JK Lakshmipat University

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2012-16

Course Structure, Detailed Syllabus

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Scheme of Examination

Teaching and Examination Scheme for 4- Year B. Tech Programme

I & II Semesters (Common to all Branches of Engineering)

Year	Code	Semester I	L T P	C	Code	Semester II	L T P	C
I	LA101	English Communication Skills	11 0	2	LA201	Professional Communication Skills	11 2	3
	MA101	Engineering Mathematics - I	3 1 0	3	MA201	Engineering Mathematics - II	3 1 0	3
	PH101	Engineering Physics – I	3 1 2	4	PH201	Engineering Physics – II	3 1 2	4
	CH101	Engineering Chemistry - I	3 1 2	4	CH201	Engineering Chemistry -II	3 1 2	4
	CSE101	Computer Programming & IT	3 0 2	4	EE201	Electrical & Electronics Engineering	3 1 2	4
	ID101	Environmental Studies	3 0 0	2	ME201	Engineering Mechanics	3 1 0	3
	ME141	Workshop Practice	0 0 3	2	ME241	Machine Drawing	0 0 3	2
	CE101	Engineering Graphics	1 0 2	2				

L = Lectures; T = Tutorials; P = Practicals; C = Credits; W = Weeks; A = Audit

Teaching and Examination Scheme for 4-Year B. Tech Programme

In Computer Science Engineering

Year	Code	Semester I	L T P	C	Code	Semester II	L T P	C
II	CSE301	Data Structures	3 0 2	5.5	ECE402	Digital Electronics	3 1 2	7
	CSE302	Object Oriented Programming	3 0 2	5.5	CSE404	Database Management Systems	3 1 2	7
	ECE301	Electronic Device & Circuits	3 1 2	7	CSE402	Discrete Structures	3 1 0	5.5
	EE301	Network Analysis & Synthesis	3 1 0	5.5	CSE403	Foundations of Computer Graphics	3 0 0	4
	MA301	Engineering Mathematics – III	3 1 0	5.5	MA402	Numerical &Statistical Analysis	3 02	5.5
	HS301	Principles of Management	3 0 0	4	HS401	Principles of Economics	3 0 0	4
Summer Term			**PS501**		**Practice School – I**		**6 W**	**4**
III	CSE501	Operating System	3 1 2	7	CSE605	Distributed Systems	3 0 0	4
	CSE502	Computer Architecture &Organization	3 1 0	5.5	CSE602	Design & Analysis of Algorithms	3 1 2	7
					CSE603	Compiler Design	3 0 2	5.5
	CSE503	Computer Networks	3 0 2	5.5	CSE604	Software Engineering	3 0 0	4
	CSE504	Theory of Computation	3 0 0	4		Elective – II	3 0 0	4
	CSE505	Web Technologies	3 1 2	7	MA601	Optimization Techniques	3 1 0	5.5
		Elective – I	3 0 0	4				
IV		Elective – III	3 0 2	4	PS801	Practice School – II / Thesis	------	16
		Elective – IV	3 0 2	4				
		Elective – V	3 0 2	4				
		Elective – VI	3 0 0	4				
		Elective – VII	3 0 0	4				
	SEM701	Seminar	0 0 4	2.5				

L = Lectures; T = Tutorials; P = Practicals; C = Credits; W = Weeks

List of Electives

Semester	Elective	Code	Course
V	Elective - I	CSE521	Management Information System
		CSE522	Information Technology & Project Management
VI	Elective-II	CSE 621	Network Security
		ECE622	Microprocessors & Interfacing
VII	Electives – III/IV/V/VI/VII	CSE 721	Real Time Systems
		CSE 722	Cyber Laws and Intellectual Property Rights
		CSE723	Cryptography
		CSE724	Network Management
		CSE725	Wireless Network
		CSE726	Artificial Intelligence
		CSE 727	Data Mining and Data Warehousing
		CSE 728	Digital Image Processing
		CSE729	Modeling and Simulation
		CSE 730	Artificial Neural Network
		CSE731	Robotics
		CSE 732	Object Oriented Analysis and Design
		CSE 733	Parallel Processing
		CSE 734	Soft Computing
		CE 735	Computer Project

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Common to all Branches)

Batch 2012-2016

SEMESTER-FIRST

Detailed Syllabus

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Scheme of Examination

ENGLISH COMMUNICATION SKILLS

Course Code	**:**	**LA 101**
Course Title	**:**	**English Communication Skills**
Course Credits	**:**	**02**
Total Hours Per Week	**:**	**2+0+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:

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Open Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Assignments such a Role Play, JAM, Extempore, Paragraph Writing, Vocabulary Exercises, etc.		15	Open/Closed Book
5.	Quiz	20 min.	05	Closed Book

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	**:**	**03**
Total Hours per week (L+T+P)	**:**	**3+1+0**

Course Syllabi:

- Functions of two or more variables, Partial Derivatives, Total derivative, Chain Rule
- Euler's Theorem, Jacobian and transformation, Applications to errors
- Maxima-Minima of functions of two variables, Lagrange's method
- Curve tracing: Cartesian, parametric and polar coordinates, Vector functions, their derivatives and integration
- Arc length and unit tangent vector, Curvature and unit normal vector, Torsion and unit binormal vector
- Directional derivative and gradient vectors, Tangent plane, Divergence and curl of a vector field, Integral calculus, Line integral, Arc length,
- Double integral: Area, change of order of integration, changing to polar coordinate
- Triple integral: Volume integral
- Vector integration: Line integral, flux, work done, circulation, Path independence, potential function and conservative fields
- Surface area and integral, Green's theorem in the plane, Stoke's theorem, Divergence theorem
- Gamma and beta function, Sequence and series, Orthogonal function, Fourier Series

Evaluation Scheme:

EC No.	Evaluation Component (EC)	Duration	Weightage	Nature	Scope (No. of Lectures)
1	Mid-term Test-I	60 Min.	20	Closed Book	1 - 10
2	Mid-term Test-II	60 Min.	20	Open Book	11 – 25
3	Quiz / Assignment / Attendance	To be decided by Instructors	20*	Open/Closed Book	To be decided by Instructors
4	End-term/ Comprehensive	3 Hrs.	40	Closed Book	1 - 40

* EC No.3 will be based on the weightage of Quiz, Assignment and Attendance.

Text books

T1 G.B. Thomas, Jr., *Thomas' calculus*, 11th edition (Indian), Pearson education, Delhi, 2008

T2 Dennis G. Zill and Warren S. Wright, *Advanced Engineering Mathematics*, Fourth Edition (Student Edition), Jones &Barlett, Viba, New Delhi, 2011

Reference Books

R1 RoberWrede, Spiegel M. R., *Schaum's outline of advanced calculus*, 3rd edition, Tata Mc-GrawHill, NewYork, 2011

R2 Peter V. O'Neil,*Advanced Engineering Mathematics*, Seventh Indian Reprint, Cengage Learning, New Delhi, 2011.

R3 Kreyszig, E., *Advanced Engineering Mathematics*, John Willey, Delhi (2011).

R4 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	**:**	**04**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi:

Theory

- 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
- 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.
- 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.
- 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

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

Practical

- To determine the wave length of monochromatic light with the help of Fresnel's Biprism
- To determine the wave length of sodium light by Newton's Ring
- To determine the specific rotation of Glucose (Sugar) solution using a Polarimeter
- To measure the Numerical Aperture of an Optical Fibre.
- To convert a Galvanometer in to an ammeter of range 1.5/3 amp and calibrate it.
- To convert a Galvanometer in to a Volt of range 1.5/3 volt and calibrate it.
- 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
- To study the variation of thermo e. m. f. of iron copper thermo couple with temperature
- To determine the wavelength of sodium light by Michelson Interferometer
- To determine coherent length and coherent time of laser using He-Ne Laser

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Closed Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Assignment(s)/ Quizzes	30 min.	20	Open/Closed Book

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	2 hour	10	Closed Book
2.	Mid Term Test-II	2 hour	20	Closed Book
3.	End Term Test/Comprehensive	2 hour	40	Closed Book
4.	Attendance	Day to day	10	……
5.	Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce	Day to day	20	……

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, 5thedn. 1997.

R2 AjoyGhatak, "Optics", Tata McGraw Hill, 4thedn

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	**:**	**04**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi:

Theory

- Introduction of water impurities, Methods for hardness determination
- Purification of water, Method for softening, Boiler problems
- Types of polymers, Plastics, Synthetic & natural rubber
- General idea of lubricants, Types of lubricants, Properties
- Types of glass, Process involve in formation of glass
- Formation &properties of cement, Chemistry of cement
- Mechanism, 3D configuration of compounds

Practical

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

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Closed Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Assignment(s)/ Presentations/ Quizzes	30 min.	20	Open/Closed Book

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	2 hour	15	Closed Book
2.	Mid Term Test-II	2 hour	15	Closed Book
3.	End Term Test	2 hour	40	Closed Book
4.	Attendance	Day to day	10	……
5.	Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce	Day to day	20	……

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).

COMPUTER PROGRAMMING & IT

Course Code	**:**	**CSE101**
Course Title	**:**	**Computer Programing & IT**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 2**

Course Syllabi:

Theory

Unit I : 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.

Unit II : 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. Multiplication of Integers.Gray code, BCD 8421 and 2421, Excess-3 and Excess-3 gray codes.

Unit III : 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.

Unit IV : Arrays in C, Pointers, Using pointers to represent arrays, Dynamic Memory allocation, structures, using typedef, Arrays of Structures & pointers, File Handling (Opening in different modes & closing of file, fscanf&fprintf only).

Unit V : 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.

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):

Sr. No.	Evaluation Component	Duration (Hours)	Marks (100)	Nature of Component
1.	Midterm test-I	1	20	Closed Book
2.	Midterm test-II	1	20	Closed Book
3.	Assignment	Continuous	10	Open Book
4.	Quiz	Continuous	10	Closed Book
5.	End Term	3	40	Closed Book

Evaluation Scheme (Practical):

Sr. No.	Evaluation Component	Duration (Hours)	Marks (100)	Nature of Component
1.	Mid Term Test-I	2	20	Closed Book
2.	Mid Term Test-II	2	20	Closed Book
3.	Viva voce evaluation	Day to Day	10	Closed Book
4.	Attendance	Day to Day	10	
5.	End Term Examination	2	40	Closed Book

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 : **2**

Total Hours per Week (L+T+P) : **3 + 0 + 0**

Course Syllabi:

- 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:

S. No.	Evaluation Component	Duration	Weightage	Date	Nature	Scope (No. of Lectures)
1	First Test	55 Min.	20		Closed Book	1 – 10
2	Second Test	55 Min.	20		Closed Book	11 – 25
3	Quizzes /Assignments (Class room)	To be decided by Instructors	20		Open/Closed Book	To be decided by Instructors
4	Comprehensive	3 Hrs.	40		Closed Book	1 – 40

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) (%)	Nature of Component
1.	Mid Term Test-I	2 hour	15	Open Book
2.	Mid Term Test-II	2 hour	15	Closed Book
3.	End Term Test	2 hour	40	Closed Book

4.	Attendance	Day to day	10	……
5.	Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce	Day to day	20	……

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**

Total Hours per Week (L+T+P) : **0 + 0 + 3**

Course Syllabi:

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:

EC No.	Evaluation Component	Duration	Marks	Nature of Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Closed Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Assignment(s)/ Quizzes	30 min.	20	Open Book

Note: A total of 3 quizzes will be conducted. Out of these, the best performance will be considered for final evaluation.

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 2012-2016

SEMESTER-SECOND

Detailed Syllabus

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Scheme of Examination

PROFESSIONAL COMMUNICATION SKILLS

Course Code	**:**	**LA 201**
Course Title	**:**	**Professional Communication Skills**
Course Credits	**:**	**03**
Total Hours per Week	**:**	**2+0+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.

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.

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Open Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Class Participation	Day to day	10	…….
4.	Assignment(s)/ Quizzes	30 min.	10	Open/Closed Book

Course Syllabi (Practical):

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

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of 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	……

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

ENGINEERING MATHEMATICS-II

Course Code	**:**	**MA201**
Course Title	**:**	**Engineering Mathematics - II**
Course Credits	**:**	**03**
Total Hours per Week (L+T+P)	**:**	**3+1+0**

Course Syllabi (Theory):

- **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
- **Partial differential equation**: Partial Differential Equations of First Order, Heat equation, wave equation, Laplace equation, Variable separable technique for solving PDE, Boundary value problems
- **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

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. Peter V. O'Neil,*Advanced Engineering Mathematics*, Seventh Indian Reprint, Cengage Learning, New Delhi, 2011.
3. G.B. Thomas, Jr., *Thomas' calculus*, 11th edition (Indian), Pearson education, Delhi, 2008
4. Erwin Kreyszig,*Advanced Engineering Mathematics*, Wiley 9th Edition.
5. B.V.Ramana, *Higher Engineering Mathematics*, Tata Mcgra Hill.

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Open Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Class Participation	Day to day	10	……..
4.	Assignment(s)/ Quizzes	30 min.	10	Open/Closed Book

ENGINEERING PHYSICS-II

Course Code	**:**	**PH201**
Course Title	**:**	**Engineering Physics - II**
Course Credits	**:**	**04**
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

- 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.

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

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Open Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Class Participation	Day to day	10	……..
4.	Assignment(s)/	30 min.	10	Open/Closed

	Quizzes			Book

Course Syllabi (Practical):

- To determine the height of object with the help of a Sextant.
- 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.
- To determine the wave length of prominent lines of mercury by plane diffraction Grating with the help of spectrometer.
- To determine the ferromagnetic constants retentivity, permeability and susceptibility by tracing I-H curve using C.R.O.
- To study the Charge & Discharge of a condenser and hence determine time constant (Both current and voltage graphs are to be plotted).
- To determine the high resistance by method of leakage, using a Ballistic Galvanometer.
- To determine dielectric constant of a material using moving coil Ballistic Galvanometer.
- To study characteristics of G.M. Counting System.
- To determine the absorption coefficient of lead using lead sheet by G.M. Counting System.
- To verify the expression for the resolving power of a Telescope.
- To determine the specific resistance of the material of a wire by Carey Fosters Bridge.

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of 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	……

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

ENGINEERING CHEMISTRY-I

Course Code	**:**	**CH 201**
Course Title	**:**	**Engineering Chemistry- II**
Course Credits	**:**	**04**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi (Theory):

- Methods & introduction of Coal
- Introduction of Solid state and structure of solids, Cubic system & Bragg's law
- Structure and properties of graphite, Liquid Crystal
- Introduction of Kinetics, Arrhenius theory, Gibbs law
- One component system
- Corrosion, Mechanism of corrosion
- Introduction of Nanotechnology
- Introduction of Optical fiber
- Introduction of Fuel

Text Books:

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

Reference Books:

6- Engineering Chemistry by B Sivasankar, (Mc-Graw Hill publication).
7- Engineering Chemistry by O.G. Palanna, (Mc-Graw Hill publication).
8- Organic Chemistry by Smith, (Mc-Graw Hill publication).
9- Organic Chemistry by IL Finar, (Pearson)
10- Engineering Chemistry (Wiely India publication).

Evaluation Scheme (Theory):

EC	Evaluation	Duration	Marks (100)	Nature of

No.	Component		(%)	Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Closed Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Class Participation	Day to day	10	……..
5.	Assignment(s)/ Quizzes	30 min.	10	Open/Closed Book

Course Syllabi (Practical):

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

Evaluation Scheme (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of 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	Day to day	25	……

	Evaluation (Discipline, Punctuality, Assignment & Viva Voce)			

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

ELECTRICAL & ELECTRONICS ENGINEERING

Course Code	**:**	**EE201**
Course Title	**:**	**Electrical & Electronics Engineering**
Course Credits	**:**	**04**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi (Theory):

- Introduction to electrical circuits, Loop analysis, Node-voltage analysis
- Wye (Y) – Delta (Δ) and Delta (Δ) – Wye (Y) transformations
- Superposition theorem, Thevenin theorem
- Fundamental aspects of single phase ac supply, Phasor representation
- Steady state analysis of series circuits, Apparent, active and reactive power, power factor
- Three-phase supply and network, Measurement of three-phase power
- Basics of transformer, Practical single phase transformer, Auto transformer
- Rotating Electrical Machines, Introduction to Semiconductor
- Diode and its working, Applications of diodes
- Bipolar Junction Transistor, Transistor configuration

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.

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Closed Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Class Participation	Day to day	10	……..
5.	Assignment(s)/ Quizzes	30 min.	10	Open/Closed Book

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 (Practical):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of 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	……

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

ENGINEERING MECHANICS

Course Code	**:**	**ME 201**
Course Title	**:**	**Engineering Mechanics**
Course Credits	**:**	**3**
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.

Reference Books:

R1. Vector Mechanics for Engineers, Beer and Johnston, Tata McGraw-Hill.

R2. Engineering Mechanics, Hibbeler, Pearson Education.

R3. Engineering Mechanics, Meriam and Kraige, John Wiley & Sons.

R4. Engineering Mechanics, Timoshenko and Young, Tata McGraw-Hill.

R5. Engineering Mechanics, Shames, Pearson Education.

R6. Engineering Mechanics, Boresi and Schmidt, CL-Engineering.

R7. Engineering Mechanics, Andrew Pytel&Kiusalas, Cengage Learning.

Evaluation Scheme (Theory):

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of Component
1.	Mid Term Test-I	1 hour	20	Closed Book
2.	Mid Term Test-II	1 hour	20	Closed Book
3.	End Term Test / Comprehensive	3 hour	40	Closed Book
4.	Class Participation	Day to day	10	…….
5.	Assignment(s)/ Quizzes	20-60 min	10	Open/Closed Book

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):

- **SECTIONAL VIEWS:** Conversion of pictorial view into sectional orthographic projections, sectional views with different types of sections such as revolved, broken aligned section missing views. Representation of those views with Auto-CAD
- **ADVANCE ISOMETRIC VIEWS:** Isometric view of complex objects and Machine Parts "Sectional Isometric Views" with AutoCAD
- Introduction to Oblique views and perspective projection and exploded views of an assembly using AutoCAD
- **INTERSECTION OF SURFACE:** Interpenetration of solids, prism and prism, cylinder and cylinder, cylinder and prism, cone and cylinder, cone and prism.
- **LATEST ISI CONVENTIONS:** Conventions covering the standard practice in machine drawing. Conventions for various components like bearing, gears, springs, key and key ways, threads, tap holes and materials. Working drawing for welded joints, Use of specifications for limits, fits and tolerances, Conventions used for surface roughness i.e. Machined surface, rough surface, etc. Bearing and bearing mountings, Engine and machine tool components.

Text Books:

T1. Yarwood, Alf. **"Introduction to Auto – CAD 2011 2D and 3D Design",** Elsevier, **1st** edition, 2010

T2. Ellen Finkelstein, **"Auto-CAD 2011 & Auto-CAD LT 2011 Bible,"** Wiley India Edition

T3. Ajeet Singh, **"Machine Drawing: Includes AutoCAD,"** TMH, 2nd edition

Reference Books:

R1 Bhatt, N.D. "**Machine Drawing**", CharotarPulisher, 38th edition, 2003.

R2 James E Fuller, **"Using Auto-CAD,"** Denmark Publishing Co.

R3 Dhawan, R.K. "**Machine Drawing**", S. Chand and Co, 2005

R4 Radhakrishnan, P., **"Computer Graphics and Design**", Dhanpatrai and Sons.

Evaluation Scheme:

EC No.	Evaluation Component	Duration	Marks (100) (%)	Nature of 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	……

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2012-2016

SEMESTER-THIRD

Detailed Syllabus

&

Scheme of Examination

DATA STRUCTURES

Course Code	**:**	**CSE301**
Course Title	**:**	**Data Structures**
Course Credits	**:**	**5.5**
Total Hours per Week (L+T+P)	**:**	**3 + 0 + 2**

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.

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, Data Structure using C, Oxford Education, Third Edition, 2012

T2. Data Structures through C,YashwantKanetkar,BPB Publications Sixth Edition, 2012

Reference Books:

R1 Alfred V. Aho, Jeffrey D. Ullman, John E. Hop croft, Data Structures and Algorithms. Pearson Education, 2012

OBJECT ORIENTED PROGRAMMING

Course Code	**:**	**CSE302**
Course Title	**:**	**Object Oriented Programming**
Course Credits	**:**	**5.5**
Total Hours Per Week (L+T+P)	**:**	**3+0+2**

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.

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

Reference Books:

R1 Programming with ANSI C++ by BhushanTrivedi, Oxford University Press

ELECTRONIC DEVICES & CIRCUITS

Course Code	**:**	**ECE301**
Course Title	**:**	**Electronics Devices & Circuits**
Course Credits	**:**	**7**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

Course Syllabi (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.
- **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.
- **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.

Course Syllabi (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.

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:

TB-1: Microelectronics Circuits (Theory and Applications), Adel S. Sedra and Kenneth C. Smith, Adapted by Arun N. Chandorkar, 5th Ed. Oxford International Student Edition.

TB-2: Electronic Device and Circuits, J.B. Gupta, Katson Educational Series.

TB-3: Electronic Devices and Circuits, David A. Bell, Oxford 5th Edition.

Reference Books:

RB-1 Millman's Electronic Devices and Circuits, JocobMillman, Christos C Halkias&SatyabrataJit, Tata Mc-Graw Hill 3rd Edition.

RB-2 Electronic Devices and Circuit Theory, Robert L. Boylestad and Louis Nashelsky, Pearson 10th Edition.

RB-3 Electronic Devices and Circuits, S. Salivahanan, N. Suresh Kumar and A Vallavaraj, Tata Mc-Graw Hill 2rd Edition.

NETWORK ANALYSIS & SYNTHESIS

Course Code	**:**	**EE301**
Course Title	**:**	**Network Analysis & Synthesis**
Course Credits	**:**	**5.5**
Total Hours Per Week (L+T+P)	**:**	**3+1+0**

Course Syllabi (Theory):

- RLC parameter, Independent and dependent sources, Voltage/current relationship for individualelement, source transformation techniques, KCL, KVL for network having both Independent and dependent sources
- Superposition, Thevenin and Norton Theorem, Maximum power transfer & Reciprocity theorem, Series and parallel resonant circuits and Q-factor, Mutual inductance ,Dot Convention and coupled circuits, Graph of a network ,Concept of tree Co-tree, Tieset,Cut-set, Incidence matrix, Tie-se matrix, Cut-set matrix
- Formulation and solution of network equilibrium equations on loop and node basis, Introduction to Laplace Transform, Laplace transform of some basic functions, Laplace transform of periodic functions, Inverse Laplace transform, Solve first and second order equation, Application of Laplace transform: Circuit Analysis for RL, RC &,RLC Circuits,Time Constant
- Voltage & current ratio of two port network, Admittance, impedance, hybrid and transmission parameter of two port networks, Conversion of one parameter to another parameter, Condition of reciprocity & symmetry
- Series, parallel and cascade connection of two port networks, Network reliability, Hurwitz Polynomials, , Positive real functions, Properties of RC, RL & LC networks, Foster and Cauer forms of RC, RL & LC networks

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/Reference Books:

T1. K.M.Soni, "Circuit & Systems" S.K.Kataria&Son , Eight Edition, 2008.

R1 Roy Choudhary, "Network Theory", TMH, 3rd Edition, 2004

R2 M.E Van Valkenburg, "Network Analysis" , PHI, 3rd Edition, 2002.

ENGINEERING MATHEMATICS - III

Course Code	**:**	**MA301**
Course Title	**:**	**Engineering Mathematics – III**
Course Credits	**:**	**5.5**
Total Hours per week (L+T+P)	**:**	**3+1+0**

Course Syllabus:

- **Integral Transforms**: Laplace transform and its properties, Fourier Transform, Integral transform method for solving differential equations, Systems of Linear Differential Equations, Discrete Fourier transform, Fast Fourier Transform
- **Special Functions**: Legendre and Bessel functions, series representations and recurrence relations
- **Calculus of variations**: Extremal function, Euler Equation, Isoperimetric problems
- **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.

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

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

PRINCIPLES OF MANAGEMENT

Course Code	**:**	**HS301**
Course Title	**:**	**Principles of Management**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3+0+0**

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

Evaluation Scheme (Theory):

Sr. No.	Evaluation Component	Duration	Marks (100) (%)
1.	Mid Term Exam	2 hours	20%
2.	End Term Exam	3 hours	50%
3.	Continuous Evaluation (Quizzes, Assignments, Presentations, Class Participation)	-	30%

Text Books:

T1. Tripathy, P.C. and Reddy, P. N. "Principles of Management". . McGraw Hill, New Delhi. 4th ed. 2008.

Reference Books:

R1 Koontz, Herold and Weihrich, Heinz. "Management". McGraw Hill, New York. 9th ed. 1988.

R2 Stoner, James A. F. and Freeman, R Edward."Management".Prentice Hall of India, New Delhi.6th e, 1989.

R3 Bateman, T. S. and Snell, S. A. "Management: Leading and Collaborating in a Competitive World", McGraw Hill Irwin. 8th edition,2009.

R3 Draft, R. L. "Principles of Management". Cengage learning.2009

R4 Schermerhron, J. R. "Introduction to Management", 10th edition, Wiley India. 2009

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2012-16

SEMESTER-FOURTH

Detailed Syllabus

&

Scheme of Examination

DIGITAL ELECTRONICS

Course Code	**:**	**ECE402**
Course Title	**:**	**Digital Electronics**
Course Credits	**:**	**7**
Total Hours per Week (L+T+P)	**:**	**3+1+2**

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, QuineMc-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

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. 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, 2003

DATA BASE MANAGEMENT SYSTEMS

Course Code	**:**	**CSE404**
Course Title	**:**	**Database Management Systems**
Course Credits	**:**	**7**
Total Hours Per Week (L+T+P)	**:**	**3 + 1 + 2**

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

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

Reference Books:

1. C J Date, A Kannan, S Swaminathan, "An Introduction to Database Systems", 8th Edition, Pearson Education (2006)
2. S K Singh, "Database Systems: Concepts, Design and Applications", Pearson Education
3. Elmsari, Navathe, "Fundamentals of Database Systems", 5th Edition, Pearson Education (2008)
4. Peter Rob, Carlos Coronel, "Database Systems: Design, Implementation and Management", 7th Edition, Cengage Learning (2007)

Textbook for Practical

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

Reference Book for Practical

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

DISCRETE STRUCTURES

Course Code	**:**	**CSE402**
Course Title	**:**	**Discrete Structures**
Course Credits	**:**	**5.5**
Total Hours per Week (L+T+P)	**:**	**3+1+0**

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.

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. Kenneth Rosen, Discrete Mathematics and its applications, 5th edition, Tata-McGraw Hill, 2002.

T2. C.L. Liu, Elements of Discrete mathematics, McGraw-Hill, 1985

Reference Books:

R1. D. B. West, Introduction to Graph Theory, Prentice Hall of India.

R2.M. Artin, Algebra, Prentice-Hall India, 1991

FOUNDATIONS OF COMPUTER GRAPHICS

Course Code	**:**	**CSE403**
Course Title	**:**	**Foundations of Computer Graphics**
Course Credits	**:**	**04**
Total Hours per Week (L+T+P)	**:**	**3+0+0**

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.

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. J. Foley, A. Van Dam, S. Feiner, J. Hughes: Computer Graphics- Principles and Practice,Pearson

T2. Hearn and Baker: Computer Graphics, PHI

Reference Books:

R1. Multimedia Systems Design, PrabhatAndleigh and Thakkar, PHI.

R2. Multimedia Information Networking, N.K.Sharda, PHI.

NUMERICAL & STATISTICAL ANALYSIS

Course Code	**:**	**MA 402**
Course Title	**:**	**Numerical& Statistical Analysis**
Course Credits	**:**	**5.5**
Total Hours per Week (L+T+P)	**:**	**3 + 0 + 2**

Course Syllabi (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: Bracketing Methods, Open Methods, Roots of Polynomials
- **Linear Algebraic Equations**: LU Decomposition and Matrix Inversion, Iterative methods for solving system of linear equations.
- **Interpolation and approximation**: Interpolation for equally and unequally spaced points, Lagrangian Polynomial, Curve Fitting: Least-Squares Regression
- **Numerical Differentiation and Integration**: Numerical Differentiation and Integration, Newton-Cotes Integration Formulae.
- **Ordinary Differential Equations**: Single step methods for solving first order ordinary differential equation
- **Random Variables and probability distributions**: Introduction to probability, Discrete and continuous random variables, probability mass, probability density and cumulative distribution functions, 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 and Non-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.
- **Analysis of variance**: One way analysis of variance, experimental design, two way analysis of variance without interaction

Course Syllabus (Practical):

Computer Programming in C and Matlab; Introduction to SPSS for solving statistical techniques.

1. To find the solution of Non-linear equations.
2. To find solution of system of equations.
3. To find the best fitted curve for a given set of points.
4. To differentiate a function numerically.
5. To integrate a functions numerically.
6. To find solution of a differential equation numerically.
7. Working on SPSS

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

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	Day to day	25

	(Assignments, Discipline, Punctuality, & Viva Voce)		

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

Text 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, *Numerical Methods for Engineers*, 6/e, McGraw Hill
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.

PRINCIPLES OF ECONOMICS

Course Code	**:**	**HS401**
Course Title	**:**	**Principles of Economics**
Course Credits	**:**	**4**
Total Hours per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (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 macro economics; Foreign Exchange rate and Balance of payments.

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 Book:

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

Reference Books:

- D N Dwivedi "Principles of Economics", Vikas Publishing House Pvt Ltd.
- G. Mankiew. Economics Principles and Applications. Cengage Learning

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2012-16

SEMESTER-FIFTH

Detailed Syllabus

&

Scheme of Examination

OPERATING SYSTEM

Course Code	**:**	**CSE501**
Course Title	**:**	**Operating System**
Course Credits	**:**	**7**
Total Hours Per Week (L+T+P)	**:**	**3 + 1 + 2**

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

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. Stalling W, "Operating Systems", 6th edition, Prentice Hall India.

T2. C.L. Liu, Elements of Discrete mathematics, McGraw-Hill, 1985

Reference Books:

R1. Silberschatz, A., Peter B. Galvin and Greg Gagne, "Operating System Principles, Wiley India, 8th Edition

R2. Tanenbaum A.S., "Modern Operating Systems", 4th Edition, PHI, 2001

R3. Flynn I.M, "Understanding Operating Systems", Cengage India Publication

COMPUTER ARCHITECURE &ORGANIZATION

Course Code	**:**	**CSE502**
Course Title	**:**	**Computer Architecture &Organization**
Course Credits	**:**	**5.5**
Total Hours per Week (L+T+P)	**:**	**3+1+0**

Course Syllabi (Theory):

BASIC STRUCTURE OF COMPUTERS

Functional units – Basic operational concepts – Bus structures – Performance andmetrics – Instructions and instruction sequencing – Hardware – Software Interface –Instruction set architecture – Addressing modes – RISC – CISC. ALU design – Fixedpoint 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 – Cachememories – Improving cache performance – Virtual memory – Memory managementrequirements – 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 andprocessors.

Course Plan (Practical):

- C Programs for Computer Arithmetic

- Design of Cache Simulator
- Assembly Language Programs

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

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

Text Books:

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, TataMcGraw Hill, 1998.

3. V.P. Heuring, H.F. Jordan, "Computer Systems Design and Architecture", Second Edition, Pearson Education, 2004.

COMPUTER NETWORKS

Course Code	**:**	**CSE503**
Course Title	**:**	**Computer Networks**
Course Credits	**:**	**5.5**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 2**

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: Throuhgputvs 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

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. 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

THEORY OF COMPUTATION

Course Code	**:**	**CSE504**
Course Title	**:**	**Theory of Computation**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

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

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 & 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

WEB TECHNOLOGIES

Course Code	**:**	**CSE505**
Course Title	**:**	**Web Technologies**
Course Credits	**:**	**7**
Total Hours Per Week (L+T+P)	**:**	**3 + 1 + 2**

Course Syllabi (Theory):

- **Introduction:**
  Introduction to Web, Protocols governing the web, Web development strategies, Web applications, Web project, Web team.

- **Web Page Designing:**
  HTML: list, table, images, frames, forms, CSS;XML: DTD, XML schemes, presenting and using XML

- **Client Side Scripting:**
  Java script: Introduction, documents, forms, statements, functions, objects;Event and event handling;

- **Server Side Programming (JSP/ASP/PHP):**
  Introduction to JSP/PHP/ASP, JSP/ASP/PHP application design, Tomcat server, IIS, JSP/ASP/PHP objects, declaring variables and methods, debugging, sharing data between Front end and Back end.

Course Syllabi (Practical):

Web Site Designing using JSP/ASP/PHP

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 & 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

MANAGEMENT INFORMATION SYSTEM

Course Code	**:**	**CSE521 (Elective-I)**
Course Title	**:**	**Management Information System**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

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. 6
- 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. 10

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 & 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.

INFORMATION TECHNOLOGY& PROJECT MANAGEMENT

Course Code	**:**	**CSE 522 (Elective-I)**
Course Title	**:**	**Information Technology & Project Management**
Course Credits	**:**	**4**
Total Hours per Week (L+T+P)	**:**	**3+0+0**

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

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 & 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

PRACTICE SCHOOL – I

Course Code	**:**	**PS501**
Course Title	**:**	**Practice School – I**
Course Credits	**:**	**4**
Duration	**:**	**6 Weeks**

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.

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

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2012-2016

SEMESTER-SIXTH

Detailed Syllabus

&

Scheme of Examination

DISTRIBUTED SYSTEMS

Course Code	**:**	**CSE605**
Course Title	**:**	**Distributed Systems**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (Theory):

Characterization of Distributed Systems: Introduction, Examples of distributed

Systems, Resource sharing and the Web Challenges.

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

absence of global clock, shared memory, Logical clocks, Lamport's& vectors logical

clocks, 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 Agreement

Problem, Byzantine agreement problem, Consensus problem, Interactive consistency

Problem, Solution to Byzantine Agreement problem, Application of Agreement problem,

Atomic Commit in Distributed Database system.

Distributed Objects and Remote Invocation: Communication between distributed

objects, 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, The Andrew File System, Recent advances.

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

Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, 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 sliding window protocol, Routing algorithms, Destination based routing, APP problem, Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm.CORBA Case Study: CORBA RMI, CORBA services.

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/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

DESIGN & ANALYSIS OF ALGORITHMS

Course Code	**:**	**CSE602**
Course Title	**:**	**Design & Analysis of Algorithms**
Course Credits	**:**	**7**
Total Hours Per Week (L+T+P)	**:**	**3 + 1 + 2**

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):

Programs for the solution of the problems mentioned in theory will be developed using C++/Java language.

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 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", McGraw 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.

COMPILER DESIGN

Course Code	**:**	**CSE603**
Course Title	**:**	**Compiler Design**
Course Credits	**:**	**5.5**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 2**

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/Yaccfor 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

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

Reference Books:

R1. Compilers- Principles, Techniques and Tools, Alfred V Aho, Monica S. Lam, Ravi Sethi, Jeffrey D Ullman – 2nd Edition, Addison-Wesley, 2007.

R2. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.

R3.. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.

SOFTWARE ENGINEERING

Course Code	**:**	**CSE604**
Course Title	**:**	**Software Engineering**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (Theory):

- Introduction to Software Engineering; Prescriptive Process Models; Agile Process; Extreme Programming (XP); Brief Overview of Other Agile Process Models: Adaptive Software Development, Scrum

- Introduction; Core Principles of Process and Practice; Principles Guiding Each Framework Activity; Requirements Engineering; Groundwork for Understanding of Software Requirements; Overview of Eliciting Requirements, Developing Use Cases, Building the Requirements Model; Negotiating Requirements; Validating Requirements; Requirement Modeling Strategies; Overview of Flow-Oriented Modeling, Behavioral Modeling; Requirements Modeling for WebApps

- Design Concepts; Design Model; Architectural Styles, Architectural Design; Assessing lternative Architectural Designs; Architectural mapping Using Data Flow, Three Views of Component; Designing Class-Based Components; Conducting Component-Level Design; Component-Level Design for WebApps; Designing Traditional Components, Component-Based Development;

- Overview of Review Techniques, A Strategic Approach to Software Testing; Strategic Issues; Test Strategies for Conventional Software; Test Strategies for Object Oriented Software; Test Strategies for WebApps; System Testing; Debugging; Software Testing Fundamentals; White-Box Testing; Basis Path Testing; Control Structure Testing; Black-Box Testing; Testing for Specialized Environments; Patterns and Software Testing; Overview of Testing O-O Applications; Testing OOA and OOD Models; O-O Testing Strategies; O-O Testing Methods; Testing Methods Applicable at Class Levels; Inter-Class Test Case Design; Testing Concepts for WebApps; An Overview of Testing Process for WebApps; Content Testing; User Interface Testing; Component-Level Testing; Navigation Testing; Configuration Testing; Security Testing; Performance Testing

- Framework for Product Metrics; Metrics for Requirements Model; Metrics for Design Model; Design Metrics for WebApps; Metrics for Source Code; Metrics for Testing; Metrics for Maintenance; Software Project Estimation; Decomposition Techniques;

Empirical Estimation Models; Estimation for Object Oriented Projects Overview of Project Scheduling

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

Reference Books:

R1. Sommerville, "Software Engineering", 8th Edition, Pearson Education
R2. Waman S. Jawadekar, "Software Engineering – Principles and Practices", TMGH Publication
R3. PankajJalote, "Software Engineering – A Precise Approach", Wiley India

NETWORK SECURITY

Course Code	**:**	**CSE621 (Elective II)**
Course Title	**:**	**Network Security**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

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

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 & 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

MICROPROCESSORS& INTERFACING

Course Code	**:**	**ECE622 (Elective-II)**
Course Title	**:**	**Microprocessors& Interfacing**
Course Credits	**:**	**4**
Total Hours per Week (L+T+P)	**:**	**3+0+0**

Course Syllabi (Theory):

- Introductionto8085ACPUarchitecture – registerorganization,addressingmodesandtheirfeatures.Softwareinstructionsetand Assembly Language Programming. Pindescriptionandfeatures.
- Instructioncycle,machinecycle,Timingdiagram.
- HardwareInterfacing:Interfacingmemory,peripheralchips(IOmappedIO&MemorymappedIO).
- InterruptsandDMA.
- Peripherals:8279,8255,8251,8253,8237,8259, A/D and D/A converters and interfacingofthesame.
- Typicalapplicationsofamicroprocessor.
- 16 bit processors: 8086 and architecture, segmented memory has cycles, read/write cycle in min/max mode. Reset operation, wait state, Halt state, Hold state, Lock operation, and interrupt processing. Addressing modes and their features. Software instruction set (including specificinstructions like string instructions, repeat, segment override, lockprefizers and their use) and Assembly Language programming with the same.
- Briefoverviewofsomeother microprocessors (eg.6800Microprocessor).

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:

1. Ramesh S. Gaonkar, "Microprocessor Architecture, programming and applications with the 8085", Penram International
2. Ray, A.K. &Burchandi, K.M, "Advanced Microprocessors and Peripherals: Architecture, Programaming and Interfacing", McGraw Hill.
3. B.Ram, "Advanced Microprocessor & Interfacing", McGraw Hill.

Reference Books:

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

OPTIMIZATION TECHNIQUES

Course Code	**:**	**MA601**
Course Title	**:**	**Optimization Techniques**
Course Credits	**:**	**5.5**
Total Hours per Week (L+T+P)	**:**	**3 + 1 + 0**

Course Syllabus:

- **Introduction:** Introduction to Optimization and its scope, Formulating a Mathematical Model, Deriving Solutions from the Model
- **Linear Programming Problems:** Introduction to Linear Programming, Linear Programming Model, Solving L.P.P - Simplex Method, Revised Simplex Method, Duality Theory and Sensitivity Analysis, Dual Simplex Method, Transportation Problem and transportation problem paradox, Assignment Problem
- **Non-linear Programming**: Introduction, Single variable and multi variable optimization, Constrained and unconstrained problems, Kuhn-Tucker conditions
- **Network Optimization Models:** The Terminology of Networks, Shortest-Path Problem, Minimum Spanning Tree Problem, Project Management with CPM/ PERT
- **Other Optimization Models:** Dynamic Programming, Integer Programming, Game Theory,
- **Simulations:** Simulation V/s mathematical modeling, Monte Carlo simulation, simulation language, ARENA, Example & cases.
- **Multi-objective optimization**: Introduction to various multi-objective optimization techniques and its scope, Linear Goal Programming and Its Solution

Evaluation Scheme:

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 & Reference Books

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

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2012-2016

SEMESTER-SEVENTH

Detailed Syllabus

&

Scheme of Examination

ROBOTICS

Course Code	**:**	**CSE731 (Elective III/IV/V/VI/VII)**
Course Title	**:**	**Robotics**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (Theory):

- **Introduction:** Definition, Classification of Robots, Geometric classification and control classification.
- **Robot Elements:** Drive systems, Control systems, sensors, End effectors, Gripper actuators and gripper design.
- **Robot Coordinate Systems and Manipulator Kinematics:** Robot co-ordinate system representation, Transformation, Homogeneous transforms and its inverse, Relating the robot to its world.
- Manipulators Kinematics, Parameters of links and joints, Kinematic chains, Dynamics of kinematic chains, Trajectory planning and control, Advanced techniques of kinematics and dynamics of mechanical systems, Parallel actuated and closed loop manipulators.
- **Robot Control:** Fundamental principles, Classification, Position, path and speed control systems, adaptive control.
- **Robot Programming:** Level of robot programming, Language based programming, task level programming, Robot programming synthesis, robot programming for foundry, press work and heat treatment, welding, machine tools, material handling, warehousing assembly, etc., automatic storage and retrieval system, Robot economics and safety, Robot integration with CAD/CAM/CIM, Collision free motion planning

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 & Reference Books:

1. Robotic Technology (Vol. I-V) Phillipe Collet Prentice Hall
2. An Introduction to Robot Technology Coiffet and ChiroozaKogan Page
3. Robotics for Engineers Y. Koren McGraw Hill
4. Robotics K.S. Fu, R.C. Gonzalez & CSG Lee McGraw Hill International
5. Robotics J.J. Craig Addison-Wesley
6. Industrial Robots Groover, Mitchell Weiss, Nagel Octrey McGraw Hill
7. Robots & Manufacturing Automation Asfahl Wiley Eastern

ARTIFICIAL NEURAL NETWORK

Course Code	**:**	**CSE730(Elective III/IV/V/VI/VII)**
Course Title	**:**	**Artificial Neural Network**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (Theory):

- Artificial Neural Networks (ANN) and their biological roots and motivations. ANNs as numerical data/signal/image processing devices. Encoding (training phase) and decoding (active phase).Taxonomy of neural networks: feedforward and recurrent networks with supervised and unsupervised learning laws. Static and dynamic processing systems, Basic data structures: mapping of vector spaces, clusters, principal components.

- A summing dendrite, synapses and their weights, pre- and post-synaptic signals, activation potential and activation function. Excitatory and inhibitory synapses, The biasing input, Types of activating functions, The Perceptron and its learning law, Classification of linearly separable patterns.

- The adaptive linear element, Linear regression, The Wiener-Hopf equation, The Least-Mean-Square (Widrow-Hoff) learning algorithm. Method of steepest descent, Adeline as a linear adaptive filter, A sequential regression algorithm

- Multi-Layer Perceptrons, Supervised Learning, Approximation and interpolation of functions. Back-Propagation Learning law. Fast training algorithms. Applications of multilayer perceptrons: Image coding, Paint-quality inspection, Nettalk.

- Feedback neural networks, Pattern storage and retrieval, Hopfield model, Boltzmann machine, recurrent neural networks

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. Artifical neural networks - B.Vegnanarayana Prentice Haul of India P Ltd 2005

Reference Books:

R1. Satish Kumar, Neural Networks – A Classroom Approach, Tata McGraw-Hill, 2003
R2.S.Haykin, Neural Networks – A Comprehensive Foundation, Prentice Hall, 1998
R3. C.M.Bishop, Pattern Recognition and Machine Learning, Springer, 2006
R4.Introduction to Artificial Neural Systems Jacek M. Zurada, JAICO Publishing House Ed. 2006.

CRYPTOGRAPHY

Course Code	**:**	**CSE723(Elective III/IV/V/VI/VII)**
Course Title	**:**	**Cryptography**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (Theory):

- Introduction to Cryptography: Basics of Symmetric Key Cryptography, Basics of Assymetric Key Cryptography, Hardness of Functions, Notions of Semantic Security (SS) and Message
- Indistinguishability (MI): Proof of Equivalence of SS and MI, Hard Core Predicate, Trap-door permutation, Goldwasser-Micali Encryption, Goldreich-Levin Theorem: Relation between Hardcore , Predicates and Trap-door permutations

- Formal Notions of Attacks: Attacks under Message Indistinguishability: Chosen Plaintext Attack(IND-CPA), Chosen Ciphertext Attacks (IND-CCA1 and IND-CCA2), Attacks under Message Non-malleability: NMCPA and NM-CCA2, Inter-relations among the attack model

- Random Oracles: Provable Security and asymmetric cryptography, hash functions, One-way functions: Weak and Strong one way functions , Pseudo-random Generators (PRG), Blum-Micali-Yao Construction, Construction of more powerful PRG, Relation between One-way functions and PRG, Pseudo-random Functions (PRF)

- Building a Pseudorandom Permutation, The LubyRackoff Construction, Formal Definition, Application of the LubyRackoff Construction , To the construction of Block Ciphers, The DES in the light of LubyRackoff Construction

- Left or Right Security (LOR), Message Authentication Codes (MACs): Formal Definition of Weak and Strong MACs, Using a PRF as a MAC, Variable length MAC , Public Key Signature Schemes: Formal Definitions, Signing and Verification, Formal Proofs of Security of Full Domain Hashing , Assumptions for Public Key Signature Schemes: One way functions Imply Secure One-time Signatures

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. Stallings, William (2006), Cryptography and Network Security, Principles and Practices. Fourth Edition. Upper Saddle River, NJ: Prentice-Hall.

Reference Books:

R1. FerGuson, Niels&Schneier, Bruce (2003). Practical Cryptography, Wiley publications

R2. Wenbo Mao, "Modern Cryptography, Theory and Practice", Pearson Education (Low Priced Edition)

NETWORK MANAGEMENT

Course Code	**:**	**CSE724 (Elective III/IV/V/VI/VII)**
Course Title	**:**	**Network Management**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (Theory):

- **Data communications and Network Management Overview :** Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.
  SNMPV1 Network Management: Organization and Information and Information Models.
  Managed network: Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.
- **SNMPv1 Network Management:** Communication and Functional Models. The SNMP Communication Model, Functional model.
  SNMP ManagementSNMPv2: Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base,SNMPv2 Protocol, Compatibility With SNMPv1.
- **SNMP Management RMON:** What is Remote Monitoring? , RMON SMI and MIB, RMON1,RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON.
  Telecommunications Management Network: Why TMN? , Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, implementation Issues.
- **Network Management Tools and Systems:** Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, and Enterprise Management Solutions.
- **Web-Based Management:** NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network: Future Directions.

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."Network Management - Principles and Practice", Mani Subrahmanian, Pearson Education.

REFERENCE BOOKS:

R1."Network management", Morris, Pearson Education.

R2."Principles of Network System Administration", Mark Burges, Wiley Dreamtech.
"Distributed Network Management", Paul, John Wiley.

WIRELESS NETWORKS

Course Code	**:**	**CSE725 (Elective III/IV/V/VI/VII)**
Course Title	**:**	**Wireless Networks**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (Theory):

- Introduction, issues in mobile computing, overview of wireless telephony: cellular concept, GSM: air-interface, channel structure, location management: HLR-VLR, hierarchical, handoffs, channel allocation in cellular systems, CDMA, GPRS.
- Wireless Networking, Wireless LAN Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP, WAP: Architecture, protocol stack, application environment, applications.
- Data management issues, data replication for mobile computers, adaptive clustering for mobile wireless networks, File system, Disconnected operations.
- Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment.
- Adhoc networks, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, applications.

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 & References:

1. J. Schiller, Mobile Communications, Addison Wesley.

2. Charles Perkins, Mobile IP, Addison Wesley.

3. Charles Perkins, Ad hoc Networks, Addison Wesley.

4. Upadhyaya, "Mobile Computing", Springer

ARTIFICIAL INTELLIGENCE

Course Code	**:**	**CSE726 (Elective III/IV/V/VI/VII)**
Course Title	**:**	**Artificial Intelligence**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (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

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:

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", Fourth Edition, Pearson Education, 2002.
3. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers, 1998.

DATA MINING &DATA WAREHOUSING

Course Code	**:**	**CSE 727 (Elective III/IV/V/VI/VII)**
Course Title	**:**	**Data Mining &Data Warehousing**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (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.

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 & 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

DIGITAL IMAGE PROCESSING

Course Code	**:**	**CSE728(Elective III/IV/V/VI/VII)**
Course Title	**:**	**Digital Image Processing**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (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.

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

Reference Books:

R1. B. Chanda and D. DuttaMajumder, "Digital Image Processing and Analysis", PHI Publication.
R2. Madhuri A. Joshi, "Digital Image Processing – An Algorithmic Approach, PHI Publication.

MODELING & SIMULATION

Course Code	**:**	**CSE729 (Elective III/IV/V/VI/VII)**
Course Title	**:**	**Modeling & Simulation**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (Theory):

- **Introduction:** Systems, models, discrete event simulation and continuous simulation.
- **Discrete Event Simulation:** Time-advance mechanisms, event modeling of discrete dynamic systems, single-server single queue model, event graphs, Monte Carlo simulation.
- **GPSS:** Model structure, entities and transactions, blocks in GPSS, process oriented programming, user defined functions, SNA, logic switches, save locations, user chains, tabulation of result, programming examples.
- **Random Number Generation:** Congruence generators, long period generators, uniformity and independence testing
- **Random Variable Generation:** Location, scale and shape parameters, discrete and continuous probability distributions; Inverse transform method, composition and acceptance rejection, methods
- **Queuing Models:** Little's theorem, analytical results for M/M/1, M/M/1/N, M/M/c, M/G/1 and other queuing models.

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.Karian, Z.A. and Dudewicz, E.J., "Modern Statistical Systems and GPSS Simulation", 2nd Ed., CRC Press. 1999

T2.Banks, J., Carson, L.S., Nelson, B.L. and Nicol, D.M., "Discrete Event System Simulation", 3rd Ed., Pearson Education. 2002

T3.Law, A.M. and Kelton, W.D., "Simulation, Modeling and Analysis", 3rd Ed., Tata McGraw-Hill. 2003

CYBER LAWS & INTELLECTUAL PROPERTY RIGHT

Course Code	**:**	**CSE 722(Elective III/IV/V/VI/VII)**
Course Title	**:**	**Cyber Laws& Intellectual Property Right**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (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

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

References :

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", McGraw Hill

6. Furnell, "Computer Insecurity", Springer

7. IT Act 2000

OBJECT ORIENTED ANALYSIS AND DESIGN

Course Code	**:**	**CSE732(Elective III/IV/V/VI/VII)**
Course Title	**:**	**Object Oriented Analysis and Design**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi (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.

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

TextBook

1. Grady Booch, James Rumbaugh, IvarJacobson : 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.

PARALLEL PROCESSING

Course Code	**:**	**CSE733(Elective III/IV/V/VI/VII)**
Course Title	**:**	**Parallel Processing**
Course Credits	**:**	**4**
Total Hours per Week (L+T+P)	**:**	**3+0+0**

Course Syllabi (Theory):

1. Introduction to Parallel Processing: Flynn's classification, SIMD and MIMDoperations, Shared Memory vs. message passing multiprocessors, Distributed sharedmemory, Hybrid multiprocessors

2. Shared Memory Multiprocessors: SMP and CC-NUMA architectures, Cachecoherence protocols, Consistency protocols, Data pre-fetching, CC-NUMA memorymanagement, SGI 4700 multiprocessor, Network Processors

3. Interconnection Networks: Static and Dynamic networks, switching techniques,Routers, Internet techniques

4. Message Passing Architectures: Message passing paradigms, Grid architecture,Workstation clusters, User level software

5. Scheduling: Multiprocessor Programming Technique, Scheduling and mapping,Internet web servers, P2P, Content aware load balancing

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:

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.

SOFT COMPUTING

Course Code	**:**	**CSE734(Elective III/IV/V/VI/VII)**
Course Title	**:**	**Soft Computing**
Course Credits	**:**	**4**
Total Hours per Week (L+T+P)	**:**	**3+0+0**

Course Syllabi (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 ofcontinuous time networks – Process modeling using ANN- Neuro controller for invertedpendulum.

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 ofmembership function using neural networks – Adaptive fuzzy system.- FLC for invertedpendulum- Home heating system- Introduction to Neuro-fuzzy systems.

OPTIMIZATION TECHNIQUES

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

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:

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 Machine Learning', Pearson Education, 2007.

Reference Books:

1. J.S.R.Jang, C.T.Sun and E.Mizutani, ' Neuro- Fuzzy and Soft Computing' PearsonEducation, 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

COMPUTER PROJECT

Course Code	**:**	**CSE735(Elective III/IV/V/VI/VII)**
Course Title	**:**	**Computer Project**
Course Credits	**:**	**4**
Total Hours Per Week (L+T+P)	**:**	**3 + 0 + 0**

Course Syllabi

The objective of the project is to enable the students to work in a project of latest topic / research area / industrial applications. Each project student shall have a guide who is a faculty member.During the semester the students are expected to do literature survey, formulate the problem and form a methodology of arriving at the solution of the problem. The students are expected to complete the project and submit a full-fledged report comprising of the complete system developed along with implementation and test results. The departmental committee shall examine the students and award credits.

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

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
CSE721 (Elective III/IV/V/VI/VII)	Real Time Systems	3	0	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	50	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.

SEMINAR

Course Code	**:**	**SEM701**
Course Title	**:**	**Seminar**
Course Credits	**:**	**2.5**
Total Hours per Week (L+T+P)	**:**	**0 + 0 + 4**

Course Syllabi (Theory):

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.

Evaluation Scheme (Theory):

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

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Computer Science & Engineering)

Batch 2012-2016

SEMESTER-EIGHTH

Detailed Syllabus

&

Scheme of Examination

PRACTICE SCHOOL – II

Course Code	**:**	**PS801**
Course Title	**:**	**Practice School – II**
Course Credits	**:**	**16**
Duration	**:**	**Five and Half Months**

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