate it.
10. To study the variation of semiconductor resistance with temperature and hence determine the Band Gap of semiconductor in the form of reverse biased P-N junction diode
11. To study the variation of thermo e. m. f. of iron copper thermo couple with temperature

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40

4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test	2 hour	20
2.	End Term Test	2 hour	40
3.	Class Participation and/or Attendance	Day to day	15
4.	Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce)	Day to day	25

***Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)**

Text Books:

T1. G.D. Ladiwala and S. S. Sharma, "Engineering Physics-I" New Age International Publication, New Delhi, I edn. 2010.

T2. G.D. Ladiwala and S. S. Sharma, "Engineering Physics-II" New Age International Publication, New Delhi, I edn. 2010.

Reference Books:

R1 ArtherBeiser, "Concept of Modern Physics" Tata McGrawHill, New Delhi, 5th edn. 1997.

R2 AjoyGhatak, "Optics", Tata McGraw Hill, 4th edn

R3 Eyvind H Wichman, "Quantum Physics" Tata McGraw Hill, Volume 4

R4 Neeraj Mehta, "Applied Physics for Engineers", PHI, I edn. 2011

R5: Dattu R Joshi, "Engineering Physics", Tata McGraw Hill, New Delhi, I edn. 2010

ENGINEERING CHEMISTRY-II

Course Code	**:**	**CH 201**
Course Title	**:**	**Engineering Chemistry- II**
Course Credits	**:**	**7**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi (Theory):

Solid State Chemistry

Solid State, Types of solids, Space Lattice and Unit cell, Types of unit cell, Cubic System – number of atoms per unit cell, Atomic Radius, Density Calculation of unit cell. Bragg's Law X-ray studies of Crystals.
Graphite – Structure, Properties and applications.
Liquid Crystal: Liquid Crystalline state, Classification of liquid crystal and their applications.

Chemical Kinetics and Phase Rule
Rate of reaction, Molecularity and order of reaction, Zero, I and II order reactions, Theories of reaction rate, Temperature Dependence of rate of reaction (Arrhenius Equation). Calculation of activation energy.
Gibbs Phase Rule: Explanations of the terms used in phase rule. Application of phase rule to one component system (Water System)

Corrosion
Definition and its significance, Theories of corrosion - Dry corrosion theory, Wet (Electrochemical) theory, Passivity, Types of electrochemical corrosion. Factors influencing rate of corrosion.Protection from corrosion – protective coating, Cathodic and anodic protection, Modification in design

New Engineering Materials
Nanotechnology and Nano materials: Fullerenes and Carbon Nano tubes - Introduction, Structural properties, preparation and their applications.
Optical Fibers: Introduction, Structural properties, preparation and their applications.
Conducting Polymers: Introduction, types of conducting polymers, Mechanism of doping (p-type, n-type) and their applications.

Fuels
Definition and classification of fuels, Calorific value – Units, Gross (HCV) and Net (LCV) calorific values.Determination of HCV and LCV by Bomb Calorimeter.Calculation of calorific value by Dulong's Formula.
Coal: Types of coal, proximate and ultimate analysis of coal. Petroleum.

Course Syllabi (Practical):

1. Proximate analysis of solid fuel.
2. Determination of calorific value of solid fuels.
3. Measurement of pH of given sample by pH meter.
4. Measurement of conductivity of given sample by conductivity meter.
5. Measurement of Fluoride in water sample.
6. To determine the strength of copper sulphate with the help of Hypo solution.
7. To determine the strength of Ferrous Ammonium sulphate solution
8. To determine the strength of NaOH and Na_2CO_3 in given alkali mixture
9. Determination of Barium as barium sulphate gravimetrically.
10. Determination of Na/K/Ca by Flame photometer in a given sample.

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test	2 hour	20
2.	End Term Test	2 hour	40
3.	Class Participation and/or Attendance	Day to day	15

4.	Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce)	Day to day	25

***Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)**

Text Books:

2. Engineering Chemistry by Jain & Jain, **Dhanpatrai publication**

Reference Books:

9- Engineering Chemistry by B Sivasankar, (Mc-Graw Hill publication).

10- Engineering Chemistry by O.G. Palanna, (Mc-Graw Hill publication).

11- Organic Chemistry by Smith, (Mc-Graw Hill publication).

12- Organic Chemistry by IL Finar, (Pearson)

13- Engineering Chemistry (Wiely India publication).

14- Introduction to Nanotechnology by Poole Owens (Wiley)

ELECTRICAL & ELECTRONICS ENGINEERING

Course Code	**:**	**EE201**
Course Title	**:**	**Electrical & Electronics Engineering**
Course Credits	**:**	**7**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi (Theory):

Introduction:, basic physical laws, circuit elements, Source Transformation, KVL, KCL, Wye (Y) – Delta (Δ) and Delta (Δ) – Wye (Y) transformations.

Theorem: Norton, Thevenin, Superposition, Max power transfer Theorem

AC Networks: Fundamental aspects of single phase ac supply, Sinusoidal Steady State, Real/Reactive Power, Phasor,Three phase circuits, Start-delta, Two watt-meter Method, simple circuits, RMS Average value, Transients in R-L, R-C, R-L-C,

Transformer & Machine: Basics of transformer Faraday and Lenz law, Mutual Inductance, construction, Working Principles of Transformers,AC/DC machines

Introduction to Semiconductors: Defining Insulator, Semiconductor, Conductors.Band gap energy and band formation, elementaryidea about semiconductorbehavior,conductivity,types of semiconductor, p-type and n-type, working principle, characteristics and applications of Diode and Transistor,Transistor CE, CB, CC configuration

Introduction to SCR&Communication.

Course Syllabi (Practical):

ELECTRICAL LAB

1. Single line diagram of a power system and a distribution sub-station and basic functional study of main components used in power systems.
2. Make house wiring including earthing for 1-phase energy meter, MCB, ceiling fan, tube light,three pin socket and a lamp operated from two different positions. Basic functional study of components used in house wiring

3. Study the construction and basic working of ceiling fan, single phase induction motor and three phase squirrel cage induction motor. Connect ceiling fan along with regulator and single phase induction motor through auto-transformer to run and vary speed.
4. (a) Basic functional study and connection of moving coil & moving iron ammeters and Voltmeters, dynamometer, wattmeter and energy meter.

   (b) Run a 3-phase squirrel cage induction motor at no load and measure its voltage, current, power and power factor. Reverse the direction of rotation.
5. Study the construction, circuit, working and application of the following lamps:

   (i) Fluorescent lamp, (ii) Sodium vapour lamp, (iii) Mercury vapour lamp, (iv) Halogen lamp and (v) Neon lamp
6. (a) Study the construction and connection of single phase transformer and auto-transformer. Measure input and output voltage and fin turn ratio.

   (b) Study the construction of a core type three phase transformer. Perform star and delta Connection on a 3-phase transformer and find relation between line and phase voltage.

ELECTRONICS LAB

7. Identification, testing and applications of resistors, inductors, capacitors, PN-diode, Zenerdiode,LED, LCD, BJT, FET, UJT, SCR, Photo diode and Photo transistor.
8. (a) Functional study of CRO, analog & digital multi-meters and function / signal generator.

   (b) Study the single phase half wave and bridge rectifier and effects of filters on waveform.
9. Study the BJT amplifier in common emitter configuration. Measure voltage gain, plot gain frequency response and calculate its bandwidth.
10. (a) Study the construction and basic working of SCR.

    (b) Study the single phase half wave and bridge controlled rectifier and observe the effect of firing angle on waveform.

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40

4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test	2 hour	20
2.	End Term Test	2 hour	40
3.	Class Participation and/or Attendance	Day to day	15
4.	Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce)	Day to day	25

***Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)**

Text Books:

T_1: S.N.Singh "Basic Electrical Engineering", Prentice-Hall of India Pvt. Ltd, 2011.

T_2 J. Millman and C. Halkias, Integrated Electronics, McGraw Hill, 2nd Edition, 6th Indian Reprint, 2011

Reference Books:

R_1 T.K.Nagsarkar,M.S. Sukhija,"Basic Electrical Engineering", Oxford University press, 2nd edition, 2011.

R_2 A.S. Sedra and K.C. Smith, Microelectronic Circuits, Saunder's College Publishing, 1991.

ENGINEERING MECHANICS

Course Code	**:**	**ME 201**
Course Title	**:**	**Engineering Mechanics**
Course Credits	**:**	**5.5**
Total Hours per Week (L+T+P)	**:**	**3+1+0**

Course Syllabi (Theory):

- Fundamentals of engineering mechanics, Laws of Motion, Equilibrium, Conditions for equilibrium, Equations of equilibrium.
- **Statics of Particles and Rigid Bodies:** System of forces, Resultant force, Resolution of force, Moment and Couples.
- **Trusses:** Truss analysis, analysis of frames and machines.
- **Friction:** Types of Friction, Laws of friction, Angle of friction, Angle of repose, Applications of Friction.
- **Lifting Machines:** Mechanical advantage, Velocity Ratio, Efficiency of machine, Ideal machine, Ideal effort and ideal load, Reversibility of machine, Law of machine, Lifting machines; System of Pulleys, Simple wheel and axle, Wheel and differential axle, Weston's differential pulley block, Worm and worm wheel.
- **Properties of Plane Surfaces:** Centroids & Centre of Mass, area of moments, principle moments of inertia, Second moment of mass.
- **Virtual work:** Principle of Virtual Work, Active forces and active force diagram.
- **Kinematics of Particles and Rigid Bodies:** Velocity, Acceleration, Types of Motion, Equations of Motion, Rectangular components of velocity and acceleration, Angular velocity and Angular acceleration, Radial and transverse velocities and accelerations, Projectiles motion on plane and Inclined Plane, Relative Motion.
- **Kinetics of Particles and Rigid Bodies**: Equation of motion in rectangular coordinate, radial and transverse components, Equation of motion in plane for a rigid body.
- **Work, Energy and Power:** Work of a force, weight, spring force and couple, Power, Efficiency, Energy, Kinetic energy of rigid body, Principle of work and energy, Conservative and Non-conservative Force, Conservation of energy.

- **Impulse and Momentum:** Linear and angular momentum, Linear and angular impulse, Principle of momentum for a particle and rigid body, Principle of linear impulse and momentum for a particle and rigid body, Principle of angular momentum and Impulse, Conservation of angular momentum, Angular momentum of rigid body.

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (Weightage %)*
1.	Mid Term Test-I	1 hour	20
2.	Mid Term Test-II	1 hour	20
3.	End Term Test	3 hour	40
4.	Class Participation	Day to day	10
5.	Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others)	30 min.	10

Text Books:

T1. Meriam and Kraige, **"Engineering Mechanics-STATICS"**, John Wiley & Sons, Fifth Edition, 2010

T2. Meriam and Kraige, **"Engineering Mechanics-DYNAMICS"**, John Wiley & Sons, Fifth Edition, 2010

Reference Books:

R1 Engineering Mechanics, Basudeb Bhattacharyya, Oxford University Press

R2 Vector Mechanics for Engineers, Beer and Johnston, Tata McGraw-Hill., Ninth Edition, 2009.

R3 Engineering Mechanics, Hibbeler, Pearson Education, Sixth Edition, 2010

R4 Engineering Mechanics, Andrew Pytel&Kiusalas, Cengage Learning, Third Edition, 2010.

R5 Engineering Mechanics, Timoshenko and Young, Tata McGraw-Hill, Fourth Edition, 2006.

R6 Engineering Mechanics-Statics and Dynamics, Shames, Pearson Education.

R7 Engineering Mechanics, Boresi and Schmidt, CL-Engineering, First Edition, 2008.

MACHINE DRAWING

Course Code	**:**	**ME 241**
Course Title	**:**	**Machine Drawing**
Course Credits	**:**	**2**
Total Hours per Week (L+T+P)	**:**	**0+0+3**

Course Syllabi (Practical):

- **Introductory concepts & BIS conventions:** Introduction, Classification of drawing, Code of practice, Drawing instruments, Size and layout of drawing sheets, Folding of drawing sheets, Description of different types of lines, Patterns of lettering, Patterns of section & other conventions, General system of dimensioning, Conventional representation of threads & threaded parts, Conventional representation of springs, Conventional representation of gears.
- **Isometric drawing:** Introduction, Isometric planes, lines and axes, Isometric scales, Isometric projection and isometric view, Some basic methods for drawing isometric figures, Conversion of orthographic views into isometric views, Conversion of orthographic views into isometric projections, Conversion of isometric figure into orthographic projections, Blueprint and reading of blueprint, Procedure of reading blueprint, Recovering missing lines and missing views, Freehand sketching, Freehand orthographic views, Freehand isometric views, AutoCAD supplement, Setting isometric grid and snap. Drawing isometric circles, displaying different views
- **Sectional views:** Introduction, Convention for placement of section planes, Types of section planes, obvious section plane, Specified section plane, Convention for placement of section views, Section of interpenetrated solids, AutoCAD supplement.
- **Limits, tolerance & fits:** Introduction, Some basic definitions, Nominal size, Actual size, Basic size, Design size, Zero line, Limits of size, Allowance, Deviation, Maximum metal condition, Least metal condition, Engineering tolerance, Consideration for setting tolerance, Grade of tolerance, Linear tolerance indication, Angular tolerance indication, Cumulative tolerance, **Fits** Types of fits, Basis of fits, Indication of fits, Selection of fits, AutoCAD supplement.

Evaluation Scheme:

EC	Evaluation Component	Duration	Marks (100)	Nature of

No.			(%)	Component
1.	Mid Term Test	2 hour	20	Closed Book
2.	End Term Test	2 hour	40	Closed Book
3.	Class Participation	Day to day	15	……
4.	Continuous Evaluation (Discipline, Punctuality, Assignment & Viva Voce)	Day to day	25	……

Text Books:

T1. Basudeb Bhattacharyya***, "Machine Drawing including AutoCAD Supplements,"***Oxford University Press, 2012, Second Impression

T2. Ajeet Singh, ***"Machine Drawing: Includes AutoCAD,"*** TMH, 2nd edition

Reference Books:

R1. Yarwood, Alf. ***"Introduction to Auto – CAD 2011 2D and 3D Design",*** Elsevier, ***1st***edition, 2010

R2. Ellen Finkelstein, ***"Auto-CAD 2011 & Auto-CAD LT 2011 Bible,"*** Wiley India Edition

R3 Bhatt, N.D. ***"Machine Drawing",***CharotarPulisher, 38th edition, 2003

R4 James E Fuller, ***"Using Auto-CAD,"*** Denmark Publishing Co.

R5 Dhawan, R.K. "***Machine Drawing***", S. Chand and Co, 2005

R6 Radhakrishnan, P., ***"Computer Graphics and Design***", Dhanpatrai and Sons

JK Lakshmipat University

LaliyaKa Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2013-17

SEMESTER-THREE

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE301	Data Structures	3	0	4	5

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test – I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks **
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock interviews/others

**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Arrays as storage elements for representing polynomial of one or more degrees or addition & multiplication, sparse matrices for transposing & multiplication, stack, queue, dequeue, circular queue for insertion and deletion with condition for over and underflow, transposition of sparse matrices with algorithms of varying complexity (Includes algorithms for operations as mentioned). Evaluation of Expression: Concept of precedence and associativity in expressions, difficulties in dealing with infix expressions, Resolving precedence of operators and association of operands, postfix & prefix expressions, conversion of expression from one form to other form using stack (with & without parenthesis), Evaluation of expression in infix, postfix & prefix forms using stack, Recursion.
- Linear linked lists: singly, doubly and circularly connected linear linked lists insertion, deletion at/ from beginning and any point in ordered or unordered lists, Comparison of arrays and linked lists as data structures. Linked implementation of stack, queue and dequeue, Algorithms for/of insertion, deletion of stack, queue, and dequeue implemented using linked structures. Polynomial representation using linked lists for addition, Concepts of Head Node in linked lists.Searching, sequential and binary search.
- Non-Linear Structures: Trees definition, characteristics concept of child, sibling, parent child relationship etc., binary tree: different types of binary trees based on distribution of nodes, binary tree (threaded and unthreaded) as data structure, insertion, deletion and traversal of binary trees, constructing binary tree from traversal results, Threaded binary Tree, Time complexity of insertion, deletion and traversal in threaded and ordinary binary trees. AVL tree: Concept of balanced trees, balance factor in AVL trees, insertion into and deletion from AVL tree, balancing AVL tree after insertion and deletion, Application of trees for representation of sets.
- Graphs: Definition, Relation between tree & graph, directed and undirected graph, representation of graphs using adjacency matrix and list, Depth first and breadth first traversal of graphs, finding connected components and spanning tree, Single source single destination shortest path algorithms. Sorting: Insertion, quick, Merge, heap, topological and bubble sorting algorithms for different characteristics of input data. Comparison of sorting algorithms in term of time complexity.

Course Syllabi (Practical):

List of Experiments:

1. Write a simple C program on a 32 bit compiler to understand the concept of array storage, size of a word. The program shall be written illustrating the concept of row major and column major storage. Find the address of element and verify it with the theoretical value. Program may be written for arrays Upto 4-dimensions.
2. Simulate a stack, queue, circular queue and dequeue using a one dimensional array as storage element. The program should implement the basic addition, deletion and traversal operations.
3. Represent a 2-variable polynomial using array. Use this representation to implement addition of polynomials.
4. Represent a sparse matrix using array. Implement addition and transposition operations using the representation.
5. Implement singly, doubly and circularly connected linked lists illustrating operations like addition at different locations, deletion from specified locations and traversal.
6. Repeat exercises 2, 3 & 4 with linked structures.
7. Implementation of binary tree with operations like addition, deletion, traversal.
8. Depth first and breadth first traversal of graphs represented using adjacency matrix and list.
9. Implementation of binary search in arrays and on linked Binary Search Tree.
10. Implementation of insertion, quick, heap, topological and bubble sorting algorithms.

Text Books:

1. ReemaThareja, Data Structure using C, Oxford Education, Third Edition, 2012
2. Data Structures through C,YashwantKanetkar, BPB Publications Sixth Edition, 2012

Reference Books:

1. Alfred V. Aho, Jeffrey D. Ullman, John E. Hop croft, Data Structures and Algorithms. Pearson Education, 2012

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE302	Object Oriented Programming	3	0	4	5

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

Identifiers and constants (Literals), Keywords, Data Types, The Operators, New Casting Operators, Typeid and throw, The Conditional structures and Looping Constructs

Difference between Struct and class in C++, The difference between Union and Class, Static Data members of a class, Pointer to objects and pointer to members of class, The local classes,

Assigning Objects

Introduction to Functions, The Inline function, Default Arguments to the function, Functions with object as parameters, Call by reference and return by reference, Prototyping and Overloading, Friend functions, Const and Volatile functions, Static functions, Private and Public functions

Introduction to constructors, The explicit constructors, Parameterized constructors, Multiple constructors, Constructors with default arguments, Dynamic Initialization, Constructor with dynamic allocation, copy constructors, The member initialization list, destructors

Overloading Operators, The need, Defining derived class using single base class, Derivation using public, private and protected access modifiers

The implementation of Inheritance in the C++ object model, The multiple-inheritance, Abstract classes, Composite objects (container objects), Compile Time and Runtime Polymorphism

Introduction, Need for Exception handling, Components of exception handling mechanism

Course Syllabi (Practical):

Programs using C++ which covers following concepts:

- Declaration and Usage of Classes and Objects
- Constructors and Destructors.
- Overloaded Functions and Overloaded Operators.
- Inheritance
- Exception handling mechanism.

Text Books:

1. Object Oriented Programming with C++ , Balagurusamy, Third Edition, Tata McGraw Hill

Reference Books:

1. Programming with ANSI C++ by Bhushan Trivedi, Oxford University Press

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE303	Principles of Programming Languages	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test – II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

Preliminary Concepts: Reasons for studying, concepts of programming languages, Definition, History, Features. Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming, and Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments.

Issues in Language Translation, Syntax and Semantics, Stages analysis and synthesis, Parse Tree, CFG and BNF grammar.

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

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, and Unconditional Statements.

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators.

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java.

Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads.

Exception handling: Exceptions, exception Propagation, Exception handler in C++ and Java.

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, application of Functional Programming Languages and comparison of functional and imperative Languages. Scripting Language: Pragmatics, Key Concepts, Case Study: Python – Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation.

TEXT BOOKS:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education,2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.

REFERENCE BOOKS:

1. Programming Languages, 2nd Edition, A.B. Tucker, R.E. Noonan, TMH.
2. Programming Languages, K. C.Louden, 2nd Edition, Thomson,2003.
3. LISP, Patric Henry Winston and Paul Horn, Pearson Education.
4. Programming in Prolog, W.F. Clocksin,&C.S.Mellish, 5th Edition, Springer.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
ECE 301	Electronic Device & Circuits	3	1	2	5

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

**The ratio of weightage between Theory and Practical content will be 60%: 40%

Syllabus (Theory)

- **Semiconductor Physics:** Mobility and conductivity, charge densities in a semiconductor, Fermi Dirac distribution, carrier concentrations and Fermi levels in semiconductor, Generation and recombination of charges, diffusion and continuity equation, Mass action Law, Hall effect.
- **Junction Diode:** PNJunction diodes, Diode as a circuit element, load line concept, clipping and clamping circuits, Voltage multipliers. Zener diode, characteristics and its applications.
- **Bipolar Junction Transistor:** Transistor characteristics, Current components, Current gains: alpha and beta. Operating point. Hybrid model, h-parameter equivalent circuits. CE, CB and CC configuration. DC and AC analysis of CE, CC and CB amplifiers. Ebers-Moll model. Biasing & stabilization techniques. Thermal runaway, Thermal stability.
- **Field Effect Transistor** JFET, MOSFET, Equivalent circuits and biasing of JFET's & MOSFET's. Low frequency CS and CD JFET amplifiers. FET as a voltage variable resistor. Biasing, Small signal model analysis.
- **Small Signal Amplifiers at Low Frequency:** Analysis of BJT and FET, DC and RC coupled amplifiers. Frequency response, mid-band gain, gains at low and high frequency. Analysis of DC and differential amplifiers. Miller's Theorem. Cascading Transistor amplifiers, Darlington pair. Emitter follower, source follower.

Syllabus (Practical)

1. Plot V-I characteristic of P-N junction diode & calculate cut-in voltage, reverse saturation current and static & dynamic resistances.
2. Plot V-I characteristic of Zener diode and study of Zener diode as voltage regulator. Observe the effect of load changes and determine load limits of the voltage regulator.
3. Study of application of diode as clipper & clamper circuit.
4. Plot input and output characteristics of BJT in CB, CC and CE configurations.
5. Plot frequency response curve for single stage amplifier and to determine gain bandwidth product.

6. Plot drain current-drain voltage and drain current-gate bias characteristics of field effect transistor and measure of I_{DSS}& V_P.
7. Plot gain-frequency characteristic of two stages RC coupled amplifier & calculate its bandwidth and compare it with theoretical value.

Text Books:

1. Microelectronics Circuits (Theory and Applications), Adel S. Sedra and Kenneth C. Smith, Adapted by Arun N. Chandorkar, 5th Ed. Oxford International Student Edition.
2. Electronic Device and Circuits, J.B. Gupta, Katson Educational Series.
3. Electronic Devices and Circuits, S. Salivahanan, N. Suresh Kumar and A Vallavaraj, Tata Mc-Graw Hill 2rd Edition

Reference Books:

1. Millman's Electronic Devices and Circuits, JocobMillman, Christos C Halkias&SatyabrataJit, Tata Mc-Graw Hill 3rd Edition.
2. Electronic Devices and Circuit Theory, Robert L. Boylestad and Louis Nashelsky, Pearson 10th Edition.
3. Electronic Devices and Circuits, David A. Bell, Oxford 5th Edition.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MA 301	Engineering Mathematics – III	3	1	0	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

Unit 1: Integral Transforms

Laplace transform and its properties, Fourier Transform.

Unit 2: Applications of Transform Calculus

Integral transform method for solving differential equations, Systems of Linear Differential Equations

Unit 3: Special Functions

Legendre and Bessel functions, series representations and recurrence relations

Unit 4: Calculus of variations

Extremal function, Euler Equation, Isoperimetric problems

Unit 5: Complex Analysis

Functions of complex variables and its derivatives, Integration in complex planes, Series, Singularities and Residues, Evaluation of Real Integrals, Conformal mappings, Schwarz-Christoffel Transformations

Text books and Reference books

7. Dennis G. Zill and Warren S. Wright, *Advanced Engineering Mathematics*, Fourth Edition (Student Edition), Jones & Barlett, Viba, New Delhi, 2011
8. Peter V. O'Neil, *Advanced Engineering Mathematics*, Seventh Indian Reprint, Cengage Learning, New Delhi, 2011.
9. Erwin Kreyszig, *Advanced Engineering Mathematics*, Wiley 9th Edition.
10. B. S. Grewal, *Higher Engineering Mathematics*, 41st Ed., Khanna Publishers, Delhi, 2011.
11. H. K. Dass, *Advanced Engineering Mathematics*, 12^{th} editions with corrections, S. Chand and Company, Meerut, 2004
12. B. V. Ramana, *Higher Engineering Mathematics*, Tata Mcgraw Hill.
13. Potter M.C., Goldberg J.L., Edward F.A., *Advanced Engineering Mathematics*, 3rd Edition, Oxford University Press, 2005

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
HS 302	Principles of Management for Engineers	2	0	0	2

Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- **Concepts of management:** Functions and Responsibilities of managers, Principles of management and visiting various, Schools of management Thoughts in developing, Excellent managers
- **Planning:** Nature and purpose of planning, Planning process and principles, Types of planning, Advantages and disadvantages of planning, Concept of objectives and types of objectives, Case analysis
- **Organizing:** Nature and purpose of organizing, Process of organizing, Span of management and determination of span of management, Principles of organizing, Departmentalization, delegation and, Decentralization. Case analysis
- **Directing and leading:** Requirements of Effective directions, Giving orders, motivation, Nature of leadership, leadership and management, Recapitulation and case discussion
- **Controlling:** concept and process, Need for controlling and types of control methods, Essentials of effective control, Benefits and problems in control systems. Case analysis
- Social responsibilities of business: Meaning, Social responsibility of business towards different groups, Social performance of business in India, Social audit, Business ethics and corporate governance

Text Books:

1. Tripathy, P.C. and Reddy, P. N. "Principles of Management". . McGraw Hill, New Delhi.4th ed. 2008.

Reference Books:

1. Koontz, Herold and Weihrich, Heinz. "Management". McGraw Hill, New York. 9th ed. 1988.
2. Stoner, James A. F. and Freeman, R Edward. "Management". Prentice Hall of India, New Delhi. 6th e, 1989.
3. Bateman, T. S. and Snell, S. A. "Management: Leading and Collaborating in a Competitive World", McGraw Hill Irwin. 8th edition,2009.
4. Draft, R. L. "Principles of Management". Cengage learning.2009
5. Schermerhron, J. R. "Introduction to Management", 10th edition, Wiley India. 2009

JK Lakshmipat University

LaliyaKa Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2013-17

SEMESTER-FOUR

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE402	Discrete Structures	3	1	0	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Language of Logic: Proposition, Compound Proposition, Conjunction, Disjunction, Implication, Converse, Inverse & Contrapositive, Bi-conditional Statements, tautology, Contradiction & Contingency, Logical Equivalences, Quantifiers, Arguments.
- Proof Methods: Vacuous, Trivial, Direct, Indirect by Contrapositive and Contradiction, Constructive & Non-constructive proof, Counterexample. The Division Algorithm, Divisibility Properties (Prime Numbers & Composite Numbers), Principle of Mathematical Induction, The Second Principle of Mathematical Induction, Fundamental Theorem of Arithmetic. Algorithm Correctness: Partial Correctness, Loop Invariant. Testing the partial correctness of linear & binary search, bubble & selection sorting.
- Graph Theory: Graphs – Directed, Undirected, Simple,. Adjacency & Incidence, Degree of Vertex, Sub graph, Complete graph, Cycle & Wheel Graph, Bipartite & Complete Bipartite Graph, Weighed Graph, Union of Simple Graphs. Complete Graphs. Isomorphic Graphs, Path, Cycles & Circuits Euclerian& Hamiltonian Graphs. Planar Graph: Kuratowski's Two Graphs, Euler's Formula, Kuratowski's Theorem. Trees: Spanning trees- Kruskal'sAlgo, Finding Spanning Tree using Depth First Search, Breadth First Search, Complexity of Graph, and Minimal Spanning Tree.
- Sets: Definition and types, Set operations, Partition of set, Cardinality (Inclusion- Exclusion & Addition Principles), Recursive definition of set. Functions: Concept, Some Special Functions (Polynomial, Exponential & Logarithmic, Absolute Value, Floor & Ceiling, Mod & Div. Functions), Properties of Functions, Cardinality of Infinite Set, Countable & Uncountable Sets, the Pigeonhole & Generalized Pigeonhole Principles, Composition of Functions.
- Relations: Boolean Matrices, Binary Relation, Adjacency Matrix of Relation, Properties of Relations, Operations on Relations, The Connectivity Relations, Transitive Closure-Warshall's Algorithm, Equivalence relations- Congruence Relations, Equivalence Class, Number of Partitions of a Finite Set, Partial & Total Orderings.

Text Books:

1. Kenneth Rosen, Discrete Mathematics and its applications, 5th edition, Tata-McGraw Hill, 2002.
2. C.L. Liu, Elements of Discrete mathematics, McGraw-Hill, 1985

Reference Books:

1. D. B. West, Introduction to Graph Theory, Prentice Hall of India.
2. M. Artin, Algebra, Prentice-Hall India, 1991

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE404	Foundations of Computer Graphics	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Introduction: Introduction to Raster scan displays, Storage tube displays, and refreshing, flicking, interlacing, color monitors, display processors, resolution, Introduction to Interactive. Computer Graphics: Picture analysis, Overview of programmer's model of interactive graphics, Fundamental problems in geometry. Scan Conversion: point, line, circle, ellipse polygon, Aliasing, and introduction to Anti-Aliasing (No antialiasing algorithm).
- 2D & 3D Co-ordinate system: Homogeneous Co-ordinates, Translation, Rotation, Scaling, Reflection, Inverse transformation, Composite transformation. Polygon Representation, Flood Filling, Boundary filling. Point Clipping, Cohen-Sutherland Line Clipping Algorithm, Polygon Clipping algorithms. Searching, sequential and binary search.
- Hidden Lines & Surfaces: Image and Object space, Depth Buffer Methods, Hidden Facets removal, Scan line algorithm, Area based algorithms. Curves and Splines: Parametric and Non parametric Representations, Bezier curve, B-Spline Curves.
- Rendering: Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading, ray tracing, color models like RGB, YIQ, CMY, HSV
- Multimedia: Multimedia components, Multimedia Input/output Technologies: Storage and retrieval technologies, Architectural considerations, file formats. Animation: Introduction, Rules, problems and Animation techniques.

Course Syllabi (Practical):

- Study of basics of openGL
- WAP to draw a Line using DDA line drawing algorithm
- WAP to draw a line using breshanham's algorithm
- Write a program to draw circle using midpoint circle algorithm
- To draw an ellipse using mid point ellipse algorithm
- Write a program to translate, rotate and scale the2D object
- Write a program to fill polygon using boundary and flood fill algorithm
- Implementation of clipping algorithm.
- Write a program to translate, rotate and scale the 3D object.
- Write a program to draw 3D effects. sphere with illumination

Text Books:

1. J. Foley, A. Van Dam, S. Feiner, J. Hughes: Computer Graphics- Principles and Practice,Pearson
2. Hearn and Baker: Computer Graphics, PHI

Reference Books:

1. Multimedia Systems Design, PrabhatAndleigh and Thakkar, PHI.
2. Multimedia Information Networking, N.K.Sharda, PHI.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE401	Database Management Systems	3	1	2	5

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Basic Concepts : data, database, database systems, database management systems, instance, schema, Database Applications, Purpose and Advantages of Database Management System (over file systems), View of Data (Data Abstraction, Data Models), Database Languages (DML, DDL), Relational Databases (Tables, DML, DDL), Data Storage and Querying (Components, Storage Manager, Query Processor), Database Architecture, Database User and Administrators
- Design Phases, Design Alternatives (Major Pitfalls), Entity Relational Model (Entity Sets, Relationship Sets, Attributes), Constraints (Mapping Cardinalities, Keys, Participation Constraints), Entity Relationship Diagram, Weak Entity Set, Extended E-R features (Generalization, Specialization and Aggregation), E-R Notations, Examples of ERD
- Features of Good Relational Design, Atomic Domain and First Normal Form, Decomposition Using Functional Dependency (Key and Functional Dependency, BCNF, 2NF, 3NF), Functional Decomposition Theory (Closure Set of Functional Dependency with Armstrong Rules, Canonical Cover and Loseless Decomposition), Dependency Preservation, Comparison of 3NF and BCNF, Decomposition Using Multi-Valued Dependencies (Multi-Valued Dependency and 4 NF)
- Structure of Relational Databases (Basic Structure, Database Schema, Types of Keys), Fundamental Relational Algebra Operations (Select, Project, Union, Set Difference, Cartesian Product and Rename Operator), Additional Relational Algebra Operators (Set Intersection, Natural Join, Division Operator, Assignment Operator), Examples
- Transaction Concept (Transaction State, Basic Definitions, ACID Property), Implementation of Atomicity and Durability (Shadow Paging Concept), Concurrent Execution (Reasons of Concurrent Execution, Serial and Concurrent Schedule), Serializability (Conflict and View Serializability), Recoverability of Schedules (Recoverable Schedule and Cascade-less Schedule), Lock-based Protocol (Types of Lock and Deadlock Concept), Two-Phase Locking Protocol, Deadlock Handling (Deadlock Prevention Techniques like Wait-Die, Wound-Wait), Recovery of Deadlock (Selection of

  Victim, Rollback, and Starvation), Insert and Delete Operations (Delete, Insertion, Phantom Phenomenon), Transaction Failure, Storage Structure and Transaction Log and Log-Based Recovery (Deffered Database Modification, Immediate Database Modification, Checkpoints)

Course Syllabi (Practical):

- Introduction to SQL, Advantages of using SQL, SQL concepts and tools, The generic SQL Sentence Construct, Create Table, Insertion of Data into tables, Viewing data in the tables, Delete Operations, Update Operations, Modifying the structure of tables, Renaming Tables, Destroying Tables, Examining Objects created by a User, Arithmetic Operators, Logical Operators, Range Searching, Pattern Matching, Column Alias, Aggregate Functions, Scalar Functions, Date Conversion Functions, Data Constraints, Defining integrity constraints in the alter table command, Dropping integrity constraints in the alter table command, Default Value Concept, Grouping Data from tables, Manipulating dates in SQL, Subqueries, Joins, Union, Intersect and Minus Clause, Index, View, Sequence

Text Books:

T1. Silberschatz, Korth, Sudarshan, "Database System Concepts", 5th Edition, McGraw Hill Publication

Reference Books:

R1. C J Date, A Kannan, S Swaminathan, "An Introduction to Database Systems", 8th Edition, Pearson Education (2006)

R2. S K Singh, "Database Systems: Concepts, Design and Applications", Pearson Education

R3. Elmsari, Navathe, "Fundamentals of Database Systems", 5th Edition, Pearson Education (2008)

R4. Peter Rob, Carlos Coronel, "Database Systems: Design, Implementation and Management", 7th Edition, Cengage Learning (2007)

Textbook for Practical

T1. "Oracle 9i PL/SQL", Oracle Press.

Reference Book for Practical

R1. Ivan Bayross, "SQL, PL/SQL The Programming Language Oracle".

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE403	Computer Architecture & Organization	3	1	0	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100					

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

BASIC STRUCTURE OF COMPUTERS : Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes – RISC – CISC. ALU design – Fixed point and floating point operations.

BASIC PROCESSING UNIT : Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control – Nano programming.

PIPELINING : Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets –Data path and control considerations – Performance considerations – Exception

handling.

MEMORY SYSTEM :Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories – Improving cache performance – Virtual memory – Memory management requirements – Associative memories – Secondary storage devices.

I/O ORGANIZATION : Accessing I/O devices – Programmed Input/Output -Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and processors.

Text Books:

1. William Stallings, “Computer Organization and Architecture – Designing for Performance”, Sixth Edition, Pearson Education, 2003.

Reference Books:

1. David A. Patterson and John L. Hennessy, “Computer Organization and Design: The Hardware/Software interface”, Third Edition, Elsevier, 2005.
2. John P. Hayes, “Computer Architecture and Organization”, Third Edition, Tata McGraw Hill, 1998.
3. V.P. Heuring, H.F. Jordan, “Computer Systems Design and Architecture”, Second Edition, Pearson Education, 2004.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
ECE 402	Digital Electronics	3	1	2	5

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Digital system and binary numbers: Signed binary numbers, binary codes, cyclic codes, error detecting and correcting codes, hamming codes.
- Gate-level minimization: The K-map method up to five variable, don't care conditions, POS simplification, NAND and NOR implementation, Quine Mc-Clusky method (Tabular method)
- Combinational Logic: Combinational circuits, analysis procedure, design procedure, binary adder-subtractor, decimal adder, binary multiplier, magnitude comparator, decoders, encoders, multiplexers ,demultiplexers
- Synchronous Sequential logic: Sequential circuits, storage elements: latches, flip flops, analysis of clocked sequential circuits, state reduction and assignments, design procedure.
- Registers and counters: Shift registers, ripple counter, synchronous counter, other counters.
- Memory and programmable logic: RAM, ROM, PLA, PAL. Design at the register transfer level: ASMs, design example, design with multiplexers. Asynchronous sequential logic: Analysis procedure, circuit with latches, design procedure, reduction of state and flow table, race Free State assignment, hazards.

Course Syllabi (Practical):

1. Study of logic gates.
2. Design and implementation of adders and subtractors using logic gates.
3. Design and implementation of code converters using logic gates.
4. Design and implementation of 4-bit binary adder/subtractor and BCD adder using IC 7483.
5. Design and implementation of 2-bit magnitude comparator using logic gates, 8-bit magnitude comparator using IC 7485.
6. Design and implementation of 16-bit odd/even parity checker/generator using IC 74180.
7. Design and implementation of multiplexer and demultiplexer using logic gates and study of IC 74150 and IC 74154.

8. Design and implementation of encoder and decoder using logic gates and study of IC 7445 and IC 74147.
9. Construction and verification of 4-bit ripple counter and Mod-10/Mod-12 ripple counter.
10. Design and implementation of 3bit synchronous up/down counter.
11. Implementation of SISO, SIPO, PISO and PIPO shift registers using flip-flops

Text Books:

1. M. Morris Mano and M. D. Ciletti, "Digital Design", 4th Edition, Pearson Education
2. Pedroni - Digital Electronics & Design, Elsevier

Reference Books:

1. F. Vahid: Digital Design: Wiley Student Edition, 2006
2. J. F. Wakerly, Digital Design Principles and Practices, Fourth Edition, Prentice-Hall, 2005.
3. R. L. Tokheim, Digital electronics, Principles and applications, 6th Edition, Tata McGraw Hill Edition.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MA 402	Numerical and Statistical Methods	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

**The ratio of weightage between Theory and Practical content will be 60%: 40%

Syllabus (Theory)

- **Modeling, Computers, and Error Analysis**: Mathematical Modeling and solution using Programming and Software, Computer Arithmetic and Errors: Approximations and Round-Off Errors, Truncation Errors and the Taylor Series
- **Transcendental and polynomial equation**: Solution of non-linear Equations: Bisection Method, *Regula-falsi* Method, Secant Method, Newton Raphson Method
- **Linear Algebraic Equations**: LU Decomposition Method, Gauss Elimination Method, Gauss Jordan Elimination Method, Iterative methods for solving system of linear equations.
- **Interpolation and approximation**: Netwon Formula for forward and backward interpolation, Sterling Central difference interpolation, Lagrangian Interpolation
- **Numerical Differentiation and Integration**: Numerical Differentiation and Integration, Newton-Cotes Integration Formulae.
- **Ordinary Differential Equations**: Picard Method, Euler Method, Modified Euler Method, Runge-Kutta 4^{th} order Method, Milne Predictor-Corrector Method
- **Random Variables and probability distributions**: Introduction to probability, Discrete and continuous random variables, Probability Distributions: Binomial, Possion, Exponential, Normal distributions, Mathematical expectation, Chebyshev's inequality, Discrete and continuous probability distributions
- **Sampling distributions**: Sampling, Types of sampling, sampling errors, sampling distribution of means, variance and proportions for normal population, The Central Limit Theorem, Chi-Square, t and F distributions
- **Estimation**: Estimators, Point and interval estimation, confidence intervals for parameters in one sample and two sample problems of normal populations, confidence intervals for proportions
- **Testing of Hypotheses**: Null and alternative hypotheses, the critical and acceptance regions, two types of error, Parametric Tests, Chi-square goodness of fit test, Contingency tables.
- **Correlation and regression**: Types of Relationships, Scatter Diagrams, Regression Line, Coefficients of Determination and Correlation

Syllabus (Practical)

Numerical Methods using MATLAB and Statistical Analysis using SPSS in Computer Labs that includes:

1. Numerical solution of algebraic and transcendental equations.
2. Numerical solution of system of linear equations.
3. Interpolation.
4. Numerical differentiation.
5. Numerical integration.

6. Numerical solution of differential equations.
7. Data Analysis using Correlation and Regression
8. Test of Hypothesis

Text books and Reference books

1. K. E. Atkinson, *Introduction to Numerical Analysis*, John Wiley and Sons.
2. M.K. Jain, S. R. K. Iyengar, R. K. Jain, *Numerical Methods For Scientific And Engineering Computation*, New age International publishers, New Delhi.
3. Steven C Chapra, Raymond P Canale, *Applied Numerical Methods with MATLAB for Engineers and Scientists*, 3rd Editions, Tata Mc Graw Hill, New Delhi, 2012.
4. Srimanta Pal, *Numerical Methods: Principles, Analyses and Algorithms*, Oxford University Press, New Delhi.
5. Cheney and Kincaid, *Numerical Methods and Applications*, Cengage Publications, New Delhi.
6. Cleve B. Moler, *Numerical Computing with MATLAB*, Prentice Hall of India, New Delhi .
7. Rishard A. Johnson, *Miller and Freund's probability and Statistics for Engineers*, PHI, 8th Ed.
8. Ravichandran J., *Probaility and statistics for Engineers*, Wiley India, New Delhi.
9. Douglas C. Montgomery and George C. Runger, *Applied Statistics and Probability for Engineers*, John Wiley & Sons, Inc., 3rd Edition (2004).
10. Prem S. Mann, *Introductory Statistics*, Wiley publication, 7th edition.

JK Lakshmipat University

LaliyaKa Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2013-17

SEMESTER-FIVE

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE501	Operating System	3	1	2	5

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test – II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks **
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Basic Elements of Computer System, Processor Registers, Instruction Execution, Interrupts, The Memory Hierarchy, Cache Memory, Operating System Objectives and Functions, The Evolution of OS, Major Achievements, Characteristics of Modern OS ,Process States, Process Description, Process Control, UNIX Process Management, Processes and Threads, Principles of Concurrency, Mutual Exclusion, Software Approaches, Mutual Exclusion: Hardware Support, Semaphores, Monitors, Message Passing, Reader/Writer Problem, Principles of Deadlock, Deadlock Prevention.
- Deadlock Avoidance, Deadlock Detection, An Integrated Deadlock Strategy, Dining Philosophers Problem, Memory Management Requirements, Memory Partitioning, Paging, Segmentation, Hardware and Control Structures, OS Software, UNIX Memory Management
- Uni-processor Scheduling: Types of Scheduling, Scheduling, Algorithms, Traditional UNIX Scheduling, Multiprocessor and Real-time Management: Multiprocessor Scheduling, Thread Scheduling, Real-Time Scheduling
- I/O Management and Disk Scheduling: I/O Devices, Organization of the I/O Function, OS Design
- Issues, I/O Buffering, Disk Scheduling, RAID, Disk cache, File Management: Overview, File Organization, File Directories, File Sharing, Record Blocking, Secondary Storage Management.
- Distributed Processing, Client/Server and Clusters: Client/Server Computing, Distributed Message, Passing, Remote Procedure Calls, Clusters.

Course Syllabi (Practical)

- Linux Basics, File System, Commands in Linux, Pipes and Filters, Communication commands, Shell Scripting in Linux

Text Books:

1. Stalling W, “Operating Systems”, 6th edition, Prentice Hall India.
2. C.L. Liu, Elements of Discrete mathematics, McGraw-Hill, 1985

Reference Books:

1. Silberschatz, A., Peter B. Galvin and Greg Gagne, “Operating System Principles, Wiley India, 8th Edition
2. Tanenbaum A.S., “Modern Operating Systems”, 4th Edition, PHI, 2001
3. Flynn I.M, “Understanding Operating Systems”, Cengage India Publication

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE503	Computer Networks	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks **
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Introduction Concepts: Goals and Applications of Networks, Network structure and architecture, The OSI reference model, services, Network Topology Design - Delay Analysis, Back Bone Design, Local Access Network Design, Physical Layer Transmission Media, Switching methods, ISDN, Terminal Handling.
- Medium Access sub layer: Medium Access sub layer - Channel Allocations, LAN protocols - ALOHA protocols - Overview of IEEE standards - FDDI. Data Link Layer - Elementary Data Link Protocols, Sliding Window protocols, Error Handling.
- Network Layer: Network Layer - Point - to Pont Networks, routing, Congestion control Internetworking -TCP / IP, IP packet, IP address, IPv6.
- Transport Layer: Transport Layer - Design issues, connection management, session Layer- Design issues, remote procedure call. Presentation Layer-Design issues, Data compression techniques, cryptography - TCP - Window Management.
- Application Layer: Application Layer: File Transfer, Access and Management, Electronic mail, Virtual Terminals, Other application. Example Networks - Internet and Public Networks.

Course Syllabi (Practical):

1. Packet transmission – packetization of data, simple point-to-point communication.

2. MAC Layer – Observe and measure the performance of various MAC Layer protocols by changing the network load, distance between the nodes wherever applicable and compare them:

- BUS Topology:
  - ALOHA: Exposure to multiple access to a shared medium, throughput vs offered load
  - CSMA: Throughput vs offered load for various node distances in the form of bit delays
  - CSMA/CD: Throughput vs offered load, packet delay vs throughput at various loads
  - Token-Passing BUS: Demand assignment when compared to random access protocols, packet delay vs throughput – comparison with CSMA/CD
  - CSMA/CA: DCF mode operation – Throughput vs offered load – comparison with CSMA/CD performance

- RING Topology:
    - Token Ring: Throuhgput vs average packet delay at various loads and timeout values, performance comparison with CSMA/CD

3. DLL: Observe and measure the performance of various DLL protocols by changing the network load, various timeout period, introducing bit errors and compare them

- Stop-and-Wait: Throughput vs BER for different packet lengths and timeout values
- Sliding Window – Go-Back-N: Pipelining concept – throughput vs BER for different packet lengths and timeout values – comparison with Stop-and-Wait
- Sliding Window – Selective-Repeat: Pipelining with selective re-transmissions concept – throughput vs BER for different packet lengths and timeout values – comparison with Go-Back-N

4. Network Layer: Study of Routing Protocols

- Distance Vector routing: Hop-by-hop routing, routing table updation, count-to-infinity problem exposure
- Link State routing: Routing table updation, effect of shortest path algorithm, comparison with DV routing

5. Application Layer:

- File transfer using sockets: TCP connection establishment, session management

6. Serial/Parallel port networking: Simple network connectivity using serial and parallel ports in a PC, setup TCP/IP communication through PPP.

7. Data security in computer networks:

- Data protection: RC4 symmetric stream cipher-key generation, encryption-decryption steps
- Network threat: Sniffing of raw data and encrypted data in a LAN

8. STAR Topology (Optional):

- ALOHA, CSMA, CSMA/CD, Stop & Wait and Sliding Window GBN protocols performance in STAR topology
- Switching in LAN: Switching at Layer 2, self-learning using Baran's backward learning algorithm

Text Books:

1. Forouzen, "Data Communication and Networking", TMH

2. A.S. Tanenbaum, Computer Networks, Pearson Education

3. W. Stallings, Data and Computer Communication, Macmillan Press

4. AnuranjanMisra, “Computer Networks”, Acme Learning

5. G. Shanmugarathinam, ”Essential of TCP/ IP”, Firewall Media

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE504	Theory of Computation	3	1	0	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Introduction; Alphabets, Strings and Languages; Automata and Grammars, Deterministic finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), NFA with epsilon transit ion, Language of NFA, Equi valence of NFA and DFA, Minimization of Finite Automata, Distinguishing one string from other, Myhill-Nerode Theorem
- Regular expression (RE) , Definition, Operators of regular expression and their precedence, Algebraic laws for Regular expressions, Kleen's Theorem, Regular expression to FA, DFA toRegular expression, Arden Theorem, Non Regular Languages, Pumping Lemma for regular Languages . Application of Pumping Lemma, Closure properties of Regular Languages, Decision properties of Regular Languages, FA with output: Moore and Mealy machine, Equivalence of Moore and Mealy Machine, Applications and Limitation of FA.
- Context free grammar (CFG) and Contex t Freee Languages (CFL): Definition, Examples, Derivation , Derivation trees, Am biguity in Grammer, Inherent ambiguity, Ambiguous to Unambiguous CFG, Useless symbols, Simplification of CFGs, Normal forms for CFGs: CNF and GNF, Closure proper ties of CFLs, Decision Properties of CFLs: Emptiness, Finiteness and Membership, Pumping lemma for CFLs,
- Push Down Automata (PDA): Description and definition, Instantaneous Description, Language of PDA, Acceptance by Final state, Acceptance by empty stack, Deterministic PDA, Equivalence of PDA and CFG, CFG to PDA and PDA to CFG, Two stack PDA
- Turing machines (TM): Basic model, definit ion and representatio n, Instantaneous Description, Language acceptance by TM, Variants of Turing Machine, TM as Computer of Integer functions, Universal TM, Church's Thesis, Recursive and recursively enumerable languages, Halting problem, Introduction to Undecidability, Undecidable problems about TMs. Post correspondence problem (PCP), Modified PCP, Introduction to recursive function theory

Text & reference Books

1. Hopcroft, Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education
2. K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science : Automata, Languages and Computation", PHI
3. Martin J. C., "Introduction to Languages and Theory of Computations", TMH
4. Papadimitrou, C. and Lewis, C.L., "Elements of the Theory of Computation", PHI

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE505	Web Technologies	3	0	4	5

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

Internet Structure, Protocols and Access: Internet Protocol Model overview, Internet Addresses, Internet Protocol, Transport Layer, Upper layer Protocols, Internet Access, Internet Applications, Future of Internet and Internet related applications

www and Web Servers : About World Wide Web, Planning a WebSite, IIS Configurations and settings, Apache Configuration, Introduction to PWS

XHTML: Introduction, Forms, Internal Linking, Image Maps, meta, frameset

Cascaded Style Sheet: Inline styles, Embedded Style Sheets, Linking Style Sheets, Text Flow andBox Model

JavaScript: Introduction, Control Structures, Functions, Arrays, Objects

Dynamic HTML:Object Model and Collection, Event Model, Filters and Transitions, Data bindingand Tabular Data Control

XML :XML namespaces, DTDs and schemas, DOM, SAX, XSL, SOAP

ASP : Introduction, ASP Objects, FSO, Data Access ObjectBuilding Interactive Animation : Working with Flash and DreamWeaver, Wireless Internet andm-business , Introduction to Wireless Internet, WAP, m-businessE-business and E-commerce: E- Business Models, Building an e-business Application, emarketing,Security

Introduction to .NET:.NET framework, The common language runtime (CLR), .NET framework class library (FCL),Introduction to common type system, value types, reference types, inside of .NET application,Introduction to assembly, Microsoft intermediate language (MSIL).

Intoduction to C#: Basics of C#, types, array, flow control, classes and objects, properties, indexer, delegate, Overviewof exception handling, interface, namespace, collection classes.

Course Syllabi (Practical):

1. Write a java program to present a set of choices for a user to select Stationary products and display the price of Product after Selection from the list.
2. Write a java program to demonstrate typical Editable Table, describing employee details for a software company.
3. Write a java program using Split pane to demonstrate a screen divided in two parts, one part contains the names of Planets and another Displays the image of planet.
4. When user selects the planet name form Left screen, appropriate image of planet displayed in right screen.
5. Develop Simple Servlet Question Answer Application to demonstrate use of HttpServletRequest and HttpServletResponse interfaces.
6. Develop Servlet Application of Basic Calculator (+,-,*, /, %) using ServletInputStream and ServletOutputStream.
7. Develop a JSP Application to accept Registration Details form user and Store it into the database table.
8. Develop a JSP Application to Authenticate User Login as per the registration details. If login success the forward user to Index Page otherwise show login failure Message.
9. Develop a web application to add items in the inventory using JSF.
10. Develop a Room Reservation System Application Using Enterprise Java Beans.
11. Develop a Hibernate application to store Feedback of Website Visitor in MySQL Database. a Develop a simple Struts Application to Demonstrate 3 page Website of Teaching Classes which passes values from every page to another.
12. Develop a simple Struts Application to Demonstrate E-mail Validator.
13. Develop a simple "Hello World" Web Service with SOAP in Java.
14. Develop a Simple Web Service and Client with JAX-WS.
15. Develop an application to show searching the Directory using JNDI capabilities.

Text Books & References

1. Xavier, C, "Web Technology and Design" , New Age International

2. Deitel, "Java for programmers", Pearson Education

3. Ivan Bayross," HTML, DHTML, Java Script, Perl & CGI", BPB Publication.

4. Ramesh Bangia, "Internet and Web Design" , New Age International

5. Jackson, "Web Technologies" Pearson Education

6. Patel and Barik, "Introduction to Web Technology & Internet", Acme Learning

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MA 502	Optimization Techniques	3	1	0	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test – I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

- **Introduction:** Introduction to Optimization and its scope, Formulating a Mathematical Model, Deriving Solutions from the Model
- **Linear Programming Problems:** Revised Simplex Method, Duality Theory and Sensitivity Analysis, Dual Simplex Method, Transportation Problem, Assignment Problem
- **Non-linear Programming:** Introduction, Single variable and multi variable optimization, Constrained and unconstrained problems, Kuhn-Tucker conditions
- **Other Optimization Models:** Dynamic Programming, Game Theory, Project Management with CPM/PERT
- **Simulations:** Simulation V/s mathematical modeling, Monte Carlo simulation, simulation language, ARENA, Example & cases
- **Queuing Theory**: Basic structure of queuing models, role of the exponential distribution, The birth and death processes, queuing models based on birth and death processes (M/M/1 Model)
- **Inventory Theory**: Components of inventory models, deterministic continuous review models
- **Sequencing Theory:** Johnsons Algorithm for n Jobs and Two machines, n Jobs and Three Machines, Two jobs and m Machines Problems

Text books and Reference books

1. S S Rao, *Engineering Optimization: Theory and Practices*, New Age International, 1996.
2. Hillier F.S. and Lieberman G.J., *Introduction to Operations Research: Concepts and Cases*, Tata McGraw Hill, 8th Ed., (Indian Adapted Edition), 2005.
3. Taha. H. A, *Operations Research: An Introduction*, Pearson Education, 7th ed., 2003.
4. Ronald L. Rardin, *Optimization in Operations Research*. Pearson Education, First Indian Reprint 2002.
5. Pant.J.C., *Introduction to Optimization: Operations Research*, Jain Brothers, 5th Ed., 2000.
6. Sharma. S. D., *Operations Research*, KedarnathRamnath& Co., 15th Edition, 2006.
7. Kalyanmoy Deb, *Optimization for Engineering Design: Algorithms and Examples*, PHI.
8. Kasana H.S. and Kumar K.D., *Introductory Operations Research: Theory and Applications*, Springer.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE521 (Elective-I)	Management Information System	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100					

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Organization & Types, Decision Making, Data & information, Characteristics & Classification of information, Cost & value of information, Various channels of information & MIS. Foundation of Information System: Introduction to Information System in Business Fundamentals of Information System, Solving Business Problems with Information System, Concept of Balanced MIS, Effectiveness & Efficiency Criteria. Tool and Techniques of MIS- dataflow diagram, flow chart etc.
- Business application of information technology, electronic commerce, Internet, Intranet, Extranet & Enterprise Solutions, Information System for Business Operations, Information system for managerial Decision Support, Information System for Strategic Advantage. Managing Information Technology, Enterprise & Global Management, Security & Ethical Challenges, Planning & Implementing Change.
- Reports: Various types of MIS reports, GUI & Other Presentation tools.
- Advanced concepts in information system: Enterprise Resource Planning: introduction, various modules like Human Resources, Finance, Accounting, Production& Logistics. Supply Chain Management, CRM, Procurement Management System Object Oriented modeling case studies.

Text & Reference Books

1. O.Brian, “Introduction to Information System”, Mc-Graw Hill.
2. O.Brian, “Management Information System”, TMH.
3. Alter, “Information Systems : A Management Perspective”, Addison Wesley.
4. Arora & Bhatia, “Information Systems for Managers”, Excel
5. Bansal, “Information System Analysis & Design”, TMH.
6. Jawadegar, “Management Information System”, TMH.
7. Murdick, “Information System for Modern Management”, PHI.
8. Alexis Leon, “Enterprise Resource Planning”, TMH.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 522 (Elective-I)	Information Technology & Project Management	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100					

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Overview of Software Project Planning Software Project, Categorization of software Project, Introduction to Stepwise Project Planning, Project Scope, Infrastructure, Resource Allocation etc, Project Plan Execution.
- Project Evaluation Strategy assessment, Technical Assessment, Cost Benefit Analysis, Cash flow forecasting, Risk Evaluation, Selection of Technologies, Rapid application Development, Prototyping Example.
- Software Effort Estimation & Activity Play Over & under estimation problem, basis for software estimation, Estimation by analogy, COCOMO, Parameter Model function, point analysis, Project schedule, Planning Model, Project Tim management, Activity duration estimation.
- Risk management, Identification, Analysis and abatement of risk, Nature of resources, critical, county cost, schedule, Monetary & control, Cost Monitoring, Priority by monetary, Managing Control , Contract Management, Human Resource Management.
- Software quality Assurance, Software quality in project planning, Software quality definition, ISO 9126 standards, Product quality management,SEICMM model

Text & References:

- Shtub, Bard, and Globerson,"Project Management: Engineering, Technology, & Implementation", Prentice Hall
- Neal Whitten , "Managing Software Development Projects, Formula for Success", 2nd Edition, John Wiley & Sons
- Bob Hughes, Mike Cotterell, "Software Project Management", 3rd Edition, McGrawHill

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 523 (Elective-I)	Data Compression & Encryption	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

Introduction: Compression Techniques, Modeling and Coding,

Mathematical Preliminaries for Lossless Compression: Overview

Introduction to Information Theory: Models, Coding

Huffman Coding: Overview, The Huffman Coding Algorithm, Minimum Variance Huffman Codes, Adaptive Huffman Coding, Application of Huffman Coding,

Arithmetic Coding: Overview, Introduction, Coding a Sequence, Generating a Binary Code, Comparison of Huffman and Arithmetic Coding, Applications

Dictionary Techniques: Overview, Introduction, Static Dictionary, Adaptive Dictionary, Applications

Mathematical Preliminaries for Lossy Coding: Overview, Introduction, Distortion Criteria, Models

Scalar Quantization: Overview, Introduction, The Quantization Problem, Uniform Quantizer, Adaptive Quantization, Nonuniform Quantization

Vector Quantization: Overview, Introduction, Advantages of Vector Quantization over Scalar Quantization

Transform Coding: Overview, Introduction, The Transform, Transforms of Interest, Discrete Cosine Transform, Quantization and Coding of Transform Coefficients, Application to Image Compression – JPEG, Application to Audio Compression,

Wavelet-Based Compression: Image Compression, Embedded Zerotree Coder, Set Partitioning in Hierarchical Trees, JPEG 2000

Encryption: Introduction: Security Services, Mechanisms, Attacks

Conventional Cryptography: Model for conventional cryptography, various ciphering techniques

Modern encryption techniques: DES, IDEA, RSA, Diffie Hellman Key exchange, Digital Signatures, Hash Functions, Message Authentication Codes

Text & References:

1. Introduction to Data Compression – Second Editon By Khalid Sayood Morgan Kaufmann, Harcourt India Publication
2. Cryptography and Network Security – William Stallings

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 524 (Elective-I)	Graph Theory	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

Matchings, Pathcover, Connectivity, Hamiltonicity, Vertex Coloring, Edge Coloring, Other Coloring Problems, Perfect graphs, Planar graphs, Other special classes of graphs, Network flow, Introduction to minor theory, Probabilistic Methods: Basics, Markov, Chebishey Inequalities, Lovasz Local Lemma, Random graph

Text & References:

1. R. Diestel, "Graph Theory", Springer-Verlag, 2nd edition, 2000.
2. N. Alon and J. Spenser, "Probabilistic Methods", John Wiley and Sons, 2nd edition, 2000.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
PS501	Practice School – I				4

S. No.	Evaluation Component	Marks (100) (Weightage %)
1	Quiz-I	4
2	Quiz-II	4
3	Group Discussion-I	4
4	Group Discussion-II	4
5	Seminar-I	4
6	Seminar-II	4
7	Diary-I	4
8	Diary-II	4
9	Observation-I	4
10	Observation- II	4
11	Mid Term Evaluation (Project Report and Presentation/Viva)	20
12	Final Evaluation (Project Report and Presentation/Viva)	40

Course Syllabi:

This course is for 6 weeks at the end of 4th semester during summer term of 4 year full time B. Tech. and 5 year Integrated Dual degree (B.Tech + M.Tech, B.Tech + MBA) programs in all the engineering disciplines. The objective of this programme is to provide the students an understanding of working of corporate world in various functions associated with an Industry/Organization. During this programme, they will observe and learn various real world applications of their curricula and develop an understanding of vast engineering operations and its various facets such as inventory, productivity, management, information systems, human resource development, data analysis etc. The general nature of PS-1 assignments is of study and orientation.

JK Lakshmipat University

LaliyaKa Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2013-17

SEMESTER-SIX

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE601	Distributed Systems	3	0	4	5

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

Characterization of Distributed Systems: Introduction, Examples of distributedSystems, Resource sharing and the Web Challenges.

System Models: Architectural models, Fundamental Models Theoretical Foundation for Distributed System: Limitation of Distributed system,

absence of global clock, shared memory, Logical clocks, Lamport's& vectors logicalclocks, Causal ordering of messages, global state, termination detection.

Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.

Distributed Deadlock Detection: system model, resource Vs communication deadlocks,deadlock prevention, avoidance, detection & resolution, centralized dead lock detection,

distributed dead lock detection, path pushing algorithms, edge chasing algorithms.

Agreement Protocols: Introduction, System models, classification of AgreementProblem, Byzantine agreement problem, Consensus problem, Interactive consistencyProblem, Solution to Byzantine Agreement problem, Application of Agreement problem,

Atomic Commit in Distributed Database system.

Distributed Objects and Remote Invocation: Communication between distributedobjects, Remote procedure call, Events and notifications, Java RMI case study.

Security: Overview of security techniques, Cryptographic algorithms, Digital signatures

Cryptography pragmatics, Case studies: Needham Schroeder, Kerberos, SSL & Millicent.

Distributed File Systems: File service architecture, Sun Network File System, TheAndrew File System, Recent advances.

Transactions and Concurrency Control: Transactions, Nested transactions, Locks,Optimistic Concurrency control, Timestamp ordering, Comparison of methods forconcurrency control.

Distributed Transactions: Flat and nested distributed transactions, Atomic Commitprotocols, Concurrency control in distributed transactions, Distributed deadlocks,

Transaction recovery. Replication: System model and group communication, Fault -tolerant services, highly available services, Transactions with replicated data.

Distributed Algorithms: Introduction to communication protocols, Balanced slidingwindow protocol, Routing algorithms, Destination based routing, APP problem,Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Electionalgorithm.CORBA Case Study: CORBA RMI, CORBA services.

Course Syllabi (Practical):

Programs related to CORBA, EJB, RMI

Text/Reference Books:

1. Singhal&Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill

2. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design",

Pearson Ed.

3. Gerald Tel, "Distributed Algorithms", Cambridge University Press

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE602	Design & Analysis of Algorithms	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Introduction: Algorithms, Analyzing algorithms, Complexity of algorithms, Growth of functions, Performance measurements, Sorting and order Statistics - Shell sort, Quick sort, Merge sort, Heap sort, Comparison of sorting algorithms, Sorting in linear time.
- Advanced Data Structures: Red-Black trees, B – trees, Binomial Heaps, Fibonacci Heaps.
- Divide and Conquer with examples such as Sorting, Matrix Multiplication, Convex hull and Searching.
- Greedy methods with examples such as Optimal Reliability Allocation, Knapsack, Minimum Spanning trees – Prim's and Kruskal's algorithms, Single source shortest paths - Dijkstra's and Bellman Ford algorithms.
- Dynamic programming with examples such as Kanpsack, All pair shortest paths – Warshal's and Floyd's algorithms, Resource allocation problem. Backtracking, Branch and Bound with examples such as Travelling Salesman Problem, Graph Coloring, n-Queen Problem, Hamiltonian Cycles and Sum of subsets.
- Selected Topics: Algebraic Computation, Fast Fourier Transform, String Matching, Theory of NP-completeness, Approximation algorithms and Randomized algorithms.

Course Syllabi (Practical):

Write programs for following Techniques using language of your choice.

1 Selection Sort

2 Bubble sort

3 Insertion sort

4 Counting sort

5 Radix sort

6 Quick Sort

7 Merge Sort

8 Linear search (Array & Linked list)

9 Binary Search (with & without recursion)

10 Binary Search Tree

11 Maximum Subarray Problem

12 Breadth First Search

13 Depth First Search

14 Minimal Spanning Trees(Prism algorithm)

15 Minimal Spanning Trees(Kruskal's Algorithm)

16 Median Finding

Text and References:

1. Thomas H. Coreman, Charles E. Leiserson and Ronald L. Rivest, “Introduction to Algorithms”, Prentice Hall of India.
2. RCT Lee, SS Tseng, RC Chang and YT Tsai, “Introduction to the Design and Analysis of Algorithms”, Mc Graw Hill, 2005.
3. E. Horowitz & S Sahni, "Fundamentals of Computer Algorithms",
4. Berman, Paul,” Algorithms”, Cengage Learning.
5. Aho, Hopcraft, Ullman, “The Design and Analysis of Computer Algorithms” Pearson Education, 2008.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE603	Compiler Design	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Introduction, lexical analysis: Language processors; The structure of a Compilers; The evolution of programming languages; The science of building a compiler; Applications of Compiler technology; Programming language basics; Lexical analysis: The Role of Lexical Analyzer; Input Buffering; Specifications of Tokens; Recognition of Tokens.
- Syntax Analysis 1: Introduction; Context-free Grammars; Writing a Grammar; Top-down Parsing, Syntax Analysis 2: Bottom-up Parsing; Introduction to LR Parsing: Simple LR.
- Syntax-Directed definitions: Evaluation order for SDDs; Applications of Syntax-directed translation; Syntax-directed translation schemes. **,** Intermediate code generation**:** Variants of syntax trees; Three-address code; Types and declarations; Translation of expressions; Type checking; Control flow; Back patching; Switch statements; Intermediate code for procedures.
- Run-Time environments: Storage Organization; Stack allocation of space; Access to non-local data on the stack; Heap management; Introduction to garbage collection,
- Code generation: Issues in the design of Code Generator; The Target language; Addresses in the target code; Basic blocks and Flow graphs; Optimization of basic blocks; A Simple Code Generator.

Course Syllabi (Practical):

Practice of Lex/Yacc for Compiler Writing, Program to check whether a string belongs to grammar or not, program to parse a tree, Program to find leading terminals, Program to find trailing terminals, Program to check whether a grammar is left recursive and remove left recursion, Program to remove left factoring, Program to show all operations of a stack

Text Books:

1. K. Muneeswaran, Compiler Design, Oxford University Press, 2012

Reference Books:

1. Compilers- Principles, Techniques and Tools, Alfred V Aho, Monica S. Lam, Ravi Sethi, Jeffrey D Ullman – 2nd Edition, Addison-Wesley, 2007.
2. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
3. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE604	Software Engineering	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

- Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes, Software Development Life Cycle (SDLC) Models: Water Fall Model, Linear Sequential Model, Prototype Model, Spiral Model, RAD Model, Evolutionary Development Models, Incremental Model, Component Assembly Model, Iterative Enhancement Models.
- Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modeling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS. Software Quality Assurance (SQA): Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Models, SEI-CMM Model
- Basic Concept of Software Design, Architectural Design, Low Level Design, Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design. Software Measurement and Metrics: Various Size Oriented Measures: Hallstead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures, Control Flow Graphs
- Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up. Testing Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing of Products. Static Testing Strategies: Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards
- Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering. Software Configuration Management Activities, Change Control Process, Software Version Control, An Overview of CASE Tools. Estimation of Various Parameters such as Cost, Efforts, Schedule/Duration, Constructive Cost Models (COCOMO), Resource Allocation Models, Software Risk Analysis and Management

Course Syllabi (Practical):

Experiments are to practice software engineering techniques. Use any open source CASE tool. You can choose any other CASE tool, as per choice.

Design Approach: Object Oriented

These designing can be done on any automation system e.g. library management system, billing system, payroll system, bus reservation system, students result management system.

1. Do a feasibility study
2. Document all the requirements as specified by customer in Software Requirement Specification
3. Design sequence diagrams for project
4. Design Collaboration diagram
5. Design Data Flow Diagram for the project
6. Design Entity Relation Diagram for the project
7. Design Class diagram
8. Code and test the project, which you have designed in last 8 labs.

Text Books:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", 7th Edition, McGraw Hill Publications

Reference Books:

1. Sommerville, "Software Engineering", 8th Edition, Pearson Education
2. Waman S. Jawadekar, "Software Engineering – Principles and Practices", TMGH
3. Publication
4. Pankaj Jalote, "Software Engineering – A Precise Approach", Wiley India ", Tata McGraw-Hill, 2003.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE609	Information Security	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Introduction to security attacks, services and mechanism, Classical encryption techniques substitution
- Ciphers and transposition ciphers, cryptanalysis, steganography, Stream and block ciphers.
- Modern Block Ciphers: Block ciphers principles, Shannon's theory of confusion and diffusion, Fiestal structure, Data encryption standard(DES), Strength of DES, Idea of differential cryptanalysis, block cipher modes of operations, Triple DES
- Introduction to group, field, finite field of the form GF(p), modular arithmetic, prime and relative prime numbers, Extended Euclidean Algorithm,
- Advanced Encryption Standard (AES) encryption and decryption Fermat's and Euler's theorem, Primality testing, Chinese Remainder theorem, Discrete Logarithmic Problem, Principals of public key crypto systems, RSA algorithm, security of RSA
- Message Authentication Codes: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions, Secure hash algorithm (SHA)
- Digital Signatures: Digital Signatures, Elgamal Digital Signature Techniques, Digital signature standards (DSS), proof of digital signature algorithm,
- Key Management and distribution: Symmetric key distribution, Diffie-Hellman Key Exchange, Public key distribution, X.509 Certificates, Public key Infrastructure.
- Authentication Applications: Kerberos, Electronic mail security: pretty good privacy (PGP), S/MIME.
- IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management. Introduction to Secure Socket Layer, Secure electronic, Transaction (SET).
- System Security: Introductory idea of Intrusion, Intrusion detection, Viruses and related threats, Firewalls

Text Books & References:

1. William Stallings, "Cryptography and Network Security: Principals and Practice", Pearson Education.
2. Behrouz A. Frouzan: Cryptography and Network Security, TMH
3. Bruce Schiener, "Applied Cryptography". John Wiley & Sons
4. Bernard Menezes," Network Security and Cryptography", Cengage Learning.
5. AtulKahate, "Cryptography and Network Security", TMH

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
ECE622 (Elective II)	Microprocessors & Interfacing	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Revision of logic circuits with emphasis on control lines, SAP concepts with stress on timing diagrams, Microinstructions, Microprogramming, Variable machine cycle, Architecture of 8085 Processor , Functions of all signals, Bus concepts, Multiplexed and De-multiplexed Bus, Minimum system.
- Instruction set, Addressing modes, Stack operation, Timing diagrams, Programming examples like Time delay, Looping, Sorting, Code conversions like BCD to Binary, Binary to BCD, HEX to ASCII, ASCII to HEX, BCD Arithmetic etc.
- 8085 based Microcomputer system, Memory Organization, Memory Interfacing, Memory Mapped I/O, I/O Mapped I/O, Interrupts, Hardware and Software Interrupts, Interrupt instructions, Programmed I/O, Interrupt driven I/O, DMA.
- Architecture of 8255 I/O peripheral chip, Modes of operation, Hand shake mode operation, BSR mode, ADC 0801 and ADC 0808 Interfacing with microprocessor, Analogue multiplexed ADC, DAC 0808 specifications, DAC Interfacing.
- 8253 timer, Modes of operation, Applications, 8279 Keyboard/Display Interface, Different modes of operation, Interfacing, Programming examples, 8237 DMA Controller.
- Introduction to Microcontrollers, 8051 Microcontroller, Memory Organization, Programming techniques, Addressing modes, Instruction set, Interrupt structure, Port structure, Different modes of operation, Programming examples.

Course Syllabi (Practical):

1. Familiarization with 8085 register level architecture and trainer kit components, including the memory map. Familiarizationwiththeprocessofstoringandviewingthecontentsofmemoryaswellas registers.
2. Study of prewritten programs on trainer kit using the basic instruction set (data transfer, Load/Store, Arithmetic, Logical)
3. Transfer of a block of data in memory to another place in memory in the direct and reverse order.
4. Searching a number in an array and finding its parity.
5. Serial and Parallel data transfer on output port 8155 & 8255 & designing of disco light, running light, and sequential lights on off by above hardware.
6. Generation of different waveform on 8253/ 8254 programmable timer.
7. Program using subroutine calls and IN/OUT instructions using 8255 PPI on the trainer kit eg, subroutine for delay, reading switch state & glowing LEDs accordingly, finding out the frequency of a pulse train etc
8. Interfacing any 8 bit Latch (eg,74LS373) with trainer kit as a peripheral mapped output port with absolute address decoding.

Text Books:

1. Ramesh S. Gaonkar, "Microprocessor Architecture, programming and applications with the 8085", Penram International
2. Muhammad Ali Mazidi, "The 8051 Microcontroller and embedded systems, Pearson Ed.
3. S. K. Venkata Ram, "Advanced Microprocessors and Microcontrollers", McGraw Hill.

Reference Books:

1. Uffenbeck, John, "Microcomputers and Microprocessors", PHI.
2. Douglas Hall, "Microprocessor and Interfacing, Programming of Hardware",McGraw Hill.
3. Krishna Kant, "Microprocessors and Microcontrollers", PHI.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 623 (Elective II)	Soft Computing	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Syllabus (Theory)

- ANN- Introduction – Biological neuron – Artificial neuron – Neuron modeling – Learning rules Single layer – Multi layer feed forward network – Back propagation – Learning factors.
- ANN - ARCHITECTURE AND APPLICATIONS Feedback networks – Discrete time Hopfield networks – Transient response of continuous time networks – Process modeling using ANN- Neuro controller for inverted pendulum.
- FUZZY SYSTEMS Classical sets – Fuzzy sets – Fuzzy relations – Fuzzification - Membership functions –Defuzzification – Methods of defuzzification – Fuzzy rules.
- FUZZY LOGIC CONTROL Membership function – Knowledge base – Decision-making logic – Optimisation of membership function using neural networks – Adaptive fuzzy system.- FLC for inverted pendulum- Home heating system- Introduction to Neuro-fuzzy systems.
- OPTIMIZATION TECHNIQUES

  Gradient Search – Non-gradient search – Genetic Algorithms: Operators, search algorithm, penalty – Evolutionary Programming: Operators, Search Algorithms.

Course Syllabi (Practical):

Write programs to implement following Techniques.

Hill Climbing

Best first Search

A* algorithm

AO* Algorithms

Control strategies.

Text Books:

1. LauranceFausett, 'Fundamentals of Neural Networks', Pearson Education, 2004.
2. Timothy J. Ross, 'Fuzzy Logic with Engineering Applications', McGraw Hill, 1997.
3. David Goldberg, "Genetic Algorithms in Search, Optimization and MachineLearning', Pearson Education, 2007.

Reference Books:

1. J.S.R.Jang, C.T.Sun and E.Mizutani, ' Neuro- Fuzzy and Soft Computing' Pearson Education, New Delhi, 2004.
2. Jacek M. Zurada, 'Introduction to Artificial Neural Systems', Jaico Publishing home, 2002.
3. John Yen and Reza Langari, 'Fuzzy Logic – Intelligence, Control and Information' Pearson Education, New Delhi, 2003.
4. Robert J.Schalkoff, ' Artifical Neural Networks', McGraw Hill, 1997.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE624 (Elective II)	Modeling & Simulation Technologies	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

Simulation Basics

- Handling Stepped and Event-based Time in Simulations
- Discrete versus Continuous Modelling
- Numerical Techniques
- Sources and Propagation of Error

Dynamical, Finite State, and Complex Model Simulations

- Graph or Network Transitions Based Simulations
- Actor Based Simulations
- Mesh Based Simulations
- Hybrid Simulations

Converting to Parallel and Distributed Simulations

- Partitioning the Data
- Partitioning the Algorithms
- Handling Inter-partition Dependencies

Probability and Statisics for Simulations and Analysis

- Introduction to Queues and Random Noise
- Random Variates Generation
- Sensitivity Analysis

Simulations Results Analysis and Viewing Tools :

- Display Forms: Tables, Graphs, and Multidimensional Visualization
- Terminals, X and MS Windows, and Web Interfaces
- Validation of Model Results

Course Syllabi (Practical):

Write simulations for the following.

- Graph or Network Transitions Based Simulations
- Actor Based Simulations

- Mesh Based Simulations
- Hybrid Simulations
- Partitioning the Data
- Partitioning the Algorithms
- Handling Inter-partition Dependencies

Text Books:

Law M, Kelton W, Simulation Modeling and Analysis, . McGraw-Hill, New York, NY, 2000

JK Lakshmipat University

LaliyaKa Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2013-17

SEMESTER-SEVEN

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 701	Data Warehousing & Data Mining	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Syllabus (Theory)

- Overview, Motivation(for Data Mining),Data Mining-Definition & Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data,(Binning, Clustering, Regression, Computer and Human inspection),Inconsistent Data, Data Integration and Transformation. **Data Reduction**:-Data Cube Aggregation, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation.
- **Concept Description**:- Definition, Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisions, Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean Association rules from Transactional Databases– Apriori Algorithm, Mining Multilevel Association rules from Transaction Databases and Mining Multi-Dimensional Association rules from Relational Databases.
- **Classification and Predictions**:

  What is Classification & Prediction, Issues regarding Classification and prediction, Decision tree, Bayesian Classification, Classification by Back propagation, Multilayer feed-forward Neural Network, Back propagation Algorithm, Classification methods Knearest neighbor classifiers, Genetic Algorithm.
- **Cluster Analysis**:

  Data types in cluster analysis, Categories of clustering methods, Partitioning methods. Hierarchical Clustering- CURE and Chameleon, Density Based Methods-DBSCAN, OPTICS, Grid Based Methods- STING, CLIQUE, Model Based Method –Statistical Approach, Neural Network approach, Outlier Analysis
- **Data Warehousing**: Overview, Definition, Delivery Process, Difference between Database System and Data Warehouse, Multi-Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting.

- Aggregation, Historical information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse.

Syllabus (Practical)

1. Gain insight for running pre- defined decision trees and explore results using MS OLAP Analytics.
2. Using IBM OLAP Miner - Understand the use of data mining for evaluating the content of multidimensional cubes.
3. Using Teradata Warehouse Miner - Create mining models that are executed in SQL.
4. Publish and analyze a business intelligence portal. Metadata & ETL Lab: The objective of this lab exercises is to implement metadata import agents to pull metadata from leading business intelligence tools and populate a metadata repository. To understand ETL processes.
5. Publish metadata stored in the repository.
6. Load data from heterogeneous sources including text files into a pre-defined warehouse schema.
7. Design a data mart from scratch to store the credit history of customers of a bank. Use this credit profiling to process future loan applications.

Text Books & Reference:

1. M.H.Dunham,"DataMining:Introductory and Advanced Topics" Pearson Education
2. Jiawei Han, MichelineKamber, "Data Mining Concepts & Techniques" Elsevier
3. Sam Anahory, Dennis Murray, "Data Warehousing in the Real World : A Practical Guide for Building Decision Support Systems, 1/e " Pearson Education
4. Mallach,"Data Warehousing System",McGraw –Hill

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE702	Mobile Computing	3	0	4	5

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Syllabus (Theory)

- Introduction to Mobile Communications and Computing: Mobile Computing (MC): Introduction to MC, novel applications, limitations, and architecture GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.
- (Wireless) Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.
- Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).
- Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.
- Database Issues: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.
- Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.
- Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.
- Protocols and Tools: Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

Syllabus (Practical)

1. SimulationofapplicationusingJ2MEsimulator

a. MidletandotherbasicUIitems.

b. BluetoothAPI

c. ImplementationofWirelessMessaging

2. SimulationofInfotainment(news,weatherforecastsetc)usingWAP

3. Simulationof applicationsusingsymbianOS

4. Study of WML and J2ME simulators

5. Design of Calendar for any given month and year using WML/J2ME

6. Simulation of Authentication and encryption technique used in GSM

Text Books:

1. Jochen Schiller, "Mobile Communications", Addison-Wesley. (Chapters 4, 7, 9, 10, 11), second edition, 2004.
2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

Reference Books:

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October2004,
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", Springer, secondedition, 2003.
4. Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE703	Artificial Intelligence	3	0	2	4

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test – I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks**	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	20	40	15	25	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others
**The ratio of weightage between Theory and Practical content will be 60%: 40%

Syllabus (Theory)

What is Artificial Intelligence?, The AI Problems, The Underlying Assumption, What is an AI Technique, The Level of the Model, Criteria for Success

Problems, Problem spaces and Search

Heuristic Search Techniques

Knowledge representation issues

Using Predicate knowledge
Rule based representation of knowledge

Syllabus (Practical)

Implementation of different problems using programming languages such as PROLOG & LISP.

Text Books:

1. Russell and Norvig. Artificial Intelligence: A Modern Approach, 3rd. edition.

Reference Books:

1. David Poole, Alan Mackworth, Randy Goebel, "Computational Intelligence : a logical approach", Oxford University Press, 2004.
2. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem solving", FourthEdition, Pearson Education, 2002.
3. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers, 1998.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
SEM701	Seminar	0	0	4	2

S. No.	Evaluation Component	Duration (Hours)	Marks (100)	Nature of Component
1.	Presentation	Weekly	25	Open Book
2.	Report(Soft Copy)	Weekly	25	Open Book
3.	Assignment	Continuous	10	Open Book
4.	Final Presentation		20	Open Book
5.	Final Report(Hard Copy)		20	Open Book

Syllabus (Practical)

Operation Procedure

1. Student has to devote full semester for SEM701 course.
2. Student has to report to the Supervisor regularly.
3. Seminars s evaluation has to be carried out in the presence of a two member Committee comprising.
4. Experts in the relevant area constituted by the Supervisor.

Final Seminar Report to be submitted has to be in formal hard bound cover bearing of the Institute emblem.

Reference Books:

Based on literature survey to be done with peer reviewed journals and magazines.

Elective – III & IV

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 728 (Elective III/IV)	Digital Image Processing	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

- Image Processing, The origins of Digital Image Processing, Examples of Fields that use Digital Image Processing, Fundamentals Steps in Digital Image Processing, Components of an Image Processing System.

- Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Some Basic Relationship between Pixels, An Introduction to the Mathematical Tools Used in Digital Image Processing

- Intensity Transformation and Spatial Filtering, Background, Some Basic Intensity Transformation Functions, Histogram Processing, Fundamentals of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters

- Filtering in the Frequency Domain, Concepts, Sampling and the Fourier Transform of Sampled
- Functions, The Discrete Fourier Transform (DFT) of One Variable, Extension to Functions of Two Variables,, Some Properties of the 2-D Discrete Fourier Transform, The Basics of Filtering in the Frequency Domain, Image Smoothing Using Frequency Domain Filters, Image Sharpening Using Frequency Domain Filters.

- Color Fundamentals, Color Models, Pseudocolor Image Processing, Basics of Full-Color Image Processing, Color Transformations, Smoothing and Sharpening.

Text Books:

1. Rafael C Gonzalez, Richard E Woods 2nd Edition, Digital Image Processing - Pearson Education 2003.

Reference Books:

1. Chanda and D. Dutta Majumder, “Digital Image Processing and Analysis”, PHI Publication.

2. Madhuri A. Joshi, “Digital Image Processing – An Algorithmic Approach, PHI Publication.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 730 (Elective III/IV)	Cyber Laws and Intellectual Property Rights	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

- History of Information Systems and its Importance, basics, Changing Nature of Information Systems, Need of Distributed Information Systems, Role of Internet and Web Services, Information System Threats and attacks, Classification of Threats and Assessing Damages Security in Mobile and Wireless Computing- Security Challenges in Mobile Devices, authentication Service Security, Security Implication for organizations, Laptops Security Basic Principles of Information Security, Confidentiality, Integrity Availability and other terms in Information Security, Information Classification and their Roles.

- Security Threats to E Commerce, Virtual Organization, Business Transactions on Web, E Governance and EDI, Concepts in Electronics payment systems, E Cash, Credit/Debit Cards. Physical Security- Needs, Disaster and Controls, Basic Tenets of Physical Security and Physical Entry Controls, Access Control- Biometrics, Factors in Biometrics Systems, Benefits, Criteria for selection of biometrics, Design Issues in Biometric Systems, Interoperability Issues, Economic and Social Aspects, Legal Challenges

- Model of Cryptographic Systems, Issues in Documents Security, System of Keys, Public Key Cryptography, Digital Signature, Requirement of Digital Signature System, Finger Prints, Firewalls, Design and Implementation Issues, Policies Network Security- Basic Concepts, Dimensions, Perimeter for Network Protection, Network Attacks, Need of Intrusion Monitoring and Detection, Intrusion Detection Virtual Private Networks- Need, Use of Tunneling with VPN, Authentication Mechanisms, Types of VPNs and their Usage, Security Concerns in VPN.

- Security metrics- Classification and their benefits Information Security & Law, IPR, Patent Law, Copyright Law, Legal Issues in Data mIning Security, Building Security into Software Life Cycle Ethics- Ethical Issues, Issues in Data and Software Privacy Cyber Crime Types & overview of Cyber Crimes

Text Books & Reference:

1. Godbole," Information Systems Security", Willey

2. Merkov, Breithaupt," Information Security", Pearson Education

3. Yadav, "Foundations of Information Technology", New Age, Delhi

4. Schou, Shoemaker, " Information Assurance for the Enterprise", Tata McGraw Hill

5. Sood,"Cyber Laws Simplified", Mc Graw Hill

6. Furnell, "Computer Insecurity", Springer

7. IT Act 2000

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 731 (Elective III/IV)	Object Oriented Analysis and Design	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

- Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.
- Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.
- Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.
- Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.
- Basic Behavioral Modeling-I: Interactions, Interaction diagrams.
- Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.
- Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.
- Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.
- Case Study: The Unified Library application.

Text Book

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education.

2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

Reference Books:

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.

2. Pascal Roques: Modeling Software Systems Using UML2, WILEY- Dreamtech India Pvt. Ltd.

3. AtulKahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.

4. Object-Oriented Analysis and Design with the Unified Process By John W. Satzinger, Robert B Jackson and Stephen D Burd, Cengage Learning.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 724 (Elective III/IV)	Network Management	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

- Problem definition and overview - What is network management, network management business drivers, network management scenarios, examples of management tools
- Basic management concepts and management architectures – agent/manager paradigm, management networks, TMN reference architecture
- Management functions and basic management algorithms – Fault, Configuration, Accounting, Performance, Security (FCAPS) reference model, OAM&P (Operations Administration Maintenance & Provisioning), management lifecycle, management processes and organization
- Management information fundamentals – management information modeling paradigms, Internet management model (SMIv2)
- Management communication fundamentals – Management protocol reference architecture, basic management patterns and their applications, advanced management patterns
- Management protocols – SNMP + management functions provided through MIBs, CLI, syslog, Netconf and YANG, Netflow and IPFIX
- Service level management: service level agreements, service level monitoring and performance measurement, service level assurance

Text Book

1. Clemm, “Network Management Fundamentals”, Cisco Press, ISBN-13 978-1-58720-137-0

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 725 (Elective III/IV)	Wireless Networks	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

UNIT I MULTIPLE RADIO ACCESS

Medium Access Alternatives: Fixed-Assignment for Voice Oriented Networks Random Access for Data Oriented Networks , Handoff and Roaming Support, Security and Privacy.

UNIT II WIRELESS WANS

First Generation Analog, Second Generation TDMA – GSM, Short Messaging Service in GSM, Second Generation CDMA – IS-95, GPRS - Third Generation Systems (WCDMA/CDMA 2000)

UNIT III WIRELESS LANS

Introduction to wireless LANs - IEEE 802.11 WLAN – Architecture and Services, physical Layer- MAC sublayer- MAC Management Sublayer, Other IEEE 802.11 standards, HIPERLAN, WiMax standard.

UNIT IV ADHOC AND SENSOR NETWORKS

Characteristics of MANETs, Table-driven and Source-initiated On Demand routing protocols, Hybrid protocols, Wireless Sensor networks- Classification, MAC and Routing protocols.

UNIT V WIRELESS MANS AND PANS

Wireless MANs – Physical and MAC layer details, Wireless PANs – Architecture of Bluetooth Systems, Physical and MAC layer details, Standards.

Text Books & Reference:

1. William Stallings, "Wireless Communications and networks" Pearson / Prentice Hall

of India, 2nd Ed., 2007.

2. Dharma Prakash Agrawal & Qing-An Zeng, “Introduction to Wireless and Mobile

Systems”, Thomson India Edition, 2nd Ed., 2007.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 735 (Elective III/IV)	Real Time Systems	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

Introduction: Definition, Typical Real Time Applications: Digital Control, High Level Controls, Signal Processing etc., Release Times, Deadlines, and Timing Constraints, Hard Real Time Systems and Soft Real Time Systems, Reference Models for Real Time Systems: Processors and Resources, Temporal Parameters of Real Time Workload, Periodic Task Model, Precedence Constraints and Data Dependency.

Real Time Scheduling: Common Approaches to Real Time Scheduling: Clock Driven Approach, Weighted Round Robin Approach, Priority Driven Approach, Dynamic Versus Static Systems, Optimality of Effective-Deadline-First (EDF) and Least-Slack-Time-First (LST) Algorithms, Offline Versus Online Scheduling, Scheduling Aperiodic and Sporadic jobs in Priority Driven and Clock Driven Systems.

Resources Access Control: Effect of Resource Contention and Resource Access Control (RAC), Non-pre-emptive Critical Sections, Basic Priority-Inheritance and Priority-Ceiling Protocols, Stack Based Priority-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption Ceiling Protocol, Access Control in Multiple-Unit Resources, Controlling Concurrent Accesses to Data Objects.

Multiprocessor System Environment: Multiprocessor and Distributed System Model, Multiprocessor Priority-Ceiling Protocol, Schedulability of Fixed-Priority End-to-End Periodic Tasks, Scheduling Algorithms for End-to-End Periodic Tasks, End-to-End Tasks in Heterogeneous Systems, Predictability and Validation of Dynamic Multiprocessor Systems, Scheduling of Tasks with Temporal Distance Constraints.

Real Time Communication: Model of Real Time Communication, Priority-Based Service and Weighted Round- Robin Service Disciplines for Switched Networks, Medium Access Control Protocols for Broadcast Networks, Internet and Resource Reservation Protocols, Real Time Protocols, Communication in Multicomputer System, An Overview of Real Time Operating Systems.

Text Books & Reference:

1. Real Time Systems by Jane W. S. Liu, Pearson Education Publication.
2. Mall Rajib, “Real Time Systems”, Pearson Education
3. Albert M. K. Cheng , “Real-Time Systems: Scheduling, Analysis, and Verification”,Wiley.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE 732 (Elective III/IV)	Parallel Processing	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

- Introduction to Parallel Processing: Flynn's classification, SIMD and MIMD operations, Shared Memory vs. message passing multiprocessors, Distributed shared memory, Hybrid multiprocessors
- Shared Memory Multiprocessors: SMP and CC-NUMA architectures, Cache coherence protocols, Consistency protocols, Data pre-fetching, CC-NUMA memory management, SGI 4700 multiprocessor, Network Processors
- Interconnection Networks: Static and Dynamic networks, switching techniques, Routers, Internet techniques
- Message Passing Architectures: Message passing paradigms, Grid architecture, Workstation clusters, User level software
- Scheduling: Multiprocessor Programming Technique, Scheduling and mapping, Internet web servers, P2P, Content aware load balancing

Text Books:

1. Introduction to Parallel Computing 2nd Edition, AnanthGrama, Anshul Gupta, George Karypis,

Vipin Kumar, The Addison Wesley Publishing Company, ISBN 0-201-64865

Reference Books:

1. D.L. Eager, J. Zahorjan, and E.D. Lazowski. Speedup Versus Efficiency in Parallel Systems, IEEE Transactions on Computers, Vol 38 No 3, March 1989.
2. Joseph JaJa, An Introduction to Parallel Algorithms, Addison-Wesley, 1992.
3. S. G. Akl, Design and Analysis of Parallel Algorithms, Prentice-Hall, 1989.
4. T. Leighton, Introduction to Parallel Algorithms and Architectures, Morgan Kaufmann, 1992.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
ECE729 (Elective III/IV)	Information Theory & Coding	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks**
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Information theory – Concept of amount of information -units, Entropy -marginal, conditional and joint entropies -relation among entropies Mutual information, information rate, channel capacity, redundancy and efficiency of channels.
- Discrete channels – Symmetric channels, Binary Symmetric Channel, Binary Erasure Channel, Cascaded channels, repetition of symbols, Binary unsymmetrical channel, and Shannon theorem. Continuous channels – Capacity of band limited Gaussian channels, Shannon-Hartley theorem, Tradeoff between band width and signal to noise ratio, Capacity of a channel with infinite band width, Optimum modulation system.
- Source coding – Encoding techniques, Purpose of encoding, Instantaneous codes, Construction of instantaneous codes, Kraft's inequality, Coding efficiency and redundancy, Noiseless coding theorem. Construction of basic source codes – Shannon-Fano algorithm, Huffman coding, Arithmetic coding, ZIP coding.
- Codes for error detection and correction – Parity check coding, Linear block codes, Error detecting and correcting capabilities, Generator and Parity check matrices, Standard array and Syndrome decoding, Hamming codes, Encoding and decoding of systematic and unsystematic codes. Cyclic codes – Generator polynomial, Generator and Parity check matrices, Encoding of cyclic codes, Syndrome computation and error detection, Decoding of cyclic codes, BCH codes, RS codes, Burst error correction.
- Convolutional codes – Encoding- State, Tree and Trellis diagrams, Maximum likelihood decoding of convolutional codes -Viterbi algorithm, Sequential decoding -Stack algorithm. Interleaving techniques – Block and convolutional interleaving, Coding and interleaving applied to CD digital audio system - CIRC encoding and decoding, interpolation and muting. ARQ – Types of ARQ, Performance of ARQ, Probability of error and throughput.

Text Books:

1. Communication Systems by SimonHaykin, John Wiley & Sons. Pvt. Ltd.
2. Principles of Communication Systems by Taub& Schilling, Tata McGraw-Hill
3. Principles of Digital Communication by Das, Mullick& Chatterjee, Wiley Eastern Ltd

Reference Books:

1. Error Control Coding Fundamentals and Applications by Shu Lin & Daniel J. Costello Jr., Prentice Hall Inc.
2. Digital Communications Fundamentals and Applications by Bernard Sklar, Person Education Asia.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
HS701	Principle of Economics	3	0	0	3

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks
20	20	40	10	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

Definition of Economics and role of economics in Engineering and Technology; Basic economic terms; The economy, working of an economy, kinds of an economy and its basic problems; Laws of Demand and Supply and market Equilibrium; Elasticity of demand its measurements and application, Production function and law of Variable Proportion and Law of Returns to Scale; Concepts of cost and revenue, short run and long run cost function; Profit maximization hypothesis, Price and output determination under Perfect Competition, Monopolistic competition and Monopoly.

Measurement of macroeconomic aggregates, National Income, Consumption, saving and investment function; Macroeconomic issues: Inflation, Unemployment and Economic growth International aspects of macroeconomics; Foreign Exchange rate and Balance of payments.

Text Book(s)

T.R. Jain and M.L. Grover, “Economics for Engineers”, V. K. (India) Enterprises

Reference Book(s)

1. D N Dwivedi “Principles of Economics”, Vikas Publishing House Pvt Ltd.
2. G. Mankiew. Economics Principles and Applications. Cengage Learning

JK Lakshmipat University

LaliyaKa Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2013-17

SEMESTER-EIGHT

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
PS801	Practice School - II	-	-	-	16

Evaluation Scheme (Theory)						Evaluation Scheme (Practical)				
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation	Additional Continuous Evaluation	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks
-	-	-	-	-	-	-	-	-	-	-

**** Duration for practice school is Five and a half month**

Course Syllabi:

This course is for five and half months (summer and one semester) in VII or VIII Semester. The objective of this programme is to provide the students, an opportunity to work on live projects of corporate world in various fields. During this programme, they will work on real world applications of their curricula through organizational function of their choice. The students are expected to be involved directly in problem solving efforts of specific interest to the host organization. The learning of PS-I will help them in completing PS-II successfully.

Evaluation Scheme:

S. No.	Evaluation Component	Marks (100) (Weightage %)
1	Quiz-I	4
2	Quiz-II	4
3	Group Discussion-I	4
4	Group Discussion-II	4
5	Seminar-I	4
6	Seminar-II	4
7	Diary-I	4
8	Diary-II	4
9	Observation-I	4
10	Observation- II	4
11	Mid Term Evaluation (Project Report and Presentation/Viva)	20
12	Final Evaluation (Project Report and Presentation/Viva)	40