Bachelor of Technology (Information Technology)

B. Tech.(IT)
4 YEARS PROGRAMME

CREDIT BASED SYSTEM
wef JULY 2006

Department
of
Computer Sc. & Engineering
GJUST HISAR

Deptt. of CSE
G.J UNIVERSITY, HISAR

B.TECH. (IT)
SCHEME OF STUDIES & EXAMINATIONS

w.e.f 2006-2007

S. No.	Semester	Credits
1.	I	27
2.	II	25
3.	III	24.5
4.	IV	25
5.	V	26
6.	VI	24
7.	VII	25
8.	VIII	23.5
Total Credits		200

Note :

1.   Students are allowed to use single memory, programmable scientific calculator during examination for all subjects in BTech.

2.   More than one Elective will only be offered subject to availability of faculty.

3.   Teacher will conduct practical in group of 20-22 students

G.J UNIVERSITY, HISAR
SCHEME OF STUDIES & EXAMINATIONS
B. Tech I-YEAR CSE/IT SEMESTER – I wef 2006-2007

Course No.	Course Title	Teaching Schedule				Credits (IT)	Credits (CSE)	Duration of Exam.
		L	T	P	Total			
HUM-101-E	Essentials of Communication (CSE/IT)	3	1	-	4	3.5	3.5	3
MATH-101-E	Mathematics-I(CSE/IT)	3	2	-	5	4	4	3
PHY-101-E	Physics-I(CSE/IT)	3	1	-	4	3.5	3.5	3
ME-103-E	Manufacturing Processes(IT)	4	-	-	4	4		3
CH-101-E	or							
	Chemistry (CSE)	3	1	-	4		3.5	3
CSE-101-E	Fundamentals of Comp. & Prog. in C (IT)	3	1	-	4	3.5		3
	or							
EE-101-E	Electrical Technology (CSE)	3	1	-	4		3.5	3
ME-101-E	Elements Of Mechanical Engineering (IT)	3	1	-	4	3.5		3
ME-105-E	**or**							
	Engineering Graphics And Drawing (CSE)	1	-	4	5		3	3
PHY-103-E	Physics Lab – **I** (CSE/IT)	-	-	2	2	1	1	3
ME-107-E	Workshop Practice (IT)	-	-	4	4	2		3
	Or							
CH-103-E	Chemistry Lab (CSE)	-	-	2	2		1	3
EE-103-E	Electrical Technology Lab (CSE)	-	-	2	2		1	3
CSE-103-E	Or							
	Computer Programming Lab (IT)	-	-	2	2	1		3
ME-109-E	Elements Of Mech. Engineering Lab (IT)	-	-	2	2	1		3
TOTAL (CSE/IT)		**16/19**	**6/6**	**10/10**	**32/35**	**27**	**24**	

G.J UNIVERSITY, HISAR
SCHEME OF STUDIES & EXAMINATIONS
B. Tech I-YEAR CSE/IT SEMESTER – II wef 2006-2007

Course No.	Course Title	Teaching Schedule				Credit (IT)	Credit (CSE)	Duration of Exam.
		L	T	P	Total			
HUM-102-E	Communication Skills In English(**CSE/IT**) OR	3	1	-	4	3.5	3.5	3
BT-102-E	Basics of Biotechnology(**CSE/IT**)							
MATH-102-E	Mathematics-II(**CSE/IT**)	3	2	-	5	4	4	3
PHY-102-E	Physics-II(**CSE/IT**)	3	1	-	4	3.5	3.5	3
ME-103-E	Manufacturing Processes(**CSE**)	4	-	-	4		4	3
	OR							
CH-101-E	Chemistry (**IT**)	3	1	-	4	3.5		3
CSE-101-E	Fundamentals Of Computer & Programming In C (**CSE**)	3	1	-	4		3.5	3
	OR							
EE-101-E	Electrical Technology (**IT**)	3	1	-	4	3.5		3
ME-101-E	Elements Of Mech. Engineering(**CSE**) OR	3	1	-	4		3.5	3
ME-105-E	Engineering Graphics And Drawing(**IT**)	1	-	4	5	3		3
PHY-104-E	Physics Lab – II(**CSE/IT**)	-	-	2	2	1	1	3
ME-107-E	Workshop Practice(**CSE**)	-	-	4	4		2	3
	OR							
CH-103-E	Chemistry Lab (**IT**)	-	-	2	2	1		3
EE-103-E	Electrical Technology Lab(**IT**)	-	-	2	2	1		3
	OR							
CSE-103-E	Computer Programming Lab (**CSE**)	-	-	2	2		1	3
ME-109-E	Elements of Mech. Engineering Lab(**CSE**)	-	-	2	2		1	3
GP-102-E	General Proficiency(**CSE/IT**)	-	-	-	-	1	1	
	TOTAL (CSE/IT)	**19/16**	**6/6**	**10/10**	**35/32**	**25**	**28**	

B. Tech. (IT)   Semester- 3

Sl. No	Course No.	Subject	L	T	P	Total Hrs	Credits	Duration of Exam (Hours)
1	MATH-201-E	Mathematics III	3	2	-	5	4	3
2	CSE-201 E	Data Structures & Algorithms CSE,EL,IT	3	1	-	4	3.5	3
3	CSE-203 E	Discrete Structures CSE,IT	3	1	-	4	3.5	3
4	EE-217-E	Digital & Analog Communication (IT,CSE)	3	1	-	4	3.5	3
5	EE-204-E	Digital Electronics (EL,EE,IT,CSE,ELI&C)	3	1	-	4	3.5	3
6	HUM-201-E	Economics	3	1	-	4	3.5	3
7	IT-201 E	PC Lab.	-	-	2	2	1	3
8	CSE-205 E	Data Structures & Algorithms Lab	-	-	2	2	1	3
9	EE-224-E	Digital Electronics Lab (EL,EE,IT,CSE,ELI&C)	-	-	2	2	1	3
		TOTAL	**18**	**7**	**6**	**31**	**24.5**	

B. Tech. (IT)   Semester- 4

Sl. No.	Course No.	Subject	L	T	P	Total Hrs	Credits	Duration of Exam (Hours)
1	CSE-202 E	Data Base Management Systems (CSE,IT)	3	1	-	4	3.5	3
2	CSE-204 E	Programming Languages (CSE,IT)	3	1	-	4	3.5	3
3	IT-205 E	Computer Networks (CSE,IT)	3	1	-	4	3.5	3
4	IT-202 E	Object Oriented Programming using C++ (CSE,IT)	3	1	-	4	3.5	3
5	CSE-210 E	Computer Architecture & Organization (CSE, IT & V-Sem EL	3	1	-	4	3.5	3
6	IT-204 E	Multimedia Technologies (Common with CSE – V Sem.)	3	1	-	4	3.5	3
7	CSE-212 E	Data Base Management Systems Lab. (CSE,IT)	-	-	2	2	1	3
8	IT-206 E	C++ Programming Lab. (CSE,IT)	-	-	2	2	1	3
9	IT-208 E	Multimedia Technologies Lab (Common with CSE – V Sem.)	-		2	2	1	3
10	IT-209 E	Computer Network Lab. (CSE,IT)	-	-	2	2	1	3
		TOTAL	**18**	**6**	**8**	**32**	**25**	**-**

Note: During the vacation following this 4th semester, candidates will carry out self study of **Open Source Software** available on the internet and will complete a 'mini project' based upon this study. This project will be evaluated in the 5th semester by departmental committee. Students are free to do this self study at any place of their choice.

B. Tech. (IT)   Semester- 5

Sl. No	Course No.	Subject	Teaching Schedule				Credits	Duration of Exam (Hours)
			L	T	P	Total Hrs		
1	IT-301 E	Rapid Application Development	3	1		4	3.5	3
2	IT-303E	System Programming & System Administration (Common with CSE – VIth Sem)	3	1	-	4	3.5	3
3	IT-305E	High Speed Networks (Common with CSE – VIth Sem)	3	1	-	4	3.5	3
4	CSE-301 E	Principles of Operating System (CSE,IT)	3	1	-	4	3.5	3
5	EE- 309- E	Microprocessor & Interfacing (EL,EE,CSE,IT,ELI&C)	3	1	-	4	3.5	3
6	CSE-303 E	Computer Graphics (CSE,IT)	3	1	-	4	3.5	3
7	IT-307 E	Rapid Application Development Lab	-	-	2	2	1	3
8	CSE-309 E	Computer Graphics Lab (CSE,IT)	-	-	2	2	1	3
9	CSE-308 E	Operating Systems Lab. (Common with CSE – VI Sem)	-	-	2	2	1	3
10	EE-329- E	Microprocessor & Interfacing Lab. (CSE,IT,EE,EL,ELI&C)	-	-	2	2	1	3
11	IT-330E	Assessment of Mini-Project based upon Open Source Software carried out at the end of 4th semester.	-	-	-	-	1	3
		TOTAL	**18**	**6**	**8**	**32**	**26**	

B. Tech. (IT)   Semester- 6

Sl. No.	Course No.	Subject	Teaching Schedule				Credits	Duration of Exam (Hours)
			L	T	P	Total Hrs		
1	IT-302 E	Network Programming	3	1		4	3.5	3
2	CSE-302 E	Principles of Software Engineering (CSE,IT)	3	1	-	4	3.5	3
3	CSE-304 E	Intelligent Systems (CSE,IT)	3	1	-	4	3.5	3
4	CSE-307 E	Web Development (Common with CSE – V Sem,)	3	1	-	4	3.5	3
5	EE-402 E	Wireless Communication (CSE, IT, VIII EL)	3	1	-	4	3.5	3
6	EE-407-E	Digital Signal Processing (Common with VII-sem EC)	3	1	-	4	3.5	3
7	IT-304 E	Network Programming Lab. (EL,IT)	-	-	2	2	1	3
8	CSE-306 E	Intelligent Systems Lab. (CSE,IT)	-	-	2	2	1	3
9	CSE-311 E	Web Development & Core JAVA Lab. (Common with V Sem – CSE)	-	-	2	2	1	3
		TOTAL	**18**	**6**	**6**	**30**	**24**	**-**

Note: During the vacation period following this semester, the student will carry out self study of **.net** technology and will implement a 'mini -project' based upon this study. This project will be evaluated in the coming 7th semester. Students are free to do this self study at any place of their choice.

B. Tech. (IT)   Semester- 7

Sr. No	Course No.	Subject	Teaching Schedule				Credits	Duration of Exam (Hours)
			L	T	P	Total Hrs		
1	IT-401 E	Data Warehousing & Data Mining	3	1	-	4	3.5	**3**
2	CSE-403 E	Software Project Management (CSE,IT)	3	1	-	4	3.5	**3**
3	IT-403 E	System & Network Administration	3	1	-	4	3.5	**3**
4		OPEN ELECTIVE-1	4	-	-	4	4	**3**
5		PROG. ELECTIVE-I	4	-	-	4	4	**3**
6	IT-405 E	System & Network Administration Lab.	-	-	3	3	1.5	**3**
7	IT-407 E	Advanced JAVA Lab. (Common with CSE – VIII Sem)	-	-	4	4	2	**3**
8	IT-498 E	Major PROJECT – Part I	-	-	4	4	2	
9	IT-485 E	Assessment of Mini-Project based upon **.net** technology carried out at the end of 6th semester.	-	-	-	-	1	-
10.	CH-451-E	Environmental Sc. & Engineering	3	-	-	3	On qualifying basis only non-credit course	
		TOTAL	**20**	**3**	**11**	**34**	**25**	

'Major Project- Part I' will commence in 7th semester where students will identify the project problem, complete the design, procure the software/books needed. The project will be completed in 8th semester along with its examinations. The evaluation of Part 1 will be done by a committee constituted by Department.

OPEN ELECTIVES-1

To be offered by other B Tech deptt of university

PROGRAMME ELECTIVES-1
CSE-401 E   Advanced Computer Architecture
IT-467- E   Computer Software Testing
CSE-425 E   Natural Language Processing
IT-471- E   Management Information system
CSE-405 E   Compiler Design

B. Tech. (IT)   Semester- 8

Sl. No	Course No.	Subject	Teaching Schedule				Credits	Duration of Exam (Hours)
			L	T	P	Total Hrs		
1	CSE-402 E	Distributed Operating System (CSE,IT)	3	1	-	4	3.5	3
2	IT-402 E	Security of Information Systems (CSE,IT)	3	1	-	4	3.5	3
3		PROG. ELECTIVES II	4	-	-	4	4	3
4		PROG. ELECTIVES III	4	-	-	4	4	3
5	IT-404 E	Computer Animation Lab.	-	-	3	3	1.5	3
6	IT-499 E*	Major PROJECT - Part II	-	-	8	8	4	3
7	IT-490 E	Colloquium	-	-	2	2	1	
8	IT-495 E	General Fitness for the Profession	-	-	-	-	2	3
		TOTAL	**14**	**2**	**13**	**29**	**23.5**	

PROGRAMME ELECTIVES-II
CSE-412-E   Object Oriented Systems Development
IT-466-E   Embedded system Design
CSE-414-E   Digital Image Processing

PROGRAMME ELECTIVES-III

IT-470 E   Web Engineering
IT-472 E   Introduction to VLSI Design
CSE-500-E   Operations Research
CSE-416 E   Social and Professional Issues in IT

   *Evaluation & Viva Voce to be conducted jointly by internal and external examiner

Note : A teacher will conduct practical class in a group of 20-22 students.

HUM-101-E   **Essentials of Communication (B Tech. CSE/IT 1ˢᵗ Sem)**

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

The course aims at inculcating a minimum level of language proficiency among students of Engineering and Technology. The purpose is to sensitise them to the nuances of English and its applications for various communication needs.

COURSE CONTENT:

Unit-I

Semantics: Synonyms, Antonyms, Homophones, Homonyms, Form and function of words

Unit-II

Syntax: Sentence structures, Verb patterns and their usage

Unit-III

Phonetics: Basic Concepts – Vowels, Consonants, Phonemes, Syllables; Articulation of Speech Sounds – Place and Manner of Articulation; Transcription of words and simple sentences, using International Phonetic Alphabet.

Unit-IV

Comprehension: Listening and Reading comprehension – Note taking, Reviewing, Summarising, Interpreting, Paraphrasing and Précis Writing.

Unit-V

Composition: Descriptive, Explanatory, Analytical and Argumentative Writing - description of simple objects like instruments, appliances, places, persons, principles; description and explanation of processes and operations; analysis and arguments in the form of debate and group discussion

Unit-VI

Text: *English for Students of Science* by A.Roy and P.L. Sharma (Orient Longman)
 Chapters for Study:
i)   "The year 2050" by Theodore J. Gordon.
ii) "The Mushroom of Death" by A. Bandhopadhyay.
iii) "The Discovery" by Herman Ould.

The prescribed text will be used as a case study for various components of the syllabus.

<div align="center">**Unit-VII (For Internal Evaluation Only):**</div>

Book Review – Herein the students will be required to read and submit a review of a book (Literary or non-literary) of their own choice. This will be followed by a presentation of the same in the class.

TEXT BOOKS:

1. *English for Students of Science* edited by A. Roy and P.L. Sharma, Orient Longman.
2. *Spoken English for India* by R.K. Bansal and J.B. Harrison, Orient Longman.
3. *Intermediate Grammar, Usage and Composition* by M.L. Tickoo and A.E. Subramanian, Orient Longman.

SUGGESTED READING:

1. *English Grammar, Composition and Correspondence* by M.A. Pink and S.E. Thomas, S. Chand and Sons Pvt. Ltd.,Delhi.
2. *A Practical English Grammar* by Thomson and Martinet, OUP, Delhi.
3. *Guide to Patterns and Usage in English by A.S. Hornby*, OUP, Delhi.
4. *A Textbook of English Phonetics for Indian Students* by T. Balasubramanian, MacMillan, Chennai.
5. *Better English Pronunciation* by J.D.O'Connor, Cambridge Univ. Press, London.
6. *English Vocabulary in Use* by McCarthy, Foundation Books (Cambridge University Press), Delhi.
7. *Assessing Listening* by Buck, Foundation Books (Cambridge University Press), Delhi.
8. *Reading Between the Lines* by McRae, Foundation Books (Cambridge university Press), Delhi.

SCHEME OF EXAMINATION:

There will be seven questions in all covering all the units, except Unit VII which (besides other modes of internal evaluation) is for internal assessment only.
All questions will be compulsory and will have sufficient internal choice.

Unit-I: 15 Marks

The question will be set so as to evaluate the following: Usage of the words given, Changing the grammatical quality and function of the words, One word Substitutes, synonyms, antonyms, homophones, homonyms.

Unit-II: 20 Marks

There will be one question having different parts. The question should test students' knowledge of sentence structures and verb patterns. The question can be in the nature of 'Do as directed', 'Tracing and rectifying structural
Errors', 'Elucidating patterns through sentences and vice-versa', 'Changing the word-order', 'Synthesizing the sentences' and 'Completing the sentences', etc.

Unit-III: 15 Marks

There will be two questions from this Unit. Question one will be in the nature of short notes testing the basic concepts and articulation of speech sounds. The second question would require transcription of individual words and simple sentences.

Unit-IV: 15 Marks

Comprehension and Interpretation of a passage given (Literary or non-literary, newspaper article, story, extract from a speech etc.), will be judged for its vocabulary, general understanding and interpretation of the content in the form of question answer exercise, culling out important points, suggesting a suitable topic/title, summarizing and précis writing etc.

Unit-V: 15 Marks

The question will require the definition, description, analysis, explanation of various objects and processes. Bedsides, a topic of contemporary relevance may be given for writing a paragraph in any one of the writing forms prescribed in the unit.

Unit-VI: 20 Marks

There will be two questions from the text prescribed. The first question will evaluate the comprehension of the text through short answer questions or a long answer question.
The second question will judge the linguistic aspect of the text such as using a particular word in its various syntactic forms like noun, adjective, verb etc.; matching the lists of words and their explanation; providing opposite/similar meanings, adding suffixes and prefixes etc.

MATH-101-E   **Mathematics-I (BTech. CSE/IT 1ˢᵗ Sem)**

L T P   Total Credit   **Duration of exam**

3   2   -   4   3 Hours

SYLLABUS
Part-A

   Infinite series : Convergence and divergence, Comparison, D' Alembert's ratio, Integral, Raobes, Logarithmic and Cauchy root tests, Alternating series, Absolute and conditional convergence.

   Applications of Differentiation : Taylor's and Maclaurin's series, Asymptotes, Curvature Asymptotes.

   Partial Differentiation & its Applications : Functions of two or more variables; partial derivatives, Total differential and differentiability, Derivatives of composite and implicit functions, Jacobians, Higher order partial derivatives.

   Homogeneous functions, Euler's theorem, Taylor's series for functions of two variables (without proof), maxima-minima of function of two variables, Lagrange's method of undetermined multipliers, Differentiation under integral sign.

Part-B

   Applications of Single & Multiple Integration : Applications of single integration to find volume of solids and surface area of solids of revolution. Double integral, change of order of integration, Double integral in polar coordinates, Applications of double integral to find area
enclosed by plane curves and volume of solids of revolution.

   Triple integral, volume of solids, change of variables, Beta
and gamma functions and relationship between them.

   Vector Calculus : Differentiation of vectors, scalar and vector point functions Gradient of a scalar field and directional derivative, divergence and curl of a vector field and their physical interpretations.
   Integration of vectors, line integral, surface integral, volume integral, Green, Stoke's and Gauss theorems (without proof) and their simple applications.

TEXT BOOKS :

1. Advanced Engineering Mathematics : F. Kreyszig.
2. Higher Engineering Mathematics : B.S. Grewal.

REFERENCE BOOKS :

1. Engineering Mathematics Part-I : S.S. Sastry.
2. Differential and Integral Calculus : Piskunov.
3. Advanced Engineering Mathematics : R.K. Jain and S.R.K.Iyengar
4. Advanced Engg. Mathematics : Michael D. Greenberg

Note: Examiner will set eight questions, taking four from Part-A and four from Part-B. Students
         will be required to attempt five questions taking at least two from each part.

PHY-101-E   Physics-I (B Tech. CSE/IT 1ˢᵗ Sem)

L	T	P	Total Credit	Duration of exam
3	1	-	3.5	3 Hours

SYLLABUS
PART-A
PHYSICAL OPTICS

Interference : Division of wave front-Fresnel's biprism, Division of amplitude – Newton's rings, Michelson interferometer, applications.

Diffraction : Difference between Fraunhofer and Fresnel diffraction. Fraunhofer diffraction through a slit. Plane transmission diffraction grating, its dispersive and resolving powers.

Polarization : Polarised and unpolarized light, double refraction; Nicol prism, quarter and half wave plates, Polarimetry; Biquartz and Laurent's half-shade polarimeters, Simple concepts of photoelasticity.

LASER

Spontaneous and stimulated emissions, Laser action, characteristics of laser beam-concepts of coherence, He-Ne and semiconductor lasers (simple ideas), applications.

FIBRE OPTICS

Propagation of light in fibres, numerical aperture, single mode and multi mode fibres, applications.

PART-B
WAVE AND OSCILLATIONS

Simple concepts of Harmonic Oscillator, resonance, quality factor. E.M. wave theory-review of basic ideas, Maxwell's equations, simple plane wave equations, simple concepts of wave guides and co-axial cables, Poynting vector.

DIELECTRICS

Molecular theory, polarization, displacement,susceptibility, dielectric coefficient, permitivity & various relations between these, Gauss's law in the presence of a dielectric, Energy stored in an electric field.

Behaviour of dielectrics in a.c. field-simple   concepts, dielectric losses.

SPECIAL THEORY OF RELATIVITY

Michelson-Moreley experiment, Lorentz transformations, variation of mass with velocity, mass energy equivalence.

NUCLEAR PHYSICS

Neutron Cross-section, Nuclear fission, Moderators, Nuclear reactors, Reactor criticality, Nuclear fusion. Interaction of radiation with matter-basic concepts, radiation detectors-ionisation chamber, G.M. Counter, Scintillation and solid state detectors, cloud chamber and bubble chamber.

TEXT BOOKS :

1. Physics of the Atom - Wehr, Richards & Adair (Narosa)
2. Perspectives of Modern Physics - Arthur Beiser (TMH)
3. Modern Engineering Physics – A.S. Vasudeva (S. Chand)

REFERENCE BOOKS :

1. Electricity and Magnetism – F.W. Sears (Narosa)
2. Physics Vol-I & II – Resnick & Halliday (Wiley Eastern)
3. A Text Book of Optics – Brij Lal & Subramanyam

Note: The Examiners will set eight questions, taking four from each part. The students will be required to attempt five questions in all selecting at least two from each part. All questions will carry equal marks.

ME- 103 E   **Manufacturing Processes (B Tech. IT 1ˢᵗ Sem & CSE 2ⁿᵈ Sem)**

L   T   P   Total Credit   **Duration of exam**

4   -   -   4   3 Hours

SYLLABUS

Unit I   Introduction: Introduction to Manufacturing Processes and their Classification. Industrial Safety; Introduction, Types of Accidents, Causes and Common Sources of Accidents, Methods of Safety, First Aid.

Unit II   Engineering Materials: General Properties and Applications of Engineering Materials, Mild Steel, Medium Carbon Steel, High Carbon Steel, High Speed Steel and Cast Iron.

Unit III   Foundry: Introduction to Casting Processes, Basic Steps in Casting Process, Pattern, Types of Patterns, Pattern Allowances, Risers, Runners, Gates, Moulding Sand and its composition, Sand Preparation, Molding Methods, Core Sands and Core Making, Core Assembly, Mold Assembly, Melting (Cupola) and Pouring, Fettling, Casting Defects and Remedies.

Unit IV   Cold Working (Sheet Metal Work): Sheet Metal Operations, Measuring, Layout Marking, Shearing, Punching, Blanking, Piercing, Forming, Bending and Joining Advantages and Limitations.
Hot Working Processes: Introduction to Hot Working, Principles of Hot Working Processes, Forging, Rolling, Extrusion, Wire Drawing..

Unit V   Introduction to Machine Tools: Specifications and Uses of commonly used Machine Tools in a Workshop such as Lathe, Shaper, Planer, Milling, Drilling, Slotter, Introduction to Metal Cutting. Nomenclature of a Single Points Cutting Tool and Tool Wear. Mechanics of Chips Formations, Type of Chips , Use of Coolants in machining.

Unit VI   Welding: Introduction to Welding, Classification of Welding Processes, Gas Welding: Oxy-Acetylene Welding, Resistance Welding; Spot and Seam Welding, Arc Welding: Metal Arc, TIG & MIG Welding, Welding Defects and Remedies, Soldering & Brazing.

Unit VII   Plant Layout, Objectives of Layout, Types of Plant Layout and their Advantages.

Text Books :
1. Workshop Technology Volt.I & II   - Hazra & Chaudhary, Asian Book Comp., New Delhi.
2. Process and Materials of Manufacture -- Lindberg, R.A. Prentice Hall of India,New Delhi.
3. Principles of Manufacturing Materials and Processes - Campbell, J.S.- McGraw- Hill.

Reference Books:
1. Manufacturing Science - Amitabha Ghosh & Ashok Kumar Malik, - East-West Press.
2. Manufacturing Process and Systems - Ostwald, Munoz , John Wiley.
3. Workshop Technology, Vol. 1, 2 & 3 – Chapman, WAJ, Edward Arnold.

Note : Eight questions will be set by the examiner, taking at least one question from each unit. Students will be required to attempt five questions.

CH-101-E   Chemistry (B Tech. CSE 1st Sem & IT 2nd Sem)

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

Unit-1 :

Thermodynamics - Second law, concept of Entropy, Entropy change for an ideal gas, free energy and work functions, Free energy change, Chemical Potential, Gibb's Helmholtz equation, Clausius - Clapeyron equation, Related numerical problems with above topics.

Unit-2 :

Phase-Rule - Terminology, Derivation of Gibb's Phase Rule Equation, One Component System (H_2O System), Two Components systems, Eutectic system (Pb-Ag), system with congruent m.pt. (Zn-Mg), systems with incongruent m.pt. (Na-K), Applications of above Systems.

Unit-3 :

Water & its treatment : Part I – Sources of water, impurities in water, hardness of water and its determination, units of hardness, alkalinity of water and its determination, Related numerical problems, scale and sludge formation (composition properties and methods of prevention).

Unit-4 :

Water and its treatment : Part II – Treatment of water for domestic use, coagulation, sedimentation, filtration and dis-infection, water softening, Ion-exchange process, mixed bed demineralisation, Desalination (reverse osmosis) (electrodialysis).

Unit-5 :

Corrosion and its prevention - Galvanic & concentration cell, Dry and wet corrosion, Electrochemical theory of corrosion, Galvanic corrosion, pitting corrosion, water-line corrosion, differential aeration corrosion, stress corrosion, factors affecting corrosion, Preventive measures (proper design, Cathodic protection, protective coatings).

Unit-6 :

Lubrication and Lubricants - Friction, mechanism of lubrication, classification and properties of lubricants, Additives for lubricants, synthetic lubricants, Greases – Preparation & properties (consistency, drop point) and uses.

Unit-7 :

Polymers and Polymerization - Organic polymers, polymerisation, various types of polymerization, effect of structure on properties of polymers, preparation properties and technical applications of thermo-plastics (PVC,PVA), thermosets (PF,UF), and elastomers (SBR,GR-N), Silicones, Introduction to polymeric compsites.

Unit-8 :

Analytical Methods - Thermal methods, Principle, method and application of Thermo gravimetric analysis, Differential thermal analysis and Differential scanning calorimetry , (Experimental details are excluded),Spectroscopic methods, Spectrophotometry, interaction of E.M. radiations with a molecule and origin of spectrum, spectroscopic, techniques-vibrational and electronic spectroscopy (Experimental details are excluded), conductometric titration, elementary discussion on Flame-photometry.

NOTE :   Eight questions are to be set with a fair weightage of all the units. The candidates will be required to attempt five questions in all.

TEXT BOOKS :
1. Engineering Chemistry, P.C. Jain, Monica Jain (Dhanpat Rai & Co.).
2. Chemistry in Engineering & Tech., Vol.I & II, Rajaram, Kuriacose (TMH).

REFERENCE BOOKS :
1. Instrumental methods of Chemical Analysis, MERITT & WILLARD (East-West Press).
2. Physical Chemistry, P.W. Atkin (ELBS, Oxford Press).
3. Physical Chemistry, W.J. Moore (Orient-Longman).

CSE -101 E   Fundamentals of Computers & Programming in C
(B Tech. IT 1st Sem & CSE 2nd Sem)

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

Unit-1: An Overview of Computer System: Anatomy of a digital Computer, Memory Units, Main and Auxiliary Storage Devices, Input Devices, Output Devices, Classification of Computers.

Radix number system: Decimal, Binary, Octal, Hexadecimal numbers and their inter-conversions; Representation of information inside the computers.

Unit-2: Operating System Basics: The user Interface, Running Programmes, Managing files, Introduction to PC operating Systems: Unix/Linux , DOS, Windows 2000.

Unit-3:   Internet basics: **:** Introduction to the basic concepts of Networks and Data Communications**,** How Internet works, Major features of internet, Emails, FTP, Using the internet.

Unit-4: Programming Languages: Machine-, Assembly-, High Level- Language, Assembler, Compiler, Interpreter, debuggers, Programming fundamentals: problem definition, algorithms, flow charts and their symbols, introduction to compiler, interpreter, assembler, linker and loader and their inter relationship.

Unit-5:   C Programming language: C fundamentals, formatted input/ output, expressions, selection   statements, loops and their applications;   Basic types, arrays, functions, including recursive functions,   program organization: local and external variables and scope; pointers & arrays.

Unit-6:   Strings: strings literals, string variables, I/O of strings, arrays of strings; applications. Preprocessor: preprocessor directives, macro definition, conditional compilation; Structures, Unions   and   Enumerations: Structure variables and operations on structures; Structured types, nested array   structures;   unions; enumeration as integers, tags and types.Declaration: Declaration syntax, storage classes, types qualifiers, declarators, initializers. Program Design: modules, information hiding, abstract data types, difference between C & C++, Low level programming: Bitwise operators, Bit fields in structures, other low level techniques.

Unit-7: Standard library: Input / output; streams, file operations, formatted I/O, character I/O, line I/O,   block, string I/O, Library support for numbers and character data, error handling:

Text Books:
- Using Information Technology, 5th Edi, Brian K Williams & Stacey C. Sawyer, 2003, TMH
- The C Programming Language by Dennis M Ritchie, Brian W. Kernigham, 1988, PHI.
- C Programming – A modern approach by K.N. King, 1996, WW Norton & Co.
  Reference Books:
    - Information technology, Dennis P. Curtin, Kim Foley, Kunal Sen, Cathleen Morin, 1998, TMH
    - Theory and problem of programming with C, Byron C Gottfried, TMH
    - Teach yourself all about computers by Barry Press and Marcia Press, 2000, IDG Books India.
    - Using Computers and Information by Jack B. Rochester, 1996, Que Education & Training.
  Note: 8 questions will be set by the examiner (at least 2 questions from unit-1 to 4, 2 each from unit –5&   6, and one from unit-7). The students will be required to attempt 5 questions in all.

EE-101-E   Electrical Technology (B Tech. CSE 1st Sem & IT 2nd Sem)

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

UNIT1. D.C. CIRCUITS :
   Ohm's Law, Kirchoff's Laws, D.C. Circuits, Nodal and Loop methods of analysis.

UNIT2.
A.C. CIRCUITS :
   Sinusoidal signal, instantaneous and peak values, RMS and average values, phase angle, polar & rectangular, exponential and trigonometric representations; R,L and C components, behaviors of these components in A.C. circuits. Concept of complex power, power factor.

TRANSIENT RESPONSE :
Transient response of RL, RC and RLC Circuits with step input.

UNIT3. NETWORK THEOREMS :
       Thevenin's theorem, Norton's theorem, superposition theorem, maximum power transfer theorem, Reciprocity theorem, Tellegen's theorem, Milman's theorem. Star to Delta & Delta to Star transformation.

UNIT4. SERIES AND PARALLEL A.C. CIRCUITS :
       Series and parallel A.C. circuits, series and parallel resonance, Q factor, cut-off frequencies and bandwidth.

UNIT5. THREE PHASE CIRCUITS :
       Phase and line voltages and currents, balanced star and delta circuits, power equation, measurement of power by two wattmeter method, Importance of earthing.

UNIT6. TRANSFORMERS :
       Principle, construction & working of transformer, Efficiency and regulation.

UNIT7. ELECTRICAL MACHINES :
       Introduction to D.C. Machines, Induction motor, Synchronous machines.

UNIT8. MEASURING INSTRUMENTS :
   Voltmeter, Ammeter, Watt meter, Energy meter.

TEXT BOOKS:
1. Basic Electrical Engg (2nd Edition) : Kothari & Nagarath, TMH
2. Electrical Technology (Vol-I) : B.L Theraja & A K Theraja, S.Chand

REFERENCE BOOKS:
1. Electrical Engineering Fundamentals : Deltoro, PHI
2. Network Analysis :Valkenburg, PHI

NOTE : Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

ME- 101 E   Elements Of Mechanical Engineering (B Tech. IT 1ˢᵗ Sem & CSE 2ⁿᵈ Sem)

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

Unit I   Properties of Steam & Boilers:

Formation of steam at constant pressure, Thermodynamics properties of steam, Condition of steam, Steam tables, Measurement of dryness fraction by throttling calorimeter, Classification of boilers, Comparison of water and fire tube boilers mounting and accessories with their functions, Constructional and operational details of Cochran and Babcock and Wilcox boilers, Problems.

Unit II   Steam Turbines and Condensers:

Classification of turbines, Working principle of impulse and reaction turbine, Compounding of impulse turbine, Comparison of impulse and reaction turbines, Types of condensers, Cooling ponds and cooling towers, Condenser and vacuum efficiencies.

Unit III   I.C. Engines and Gas Turbines:

Introduction, Classification, Constructional details and working of two-stroke and four-stroke diesel and petrol engines, Otto, Diesel and Dual cycles, Working principle of gas turbine, Constant pressure gas turbine cycle.

Unit IV   Water Turbines, Pumps and Hydraulic Devices:

Introduction, Classification, Construction details and working of Pelton, Francis and Kaplan turbines, Specific speed and selection of turbines, Classification of water pumps and their working, Hydraulic jack and lift.

Unit V   Simple Lifting Machines:

Definition of machine, Velocity ratio, Mechanical advantage, Efficiency, Laws of machines, Reversibility of machine, Wheel and axle, Differential pulley block, Single, double and triple start worm and worm wheel, Single and double purchase winch crabs, Simple and compound screw jacks. Problems.

Unit VI   Power Transmission Methods and Devices:

Introduction to Power transmission, Belt drive, Rope drive, Chain drive, Pulley, Gear drive, Types of gears, Gear train, Clutches, Types and function of clutches, Types and function of brakes, Power measurement by dynamometer, Types of dynamometers.

Unit VII   Stresses and Strains:

Introduction, Concept & types of Stresses and strains, Poison's ratio, stresses and strains in simple and compound bars under axial loading, Stress-strain diagrams, Hooks law, Elastic constants & their relationships, Principle stresses & strains and principal- planes, Mohr's circle of stresses. Numerical problems.

Unit VIII   Bending Moment & Shear Force:

Definitions, SF and BM diagrams for cantilever and simply supported beam. Calculation of maximum SF, BM and point of contra-flexure under the loads of (i) concentrated load (ii) uniformly distributed load (iii) combination of concentrated and uniformly distributed loads. Problems.

Text Books:
1. Strength of Materials - G.H. Ryder, Pub.- ELBS.
2. Hydraulic and Fluid Mechanics – Modi and Seth, Pub. – Standard Book House, New Delhi
3. Engineering Thermodynamics – C.P. Arora, Pub. - TMH, New Delhi
4. Thermal Engineering – A.S. Sarad, Pub. - Satya Prakashan, New Delhi.
5. Engineering Mechanics – K.L. Kumar, Pub. - TMH, New Delhi.
6. Theory of Machines – S.S. Rattan, Pub. – TMH, New Delhi.

Reference Books:
1. Strength of Materials – Popov, Pub. - PHI, New Delhi.
2. Hydraulic Machines – Jagdish Lal, Pub.- Metropolitan, Allahbad.
3. Thermal Science and Engineering – D.S. Kumar, Pub. – Kateria & Sons, New Delhi.

NOTE: In the semester examination, the examiner will set eight questions, at least one question from each unit. The students will be required to attend only 5 questions.

ME-105 E   Engineering Graphics And Drawing (B Tech. CSE 1st Sem & IT 2nd Sem)

L   T   P   Total Credit   **Duration of exam**

1   4   3   3 Hours

SYLLABUS

Unit I   Various types of projections, First and Third angle systems of orthographic projections. Projection of Points in different quadrants.

Unit II   Projections of Straight Lines – parallel to one or both reference planes, contained by one or both planes, perpendicular to one of the planes, inclined to one plane but parallel to the other planes, inclined to both the planes, true length of a line and its inclination with reference planes, traces of a line.

Unit III   Projections of Planes – parallel to one reference plane, inclined to one plane but perpendicular to the other, inclined to both reference planes.

Unit IV   Projections of Polyhedra Solids and Solids of Revolution - in simple positions with axis perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other, Projections of sections of Prisms, Pyramids, Cylinders and Cones. True shape of section. Development of surfaces of various solids.

Unit V   Isometric projections - introduction, isometric scale, Isometric views of plane figures, prisms, pyramids and cylinders.

Unit VI   Orthographic drawings of Bolts and Nuts, Bolted Joints, Screw threads, Screwed Joints.

Unit VII   Free Hand Sketching - Orthographic Views from Isometric, Views of Simple Machine Components such as Brackets, Bearing Blocks , Guiding Blocks and Simple Couplings.

Note :   **Some simple exercises may be attempted with AUTOCAD.**

Text Book
1.   Engineering Drawing Plane and Solid Geometry : N.D. Bhatt and V.M.Panchal, Forty-Fourth Edition 2002, Charotar Publishing House.

Reference Books
1.   Engineering Graphics and Drafting : P.S. Gill, Millennium Edition, S.K. Kataria and Sons.
2.   A Text Book of Engineering Drawing : S.B. Mathur, Second Revised and Enlarged Edition 2000, Vikas Publishing House.
3.   Engineering Graphics using AUTOCAD 2000 : T. Jeyapoovan, First Edition 2002, Vikas Publishing House.

PHY-103-E : Physics Lab.-I (B Tech. CSE/IT 1ˢᵗ Sem)

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours

SYLLABUS

The experiments in Ist semester will be based mainly upon optics, electrostatics, wave and oscillations which are the parts of the theory syllabus of Ist semester.

1.   To find the wavelength of sodium light by Newton's rings experiment.
2.   To find the wavelength of sodium light by Fresnel's biprism experiment.
3.   To find the wavelength of various colours of white light with the help of a plane transmission diffraction grating.
4.   To find the refractive index and cauchy's constants of a prism by using spectrometer.
5.   To find the wavelength of sodium light by Michelson interferometer.
6. To find the resolving power of a telescope.
7.   To find the pitch of a screw using He-Ne laser.
8.   To find the specific rotation of sugar solution by using a polarimeter.
9.   To compare the capacitances of two capacitors by De'sauty bridge and hence to find the dielectric constant of a medium.
10.   To find the flashing and quenching potentials of Argon and also to find the capacitance of unknown capacitor.
11.   To study the photoconducting cell and hence to verify the inverse square law.
12.   To find the temperature co-efficient of resistance by using platinum resistance thermometer and Callender and Griffith bridge.
13.   To find the frequency of A.C. mains by using sonometer.
14.   To find the velocity of ultrasonic waves in non-conducting medium by piezo-electric method.

RECOMMENDED BOOKS :
1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)
2. Practical Physics – S.L.Gupta & V.Kumar (Pragati Prakashan).
3. Advanced Practical Physics Vol.I & II – Chauhan & Singh (Pragati Prakashan).

Note :   Students will be required to perform atleast   10 experiments out of the list in a semester.

ME- 107 E   Workshop Practice (B Tech. IT 1st Sem & CSE 2nd Sem)

L   T   P   Total Credit   **Duration of exam**
-    -   4   2   3 Hours

SYLLABUS

List of Experiments / Jobs

1.   To study different types of measuring tools used in metrology and determine least counts of vernier calipers, micrometers and vernier height gauges.

2.   To study different types of machine tools (lathe, shape or planer or slotter, milling, drilling machines)

3.   To prepare a job on a lathe involving facing, outside turning, taper turning, step turning, radius making and parting-off.

4.   To study different types of fitting tools and marking tools used in fitting practice.

5.   To prepare lay out on a metal sheet by making and prepare rectangular tray, pipe shaped components e.g. funnel.

6.   To prepare joints for welding suitable for butt welding and lap welding.

7.   To perform pipe welding.

8.   To study various types of carpentry tools and prepare simple types of at least two wooden joints.

9.   To prepare simple engineering components/ shapes by forging.

10.   To prepare mold and core assembly, to put metal in the mold and fettle the casting.

11.   To prepare horizontal surface/ vertical surface/ curved surface/ slots or V-grooves on a shaper/ planner.

12.   To prepare a job involving side and face milling on a milling machine.

NOTE: 1.   At least ten experiments/ jobs are to be performed/ prepared by students in the semester.

2.   At least 8 experiments/ jobs should be performed / prepared from the above list, remaining two may either be performed/ prepared from the above list or designed & set by the concerned institution as per the scope of the syllabus of Manufacturing Processes and facilities available in the Institute.

CH-103-E Chemistry Lab. (BTech. CSE 1ˢᵗ Sem & IT 2ⁿᵈ Sem)

L T P   Total Credit   **Duration of exam**
-   - 2   1   3 Hours

SYLLABUS
LIST OF EXPERIMENTS
1. Determination of Ca^{++} and Mg^{++} hardness of water using EDTA   solution.
2. Determination of alkalinity of water sample.
3. Determination of dissolved oxygen (DO) in the given water sample.
4. To find the melting & eutectic point for a two component system by using method of cooling curve.
5. Determination of viscosity of lubricant by Red Wood viscometer (No. 1 & No. 2).
6. To determine flash point & fire point of an oil by Pensky - Marten's flash point apparatus.
7. To prepare Phenol-formaldehyde and Urea formaldehyde resin.
8. To find out saponification No. of an oil.
9   Estimation of calcium in lime stone and dolomite.
10. Determination   of   concentration   of $KMnO_4$ solution spectrophotomet-erically.
11. Determination of strength of HCl solution by titrating it against NaOH solution conductometerically.
12. To determine amount of sodium and potassium in a, given water sample by flame photometer.
13. Estimation of total iron in an iron alloy.

Note :   At least ten experiments are to be performed by the
students.

SUGGESTED BOOKS :
1.   A Text Book on Experimental and Calculation - Engineering
        Chemistry, S.S. Dara, S. Chand & Company (Ltd.)
2.   Essential of Experimental Engineering Chemistry, Shashi
        Chawla, Dhanpat Rai Publishing Company.
3.   Theory & Practice Applied Chemistry – O.P. Virmani, A.K.
        Narula (New Age)

EE-103-E   Electrical Technology Lab (BTech. CSE 1ˢᵗ Sem & IT 2ⁿᵈ Sem)

L T P Total Credit   **Duration of exam**

-   -   2   1   3 Hours

SYLLABUS

LIST OF EXPERIMENTS

1. To verify KCL and KVL.

2. To verify Thevenin's & Norton's Theorems.

3. To Verify maximum power transfer theorem   in D.C. Circuit & A.C circuit.

4. To verify reciprocity & Superposition theorems.

5. To study frequency response of a series R-L-C circuit and determine resonant frequency& Q-factor for various Values of R,L,C.

6. To study frequency response of a parallel R-L-C circuit and determine resonant frequency & Q -Factor for various values of R,L,C.

7. To perform direct load test of a transformer and plot efficiency Vs load characteristic.

8.To perform direct load test of a D.C. shunt generator and plot load voltage Vs load current curve.

9.To plot V-curve of a synchronous motor.

10.To perform O.C. and S.C. tests of a three phase induction motor.

11.To study various type of meters.

12.Measurement of power by 3 voltmeter / 3 ammeter method.

13.Measurement of power in a 3 phase system by two watt meter method.

NOTE: 1. At least 10 experiments are to be performed by students in the semester.
        2.   At least 7 experiments should be performed from the above list, remaining three experiments may either be performed from the above list or designed and set by the concerned institution as per the scope of the syllabus of EE-101-E.

CSE -103 E   C Programming Lab. (B Tech. IT 1st Sem & CSE 2nd Sem)

L T P   Total Credit   **Duration of exam**

- - 2   1   3 Hours

SYLLABUS

Representative programming problems:-

1. Write a program to find the largest of three numbers. (if-then-else)
2. Write a program to find the largest number out of ten numbers (for-statement)
3. Write a program to find the average mail height & average female heights in
    the class (input is in form of sex code, height).
4. Write a program to find roots of quadratic equation using functions and switch statements.
5. Write a program using arrays to find the largest and second largest no.
    out of given 50 nos.
6. Write a program to multiply two matrices
7. Write a program to read a string and write it in reverse order
8. Write a program to concatenate two strings
9. Write a program to sort numbers using the Quicksort Algorithm.
10. Represent a deck of playing cards using arrays.
11. Write a program to check that the input string is a palindrome or not.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

ME- 109 E   Elements of Mechanical Engineering Lab. (BTech. IT 1ˢᵗ Sem & CSE 2ⁿᵈ Sem)

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

LIST OF EXPERIMENTS

1. To study Cochran & Babcock & Wilcox boilers.

2. To study the working & function of mountings & accessories in boilers.

3. To study 2-Stroke & 4-Stroke diesel engines.

4. To study 2-Stroke & 4-Stroke petrol engines.

5. To calculate the V.R., M.A. & efficiency of single, double & triple start worm & worm wheel.

6. To calculate the V.R., M.A. & efficiency of single & double purchase winch crabs.

7. To find the percentage error between observed and calculated values of stresses in the members of a Jib crane.

8. To draw the SF & BM diagrams of a simply supported beam with concentrated loads.

9. To study the simple & compound screw jacks and find their MA, VR & efficiency.

10. To study the various types of dynamometers.

11. To the constructional features & working of Pelton/Kaplan/Francis.

12. To prepare stress-strain diagram for mild steel & cast iron specimens under tension and compression respectively on a Universal testing machine.

13. To determine the Rockwell / Brinell /Vickers hardness no. of a given specimen on the respective machines.

Note:
1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list.
Remaining   three   experiments should be performed as designed & set by
the concerned Institution as per the scope of the syllabus.

HUM-102-E   Communication Skills In English (BTech. CSE/IT 2nd   Sem)

L   T   P   Total Credit   **Duration of exam**
3   1   0   3.5   3 Hours

SYLLABUS

This course is designed for the students of Engineering and Technology who need English for specific purposes in specific situations. It aims at imparting the communication skills that are needed in their academic and professional pursuits. This is achieved through an amalgamation of traditional lecture-oriented approach of teaching with the task based skill oriented methodology of learning.

COURSE CONTENT:
Unit-I
Communicative Grammar: Spotting the errors pertaining to nouns, pronouns, adjective and adverbs; Concord - grammatical concord, notional concord and the principle of proximity between subject and verb.

Unit-II
Lexis: Idioms and phrases; Words often confused; One-Word Substitutes; Formation of words (suffixes, prefixes and derivatives); Foreign Words (A selected list)

Unit-III
Oral Communication:
Part-A: Introduction to principal components of spoken English – Word-stress patterns, Intonation, Weak forms in English
Part-B: Developing listening and speaking skills through various activities, such as (a) role play activities, (b) Practising short dialogues (c) Group discussion (d) Debates (e) Speeches (f) Listening to news bulletins (g) Viewing and reviewing T.V. programmes etc.

Unit-IV
Written Communication:
Developing reading and writing skills through such tasks/activities as developing outlines, key expressions, situations, slogan writing and theme building exercises

Reading verbal and non-verbal texts-like cartoons, Graphs and tabulated data etc.

Unit-V (For Internal Evaluation Only):

Book Review – Herein the students will be required to read and submit a review of a book (Literary or non-literary) of their own choice. This will be followed by a presentation of the same in the class

Unit-VI
Technical Writing:

(a) Business Letters, Format of Business letters and Business letter writing
(b) E-mail writing
(c) Reports, Types of Reports and Format of Formal Reports
(d) Press Report Writing

SUGGESTED READING:

1. *Language in Use (Upper intermediate Level,* Adrian Doff Christopher Jones, Cambridge University Press
2. *Common Errors in English,* Abul Hashem, Ramesh Publishing House, new Delhi.
3. *Objective English*, Tata Mc. Graw Hill Publishing Company Ltd., New Delhi.
4. *Spoken English for India,* R.K. Bansal & J.B. Harrison, Orient Longman, Delhi.

5. *The sounds of English,* Veena Kumar, Makaav Educational Software, New Delhi.
6. *English Phonetics & Phonology*, P. Roach, Cambridge University Press, London.
7. *English for Engineers and Technologists: A Skill Approach*, Vol. 2, Orient Longman,Delhi.
8. *Business Communication,* M.S. Ramesh and C.C. Pattanshetti, R.Chand and Company, Delhi
9. *Group Discussion,* Sudha Publications/Ramesh Publishing House, New Delhi.

SCHEME OF EXAMINATION:
All questions will be compulsory and will cover all the aspects of the syllabus **except unit V**. There will be sufficient internal choice.

Unit-I: 20 Marks
Questions No. 1 will require the students to carefully read the sentences given and trace the errors, if any, and then supply the correct alternatives/answers.

Unit-II: 20 Marks
Question No. 2 may have four or five parts testing knowledge of different items of vocabulary.

Unit-III: 20 Marks
Question No. 3 will have two parts of 10 marks each from part A and B of the unit. Part A will have content words, form words and sentences for stress marking, transcription and intonation marking respectively. Part B will test students' speaking skills through various oral tasks and activities - debate, group discussion and speech - in written form only.

Note: **Speaking and listening skills will primarily be tested orally through internal assessment.**

Unit-IV: 20 Marks
Question No. 4 may have many parts. The questions will be framed to test students' composition skills on the elements prescribed in the unit. For example, the students may be required to develop a hypothetical situation in a dialogue form, or to develop an outline, key expression, graph etc.

Unit-V is for internal assessment only.

Unit-VI: 20 Marks
Question No. 5 may have two parts. While the one part may require the students to frame either a press/news report for the print media or write the given business letter, or e-mail a message, the second part will have a theory question on the format of formal report and business letter.

BT-102-E   Basics of Biotechnology (BTech. CSE/IT 2nd   Sem)

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

Unit-I

1.   **Cell Structure and Function** : Prokaryotes and Eukaryotes: Cell Wall, Membrances, Nucleus, Mitochondria, Chloroplast, Ribosome, Vacuoles, Bacteria and viruses : a brief descriptions.
2.   **Biomolecules** : A brief account of sturucture of Carbohydrates, Lipids, Proteins.
3.   **Cell Division** : Mitosis and Meiosis.
4.   **Genes** : Classical- brief idea about Mendel's laws and chromosomes, Nature of Genetic material, DNA and RNA, DNA replication.

Unit-II

5.   **Gene Expression** : Central dogma, genetic code, molecular mechanism on mutations, regulation of gene expression, housekeeping genes, differentiation and development mutations and their molecular basis.
6.   **Genetic Engineering** : an introduction to genetic engineering : Cloning (vectors, enzymes); cDNA and genomic libraries, Transgenics, DNA fingerprinting, Genomics.

Unit-III

7.   **Development of Biotechnology** : Nature and Scope of Biotechnology.
8.   **Applications of Biotechnology** : Bioprocess and fermentation technology, Cell Culture, Enzyme technology, Biological fuel generation, Single cell protein, Sewage Treatment, Environmental Biotechnology, Biotechnology and medicine, Biotechnology in agriculture & forestry industry, Food and Beverage Technology Production of Biological inventions, Safety in Biotechnology.

Text/Reference Books :

1.   Biotechnology, Smith, Cambridge Press.
2.   Modern Concepts of Biotechnology, H.D.Kumar, Vikas Publishing House (P) Ltd.
3.   Elements of Biotechnology, P.K.Gupta, Rastogi Publications.

MATH-102-E   **Mathematics-II (BTech. CSE/IT 2ⁿᵈ Sem)**

L T P   Total Credit   **Duration of exam**

3 2 -   4   3 Hours

SYLLABUS

Part-A

   Matrices & its Applications : Rank of a matrix, elementary transformations, elementary matrices, inverse using elementary transformations, normal form of a matrix, linear dependence and in dependence of vactors, consistency of linear system of equations, linear and orthogonal transformations, eigen values and eigen vectors, properties of eigen values, Cayley - Hamilton theorem and its applications.

Part-B

   Ordinary Differential Equations & its Applications : Exact differential equations. Equations reducible to exact differential equations. Applications of Differential equations of first order & first degree to simple electric circuits, Newton's law of cooling, heat flow and orthogonal trajectories.

   Linear differential equations of second and higher order. Complete solution, complementary function and particular integral, method of variation of parameters to find particular Integral, Cauchy's and Legender's linear equations, simultaneous linear equations with constant co-efficients. Applications of linear differential equations to simple pendulum, oscillatory electric circuits.

Part-C

   Laplace Transforms and its Applications : Laplace transforms of elementary functions, properties of Laplace transforms, existence conditions, transforms of derivaties, transforms of integrals, multiplication by t^n, division by t. Evaluation of integrals by Laplace   transforms. Laplace transform of Unit step function, unit impulse function and periodic function.   Inverse transforms,   convolution theorem, application to   linear differential equations and simultaneous linear differential equations with constant coefficients.

   Partial Differential Equations and Its Applications : Formation of partial differential equations, Lagrange's linear partial differential equation, First order non-linear partial differential equation, Charpit's method. Method of separation of variables and its applications to wave equation and one dimensional heat equation, two dimensional heat flow, steady state solutions only.

TEXT BOOKS :
1. Advanced Engg. Mathematics F Kreyszig
2. Higher Engg. Mathematics B.S. Grewal

REFERENCE BOOKS :
1. Differential Equations – H.T.H. Piaggio.
2. Elements of Partial Differential Equations – I.N. Sneddon.
3. Advanced Engineering Mathematics – R.K. Jain, S.R.K.Iyengar.
4. Advanced Engg. Mathematics – Michael D. Greenberg.

Note: Examiner will set eight questions, taking two from Part-A, three from Part-B and three from Part-C. Students will be required to attempt five question taking atleast one from each part.

PHY-102-E : Physics-II (BTech. CSE/IT 2nd Sem)

L T P Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

PART-A

CRYSTAL STRUCTURE

   Space Lattice, unit cell and translation vectors, Miller indices, simple crystal structure, Bonding in solids, Experimental x-ray diffraction method, Laue method, powder Method, Point defects in solids, Elementary idea of quarks and gluons.

QUANTUM PHYSICS

   Difficulties with Classical physics, Introduction to quantum mechanics-simple concepts, discovery of Planck's constant, Group velocity and   phase velocity, Schrodinger wave equations - time dependant and   time independent Schrodinger equations, Elementary ideas of quantum statistics.

FREE ELECTION THEORY

   Elements of classical free electron theory   and   its limitations, Drude's Theory of Conduction, quantum theory of free electrons, Fermi level, Density of states, Fermi-Dirac distribution function, Thermionic emission, Richardson's equation.

PART-B

BAND THEORY OF SOLIDS

   Origin of energy bands, Kronig, Penney Model (qualitative), E-K diagrams, Brillouin Zones, Concept of effective mass and holes, Classification of solids into metals, Semiconductors and insulators, Fermi energy and its variation with temperature. Hall effect and its Applications.

PHOTOCONDUCTIVITY AND PHOTOVOLTAICS

   Photoconductivity in insulating crystals, variation with illumination, effect of traps, applications of photoconductivity, photovoltaic cells and their characteristics.

MAGNETIC PROPERTIES OF SOLIDS

   Atomic magnetic moments, orbital diamagnetism, Classical theory of paramagnetism, ferro magnetism - molecular fields and domains.

SUPER CONDUCTIVITY

        Introduction (experimental survey), Meissner effect, London equation.

TEXT BOOKS :
1. Introduction to Solid State Physics (VII Ed.) – Charles Kittel (John Wiley).
2. Quantum Mechanics – Powell and Crasemann (Oxford & IBH)
3. Fundamentals of Solid State Physics – B.S.Saxena, R.C.Gupta and P.N.Saxena (Pragati Prakashan).

REFERENCE BOOKS :

1. Sold State Physics – Pillai (New Age).
2. A text book of Engg. Physics – Avadhanulu and Kshirsagar (S.Chand)
3. Quantum Mechanics – Ghatak & Loknathan.

Note: The Examiners will set eight questions, taking four from each part. The students will be
        required to attempt five questions in all selecting at least two from each part. All
        questions will carry equal marks.

PHY-104-E : Physics Lab.-II (BTech. CSE/IT 2ⁿᵈ Sem)

L   T   P   Total Credit   **Duration of exam**

-    -   2   1   3 Hours

SYLLABUS

LIST OF EXPERIMENTS

The experiments in Second semester will be based upon electricity, Magnetism, Modern Physics and Solid State Physics which are the parts of theory syllabus.

1. To find the low resistance by carey - Foster's bridge.
2. To find the resistance of a galvanometer by Thomson's constant diffelction method using a post office box.
3. To find the value of high resistances by Substitution method.
4. To find the value of high resistances by Leakage method.
5. To study the characteristics of a solar cell and to find the fill factor.
6. To find the value of e/m for electrons by Helical method.
7. To find the ionisation potential of Argon/Mercury using a thyratron tube.
8. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus.
9. To study the characteristics of (Cu-Fe, Cu-Constantan) thermo couple.
10. To find the value of Planck's constant by using a photo electric cell.
11. To find the value of co-efficient of self-inductance by using a Rayleigh bridge.
12. To find the value of Hall Co-efficient of semi-conductor.
13. To study the V-I characteristics of a p-n diode.
14. To find the band gap of intrinsic semi-conductor using four probe method.
15. To calculate the hysteresis loss by tracing a B-H curve.

RECOMMENDED BOOKS :

1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)
2. Practical Physics – S.L.Gupta & V.Kumar (Pragati Prakashan).
3. Advanced Practical Physics Vol.I & II – Chauhan & Singh (Pragati Prakashan).

Note :   Students will be required to perform atleast 10 experiments out of the list in a semester.

B.Tech. (IT)

3rd YEAR

MATH-201-E   MATHEMATICS-III   (BTech IT 3ʳᵈ Sem)

L   T   P   Total Credit   **Duration of exam**
3   2   -   4   3 Hours
SYLLABUS

Part-A
Fourier Series and Fourier Transforms : Euler's formulae, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and consine series.

Fourier integrals, Fourier transforms, Shifting theorem (both on time and frequency axes), Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem, Fourier transform of Dirac-delta function.

Part-B
Functions of Complex Variable : Definition, Exponential function, Trignometric and Hyperbolic functions, Logrithmic functions. Limit and Continuity of a function, Differnetiability and Analyticity.

Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations. Harmonic functions, application to flow problems. Integration of complex functions. Cauchy- Integral theorem and formula.

Power series, radius and circle of convergence, Taylor's Maclaurin's and Laurent's series. Zeroes and singularities of complex functions, Residues. Evaluation of real integrals using residues (around unit and semi circle only).

Part-C
Probability Distributions and Hypothesis Testing : Conditional probability, Bayes theorem and its applications, expected value of a random variable. Properties and application of Binomial, Poisson and Normal distributions.

Testing of a hypothesis, tests of significance for large samples, Student's t-distribution (applications only), Chi-square test of goodness of fit.

Linear Programming : Linear programming problems formulation, Solving linear programming problems using (i) Graphical method (ii) Simplex method (iii) Dual simplex method.

Text books :

1. Advanced Engg. Mathematics : F Kreyszig.
2. Higher Engg. Mathematics : B.S. Grewal.

Reference books :

1. Advance Engg. Mathematics : R.K. Jain, S.R.K.Iyenger.
2. Advanced Engg. Mathematics : Michael D. Greenberg.
3. Operation Research : H.A. Taha.
4. Probability and statistics for Engineers : Johnson. PHI.

Note: Examiner will set eight questions, taking two from Part-A, three from Part-B and three from Part-C. Students will be required to attempt five question taking atleast one from each part.

CSE-201 E   **Data Structures & Algorithms (BTech IT 3rd Sem)**

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

Unit-1: Introduction to Data Structures: Definition of data structures and abstract data types, Static and Dynamic implementations, Examples and real life applications; The Stacks : Definition, Array based implementation of stacks, Linked List based implementation of stacks, Examples : Infix, postfix, prefix representation, Conversions, Applications.

Unit-2: Queues and Lists: Definition, Array based implementation of Queues / Lists, Linked List implementation of Queues / Lists, Circular implementation of Queues and Singly linked Lists, Straight / circular implementation of doubly linked Queues / Lists, Priority Queues, Applications.

Unit-3: Trees: Definition of trees and Binary trees, Properties of Binary trees and Implementation, Binary Traversal pre-order, post order, In- order traversal, Binary Search Trees, Implementations, Threaded trees, Balanced multi way search trees, AVL Trees, Implementations

Unit-4: Graphs: Definition of Undirected and Directed Graphs and Networks, The Array based implementation of graphs, Adjacency matrix, path matrix implementation, The Linked List representation of graphs, Shortest path Algorithm, Graph Traversal – Breadth first Traversal, Depth first Traversal, Tables : Definition, Hash function, Implementations and Applications.

Unit-5: Running time: Time Complexity, Big – Oh - notation, Running Times, Best Case, Worst Case, Average Case, Factors depends on running time, Introduction to Recursion, Divide and Conquer Algorithm, Evaluating time Complexity.

Unit-6: Sorting Algorithms : Introduction, Sorting by exchange, selection, insertions : Bubble sort, Straight selection sort, Efficiency of above algorithms,; Shell sort, Performance of shell sort, Merge sort, Merging of sorted arrays& Algorithms; Quick sort Algorithm analysis,

Heap sort: Heap Construction, Heap sort, bottom – up, Top – down Heap sort approach;

Searching Algorithms: Straight Sequential Search, Binary Search (recursive & non–recursive Algorithms)

Text Book:
- Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.

Reference Books:
- Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
- Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
- Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
- Data Structures and Program Design in C By Robert Kruse, PHI,
- Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum's outline by TMH
- Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
- Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-203 E   **Discrete Structures (B Tech IT 3ʳᵈ Sem)**

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

Unit-1: Set Theory: Introduction to set theory, Set operations, Algebra of sets, Duality, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions , Partial ordering relations and lattices

Function and its types, Composition of function and relations, Cardinality and inverse relations

Unit-2: Propositional Calculus: Basic operations: AND(^), OR(v), NOT(~), Truth value of a compound statement, propositions, tautologies, contradictions.

Unit–3: Techniques Of Counting: Permutations with and without repetition, Combination.

Unit-4: Recursion And Recurrence Relation : Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

Unit-5: Algebric Structures Definition and examples of a monoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem

Unit-6: Graphs And Trees: Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eurelian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Trees, Spanning trees, Binary trees and its traversals

Text Book:
- Elements of Discrete Mathematics   C.L Liu, 1985, McGraw Hill

Reference Books:
- Discrete Mathematics by Johnson Bough R., 5ᵗʰ Edition, PEA, 2001..
- Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.
- Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Sc Press.
- App Discrete Structures for Computer Science, Doerr and Levasseur, (Chicago: 1985,SRA
- Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold, London,
- Schaums Outline series: Theory and problems of Probability by S. Lipshutz, 1982, McGraw-Hill Singapore
- Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI
- Discrete Mathematical Structures with Applications to Computers by Tembley & Manohar, 1995, Mc Graw Hill.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

EE-217 E   **Digital and Analog Communication (BTech IT 3rd Sem)**

L   T   P   Total Credit   **Duration of exam**
3   1   -   3.5   3 Hours
                                    SYLLABUS

Unit-1: Communication system components: Introduction to Communication: Definition & means of communications; Digital and analog signals: sign waves, square waves; Properties of signals: amplitude, frequency, phase; Theoretical basis for data communication: Fourier analysis: Fourier series and Fourier Transform (property, ESD, PSD and Raleigh) effect of limited bandwidth on digital signal.

Unit-2: Data Transmission System: Physical connections: modulation, amplitude-, frequency-, phase- modulation; Data encoding: binary encoding (NRZ), Manchester encoding, differential Manchester encoding.
Transmission Media: Twisted pair-, co-axial-, fiber optic-cables, wireless media Transmission impairments: attenuation, limited bandwidth of the channels, delay distortion, noise, data rate of the channels (Nyquist theorem, Shannon limit). Physical layer interfaces: RS 232, X.21

Unit-3: Standards in data communications: Communication modes: simplex, half duplex, full duplex; Transmission modes: serial-, parallel-transmission; Synchronizations: Asynchronous-, synchronous-transmission; Type of services: connection oriented-, connectionless-services; Flow control: unrestricted simplex protocol, simplex stop- and -wait protocol, sliding window protocol; Switching systems: circuit switching; picketing switching: data gram , virtual circuits, permanent virtual circuits.

Telephone Systems: PSTN, ISDN, asynchronous digital subscriber line.
Multiplexing: frequency division-, time-, wave- division multiplexing

Unit-4: Security in data communications: Transmission errors: feedback-, forward-error control approaches; Error detection; Parity check, block sum check, frame check sequences; Error correction: hamming codes, cyclic redundancy check; Data encryption: secret key cryptography, public key cryptograph; Data compression: run length encoding, Huffman encoding.
Text Book:
- Data Communications, Computer Networks and Open Systems Halsall Fred, (4th editon) 2000, Addison Wesley, Low Price edition
- **Reference Books:**
- Business Data Communications, Fitzgerald Jerry, 7th Ed. New York, 2001, JW&S,
- Comm Systems, 4th Edi, by A. Bruce Carlson, Paul B. Crilly, Janet C. Rutledge, 2002, TMH.
- Data Communications, Computer Networks and Open Systems, Halsall Fred, 1996, AW.
- Digital Communications, J.G . Proakiss, 4th Ed., MGH
- Satellite Communication, Pratt, John Wiley
- Data & Computer Communications, W.Stallings PHI
- Digital & Data Communication systems, Roden 1992, PHI,
- Introduction to Digital & Data Communications, Miller Jaico Pub.
- Data Communications and Networking, Behrouz A. Forouzan, 2003, 2nd Edition, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

EE-204-E   **Digital Electronics (BTech IT 3rd Sem)**

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours

SYLLABUS

Unit 1 Fundamentals Of Digital Techniques :
Digital signal, logic gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, Boolean algebra.
Review of Number systems. Binary codes: BCD, Excess-3, Gray,   EBCDIC, ASCII, Error
detection and correction codes.

Unit 2   Combinational Design Using Gates:
Design using gates, Karnaugh map and Quine Mcluskey methods of simplification.

Unit 3   Combinational Design Using Msi Devices
Multiplexers and Demultiplexers and their use as logic elements, Decoders, Adders / Subtractors,
BCD arithmetic circuits, Encoders, Decoders / Drivers for   display   devices.

Unit 4   Sequential Circuits:
Flip Flops : S-R, J-K, T, D, master-slave, edge triggered, shift registers, sequence generators,
Counters, Asynchronous and Synchronous Ring counters and Johnson Counter, Design of
Synchronous and Asynchronous sequential circuits.

Unit 5   Digital Logic Families:
Switching mode operation of p-n junction, bipolar and MOS. devices. Bipolar logic families:RTL,
DTL, DCTL, HTL, TTL, ECL, MOS, and CMOS logic families. Tristate logic, Interfacing of
CMOS and TTL families.

Unit 6   A/D And D/A Converters:
Sample and hold circuit, weighted resistor and R -2 R ladder D/A Converters, specifications for
D/A converters. A/D converters : Quantization, parallel -comparator, successive approximation,
counting type, dual-slope ADC, specifications of ADCs.

Unit 7   Programmable Logic Devices:
ROM, PLA, PAL, FPGA and CPLDs.

Text book :
1. Modern Digital Electronics(Edition III) :   R. P. Jain; TMH

Reference books :
1. Digital Integrated Electronics : Taub & Schilling; MGH
2. Digital Principles and Applications : Malvino & Leach; McGraw Hill.
3. Digital Design : Morris Mano; PHI.

NOTE : Eight questions are to be set in all by the examiner taking at least one question from each
unit. Students will be required to attempt five questions in all.

HUM-201-E   **ECONOMICS   (BTech IT 3ʳᵈ Sem)**

L   T   P   Total Credit   **Duration of exam**
3   1   -   3.5   3 Hours
SYLLABUS
COURSE OBJECTIVE : The purpose of this course is to :
1. Acquaint the student in the basic economic concepts and their operational significance and
2 .Stimulate him to think systematically and objectively about contemporary economic problems.

UNIT-I

Definition of Economics - various definitions, Nature of Economic problem, Production possibility curve Economic laws and their nature.   Relation between Science, Engineering, Technology and Economics.

UNIT-II

Concepts and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility - its practical application and importance.

UNIT-III

Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve, Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & applications of the concept of elasticity of demand.

UNIT-IV

Meaning of production and factors of production; Law of variable proportions, Returns to scale, Internal and External economics and diseconomies of scale.
Various concepts of cost - Fixed cost, variable cost, average   cost, marginal cost, money cost, real cost opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

UNIT-V

Meaning of Market, Types of Market - Perfect Competition, Monopoly, Oligoply, Monoplistic Competition (Main features of these markets)

Supply and Law of Supply, Role of Demand & Supply in Price Determinition and effect of changes in demand and supply on prices.

UNIT-VI

Nature and characteristics of Indian economy (brief and elementary introduction), Privatization - meaning, merits and demerits. Globalisation of Indian economy - merits and demerits. Elementary Concepts of VAT, WTO, GATT & TRIPS agreement.

Text books :
1.   Principles of Economics : P.N. Chopra (Kalyani Publishers).
2.   Modern Economic Theory – K.K. Dewett (S.Chand)
Reference books :
1.   A Text Book of Economic Theory Stonier and Hague (Longman's Landon)
2.   Micro Economic Theory – M.L. Jhingan (S.Chand)
3.   Micro Economic Theory - H.L. Ahuja (S.Chand)
4.   Modern Micro Economics :   S.K. Mishra (Pragati Publications)
5.   Economic Theory - A.B.N. Kulkarni & A.B. Kalkundrikar (R.Chand & Co.)
6.   Indian Economy : Rudar Dutt & K.P.M. Sundhram

NOTE: Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

IT-201 E   **PC Lab.** (BTech IT 3rd Sem)

L T P Total Credit   **Duration of exam**
- - 2   1   3 Hours
                         SYLLABUS

PC Software: Application of basics of MS Word 2000, MS Excel 2000, MS Power Point 2000, MS Access 2000.
1.   To prepare the Your Bio Data using MS Word
2.   To prepare the list of marks obtained by students in different subjects and show with the help of chart/graph the average, min and max marks in each subject.
3.   Preapare a presentation explaining the facilities/infrastructure available in your college/institute.
4.   Create a database of books in the library on a mini scale w.r.t. Computers and manipulate the database using different forms and reports.

PC Hardware :
1.   To check and measure various supply voltages of PC.
2.   To make comparative study of motherboards.
3.   To observe and study various cables, connections and parts used in computer communication.
4.   To study various cards used in a system viz. display card, LAN card etc.
5.   To remove, study and replace floppy disk drive.
6.   To remove, study and replace hard disk.
7.   To remove, study and replace CD ROM drive.
8.   To study monitor, its circuitry and various presents and some elementary fault detection.
9.   To study printer assembly and elementary fault detection of DMP and laser printers.
10.   To observe various cables and connectors used in networking.
11.   To study parts of keyboard and mouse.
12.   To assemble a PC.
13.   Troubleshooting exercises related to various components of computer like monitor, drives, memory and printers etc.

   Reference Books:
      a. Complete PC upgrade & maintenance guide, Mark Mines, BPB publ.
      b. PC Hardware: The complete reference, Craig Zacker & John Rouske, TMH
      c. Upgrading and Repairing PCs, Scott Mueller, 1999, PHI,

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

CSE-205 E   **Data Structures & Algorithms Lab.** (BTech IT 3rd Sem)

L   T   P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours

SYLLABUS

1.   Write a program to search an element in a two-dimensional array using linear search.

2.   Using iteration & recursion concepts write programs for finding the element in the array using Binary Search Method

3.   Write a program to perform following operations on tables using functions only
     a) Addition   b) Subtraction c) Multiplication d) Transpose

4.   Using iteration & recursion concepts write the programs for Quick Sort Technique

5.   Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.

6.   Write a program for swapping of two numbers using 'call by value' and 'call by reference strategies.

7.   Write a program to implement binary search tree.
       (Insertion and Deletion in Binary search Tree)

8.   Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list

9 .   Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file.

10.   Create a linked list and perform the following operations on it
      a) add a node   b) Delete a node

11.   Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.

12.   Write a program to simulate the various graph traversing algorithms.

13.   Write a program which simulates the various tree traversal algorithms.

   Note: **At least 5 to 10 more exercises to be given by the teacher concerned.**

EE-224-E   **Digital Electronics Lab(BTech IT 3ʳᵈ Sem)**

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours

SYLLABUS
LIST OF EXPERIMENTS:

1. Study of TTL gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.

2. Design & realize a given function using K-maps and verify its performance.

3. To verify the operation of multiplexer & Demultiplexer.

4. To verify the operation of comparator.

5. To verify the truth tables of S-R, J-K, T & D type flip flops.

6. To verify the operation of bi-directional shift register.

7. To design & verify the operation of 3-bit synchronous counter.

8. To design and verify the operation of synchronous UP/DOWN decade counter using J K flip-flops & drive a
     seven-segment display using the same.

9. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flip-flops & drive a
     seven-segment display using the same.

10. To design & realize a sequence generator for a given sequence using J-K flip-flops.

11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.

12. Design a 4-bit shift-register and verify its operation . Verify the operation of a ring counter and a Johnson
      counter.

NOTE : At least ten experiments are to be performed, atleast seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

CSE-202 E   Database Management Systems (BTech IT 4ᵗʰ Sem)

L T P Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
                         SYLLABUS

Unit–1:Introduction Overview of database Management System; Various views of data, data Models, Introduction to Database Languages. Advantages of DBMS over file processing systems, Responsibility of Database Administrator,

Unit-2: Introduction to Client/Server architecture, Three levels architecture of Database Systems, E-R Diagram (Entity Relationship), mapping Constraints, Keys, Reduction of E-R diagram into tables.

Unit-3: File Organisation: Sequential Files, index sequential files, direct files, Hashing, B-trees Index files.

Unit-4: Relational Model, Relational Algebra & various operations, Relational and Tuple calculus.

Unit-5: Introduction to Query Languages :QLB , QBE, Structured query language – with special reference of (SQL of ORACLE), integrity constraints, functional dependencies & NORMALISATION – (up to 4ᵗʰ Normal forms), BCNF (Boyce – code normal forms)

Unit-6: Introduction to Distributed Data processing, parallel Databases, data mining & data warehousing, network model & hierarchical model, Introduction to Concurrency control and Recovery systems.

Text Books:
- Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan, 3ʳᵈ edition, 1997, McGraw-Hill, International Edition.
- Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub.

Reference Books:
- Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3ʳᵈ edition, 2000, Addision-Wesley, Low Priced Edition.

- An Introduction to Database Systems by C.J. Date, 7ᵗʰ edition, Addison-Wesley, Low Priced Edition, 2000.
- Database Management and Design by G.W. Hansen and J.V. Hansen, 2ⁿᵈ edition, 1999, Prentice-Hall of India, Eastern Economy Edition.
- Database Management Systems by A.K. Majumdar and P. Bhattacharyya, 5ᵗʰ edition, 1999, Tata McGraw-Hill Publishing.
- A Guide to the SQL Standard, Date, C. and Darwen,H. 3rd edition, Reading, MA: 1994, Addison-Wesley.
- Data Management & file Structure by Looms, 1989, PHI

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-204 E   **Programming Languages** (BTech IT 4ᵗʰ Sem)

L T P Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
                              SYLLABUS

Unit-1: Introduction: Syntactic and semantic rules of a Programming language, Characteristics of a good programming language, Programming language translators compiler & interpreters , Elementary data types – data objects, variable & constants, data types, Specification & implementation of elementary data types, Declarations ,type checking & type conversions , Assignment & initialization, Numeric data types, enumerations, Booleans & characters.

Unit-2: Structured data objects : Structured data objects & data types , specification & implementation of structured data types, Declaration & type checking of data structure ,vector & arrays, records Character strings, variable size data structures , Union, pointer & programmer defined data objects, sets, files.

Unit-3 : Subprograms and Programmer Defined Data Types: Evolution of data type concept ,abstraction, encapsulation & information hiding , Subprograms ,type definitions, abstract data types.

Unit–4: Sequence Control: Implicit & explicit sequence control ,sequence control within expressions, sequence control within statement, Subprogram sequence control: simple call return ,recursive subprograms, Exception & exception handlers, co routines,   sequence control .

Unit-5: Data Control: Names & referencing environment, static & dynamic scope, block structure, Local data & local referencing environment, Shared data: dynamic & static scope. Parameter & parameter transmission schemes.

Unit-6: Storage Management: Major run time elements requiring storage ,programmer and system controlled storage management & phases , Static storage management , Stack based storage management, Heap storage management ,variable & fixed size elements.

Unit-7: Programming Languages: Introduction to procedural, non-procedural ,structured, functional and object oriented programming language, Comparison of C & C++ programming languages.

Text Book:
- **P**rogramming languages Design & implementation by T.W. .Pratt, 1996, Prentice Hall Pub.
- Programming Languages – Principles and Paradigms by Allen Tucker & Robert Noonan, 2002, TMH,

Reference Books:
- Fundamentals of Programming languages by Ellis Horowitz, 1984, Galgotia publications (Springer Verlag),
- Programming languages concepts by C. Ghezzi, 1989, Wiley Publications.,
- Prog Languages – Principles and Pradigms Allen Tucker , Robert Noonan 2002, T.M.H.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT- 205 E   Computer Networks (BTech IT 4th Sem)

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours

SYLLABUS

Introduction: Uses, Topologies, Reference Models.

Networking Devices: Hubs, Repeaters, Bridges, Modems, Switches, Routers, Gateways.

Flow Control at Data Link Layer: Need of flow control, Stop-and-wait, Go-back-N and selective repeat flow control protocols, SDLC, HDLC.

Framing & Error Handling: Framing Protocols, Error detection and correction mechanisms.

Multiple Access Communication: Pure and Slotted, Carrier sense, splitting and controlled access multiple access algorithms.

LAN Standards & Technologies: Ethernet (IEEE 802.3, IEEE 802.3u, IEEE   802.3z), DQDB(IEEE 802.6), Wireless LAN (IEEE 802.11), Bluetooth(IEEE 802.15).

Routing and Congestion Control: Addressing, Routing and Congestion Control Algorithms.

Network Layer in Internet: IPV4 and IPV6, IP addressing, ARP, IP routing(OSPF & BGP), internet multicasting, mobile IP.

Transport Layer: Connection Management, Flow control and multiplexing. Basics of Internet Transport Protocols.

Network Management: Network Management Basics, Remote Monitoring Techniques, SNMP, Applications.

Network Operating Systems: Case Study of Novell Netware, Window NT/Window 2000 and Unix/Linux Network Operating Systems.

Reference Books:

- Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000, Addison Wesley, Low Price Edition.
- Business Data Communications, Fitzgerald Jerry,.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-202 E   Object Oriented Programming Using C++ (BTech IT 4ᵗʰ Sem)

L	T	P	Total Credit		Duration of exam
3	1	-	3.5		3 Hours

SYLLABUS

Unit–1: Introduction to C++, C++ Standard Library, Basics of a Typical C++ Environment, Pre-processors Directives, Illustrative Simple C++ Programs. Header Files and Namespaces, library files.

Unit-2: Object Oriented Concepts : Introduction to Objects and Object Oriented Programming, Encapsulation (Information Hiding), Access Modifiers: Controlling access to a class, method, or variable (public, protected, private, package), Other Modifiers, Polymorphism: Overloading,, Inheritance, Overriding Methods, Abstract Classes, Reusability, Class's Behaviors.

Unit–3: Classes and Data Abstraction: Introduction, Structure Definitions, Accessing Members of Structures, Class Scope and Accessing Class Members, Separating Interface from Implementation, Controlling Access Function And Utility Functions, Initializing Class Objects: Constructors, Using Default Arguments With Constructors, Using Destructors, Classes : Const(Constant) Object And Const Member Functions, Object as Member of Classes, Friend Function and Friend Classes, Using This Pointer, Dynamic Memory Allocation with New and Delete, Static Class Members, Container Classes And Integrators, Proxy Classes, Function overloading.

Unit-4: Operator Overloading: Introduction, Fundamentals of Operator Overloading, Restrictions On Operators Overloading, Operator Functions as Class Members vs. as Friend Functions, Overloading, <<, >> Overloading Unary Operators, Overloading Binary Operators.

Unit-5: Inheritance: Introduction, Inheritance: Base Classes And Derived Classes, Protected Members, Casting Base- Class Pointers to Derived- Class Pointers, Using Member Functions, Overriding Base –Class Members in a Derived Class, Public, Protected and Private Inheritance, Using Constructors and Destructors in derived Classes, Implicit Derived –Class Object To Base-Class Object Conversion, Composition Vs. Inheritance.

Unit–6: **Virtual Functions and Polymorphism:** Introduction to Virtual Functions, Abstract Base Classes And Concrete Classes, Polymorphism, New Classes And Dynamic Binding, Virtual Destructors, Polymorphism, Dynamic Binding.

Unit-7: Files and I/O Streams: Files and Streams, Creating a Sequential Access File, Reading Data From A Sequential Access File, Updating Sequential Access Files, Random Access Files, Creating A Random Access File, Writing Data Randomly To a Random Access File, Reading Data Sequentially from a Random Access File. Stream Input/Output Classes and Objects, Stream Output, Stream Input, Unformatted I/O (with read and write), Stream Manipulators, Stream Format States, Stream Error States.

Unit-8: Templates & Exception Handling: Function Templates, Overloading Template Functions, Class Template, Class Templates and Non-Type Parameters, Templates and Inheritance, Templates and Friends, Templates and Static Members.
Introduction, Basics of C++ Exception Handling: Try Throw, Catch, Throwing an Exception, Catching an Exception, Rethrowing an Exception, Exception specifications, Processing Unexpected Exceptions, Stack Unwinding, Constructors, Destructors and Exception Handling, Exceptions and Inheritance.

Text Books:
- C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall
- Object Oriented Programming in Turbo C++ by Robert Lafore ,1994.
- Programming with C++ By D Ravichandran, 2003, T.M.H

Reference books:
- Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw-Hill
- Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley,
- The Complete Reference in C++ By Herbert Schildt, 2002, TMH.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE- 210 E   **Computer Architecture & Organization** (BTech IT 4th Sem)

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours

SYLLABUS

Unit-1: Basic Principles: Boolean algebra and Logic gates, Combinational logic blocks(Adders, Multiplexers, Encoders, de-coder), Sequential logic blocks(Latches, Flip-Flops, Registers, Counters)

Unit-2: General System Architecture: Store program control concept, Flynn's classification of computers (SISD, MISD, MIMD); Multilevel viewpoint of a machine: digital logic, micro architecture, ISA, operating systems, high level language; structured organization; CPU, caches, main memory, secondary memory units & I/O; Performance metrics; MIPS, MFLOPS.

Unit-3: Instruction Set Architecture: Instruction set based classification of processors (RISC, CISC, and their comparison); addressing modes: register, immediate, direct, indirect, indexed; Operations in the instruction set; Arithmetic and Logical, Data Transfer, Control Flow; Instruction set formats (fixed, variable, hybrid); Language of the machine: 8086 ; simulation using MSAM.

Unit-4: Basic non pipelined CPU Architecture: CPU Architecture types (accumulator, register, stack, memory/ register) detailed data path of a typical register based CPU, Fetch-Decode-Execute cycle (typically 3 to 5 stage); microinstruction sequencing, implementation of control unit, Enhancing performance with pipelining.

Unit-5: Memory Hierarchy & I/O Techniques: The need for a memory hierarchy (Locality of reference principle, Memory hierarchy in practice: Cache, main memory and secondary memory, Memory parameters: access/ cycle time, cost per bit); Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations.

Unit-6: Introduction to Parallelism: Goals of parallelism (Exploitation of concurrency, throughput enhancement); Amdahl's law; Instruction level parallelism (pipelining, super scaling – basic features); Processor level parallelism (Multiprocessor systems overview).

Unit-7: Computer Organization [80x86]:   Instruction codes, computer register, computer instructions, timing and control, instruction cycle, type of instructions, memory reference, register reference. I/O reference, Basics of Logic Design, accumulator logic, Control memory, address sequencing, micro-instruction formats, micro-program sequencer, Stack Organization, Instruction Formats, Types of interrupts; Memory Hierarchy.

Text Books:
- Computer Organization and Design, 2nd Ed., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.
- Computer Architecture and Organization, 3rd Edi, by John P. Hayes, 1998, TMH.

Reference Books:
- Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall Upper Saddle River, New Jersey
- Computer Organization, 5th Edi, by Carl Hamacher, Zvonko Vranesic,2002, Safwat Zaky.
- Structured Computer Organisation by A.S. Tanenbaum, 4th edition, Prentice-Hall of India, 1999, Eastern Economic Edition.
- Computer Organisation & Architecture: Designing for performance by W. Stallings, 4th edition, 1996, Prentice-Hall International edition.
- Computer System Architecture by M. Mano, 2001, Prentice-Hall.
- Computer Architecture- Nicholas Carter, 2002, T.M.H.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-204 E **Multimedia Technologies** (BTech IT 4th Sem)

L T P   Total Credit **Duration of exam**
3 1 -   3.5 3 Hours

SYLLABUS

Unit-1:   Basics of Multimedia Technology: Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD- Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools; LANs and multimedia; internet, World Wide Web & multimedia distribution network-ATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.

Unit-2:   Image Compression & Standards: Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.

Unit-3:   Audio & Video: Digital representation of sound; time domain sampled representation; method of encoding the analog signals; subband coding; fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadraphonic signal processing; editing sampled sound; MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.

Unit-4:   Virtual Reality: Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems.
Applications of environment in various fields.

Text Books:
- An introduction, Villamil & Molina, Multimedia Mc Milan, 1997
- multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

Reference Books:
- Multimedia: Production, planning and delivery, Villamil & Molina,Que, 1997
- Multimedia on the PC, Sinclair,BPB
- Multimedia: Making it work, Tay Vaughan, fifth edition, 1994, TMH.
- Multimedia in Action by James E Shuman, 1997, Wadsworth Publ.,
- Multimedia in Practice by Jeff coate Judith, 1995,PHI.
- Multimedia Systems by Koegel, AWL
- Multimedia Making it Work by Vaughar, etl.
- Multimedia Systems by John .F. Koegel, 2001, Buford.
- Multimedia Communications by Halsall & Fred, 2001,AW.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE- 212 E   **Database Management Systems Lab** (BTech IT 4th Sem)

L   T   P   Total Credit   **Duration of exam**
-    -   2   1   3 Hours

SYLLABUS

I.   Create a database and write the programs to carry out the following operation :

1. Add a record in the database
2. Delete a record in the database
3. Modify the record in the database
4. Generate queries
5. Generate the report
6. List all the records of database in ascending order.

II   Develop a menu driven project for management of database system:

1. Library information system
    (a) Engineering
    (b) MCA

2. Inventory control system
    (c) Computer Lab
    (d) College Store

3. Student information system
    (e) Academic
    (f) Finance

4. Time table development system
    (g) CSE, IT & MCA Departments
    (h) Electrical & Mechanical Departments

Usage of S/w:

1. VB, ORACLE and/or DB2
2. VB, MSACCESS
3. ORACLE, D2K
4. VB, MS SQL SERVER 2000

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

IT-206 E **C ++ Programming Lab.** (BTech IT 4ᵗʰ Sem)

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours

SYLLABUS

Q1.   Raising a number n to a power p is the same as multiplying n by itself p times. Write a function
called power ( ) that takes a double value for n and an int value for p, and returns the result as
double value. Use a default argument of 2 for p, so that if this argument is omitted, the number will
be squared. Write a main ( ) function that gets values from the user to test this function.

Q2.   A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y
coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis
and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate
is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y
coordinates.
Write a program that uses a structure called point to model a point. Define three points, and have
the user input values to two of them. Than set the third point equal to the sum of the other two,
and display the value of the new point. Interaction with the program might look like this:
Enter coordinates for P1:   3   4
Enter coordinates for P2:   5   7
Coordinates of P1 + P2 are :   8, 11

Q 3.   Create the equivalent of a four function calculator. The program should request the user to enter a
number, an operator, and another number. It should then carry out the specified arithmetical   operation:
adding, subtracting, multiplying, or dividing the two numbers. (It should use a switch   statement   to
select the operation). Finally it should display the result.
When it finishes the calculation, the program should ask if the user wants to do another
calculation. The response can be 'Y' or 'N'. Some sample interaction with the program might
look like this.
Enter first number, operator, second number: 10/ 3
Answer = 3.333333
Do another (Y/ N)? Y
Enter first number, operator, second number 12 + 100
Answer = 112
Do another (Y/ N) ? N

Q4.   A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code
(212), the exchange (767) and the number (8900). Write a program that uses a structure to store
these three parts of a phone number separately. Call the structure phone. Create two structure
variables of type phone. Initialize one, and have the user input a number for the other one. Then
display both numbers. The interchange might look like this:
Enter your area code, exchange, and number: 415 555 1212
My number is (212) 767-8900
Your number is (415) 555-1212

Q 5.   Create two classes DM and DB which store the value of distances. DM stores distances in
metres and centimeters and DB in feet and inches. Write a program that can read values for the
class objects and add one object of DM with another object of DB.
Use a friend function to carry out the addition operation. The object that stores the results maybe
a DM object or DB object, depending on the units in which the results are required.
The display should be in the format of feet and inches or metres and cenitmetres depending on
the object on display.

Q 6.   Create a class rational which represents a numerical value by two double values- NUMERATOR
& DENOMINATOR. Include the following public member Functions:
- constructor with no arguments (default).
- constructor with two arguments.
- void reduce( ) that reduces the rational number by eliminating the highest common
factor between the numerator and denominator.

- Overload + operator to add two rational number.
- Overload >> operator to enable input through cin.
- Overload << operator to enable output through cout.

Write a main ( ) to test all the functions in the class.

Q 7.   Consider the following class definition
        class father {
                protected : int age;
        public;
                father (int x) {age = x;}
                virtual void iam ( )
                { cout < < "I AM THE FATHER, my age is : "<< age<< end1:}
        };
        Derive the two classes son and daughter from the above class and for each, define iam ( ) to write
        our similar but appropriate messages. You should also define suitable constructors for these
        classes.
        Now, write a main ( ) that creates objects of the three classes and then calls iam ( ) for them.
        Declare pointer to father. Successively, assign addresses of objects of the two derived classes to
        this pointer and in each case, call iam ( ) through the pointer to demonstrate polymorphism in
        action.

Q 8.   Write a program that creates a binary file by reading the data for the students from the terminal.
        The data of each student consist of roll no., name (a string of 30 or lesser no. of characters) and
        marks.

Q9.   A hospital wants to create a database regarding its indoor patients. The information to store
        include
                a)   Name of the patient
                b)   Date of admission
                c)   Disease
                d)   Date of discharge
        Create a structure to store the date (year, month and date as its members). Create a base class to
        store the above information. The member function should include functions to enter information
        and display a list of all the patients in the database. Create a derived class to store the age of the
        patients. List the information about all the to store the age of the patients. List the information
        about all the pediatric patients (less than twelve years in age).

Q 10.   Make a class **Employee** with a name and salary. Make a class **Manager** inherit from **Employee**.
        Add an instance variable, named department, of type string. Supply a method to **toString** that
        prints the manager's name, department and salary. Make a class **Executive** inherit from **Manager**.
Supply a method **to String** that prints the string **"Executive"** followed by the   information stored in the
Manager superclass object. Supply a test program that tests these classes and methods.

Q11.   Imagine a tollbooth with a class called toll Booth. The two data items are a type unsigned int to
        hold the total number of cars, and a type double to hold the total amount of money collected. A
        constructor initializes both these to 0. A member function called payingCar ( ) increments the
        car total and adds 0.50 to the cash total. Another function, called nopayCar ( ), increments the
        car total but adds nothing to the cash total. Finally, a member function called displays the two
        totals.

        Include a program to test this class. This program should allow the user to push one key to count
        a paying car, and another to count a nonpaying car. Pushing the ESC kay should cause the
        program to print out the total cars and total cash and then exit.

Q12.   Write a function called reversit ( ) that reverses a string (an array of char). Use a for loop that
        swaps the first and last characters, then the second and next to last characters and so on. The
        string should be passed to reversit ( ) as an argument.

Write a program to exercise reversit ( ). The program should get a string from the user, call reversit ( ), and print out the result. Use an input method that allows embedded blanks. Test the program with Napoleon's famous phrase, "Able was I ere I saw Elba)".

Q13. Create some objects of the string class, and put them in a Deque-some at the head of the Deque and some at the tail. Display the contents of the Deque using the forEach ( ) function and a user written display function. Then search the Deque for a particular string, using the first That ( ) function and display any strings that match. Finally remove all the items from the Deque using the getLeft ( ) function and display each item. Notice the order in which the items are displayed: Using getLeft ( ), those inserted on the left (head) of the Deque are removed in "last in first out" order while those put on the right side are removed in "first in first out" order. The opposite would be true if getRight ( ) were used.

Q 14. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data ( ) to initialize base class data members and another member function display_area ( ) to compute and display the area of figures. Make display_area ( ) as a virtual function and redefine this function in the derived classes to suit their requirements.
Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area.

Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles and used as follows:
Area of rectangle   = x * y
Area of triangle   = ½ * x * y

IT-208 E **Multimedia Technologies Lab.** (BTech IT 4th Sem)

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours

SYLLABUS

1.   Write a program to justify a text entered by the user on both the left and right hand side. For example, the test " An architect may have a graphics program to draw an entire building but be interested in only ground floor", can be justified in 30 columns as shown below. An   architect may have a Graphics programs draw an Entric building   but   be interested in only   ground floor.

2.   Study the notes of a piano and stimulate them using the key board and store them in a file.

3.   Write a program to read a paragraph and store it to a file name suggested by the author.

4.   Devise a routine to produce the animation effect of a square transforming to a triangle and then to a circle.

5.   Write a program to show a bitmap image on your computer screen.

6.   Create a web page for a clothing company which contains all the details of that company and   at-least five links to other web pages.

7.   Write a program by which we can split mpeg video into smaller pieces for the   purpose of   sending it over the web or by small capacity floppy diskettes and then   joining   them   at the   destination.

8.   Write a program to simulate the game of pool table.

9.   Write a program to simulate the game Mine Sweeper.

10.   Write a program to play "wave" or "midi" format sound files.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

IT - 209 E   **Computer Network Lab.** (BTech IT 4th Sem)

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours

SYLLABUS

Exercises involving various networking protocols.

Note: At least 10 exercises to be given by the teacher concerned.

IT - 209 E   **Computer Network Lab.** (BTech IT 4th Sem)

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours

SYLLABUS

Exercises involving various networking protocols.

Note: At least 10 exercises to be given by the teacher concerned.

B.Tech. (IT)

3rd YEAR

IT-301 E   Rapid Application Development (BTech IT 5th Sem)

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
SYLLABUS

Unit-1:   Visual Programming Environment: Concept of procedure and event oriented languages, Integrated Development Environment for VC++ and Visual Basic, Components of Visual C++ and Visual Basic.

Unit-2: **Parts of Visual C++ Program:** Application object, main window object, view object, document object, Document-View architecture and its advantages, dEvent oriented windows Programming, device context, Microsoft Foundation Classes- an Overview, Simple MFC application, API's .

Unit-3: Reading keystrokes, handling mouse, creating menus, toolbars, buttons, status bar prompts, dialog box, check box, radio buttons, list boxes, combo boxes, sliders, multiple documents.

Unit-4: Serialization, file handling, debugging.

Unit-5:   DLL's, OLE Object Technologies, Creating Internet Programs using Visual C++ and Visual Basic, Creating Active X Controls, connecting to Database (using DAO/ ADO/ RDO) using Visual Basic and Visual C++.

Text Books

- Microsoft Visual C++ By Steven Holzner (Pub: BPB)
- Visual C++ Programming, 2nd edition by Steven Holzner(Pub: PHI)
- Using Visual Basic for Applications By Paul Sanna(Pub: PHI)
- Visual Basic Programming By Steven Holzner
- MSDN Help

Reference Books

- Visual C++: From the ground Up By Mucller (Pub :TMH)

- Programming Visual C++ by David J. Kruglinski

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-303 E Systems Programming & System Administration (BTech IT 5ᵗʰ Sem)

L T P Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
SYLLABUS

Unit-1: Evolution of Components Systems Programming, Assemblers, Loaders, Linkers, Macros, Compilers. software tools, Text editors, Interpreters and program generators, Debug Monitors, Programming environment.

Unit-2: Compiler: Brief overview of compilation process, Incremental compiler, Assembler: Problem statement, single phase and two phase assembler, symbol table; Loader schemes, compile and go Loader, general loader schemes, absolute loader, Subroutine linkage, Reallocating loader, Direct linkage Loader, Binders, Linking loader, overlays.

Unit-3: Macro language and macro-processor, macro instructions, features of macro facility, macro instruction arguments, conditional macro expansion, macro calls with macro instruction defining macros.

Unit-4: Theoretical Concept of Unix Operating System: Basic features of operating system; File structure: CPU scheduling; Memory management: swapping, demand paging; file system: block and fragments, inodes, directory structure; User to user communication.

Unit-5: Getting Started with Unix: User names and groups, logging in; Format of Unix commands; Changing your password; Characters with special meaning; Unix documentation; Files and directories; Current directory, looking at the directory contents, absolute and relative pathnames, some Unix directories and files; Looking at the file contents; File permissions; basic operation on files; changing permission modes; Standard files, standard output; Standard input, standard error; filters and pipelines; Processes; finding out about processes; Stopping background process; Unix editor vi.

Unit-6: Test Manipulation: Inspecting files; File statistics; Searching for patterns; Comparing files; Operating on files; Printing files; Rearranging files; Sorting files; Splitting files; Translating characters; AWK utility.

Unit-7: Shell Programming: Programming in the Borne and C-Shell; Wild cards; Simple shell programs; Shell variables; Shell programming constructs; interactive shell scripts; Advanced features.

Unit-8: System Administration: Definition of system administration; Booting the system; Maintaining user accounts; File systems and special files; Backups and restoration; Role and functions of a system manager.
Overview of the linux. operating system

Text Books:
- Systems Programming by Donovan, TMH.
- The unix programming environment by Brain Kernighen & Rob Pike, 1984, PHI & Rob Pike.
- Design of the Unix operating system by Maurich Bach, 1986, PHI.
- Introduction to UNIX and LINUX by John Muster, 2003, TMH.

Reference Book:
- Advanced Unix programmer's Guide by Stephen Prato, BPB
- Unix- Concept and applications by Sumitabha Das, 2002, T.M..H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-305 E   High Speed Networks (BTech IT 5th Sem)

L T P   Total Credit   **Duration of exam**
3   1   -   3.5   3 Hours
SYLLABUS

Unit 1 :   HIGH SPEED LAN

Gigabit Ethernet: overview of fast Ethernet, IEEE 802.3z standard, protocol architecture, network design using Gigabit Ethernet, applications, 10GB Ethernet.

Wireless Networks : Existing & Emerging standards, Wireless LAN(802.11), Broadband Wireless(802.16), Bluetooth(802.15) their architecture, protocol stack and frame format. Mobile Networks

Fibre Channel : Fibre channel characteristics, topology, ports, layered model, session management, flow control, addressing, SAN.

Unit 2 :   HIGH SPEED WAN

Frame Relay : Protocol architecture, frame format, routing.

ISDN & B-ISDN : Channels, interfaces, addressing, protocol architecture, services.

ATM : Virtual circuits, cell switching, reference model, traffic management.

Unit 3 :   INTERNET SUITE OF PROTOCOLS

Internet Layer : IPV4 and IPV6, IP addressing, ARP, IP routing(OSPF & BGP), internet multicasting, mobile IP.

Transport Layer : UDP/TCP protocols & architecture, TCP connection management, wireless TCP.

Application Layer : DNS, FTP, Voice over IP, audio & video compression.

References:

- High Speed Networks - William Stallings, Pearsons Publication.
- Computer Networks and Internets - Douglas E.Comer, Addison Wesley.
- An Engineering Approach to Computer Networking - S.Keshav, Addison Wesley.
- High Speed Network – Tere Parnel, TMH Publications.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-301 E   **Principles of Operating Systems**(BTech IT 5th Sem)

L T P Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
                                      SYLLABUS

Unit-1: Introduction: Introduction to Operating System Concepts (including Multitasking, multiprogramming, multi user, Multithreading etc)., Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.

Unit–2: Process Management: Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms -First Come First Serve (FCFS), Shortest-Job-First (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling.

Unit–3:   Memory Management: Logical & Physical Address Space, swapping, contiguous memory allocation, non-contiguous memory allocation paging and segmentation techniques, segmentation with paging; virtual memory management - Demand Paging & Page-Replacement Algorithms; Demand Segmentation.

Unit–4:   File System: Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms, Introduction to distributed file system.

Unit–5: Process-Synchronization & Deadlocks: Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, avoidance & detection; deadlock recovery.

Unit-6: I/O Systems: I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Performance Issues.

Unit–7: Unix System And Windows NT Overview
Unix system call for processes and file system management, Shell interpreter, Windows NT architecture overview, Windows NT file system.

Text Books:
  * Operating System Concepts by Silberchatz et al, 5th edition, 1998, Addison-Wesley.
  * Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
  * Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall

Reference Books:
  * Operating System By Peterson , 1985, AW.
  * Operating System By Milankovic, 1990, TMH.
  * Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH.
  * Operating Systems by Mandrik & Donovan, TMH
  * Operating Systems By Deitel, 1990, AWL.
  * Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

EE-309-E   Microprocessors And Interfacing (BTech IT 5ᵗʰ Sem)

L   T   P   Total Credit   **Duration of exam**

3   1   -   3.5   3 Hours

SYLLABUS

PART A

Unit 1.   The 8085 processor :

Introduction to microprocessor, 8085 microprocessor: Architecture, instruction set, interrupt structure, and assembly language programming.

Unit 2.   The 8086 microprocessor architecture:

Architecture, block diagram of 8086, details of sub-blocks such as EU, BIU; memory segmentation and physical address computations, program relocation, addressing modes, instruction formats, pin diagram and description of various signals.

Unit 3.   Instruction set of 8086:

Instruction execution timing, assembler instruction format, data transfer instructions, arithmetic instructions, branch instructions, looping instructions, NOP and HLT instructions, flag manipulation instructions, logical instructions, shift and rotate instructions, directives and operators, programming examples.

PART B

Unit 4.   Interfacing device :

The 8255 PPI chip: Architecture, control words, modes and examples.

Unit 5.   DMA :

Introduction to DMA process, 8237 DMA controller,

Unit 6.   Interrupt and timer :

8259 Programmable interrupt controller, Programmable interval timer chips.

Text Books :

1. Microprocessor Architecture, Programming & Applications with 8085 : Ramesh S Gaonkar; Wiley Eastern Ltd.
2. The Intel Microprocessors 8086- Pentium processor : Brey; PHI

Reference Books:

1. Microprocessors and interfacing : Hall; TMH
2. The 8088 & 8086 Microprocessors-Programming, interfacing,Hardware & Applications :Triebel & Singh; PHI
3. Microcomputer systems: the 8086/8088 Family: architecture, Programming & Design : Yu-Chang Liu & Glenn
    A Gibson; PHI.
4. Advanced Microprocessors and Interfacing : Badri Ram; TMH

NOTE: 8 questions are to be set selecting FIVE questions from PART A and THREE questions from PART- B .Students have to attempt any five questions.

CSE -303 E   **Computer Graphics** (BTech IT 5th Sem)

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
                              SYLLABUS

Unit-1: Introduction to Computer Graphics: What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, mid point circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm.

Unit-2:   Two/Three Dimensional Viewing: The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck).

Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation.

Three dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

Unit-3: Viewing in 3D: Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.

Unit-4:   Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm.

Unit-5: Representing Curves and Surfaces: Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method.

Unit-6:   Illumination, shading, image manipulation: Illumination models, shading models for polygons, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images.

Text Books:
- Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addision Wesley.
- Computer Graphics by Donald Hearn and M.Pauline Baker, 2nd Edition, 1999, PHI

Reference Books:
- Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition
- Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999, Addision Wesley.
- Computer Graphics: Secrets and Solutions by Corrign John, BPB
- Graphics, GUI, Games & Multimedia Projects in C by Pilania & Mahendra, Standard Publ.
- Computer Graphics Secrets and solutions by Corrign John, 1994, BPV
- Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-307 E   Rapid Application Development Lab. (BTech IT 5th Sem)

L   T   P   Total Credit   **Duration of exam**
\-   -   2   1   3 Hours

SYLLABUS

Note: At least 10 experiments are to be performed by the students in the semester

1. Study window's API's? Find out their relationship with MFC classes. Appreciate how they are helpful in finding complexities of window's programming?

2. Get familiar with the essential classes in a typical (document view architecture) VC program and their relationships with each other.

3. Write a program to handle the mouse event right click on client area and display a message box as "Right Button Click".

4. Create a simple model dialog box to read the information about a student i.e. name, roll no. class using appropriate fields.

5. Write a simple console application to create archive class object from file class that reads and stores a simple structure (record).

6. Create a simple database in MS access and connect it to Visual Basic using ADO or DAO.

7. Write a program that reads a text and changes its font, font size as selected by the user from different fonts contained in a list box.

8. With the help of Visual Basic, created an object of excel application and implement any function of it.

9. Write a simple program that displays an appropriate message when an illegal operation is performed, using error handling technique in VB.

10. Make an active X control of your own using Visual Basic.

CSE-309 E   **Computer Graphics Lab.** (BTech IT 5th Sem)

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours
                                   SYLLABUS

List of programs to be developed

1.   Write a program for 2D line drawing as Raster Graphics Display.
2.   Write a program for circle drawing as Raster Graphics Display.
3.   Write a program for polygon filling as Raster Graphics Display
4.   Write a program for line clipping.
5.   Write a program for polygon clipping.
6.   Write a program for displaying 3D objects as 2D display using perspective transformation.
7.   Write a program for rotation of a 3D object about arbitrary axis.
8.   Write a program for Hidden surface removal from a 3D object.

       Note: At least 5 to 10 more exercises to be given by the teacher concerned**.**

CSE-308 E   **Operating Systems Lab.** (BTech IT 5th Sem)

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours
                              SYLLABUS

- Study of WINDOWS 2000 Operating System.

- Administration of WINDOWS 2000 (including DNS,LDAP, Directory Services)

- Study of LINUX Operating System (Linux kernel, shell, basic commands pipe & filter commands).

- Administration of LINUX Operating System.

- Writing of Shell Scripts (Shell programming).

- AWK programming.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

EE-329-E   Microprocessors And Interfacing Lab(BTech IT 5th Sem)

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours
                           SYLLABUS
LIST OF EXPERIMENTS:

1. Study of 8085 Microprocessor kit.

2. Write a program using 8085 and verify for :
    a. Addition of two 8-bit numbers.
    b. Addition of two 8-bit numbers (with carry).

3. Write a program using 8085 and verify for :
    a. 8-bit subtraction (display borrow)
    b. 16-bit subtraction (display borrow)

4. Write a program using 8085 for multiplication of two 8- bit numbers by repeated addition method. Check for minimum number of additions and test for typical data.

5.   Write a program using 8085 for multiplication of two 8- bit numbers by bit rotation method and verify.

6. Write a program using 8085 for division of two 8- bit numbers by repeated subtraction method and test for typical data.

7. Write a program using 8085 for dividing two 8- bit numbers by bit rotation method and test for typical data.

8. Study of 8086 microprocessor kit

9.   Write a program using 8086 for division of a defined double word (stored in a data segment) by another double Word division and verify.

10. Write a program using 8086 for finding the square root of a given number and verify.

11. Write a program using 8086 for copying 12 bytes of data from source to destination and verify.

12. Write a program using 8086 and verify for:
      a. Finding the largest number from an array.
      b. Finding the smallest number from an array.

13. Write a program using 8086 for arranging an array of numbers in descending order and verify.

14. Write a program using 8086 for arranging an array of numbers in ascending order and verify.

15. Write a program for finding square of a number using look-up table and verify.   .

16. Write a program to interface a two digit number using seven-segment LEDs. Use 8085/8086 microprocessor and 8255 PPI.

17. Write a program to control the operation of stepper motor using 8085/8086 microprocessor and 8255 PPI.

NOTE: At least ten experiments have to be performed in the semester out of which seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus of EE-309-C.

IT-302 E **Network Programming (BTech IT 6ᵗʰ Sem)**

L T P   Total Credit   **Duration of exam**
3   1   -   3.5   3 Hours
                                   SYLLABUS

Unit-1:   Introduction to networking, TC/IP Protocol architecture, Classful internet addresses, subnets, super netting, address resolution Protocol (RAP) and RARP, IP datagram format, UDP and TCP/data grams , ICMP its purpose , FINGER, NET STAT details & IPconfig, Ping, TRACERT, ROUTE.

Unit-2: Socket introduction, elementary TCP sockets, TCP client sever, I/O functions, select& poll functions, socket options elementary UDP sockets, elementary node and address conversions, echo service (TCP and UDP).

Unit-3: Algorithm and issues in server software design :iterative connectionless servers, (UDP), Iterative, connection oriented servers (TCP), single process, concurrent servers multiprotocol servers (TCP,UDP), multi service servers (TCP,UDP).

Unit-4: Remote procedure call concept (RCP) :RPC models, analogy between RPC of client and server, remote programs and procedures, their multiple versions and mutual exclusion communication semantics, RPC retransmits, dynamic port mapping ,authentication.

Unit-5: Network file system concept of data link access, debugging techniques ,Routing sockets, broadcasting to mobile network.

Text Books:
  * Unix Network programming Vol -2ⁿᵈ edition, W.Richard Stevens
  * Internet working with TCP/IP Vol-1, Doubles e-commer.
  * Internetworking TCP/IP Vol III Doubles E comer, David L.Stevens

Reference Book:
  * Internetworking with TCP/IP, Vol II

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-302 E Principles of Software Engineering (BTech IT 6th Sem)

L   T   P   Total Credit   **Duration of exam**
3   1   -   3.5   3 Hours
SYLLABUS
Unit-1: Introduction: The process, software products, emergence of software engineering, evolving role of software, software life cycle models, Software Characteristics, Applications, Software crisis.

Unit-2 : Software project management:Project management concepts, software process and project metrics Project planning, project size estimation metrics, project estimation Techniques, empirical estimation techniques, COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking.

Unit-3 : Requirements Analysis and specification requirements engineering, system modeling and simulation Analysis principles modeling, partitioning Software, prototyping: , Prototyping methods and tools; Specification principles, Representation, the software requirements specification and reviews Analysis Modeling: Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling; The mechanics of structured analysis: Creating entity/ relationship diagram, data flow model, control flow model, the control and process specification; The data dictionary; Other classical analysis methods.

Unit-4: System Design: Design concepts and principles: the design process: Design and software quality, design principles; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity; The design model; Design documentation.
Architectural Design: Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs ,architectural complexity; Mapping requirements into a software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design.

Unit-5 : Testing and maintenance: Software Testing Techniques, software testing fundamentals: objectives, principles, testability; Test case design, white box testing, basis path testing: Control structure testing: Black box testing, testing for specialized environments ,architectures and applications. Software Testing Strategies: Verification and validation, Unit testing, Integration testing,; Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, the debugging process debugging approaches. Software re-engineering , reverse engineering ,restructuring, forward engineering.

Unit-6 : Software Reliability and Quality Assurance :Quality concepts, Software quality assurance , SQA activities; Software reviews: cost impact of software defects, defect amplification and removal; formal technical reviews: The review meeting, review reporting and record keeping, review guidelines; Formal approaches to SQA; Statistical software quality assurance; software reliability: Measures of reliability and availability ,The ISO 9000 Quality standards: The ISO approach to quality assurance systems, The ISO 9001 standard, Software Configuration Management.

Unit-7: **Computer Aided software Engineering**:   CASE, building blocks, integrated case environments and architecture, repository.
Text Book:
- Software Engineering – A Practitioner's Approach, Roger S. Pressman, 1996, MGH.
Reference Books:
- Fundamentals of software Engineering,   Rajib Mall, PHI
- Software Engineering by Ian sommerville, Pearson Edu, 5th edition, 1999, AW,
- Software Engineering – David Gustafson, 2002, T.M.H
- Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995
  JW&S,
- An Integrated Approach to software engineering by Pankaj jalote , 1991 Narosa,

CSE-304 E   Intelligent Systems (BTech IT 6th Sem)

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours

SYLLABUS

Unit-1: Foundational issues in intelligent systems: Foundation and history of AI, Ai problems and techniques – AI programming languages, introduction to LISP and PROLOG- problem spaces and searches, blind search strategies, Breadth first- Depth first- heuristic search techniques Hill climbing: best first- A * algorithm AO* algorithm- game tree, Min max algorithms, game playing- alpha beta pruning.

Unit-2: Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems.

Unit-3: Reasoning under uncertainty, review of probability, Baye's probabilistic interferences and Dempster shafer theory, Heuristic methods, symbolic reasoning under uncertainty, Statistical reasoning, Fuzzy reasoning, Temporal reasoning, Non monotonic reasoning.

Unit-4: Planning, planning in situational calculus, representation for planning, partial order planning algorithm, learning from examples, discovery as learning, I earning by analogy, explanation based learning, neural nets, genetic algorithms.

Unit-5: Principles of Natural language processing, rule based systems architecture, Expert systems, knowledge acquisition concepts, AI application to robotics, and current trends in intelligent systems.

Text Book:
- Artificial Intelligence: A Modern Approach,. Russell & Norvig. 1995, Prentice Hall.

Reference Books:
- Artificial Intelligence, Elain Rich and Kevin Knight, 1991, TMH.
- Artificial Intelligence-A modern approach, Staurt Russel and peter norvig, 1998, PHI.
- Artificial intelligence, Patrick Henry Winston:, 1992, Addition Wesley 3rd Ed.,

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE- 307 E   **Web Development (BTech IT 6ᵗʰ Sem)**

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
                                  SYLLABUS

Unit-1: Introduction to the Internet, The world wide web: The idea of hypertext and hyper media; How the web works-HTTP, HTML and URLs; How the browser works-MIME types, plugins and helper applications; The standards-HTML, XML, XHTML and the W3C.

Hypertext markup language: The anatomy of an HTML document; Marking up for structure and style: basic page markup, absolute and relative links, ordered and unordered lists, embedding images and controlling appearance, table creation and use, frames, nesting and targeting.
Descriptive markup: Meta tags for common tasks, semantic tags for aiding search, the doubling code and RDF.

Unit-2: Separating style from structure with style sheets: Internal style specifications within HTML, External linked style specification using CSS, page and site design considerations.

Client side programming: Introduction to the JavaScript syntax, the JavaScript object model, Event handling, Output in JavaScript, Forms handling, miscellaneous topics such as cookies, hidden fields, and images; Applications.

Unit-3: Server side programming: Introduction to Server Side Technologies CGI/ASP/JSP., Programming languages for server Side Scripting, Configuring the server to support CGI, applications; Input/ output operations on the WWW, Forms processing, (using PERL/VBSCRIPT/JavaSCIPT)

Unit-4:   Other dynamic content technologies: introduction to ASP & JSP, Delivering multimedia over web pages, The VRML idea, The Java phenomenon-applets and servelets, issues and web development.

Unit-5: Introduction to Microsoft .NET Technology and its comparison with the competing Technologies.

Text books:
- Beginning XHTML by Frank Boumpery, Cassandra Greer, Dave Raggett, Jenny Raggett, Sebastian Schnitzenbaumer & ted Wugofski, 2000, WROX press (Indian Shroff Publ. SPD) 1ˢᵗ edition
- HTML & XHTML: The Definitive Guide by Chuck Musciano, Bill Kennedy, 2000, 4ᵗʰ Edi.

Reference books:
- XHTML Black Book by Steven Holzner, 2000
- CGI Programming on the World Wide Web. O'Reilly Associates.
- Web Technologies By Achyut S Godbole , Atul Kahate, 2003, T.M.H
- Scott Guelich, Shishir Gundararam, Gunther Birzniek; CGI Programing with Perl 2/e O'Reilly.
- Doug Tidwell, James Snell, Pavel Kulchenko; Programming Web services, O'Reilly.
- Intranets by James D.Cimino, 1997, Jaico Publ.
- Internet and Web Technologies – Raj Kamal, 2002, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

EE-402-E   Wireless Communication (BTech IT-- VI Sem)

L   T   P   Total Credit   **Duration of exam**
3   1   -   3.5   3 Hours
SYLLABUS

UNIT 1. INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS:
Evolution of mobile radio communications, examples of wireless comm. systems, paging systems, Cordless telephone systems, comparison of various wireless systems.

UNIT 2. MODERN WIRELESS COMMUNICATION SYSTEMS:
Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, Blue tooth and Personal Area networks.

UNIT 3. INTRODUCTION TO CELLULAR MOBILE SYSTEMS:
Spectrum Allocation, basic Cellular Systems, performance Criteria, Operation of cellular systems, analog cellular systems, digital Cellular Systems.

UNIT 4. ELLULAR SYSTEM DESIGN FUNDAMENTALS:
Frequency Reuse, channel assignment strategies, handoff Strategies, Interference and system capacity, tracking and grade off service, improving coverage and capacity.

UNIT 5. MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION:
Introduction to Multiple Access, FDMA, TDMA, Spread Spectrum multiple Access, space division multiple access, packet ratio, capacity of a cellular systems.

UNIT 6. WIRELESS NETWORKING:
Difference between wireless and fixed telephone networks, development of wireless networks, fixed network transmission hierarchy, traffic routing in wireless networks, wireless data services, common channel signaling, ISDN (Integrated Services digital Networks), advanced intelligent networks.

UNIT 7. INTELLIGENT CELL CONCEPT AND APPLICATION:
Intelligent cell concept, applications of intelligent micro-cell Systems, in-Building Communication, CDMA cellular Radio Networks.

Text Books:

1. Wireless Communications: Theodore S. Rappaport; Pearsons.
2. Mobile Cellular Telecommunication: W.C.Y.Lee; McGraw Hill

Reference Book:
1. Mobile Communications: Jochen Schiller; Pearson

NOTE: Eight questions are to be set -one question from each unit. Students have to attempt any five question.

EE-407-E   **Digital Signal Processing** (BTech IT 6th Sem)

L T P   Total Credit   **Duration of exam**
3 1   -   3.5   3 Hours
                                   SYLLABUS

UNIT1.   DISCRETE-TIME SIGNALS:
Signal classifications, frequency domain representation, time domain representation, representation of sequences by Fourier transform, properties of Fourier transform, discrete time random signals, energy and power theorems.

UNIT2.   DISCRETE-TIME SYSTEMS : Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite impulse response (IIR) system.

UNIT3.   SAMPLING OF TIME SIGNALS:
Sampling theorem, application, frequency domain representation of sampling, reconstruction of band limited signal from its samples. discrete time processing of continuous time signals, changing the sampling rate using discrete time processing.

UNIT4.   Z-TRANSFORM :
Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Z-transform, applications of Z-transform.

UNIT5.   BASICS OF DIGITAL FILTERS : Fundamentals of digital filtering, various types of digital filters, design techniques of digital filters : window technique for FIR, bi-linear transformation and backward difference methods for IIR filter design, analysis of finite word length effects in DSP, DSP algorithm implementation consideration. Applications of DSP.

UNIT6. MULTIRATE DIGITAL SIGNAL PROCESSING:
Introduction to multirate digital signal processing, sampling rate conversion, filter structures, multistage decimator and interpolators, digital filter banks.

Text books :
1. Digital Signal Processing : Proakis and Manolakis; PHI
2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH

Reference books:
1. Digital Signal Processing: Alon V. Oppenhelm;PHI
2. Digital Signal processing(II-Edition): Mitra, TMH

NOTE: Eight questions are to be set - at least one from each unit. Students have to attempt five questions.

IT-304 E   **Network Programming Lab. (BTech IT 6ᵗʰ Sem)**

L T P   Total Credit   **Duration of exam**
-   -   2   1   3 Hours
                        SYLLABUS

The socket programming can be done on Unix/Linux operating or/and Windows. Socket programming, and the language can be C/VC++ and/or Java

  1. Write a program to Create Sockets For Sending And Receiving Data.
  2. Write a program to Obtain The Local & Remote Socket Address.
  3. Write a program to Create Sockets For Handling Multiple Connection
  4. Write a program   to Obtain The Information   About The (A) Host (B) Network (C) Protocols (D) Domains
  5. Write a program to Manipulate The IP Address.
  6. Write a program to Write A Telnet Client.
  7. Write a program to Make An FTP Client

  Note: **At least 5 to 10 more exercises to be given by the teacher concerned.**

CSE-306 E   **Intelligent System Lab. (BTech IT 6th Sem)**

L T P Total Credit   **Duration of exam**
- - 2   1   3 Hours
                        SYLLABUS

1.   Study of PROLOG.
Write the following programs using PROLOG.

2.   Write a program to solve 8 queens problem.

3.   Solve any problem using depth first search.

4.   Solve any problem using best first search.

5.   Solve 8-puzzle problem using best first search

6.   Solve Robot (traversal) problem using means End Analysis.

7.   Solve traveling salesman problem.

     Note: At least 5 to 10 more exercises to be given by the teacher concerned.

CSE-311 E Web Development & Core JAVA Lab. (BTech IT 6th Sem)

L T P   Total Credit   **Duration of exam**
-   - 2   1   3 Hours
                                   SYLLABUS

Java programs using classes & objects and various control constructs such as loops etc , and
data structures such as arrays , structures and functions.
Java programs for creating Applets for display of Images ,Texts and Animation
Programs related to interfaces & packages
Input output & Random files programs in java
Java programs using Event driven concept
Programs related to Network Programming

Development of Web site for the college or newspaper agency.

Books recommended for Lab.

- Java Elements – Principles of Programming in Java , Duane A. Bailey , Duane W. Bailey, 2000, T.M.H
- The Java Handbook by Patrick Naughton, TMH, N.Delhi

B.Tech. (IT)

4th YEAR

IT-401 E   Data Warehousing And Data Mining (BTech IT 7th Sem)

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours

SYLLABUS

Unit-1: **Data warehousing** Definition, usage and trends. DBMS vs data warehouse, Data marts, Metadata, Multidimensional data mode, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations.

Unit-2: **Data warehouse process & architecture**, OLTP vs OLAP, ROLAP vs MOLAP, types of OLAP, servers, 3-Tier data warehouse architecture, distributed and virtual data warehouses, data warehouse manager.

Unit-3: **Data warehouse implementation**, computation of data cubes, modelling OLAP data, OLAP queries manager, data warehouse back end tools, complex aggregation at multiple granularities, tuning and testing of data warehouse.

Unit-4: **Data mining** definition & task, KDD versus data mining, data mining techniques, tools and applications.

Unit-5: **Data mining query languages**, data specification, specifying knowledge, hierarchy specification, pattern presentation & visualisation specification, data mining languages and standardisation of data mining.

Unit-6: **Data mining techniques**: Association rules, Clustering techniques, Decision tree knowledge discovery through Neural Networks & Genetic Algorithm, Rough Sets, Support Victor Machines and Fuzzy techniques.

Unit-7: **Mining complex data objects**, Spatial databases, Multimedia databases, Time series and Sequence data; mining Text Databases and mining Word Wide Web.

Text Books:
- Data Warehousing In the Real World; Sam Anahory & Dennis Murray; 1997, Pearson
- Data Mining- Concepts & Techniques; Jiawei Han & Micheline Kamber- 2001, Morgan Kaufmann.
- Data Mining Techniques; Arun Pujar; 2001, University Press; Hyderbad.

Reference Books:

- Data Mining; Pieter Adriaans & Dolf Zantinge; 1997, Pearson,
- Data Warehousing, Data Miniing and OLTP; Alex Berson, 1997, Mc Graw Hill.
- Data warehousing System; Mallach; 2000, Mc Graw Hill.
- Building the Data Warehouse; W.H. Inman, 1996, John Wiley & Sons.
- Developing the Data Warehouses; W.H Ionhman,C.Klelly, John Wiley & Sons.
- Managing the Data Warehouses; W.H.Inman, C.L.Gassey, John Wiley & Sons. .

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-403 E   **Software Project Management** (BTech IT 7th Sem)

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
                                 SYLLABUS

Unit-1: Introduction to Software Project Management (SPM): Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, project as a system, management control, requirement specification, information and control in organization.
Unit-2: Stepwise Project planning: Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/ publicize plan.
Unit-3: Project Evaluation & Estimation: Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods, rapid application development, water fall-, V-process-, spiral- models. Prototyping, delivery. Albrecht function point analysis.
Unit-4:   Activity planning & Risk Management: Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks.
Risk Management: Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values..
Unit-5:   Resource allocation &Monitoring the control: Introduction, the nature of resources, identifying resource requirements, scheduling resources creating critical paths, counting the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence.
Monitoring the control: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control.
Unit-6:   Managing contracts and people: Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures, conclusion, further exercises..
Unit-7: Software quality: Introduction, the place of software quality in project planning, the importance of software quality, defining software quality, ISO 9126, Practical software quality measures, product versus process quality management, external standards, techniques to help enhance software quality.
Unit-8: Study of Any Software Project Management software: viz Project 2000 or equivalent

Text Book:
  • Software Project Management (2nd Edition), by Bob Hughes and Mike Cotterell, 1999, TMH
Reference Books:
  • Software Engineering – A Practitioner's approach, Roger S. Pressman (5th edi), 2001, MGH
  • Software Project Management, Walker Royce, 1998, Addison Wesley.
  • Project Management 2/c. Maylor
  • Managing Global software Projects, Ramesh, 2001, TMH.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT- 403 E   **Systems & Network Administration**(BTech IT 7th Sem)

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
                        SYLLABUS

UNIT-1:   **Introduction to Systems and Network Administration**: The Scope of Systems and Network Administration, The Goals of Systems and Network Administration, System **Components and their Management**:   Operating Systems: Windows and Unix Variants, File Systems and Standards (UFS, NFS, NTFS), Processes and Job Control, Privileged, User and Group Accounts, Logs and Audits, Systems Performance Tuning:

Host Management: Booting and Shutting down of an Operating System, Formatting, Partitioning and Building a File System, File System Layout, Concept of swap space, Cloning Systems, OS Installation, Installation and configuration of devices and drivers, Software Installation and Structuring Software, Open Source Software: The GNU Project, Superuser/Administrator Privileges, User Management, Adding/Removing users, Controlling User Resources, Disk Space Allocation and quotas, Process Management and Monitoring, Scheduling Processes, Killing/Stopping processes, Restarting a Process, Monitoring Process Activity, Maintaining Log Files, File System Repair, Backup and Restoration, , Handling Man Pages/Help System, Kernel Customization,   Integrating Multiple Operating Systems,   System Sharing, User IDs, Passwords and Authentication.

UNIT-2:   **Network Administration**: Introduction to Network Administration Approaches, Addressing and Subnetting : Fixed Vs Variable Masks, VLAN Principles and Configuration, Routing Concepts, Static and Dynamic Routing, Routing Protocols: RIP, OSPF, BGP, Network Address Translation (NAT), Configuring a Linux/Windows Box as a Router, Dial-up configuration and Authentication: PPP, Radius, RAS, Configuring a DNS Server, Configuring Sendmail Service, Configuring a Web Server, Configuring a Proxy Server, TCP/IP Troubleshooting: ping, traceroute, ifconfig, netstat, ipconfig, Network Management.

UNIT-3:   **Host and Network Security** :Security Planning, Categories of Security: C1, C2, C3, C4, Password Security, Access Control and Monitoring: Wrappers, Firewalls: Filtering Rules, Detection and Prevention of Denial of Service (DOS) Attacks, Automatic Identification of Configuration Loop Holes, Security Information Resources: CERT, Installing and Upgrading System Software, Use of Scripting tools: Shell Scripting, Perl/Python Scripting, Use of Make Option

UNIT-4:   **Security Planning**, Categories of Security: C1, C2, C3, C4, password security, Access Control and Monitoring.

Reference Books:

- "Principles of Network and System Administration", Mark Burgess, 2000, John Wiley and Sons Ltd,
- "TCP/IP Network Administration" (3rd Edition), Craig Hunt, O'Reilly and Associates Inc., 2002.
- "Windows 2000 Administration", George Splading, 2000, McGraw-Hill.
- "Linux Network Administrator's Guide", Olaf Kirch and Terry Dawson, (2nd Edition), O'Reilly and Associates Inc., 2000, (Shroff Publishers and Distributors, Culcutta),

Software Requirements: Microsoft Windows 2000, Linux, Perl/Python

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT 405 E   System and Network Administration Lab. (BTech IT 7th Sem)

L T P   Total Credit   **Duration of exam**
-   -   3   1.5   3 Hours
                         SYLLABUS

- Management of the users & the domain.

- Configuring DHCP.

- Setting up the local security policy.

- Start and stop services from user window and command prompt.

- Use of event viewer.

- Use of the performance monitor.

- Management of the IIS and FJP server.

- Setting up of local area network.

- Setting up of router in Window 2000 server.

- Use of utilities   (a) Ping   (b) Trocert   (c) netstat   (d) net
  (e) IP configuration   (f) Path ping

    - Use of network monitor.

    - Setting up of a DNS.

    - Setting up and use "Terminal Clinet Services".

IT 407 E   **Advanced JAVA Lab.** (BTech IT 7th Sem)

L   T   P   Total Credit   **Duration of exam**
-    -   4   2   3 Hours

SYLLABUS

Development of programs relating to:

- **JDBC**

- **Servlets**

- **Beans**

- **RMI**

- **JSP**

CH-451E   **ENVIRONMENTAL SCIENCE & ENGINEERING**
(BTech IT 7ᵗʰ Sem)

L   T   P   Total Credit   **Duration of exam**
3   -   -   -   3 Hours
SYLLABUS

Environment & Ecology :
Introduction, component of environment, factors affecting environment objectives of environment management, segments of environment, atmosphere lithosphere, hydrosphere, biosphere, environmental pollution, classification of pollutants, types of pollutants.   Ecology - Principle of ecology, environment and eco-factors (Medium & Biotic), Types of eco-system, ecological pyramids, Biogeochemical cycles in environment (sulphur cycle, phosphorus cycle, oxygen cycle, hydrological cycle-H cycle, Nitrogen cycle).

Waste Water & Its treatment processes :

Waste-water characteristics, effluent standards, primary treatment, secondary treatment – aerobic (activated sludge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB)

Air pollution :
Classification of air pollutants
Particulates: Physical characteristics, mode of formation, settling properties, Control measures
Hydrocarbons: Nature, sources, control
Carbon Monoxide: Source, harmful effects on human health, control measures.
Oxides of Sulphur and Nitrogen : Sources, effects on human health and plants, control measures.

Solid Waste: Types, sources and properties of solid waste, solid waste management – Generation, Collection and techniques for ultimate disposal, Elementary discussion on resource and energy recovery.

Books Suggested:

1.   Environmental Engg: by Howard S. Peavy & others, MGH International
2.   Metcaf - EDDY-Waste-water engineering revised by George
        Teholonobus (TMH)
3.   Environmental Chemistry by B.K.Sharma, Goel Publishing , Meerut.
4.   Environmental Chemistry, A.K.DE, Wiley Eastern.

   Note: Eight questions will be set and students will be required to attempt five questions in all.

CSE-401 E   Advanced Computer Architecture (IT-- VII Sem Elective I)

L   T   P   Total Credit   **Duration of exam**
4 - -   4   3 Hours
                                         SYLLABUS

Parallel Computer Models
The state of Computing, Multiprocesors and Multicomputers, Multivector and SIMD Computers, PRAM and VLSI Models

Program and Network Properties
Conditions of Parallelism, Program Partitioning and Scheduling, Program Flow Mechanism, System Interconnect Architecture,

Processors and Memory Hierarchy
Advanced Processor Technology, Superscalar and vector Processors, Memory Hierarchy Technology, Virtual Memory Technology.

Bus, Cache, and Shared Memory
Backplane Bus Systems, Cache Memory Organizations, Shared-Memory Organizations, Sequential and Weak Consistency Models

Pipelining and Superscalar Techniques
Linear Pipeline Processors, Nonlinear Pipelene Processors, Instruction Pipeline Design, Arithmetic Pipeline Design, Superscalar and Superpipeline Design

Multiprocessors and Multicomputers
Multiprocessor System Interconnects, Cache Coherence and Synchronization Mechanisms, Message-Passing Mechanisms

Multivector, Scalable, Multithreaded, Data Flow Architecture
Vector Processing principles, Multivector Multiprocessors, Compound Vector Processing, Principles of Multithreading, Dataflow and Hybrid Architectures.

Text Book:
*   Advance computer architecture by Kai Hwang MGH.

Reference Books:
*   Pipelined and Parallel processor design by Michael J. Fiynn – 1995, Narosa.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-467 E   Computer Software Testing (IT-- VII Sem Elective I)

L T P Total Credit   **Duration of exam**
4 - -   4   3 Hours
<div align="center">

SYLLABUS
</div>

Unit-1: Fundamentals and Testing types: First, second and later cycles of testing. Objectives and limits of testing. Overview of S/W development stages, Planning and Design stages and testing during these stages. Glass box code, Regression and Black box testing, Software errors, Categories of software error.

Unit-2: Reporting and analyzing bugs: Problem reports, Content and Characteristics of Problem Report, analysis and Tactics for analyzing a reproducible bug. Making a bug reproducible

Unit-3: Problem Tracking System: Objective of Problem Tracking System, tasks of the system, Problem tracking overview, users of the tracking system, mechanics of the database

Unit-4: Test Case Design: Characteristics of a good test, equivalence classes and boundary values, visible state transitions, Race conditions and other time dependencies, load testing. Error guessing, Function equivalence testing, Regression Testing, General issues in configuration testing, printer testing

Unit-5:   Localization and User Manuals testing: Translated text expands, Character sets, Keyboards, Text filters, Loading, saving, importing, and exporting high and low ASCII, Operating system Language, Hot keys, Error message identifiers, Hyphenation rules, Spelling rules, Sorting Rules, Uppercase and Lowercase conversion, Printers, Sizes of paper, CPU's and video, Rodents, Data formats and setup options, Rulers and measurements, Culture-bound Graphics and output, European product compatibility, Memory availability, automated testing, Testing User Manuals, Effective documentation, documentation tester's objective, How testing documentation contributes to software reliability

Unit-6:   **Testing Tools and Test Planning**: Fundamental tools, Automated acceptance and regression tests, standards, Translucent box testing Overall objective of the test plan: product or tool? Detailed objective , type of test, strategy for developing components of test planning documents, components of test planning documents, documenting test materials

Unit-7: S/W Development tradeoffs and models, Quality-related costs, The development time line, Product design, alpha, Pre-beta, Beta, User Interface freeze, Pre-final, Final integrity testing, Project post-mortems, Legal consequences of defective software, Managing and role of a testing group, independent test agencies

Text Book:

- Testing Computer Software, by Cem Kaner, Jack Falk,Hung Quoc Nguyen, 1999, Pub: Wiley, (Second Edition).

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-425 E   Natural Language Processing (IT-- VII Sem Elective I)

L T P Total Credit   **Duration of exam**
4 - -   4   3 Hours

SYLLABUS

Unit-1: Components of natural language processing: lexicography, syntax, semantics, pragmatics: word level representation of natural languages prosoty & natural languages.

Unit-2: Formal languages and grammars: chomsky hierarchy, Left-Associative grammars, ambiguous grammars, resolution of ambiguities.

Unit-3: Computation linguistics: recognition and parsing of natural language structures: ATN & RTN,General techniques of parsing: CKY, Earley & Tomitas algorithm.

Unit-4: **S**emantics-knowledge representation semantic networks logic and inference pragmatics, graph models and optimization, prolog for natural language semantic.

Unit-5: Application of NLP: intelligent work processors: Machine translation, user interfaces, Man-Machine interfaces, natural language querying, tutoring and authoring systems, speech recognition, commercial use of NLP.

Text Book:
- "Natural Language Understanding" James Allen ,Benjamin-1995, cummings Pub. Comp. Ltd.,

Reference Books:
- "Language as a cognitive process", Terry Winograd 1983, AW
- "Natural Language processing in prolog" G. Gazder, 1989, Addison Wesley.
- " Introduction of Formal Language Theory, Mdlj Arbib & Kfaury, 1988, Springer Verlog

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-471 E   Management Information System (IT-- VII Sem Elective I)

L T P   Total Credit   Duration of exam
4 - -   4   3 Hours
                          SYLLABUS

Unit 1: Introduction to Management Information System: Background, Meaning, Nature, Characteristics, Myths, Requirements, Problems and Solutions, Benefits, Limitations, Significance and Role of Management Information System.

Fundamentals of Information: Concept of information, Characteristics of Information, Value of information, Manager as information processor, Types of Information, Level of management and their information requirement.

Unit 2: Conceptual Framework of Information System: Concept of System, Definition of System, Characteristics of System, System Stakeholder, Types of System, Environment drivers for today's Information System, Evolution of Information System, Approaches to management information system, A framework for management information system Architecture, Components of management information system, Classification of Information System, Major challenges of information system, Future of Management Information System.

Management Process and Information System: Process of Management, Meaning of Planning, Organizing, Staffing: Directing, Controlling functions and how MIS supports these functions.

Unit 3: Management Information System for Business Operations: Various functional areas of management, Sub-systems, components and working of Finance & accounting, Marketing, HR, Production, and R & D information systems.

Unit 4: Concept of Decision Making and MIS: Introduction, Decision Making and Managers, Classification of managerial decisions, Models for decision making, Management Information System and decision making, Concept of Balance, efficiency and effectiveness of MIS.

Unit 5: Development of Management Information System: Introduction, Information system planning, Motivational forces behind development of information system, Principles for information system development, SDLC approach for MIS development.

Tools for Management Information System: Introduction, Factors affecting selection of tools, Development tools for Management Information System.

Unit 6: Implementation, Evaluation, and Maintenance of MIS.

Control and Security Issues in Management Information System: Control, Why need to Control MIS, Types of Control, Audit in MIS, Security Hazards, Security Techniques.

Case studies: To introduce business problems and to discuss various stages for understanding the systems development process.

Text Books:
- Management Information Systems: A Computer oriented approach for business applications by Dharminder Kumar, Sangeeta Gupta, Excel books, 2006, New Delhi.
- Management Information System by W. S. Jawadekar, 2002, Tata McGraw Hill.

Reference books:
- Management Information System; James A.O'Brien; TMH
- Management Information System by Davis Olson Mac Graw Hill
- Management Information System by Stasllings,(Maxwell Mc Millman Publishers)
- Information System; a Management Perspective; Alter Addison Wesley

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-405 E   Compiler Design (IT-- VII Sem Elective I)

L   T   P   Total Credit   **Duration of exam**
4 -   -   4   3 Hours
SYLLABUS

Unit–1: Introduction To Compilers: Compilers and translators, need of translators, structure of compiler :its different phases, Compiler construction tools.

Unit–2: Lexical Analysis: Role of lexical analyzer, design of lexical analyzer, regular expressions , Specification and recognition of tokens, input buffering, A language specifying lexical analyzer. Finite automata, conversion from regular expression to finite automata, and vice versa, minimizing number of states of DFA, Implementation of lexical analyzer.

Unit–3: Syntax Analysis: Role of parsers, context free grammars, definition of parsing.

Unit–4:   Parsing Technique: Shift- reduce parsing, operator precedence parsing, top down par sing, predictive parsing.

Unit–5: LR parsers, SLR, LALR and Canonical LR parser.

Unit–6: Syntax Directed Translations: Syntax directed definition, construction of syntax trees, syntax directed translation scheme, implementation of syntax directed translation, three address code, quadruples and triples.

Unit–7: Symbol Table & Error Detection And Recovery: Symbol tables, its contents and data structure for symbol tables; trees, arrays, linked lists, hash tables. Errors, lexical phase error, syntactic phase error, semantic error.

Unit–8:   Code Optimization & Code Generation: Code generation, forms of objects code, machine dependent code, optimization, register allocation for temporary and user defined variables.

Text Books:
- Compilers Principle, Techniques & Tools - Alfread V. AHO, Ravi Sethi & J.D. Ullman; - 1998Addison Wesley.
- Compiler Design by O.G. Kakde, 1995, Laxmi Publ.

Reference Books:
- Theory and practice of compiler writing, Tremblay & Sorenson, 1985, Mc. Graw Hill.
- System software by Dhamdae, 1986, MGH.
- Principles of compiler Design, Narosa Publication

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-402 E   Distributed Operating System(BTech IT 8ᵗʰ Sem)

L T P Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours

SYLLABUS

Unit-1: Introduction: Introduction to Distributed System, Goals of Distributed system, Hardware and Software concepts, Design issues. Communication in distributed system: Layered protocols, ATM networks, Client – Server model ,Remote Procedure Calls and Group Communication. Middleware and Distributed Operating Systems.

Unit-2: Synchronization in Distributed System: Clock synchronization, Mutual Exclusion, Election algorithm, the Bully algorithm, a Ring algorithm, Atomic Transactions, Deadlock in Distributed Systems, Distributed Deadlock Prevention, Distributed Deadlock Detection .

Unit-3: Processes and Processors in distributed systems: Threads, System models, Processors Allocation, Scheduling in Distributed System, Real Time Distributed Systems.

Unit-4: Distributed file systems: Distributed file system Design, Distributed file system Implementation, Trends in Distributed file systems.

Distributed Shared Memory: What is shared memory, Consistency models, Page based distributed shared memory, shared variables distributed shared memory.

Unit-5: Case study MACH: Introduction to MACH, process management in MACH, communication in MACH, UNIX emulation in MACH.

Text Book:

- Distributed Operating System – Andrew S. Tanenbaum, PHI.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT – 402 E   Security of Information Systems(BTech IT 8ᵗʰ Sem)

L T P   Total Credit   **Duration of exam**
3 1 -   3.5   3 Hours
<div align="center">SYLLABUS</div>

Overview of Information Security: Basic Concepts, Cryptosystems, Cryptoanalysis, Ciphers & Cipher modes.

Symmetric Key Cryptography: DES, AES.

Asymmetric Key Cryptography: RSA algorithm, Key management protocols, Diffie Hellman Algorithm

Digital Signature: Digital Signatures, Public Key Infrastructure

Program Security: Security problems in Coding, Malicious Logic, Protection.

Database Security: Access Controls, Security & Integrity Threats, Defence Mechanisms.

.Net Security: User based security, Code access security, form authentication.

LAN Security: Threats, Authentication & access control, Secured communication Mechanisms (IPSec, Kerberos, Biometric, PKI), Secured Design for LAN.

Email & Transaction Security Mechanisms: Privacy Enhanced Mail(PEM), S/MIME, SET protocol, Client-Server Security on web.

Wi-Fi & IEEE 802.11 Security: Protocol architecture, WEP, Access controls

Text Books:

- "Security in Computing (Second Edition)", Charles P. Pfleeger, 1996, Prentic-Hall International, Inc.,
- "Applied Cryptography Protocols, Algorithms, and Source Code in C (Second edition)", Bruce Schneier, 1995, John **Reference Books:**
- "Security Technologies for the World Wide Web", Rolf Oppliger, Artech House, Inc.
- "Digital Certificates Applied Internet Security", Jalal Feghhi, Jalli Feghhi and Peter Williams, Addison Wesley Longman,

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT 404 E   Computer Animation Lab. (BTech IT 8th Sem)

L T P Total Credit   Duration of exam
-   - 3   1.5   3 Hours
                                    SYLLABUS

1.   Exercises involving advertisement on the Web.

2.   Animation of a video game.

3.   Animation of a traffic light signal controlling car movements.

4.   Animation of a bird flying over a mountain.

5.   Animation of landing of plane.

6.   Animation of morphing from face to truck.

7.   Animation of face from frown to smile.

8.   Animation of plucking a flower from plant.

9.   Animation of movement of jumping ball in a uniform speed.

10.   Animation of a person sitting on a car seat and tying belt.

L T P Total Credit   Duration of exam
-   - 3   1.5   3 Hours
                                    SYLLABUS

CSE-412 E Object Oriented Systems Development (IT-- VIII Sem Elective II)

L T P   Total Credit   **Duration of exam**
4 - -   4   3 Hours
<div align="center">SYLLABUS</div>

Unit-1: Introduction: Review of the Traditional Methodologies, Advantages of Object Oriented Methodologies over Traditional Methodologies, Classes, Objects, Encapsulation, Association, Aggregation, Inheritance, Polymorphism, States and Transitions.
Visual Modelling using Unified Modelling Language (UML): What is Visual Modelling? Object Oriented Modelling, Introduction to Unified Modelling Language (UML): History of UML, Overview of UML – Capabilities, Usage of UML. Introduction to Rational Rose CASE tool:
    Introduction – Importance of Rational Rose, Capabilities of Rational Rose Case Tool.
Unit-2:   Introduction to Objectory Software Development Process: Introduction, Benefits, Phases and Iterations, Elaboration Stage, Construction Stage, Transition Stage.
Creating Use Case Diagrams: Actors and Use Cases, Use Case Relationships, Types of Relationships, Use Case Diagrams: Creating Main Use Case -,Relationships - , Additional Use Case - Diagrams in Rational Rose, Activity Diagrams Activities, Transitions, Decision Points, Swimlanes

Unit-3: Identifying Classes ,Packages and drawing a Class Diagram: State, Behaviour, Identity of Objects, Stereotypes and Classes, Creating and Documenting Classes in rational Rose, Packages, Drawing a Class Diagram Specifying Relationships : The Need of Defining Relationships, Association and Aggregation Relationships, Naming Relationships, Role Names, Multiplicity Indicators, Reflexive Relationships, Package Relationships, Inheritance, Finding Relationships, Creating Relationships in Rational Rose

Unit-4: Discovering Object Interactions: Documenting Scenarios using Interaction Diagrams, Types of Interaction Diagrams, Adding Behaviour and Structure: Representing Behaviour and Structure, Creating Attributes & operations and documenting them, Displaying attributes and operations, Association Classes, Analysing Object Behaviour: Modelling Dynamic Behaviour, States

Unit-5: Checking the Model: Making the Model Homogeneous, Combining Classes, Splitting Classes, Eliminating Classes, Consistency Checking, Scenario Walk-through, Event Tracing, Documentation Review, Designing the System Architecture : The need for Architecture, The "4+1" view of Architecture, The Logical view, The Component View, The Process View, The Deployment View, The Use Case view.

Unit-6: The Iteration Planning Process: Benefits, Goals, Design the User Interface,   Adding Design Classes, The Emergence of Patterns, Designing Relationships, Designing Attributes and Operations, Designing for Inheritance, Coding, Testing, and Documenting the Iteration.

Text Books:
*   "UML User Guide", Grady Booch, James Rumbaugh, Ivar Jacobson, 2000, Addison Wesley.
*   Visual Modeling with Rational Rose 2000 and UMLBy Terry Quatrani Foreword by Grady Booch, 2000

Reference Books:
*   "UML Reference Guide", James Rumbaugh, Ivar Jacobson, Grady Booch, 2000, Addison Wesley.
*   "The Objectory Software Development Process", Ivar Jacobson, Grady Booch, James Rumbaugh, 1999, Addison Wesley.
*   UML Distiled by Maxtin Fowler with Kendall Scott,2000 ,Second Edition
*   Sams Teach Yourself "UML" In 24 Hours By Joseph Schmuller ,2000

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-466 E   **Embedded Systems Design(IT-- VIII Sem Elective II)**

L T P   Total Credit   **Duration of exam**
4 - -   4   3 Hours
                        SYLLABUS

Unit-1: Real time operating system overview, exposure to Windows CE, QNX, Micro kernels and μc/OS of introduction to process models. Interrupt routines in an RTOs environment, encapsulating semaphores and queues, hard real-time scheduling considerations, saving memory space.

Unit-2: 16 & 32 bit microprocessor and micro-controller and DSP hardware with reference to Embedded system.

Unit-3: Embedded software development tools and compilers – host and target machines, linker/ locators for embedded software, cross compilers, cross assemblers and tool chairs, gce compiler, basic concept of device drivers, serial communication interface device driver.

Unit-4: System synthesis of Hardware/ software co-emulation, simulation speed of emulators. JTAG OCD

Unit-5: Communication protocols with special reference to embedded system. TCP/IP, VDP wireless protocols, IRDA, Blue tooth IEEE 8.8.11.

Text Books:
- An embedded system primer by David E Simon, 1999, Addison-Wesley
- Programming for Embedded system by Dreamtech software team, John wiley, 2002

Reference Books:
- TCP/IP Lean: Web servers for embedded systems by Jeramy Bentham, 2002
- Real –time programming: A guide to 32 bit embedded development, Rick Grehan, 1999, AW.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-414E   **Digital Image Processing (IT-- VIII Sem Elective II)**

L T P Total Credit   **Duration of exam**

4 - - 4   3 Hours

SYLLABUS

Unit-1: Introduction and Fundamental to Digital Image Processing: What is Digital Image Processing, Origin of Digital Image Processing, Examples that use Digital Image Processing, Fundamental steps in Digital Image Processing, Components of Digital Image Processing System, Image sensing and acquisition, Image sampling, quantization and representation, Basic relationship between pixels.

Unit-2: Image Enhancement in the Spatial Domain & Frequency domain: Background, Basic gray level transformation, Histogram processing, Basics of spatial filtering, Smoothing and Sharpening Spatial filters, Introduction to Fourier Transform and the Frequency Domain, Discrete Fourier Transform. Smoothing and Sharpening Frequency-Domain filters.

Unit-3: Image Restoration: Image Degradation/Restoration Process, Noise models, Restoration in presence of noise, Inverse Filtering, Minimum Mean Square Filtering, Geometric mean filter, Geometric transformations.

Unit-4: Color Image Processing: Color Fundamentals, Color models, Basis of full color image processing, Color transformations.

Unit-5: Image Compression: Fundamentals, Image compression models, Error free compression, Lossy compression.

Unit-6: Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region oriented segmentation.

Unit-7: Representation, Description and Recognition: Representation-chain codes, polygonal approximation and skeletons, Boundary descriptors-simple descriptors, shape numbers, Regional descriptors- simple, topological descriptors, Pattern and Pattern classes-Recognition based on matching techniques.

Unit-8: Recognition: Pattern and pattern Classes, Decision-Theoretic Methods.

Text Book:
- Digital Image Processing by Rafael C.Gonzalez & Richard E. Woods –2002, Pearson Education

Reference Book:
- Digital Image Processing by A.K. Jain, 1995,-PHI

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-470 E   Web Engineering (IT-- VIII Sem Elective III)

L T P   Total Credit   **Duration of exam**
4 - -   4   3 Hours
SYLLABUS

Unit-1:   **Information Architecture**: The role of the Information Architect, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites and Intranets, Creating Cohesive Organization Systems Designing Navigation Systems, Types of Navigation systems, Integrated Navigation Elements, Remote Navigation Elements, Designing Elegant Navigation Systems, Searching Systems, Searching your Web Site, Designing the Search Interface, Indexing the Right Stuff, To search or Not To Search, Grouping Content, Conceptual Design, High-Level Architecture Blueprints, Architectural Page Mockups, Design Sketches.

Unit-2:   **Dynamic HTML and Web Designing**: HTML Basic Concepts, Good Web Design, Process of Web Publishing, Phases of Web Site development, Structure of HTML documents, HTML Elements-Core attributes, Language attributes, Core Events, Block Level Events, Text Level Events, Linking Basics, Linking in HTML, Images and Anchors, Anchor Attributes, Image maps, Semantic Linking Meta Information, Image Preliminaries, Image Download Issues, Image as Buttons, Introduction to Layout: Backgrounds, Colors and Text, Fonts, Layout with Tables. Advanced Layout: Frames and Layers, HTML and other media types. Audio Support in Browsers, Video Support, Other binary Formats.   Style Sheets, Positioning with Style sheets.   Basic Interactivity and HTML: FORMS, Form Control, New and emerging Form elements.

Unit-3: Java Server Pages and Active Server Pages: Basics, Integrating Script, JSP/ASP Objects and Components, configuring and troubleshooting,: Request and response objects, Retrieving the contents of a an HTML form, Retrieving a Query String, Cookies, Creating and Reading Cookies. Using application Objects and Events.

Unit-4: Overview of advance features of XML

Text Books:
- HTML The complete Reference, TMH
- CGI Programming with Perl 2/e, Scott Guelich, Shishir Gundavaram, Gunther Birzniek; O'Reilly
- Doug Tidwell, James Snell, Pavel Kulchenko; Programming Web Services with SOAP, O' Reilly
- Pardi, XML in Action, Web Technology, PHI

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-500-E   OPERATIONS RESEARCH (CSE-- VIII Sem Elective III)

L T P   Total Credit   **Duration of exam**
4 - -   4   3 Hours
SYLLABUS

Unit-I :
    The origin of OR, Phases of an O.R. study, Impact of OR,
Formulation of Linear-programming model, Graphical solution.
Converting the linear programming problem to standard form,
Simplex method.

Unit-II :
    Big-M   method, Two-Phase method, Degeneracy,   Alternate
optima, unbounded and infeasible solution.

Unit-III :
    Definition of the dual problem, primal-dual relationship,
Dual Simplex method, Postoptimal and sensitivity analysis.

Unit-IV & V :
    Assignment   problem   and   its   mathematical   formulation,
solution of assignment problem (Hyngarian method), Transportation
problem and its mathematical formulation, Initial basic feasible
solution of transportation problem by North-West corner rule,
Lowest-Cost Entry method and Vogel's Approximation   method,
Optimal solution of transportation problem.

Unit-VI :
    Network models, Minimal spanning tree algorithm, Shortest-
route problem (Floyd's Algorithm and Dijkstras algoritham),
Maximal flow problem, Introduction to CPM & PERT.

Unit-VII :
    Introduction to Dynamic Programming, General inventory Model,
Static Economic Order Quantity (EOQ) Models.

Unit-VIII :
     Elements of a Queuing model, Pure Birth & Death model,
Generalized Poisson Queuing model, Specialized Poisson Queues.

Books Recommended :

1.   Operations Research by Hamdy A. Taha.
2.   Introduction to Operations Research by Hiller and Dieherman,
     TMH.
3.   Optimization Theory and Application : S.S. Rao, John Wiley.

Note :   Examiner will set eight questions, taking one from each
         unit. Students will be required to attempt any five
         questions.

IT-472 E   Introduction to VLSI Design (IT-- VIII Sem Elective III)

L   T   P   Total Credit   **Duration of exam**
4 - -   4   3 Hours
SYLLABUS

Unit-1:   Crystal Growth: MGS, EGS, Czochralspi crystal Puller, Silicon shaping, Wafer Preparation. Epitaxy: Vapour Phase Epitaxy, Epitaxial Layer evaluation Molcullar Beam Epitaxy.

Unit-2:   Oxidation: Thermal Oxidation Kinetics, Oxidation techniques, Oxide Properties, Oxidation induced Defects.   Lithography: Photolithography, e-beam lithography, X ray Lithography.

Unit-3:   Reactive Plasma Etching: Plasma Properties, Feature Size control and anisotropic etching, Plasma etching techniques and equipment. Di-electric and Poly-Silicon Film Deposition: Deposition Processes for Poly-Si, SiO_2, SiO_3N_4; Plasma assisted Depositions.

Unit-4: Diffusion: A Qualitative view of atomic diffusion in Solids, diffusion mechanisms, Fick's one dimensional diffusion equation, constant source and limited source diffusion, diffusion of Grp3 and 5 impurities in Silicon Impurity sources, diffusion apparatus, Characterization of diffused layers. Ion Implantation: Introduction, Range Theory, Implantation Equipment Anncaling.

Unit-5:   Metallization: Metallization applications, Choices, Physical Vapour Deposition. Sputtcring, Metallization Problems. Assembly & Packaging: Package Types, design considerations, Package fabrication technologies, Future trends.

Unit-6: Isolation techniques: Bipolar IC fabrication Process Sequence. n MOS IC fabrication Process Sequence.

Text Books:
- VLSI Technology, S.M. Sze , 1998, MGH
- VLSI Fabrication Principles, S.K. Ghandhi

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-416 E Social and Professional Issues in IT (IT-- VIII Sem Elective III)

L T P   Total Credit   **Duration of exam**
4 - -   4   3 Hours

SYLLABUS

Unit-1: Legal Issues: Introduction to legal concepts, Basic outline of Criminal and Civil Laws, Concepts relating to laws of Contract and Commercial Law, Substantive Legal Issues, Intellectual property Issues, Cyber crime, Data protection principles and implications of the European Union Data Protection Directive, Confidentiality and privacy, Intellectual property rights, Copyright and Industrial Property, Patents, Trade Marks and laws relating to designs, Software Protection and piracy, Dealing with Copyright, Originality, Exception to Copyright infringement, Employees and freelance programs, devices to overcome protection Software Licensing , Methods of licensing, Copyright and electronic publishing , Copyright problems posed by electronic publishing.

Unit-2: Multimedia, licensing and related issues: Protection of Databases, Trade marks and passing off, Internet related issues, Contract issues and Law, Basic understanding of the Types of Agreements in large computerization projects – Implementation Agreements, License Agreements, Maintenance agreements etc., Enforcement issues, dispute resolution, arbitration, legislative action,

Unit-3: Other Professional Issues: Duties of a professional, Duties to client, Duties to Employer, Duties to profession, Duties to society, Accountability for quality, timeliness and use of resources, Human relationships and change management, Avoiding computer misuse, Hacking, unauthorized access and types of Computer Crime, Introduction of Viruses, Fraud and types of Computer Fraud, Public interest and Social implications, Environmental protection, Health and safety issues, Privacy, Ethics and Codes of Professional Conduct, The need for professional ethics, Characteristics of professions, Integrity & Honesty, Competence, Professional development, judgment, knowledge of law, relations, standards, independence, Acting with responsibility, professional skill, comply with law, Confidentiality, due care, Contribute towards advancement of human welfare, Public interest, Public awareness, Basic human rights, Ethics and the Internet, Netiquette and Policy approaches, Professional relationships, Are computer professionals "Professionals", Conflicting responsibilities and misconduct, Codes of Ethics: Relationship between Code of ethics and professional conduct. Case study of some professional body such as Computer Society of India / BCS(UK).

Text Book:
- Professional Issues in Software Engineering (2nd edition.), Bott F. et al., 1995, UCL Press.

Reference Books:
- (Eds), The Responsible Software Engineer: Selected Readings in IT Professionalism, Myers C., Hall T. and Pitt D., 1997, Springer
- *   BCS code of conduct: http://www.bcs.org/docs/01100/1194/pdf/codeofc.pdf
- BCS Code of Practice: http://www1.bcs.org/docs/01100/1194/Cop.htm
- ACS code of Ethics http://203.58.197.209/acs/events_admin/static/national/pospaper/acs131.htm

Note: Eight questions will be set in all by the examiners taking at least two question from each unit. Students will be required to attempt five questions in all.