# BACHELOR OF TECHNOLOGY
## (INFORMATION TECHNOLOGY)
### FIFTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper ID</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETCS 301</td>
<td></td>
<td>Algorithms Design and Analysis</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>M</td>
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<tr>
<td>ETCS 303</td>
<td></td>
<td>Software Engineering</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>M</td>
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<tr>
<td>ETCS 307</td>
<td></td>
<td>Java Programming</td>
<td>3</td>
<td>1</td>
<td>4</td>
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<tr>
<td>ETMS 311</td>
<td></td>
<td>Industrial Management</td>
<td>3</td>
<td>0</td>
<td>3</td>
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<tr>
<td>ETIT-309</td>
<td></td>
<td>Communication Systems</td>
<td>3</td>
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<tr>
<td>ETHS 301</td>
<td></td>
<td>Communication Skills for Professionals</td>
<td>2</td>
<td></td>
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</tbody>
</table>

|              |          |                                             |   |     |        |        |
| PRACTICAL/VIV A VOCE |          |                                             |   |     |        |        |
| ETCS 351    |          | Algorithms Design and Analysis Lab          | 0 | 2   | 1       |        |
| ETCS 353    |          | Software Engineering Lab                    | 0 | 2   | 1       |        |
| ETCS 357    |          | Java Programming Lab                        | 0 | 2   |         |        |
| ETIT 359    |          | Viva Industrial Training / In-house Workshop | 0 | 0   | 1       |        |
| ETIT 357    |          | Communication Systems Lab                   | 0 | 2   | 1       |        |
| ETHS 351    |          | Communication Skills for Professionals Lab  | 0 | 2   | 1       |        |

| TOTAL       |          |                                             | 17| 14  | 26      |        |

M: Mandatory for award of degree

* Viva-Voce for evaluation of Industrial Training / In-house Workshop will be conducted in this semester.

* Using UML 2.0

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Scheme and Syllabi for B. Tech-IT, 1st year (Common to all branches) w.e.f batch 2014-15 and (2nd, 3rd & 4th years) w.e.f batch 2013-14 approved in the 22nd BOS of USET on 30th June, 2014 and approved in the 37th AC Sub Committee Meeting held on 10th July, 2014.
## BACHELOR OF TECHNOLOGY
(Information Technology)
SIXTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper ID</th>
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<th>Credits</th>
<th>Status</th>
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<tr>
<td>ETCS 302</td>
<td></td>
<td>Compiler Design</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>M</td>
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<td>ETCS 304</td>
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<td>Operating Systems</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>M</td>
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<tr>
<td>ETEC 310</td>
<td></td>
<td>Data Communication and Networks</td>
<td>3</td>
<td>1</td>
<td>4</td>
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<tr>
<td>ETCS 308</td>
<td></td>
<td>Web Engineering</td>
<td>3</td>
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<tr>
<td>ETCS 310</td>
<td></td>
<td>Artificial Intelligence</td>
<td>3</td>
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<td>4</td>
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<tr>
<td>ETEE-310</td>
<td></td>
<td>Microprocessor and Microcontroller</td>
<td>3</td>
<td>1</td>
<td>4</td>
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### THEORY PAPERS

<table>
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<tr>
<th>Code No.</th>
<th>Paper ID</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETCS 352</td>
<td></td>
<td>Operating Systems (Linux Programming and Administration) Lab</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td></td>
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<tr>
<td>ETEC 358</td>
<td></td>
<td>Data Communication and Networks Lab</td>
<td>0</td>
<td>2</td>
<td>1</td>
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</tr>
<tr>
<td>ETCS 356</td>
<td></td>
<td>Engineering Lab</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ETEE 358</td>
<td></td>
<td>Processor and Microcontroller</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### PRACTICAL/VIVA VOCE

**Total**

|          |         |               | 18 | 13  | 27      |        |

M: Mandatory for award of degree

**Note:** Minimum of 4-6 weeks of industrial training related to CSE will be held after 6th semester; however, viva-voce will be conducted in 7th semester.

**Imp:** Elective Paper will be floated in 7th semester, if one-third of the total students opt for the same. It is advised that the decision about the elective subject for 7th Semester is done before 15th April every year before the end of 6th semester.

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GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY

Scheme and Syllabi for B. Tech-IT, 1st year (Common to all branches) **w.e.f batch 2014-15** and (2nd, 3rd & 4th years) **w.e.f batch 2013-14** approved in the 22nd BOS of USET on 30th June, 2014 and approved in the 37th AC Sub Committee Meeting held on 10th July, 2014.
INSTRUCTIONS TO PAPER SETTERS:  

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

Objective: To learn object oriented concepts and enhancing programming skills.

UNIT I
Overview and characteristics of Java, Java program Compilation and Execution Process, Organization of the Java Virtual Machine (JVM) as an interpreter and emulator, Instruction Set, Class File Format, Verification, Class Area, Java Stack, Heap, Garbage Collection, Security Promises of the JVM, Security Architecture and Security Policy, Class loaders and security aspects, sandbox model.

UNIT II
Java Fundamentals, Data Types & Literals, Variables, Wrapper Classes, Arrays, Arithmetic Operators, Logical Operators, Control of Flow, Classes and Instances, Class Member Modifiers, Anonymous Inner Class, Interfaces and Abstract Classes, throw and throws clauses, user defined Exceptions, The String Class, tokenizers, applets, Extendable and Security concerns.

UNIT III
Threads: Creating, Priority, Blocked States, Extending Thread Class, Runnable Interface, Starting Threads, Thread Synchronization, Synchronize Threads, Sync Code Block, Overriding Synchronized Methods, Thread Communication, wait, notify and notifyall.


UNIT IV
Input/Output Stream, Stream Filters, Buffered Streams, Line in and Out, Random Access File, JDBC (Database Connectivity with MS-Access, Oracle, MS-SQL Server), Object serialization, Sockets, development of client server applications, design of multi-threaded server. Remote Method invocation, Java Native interfaces, Development of embedded applications.

Collection API Interfaces, Vector, stack, Hashmap classes, Abstractions, set, List, Map, Iterators.

Text Books:
T1 Patrick Naughton and Herbertz Schidt, “Java - the complete Reference”, TMH
T2 Sierra & Bates, “Head First Java”, O’reilly

Reference Books:
R1 E. Balaguruswamy, “Programming with Java”, TMH
R3 Decker & Hirshfield, “Programming Java”, Vikas Publication.
Objective: The course provides a broad introduction to some aspects of business management and running of business organization.

UNIT I

UNIT II

UNIT III

UNIT IV

Text Books:

Reference Books:
Objectives: The objective of the paper is to facilitate the students with the knowledge of electronic communication thereby enabling the student to obtain the platform for studying in communication system.

UNIT I
Introduction: Overview of communication system, Communication channels, Mathematical Models for Communication Channels
Introduction of Random Variables: Definition of random variables, PDF, CDF and its properties, joint PDF, CDF, Marginalization of PDF, CDF, WSS wide stationary, strict sense stationary, non stationary signals, UDF, GDF, RDF, Bernoulli distribution, White process, Poisson process, Wiener process.

UNIT II
Pulse Analog Modulation: Sampling-Natural and Flat top. Reconstruction, TDM-Pulse Amplitude Modulation (TDM-PAM), Pulse Width Modulation (PWM), Pulse Position Modulation (PPM), Generation and Recovery.
Pulse Digital Modulation: Pulse Code Modulation (PCM), Differential Pulse Code Modulation (DPCM), Delta Modulation (DM), ADPCM.

UNIT III
Information and Coding Theory: Entropy, Information, Channel Capacity, Source Coding Theorem: Shannon Fano Coding, Huffman Coding.

UNIT IV
Advanced Communication Systems: Introduction to cell phones, land line phones, Production to satellite Communication.

Text Books:

Reference Books:
Objective: To develop communication competence in prospective engineers so that they are able to communicate information as well as their thoughts and ideas with clarity and precision. This course will also equip them with the skills required for a variety of practical applications of communication such as applying for a job, writing reports and proposals. Further, it will make them aware of the new developments in communication that have become part of business organisations today.

UNIT I


Self Development and Assessment - Self assessment, Awareness, Perception and Attitudes, Values and belief, Personal goal setting, Career planning, Self esteem.

UNIT II
Introduction to Phonetics: IPA system (as in Oxford Advanced Learner’s Dictionary), Speech Mechanism, The Description of Speech Sounds, Phoneme, Diphthong, Syllable, Stress, Intonation, Prosodic Features; Pronunciation; Phonetic Transcription - Conversion of words to phonetic symbols and from phonetic symbols to words. British & American English (basic difference in vocabulary, spelling, pronunciation, structure).

Non-Verbal Language: Importance, characteristics, types – Paralanguage (voice, tone, volume, speed, pitch, effective pause), Body Language (gesture, eye contact, facial expressions, eye contact), Proxemics, Chronemics, Appearance, Symbols.

UNIT III

Meeting Documentation -- notice, memo, circular, agenda and minutes of meeting.


Preparing a written report for seminar, conference. Writing a paper for conference presentation/journal submission.

UNIT IV
Listening and Speaking Skills: Importance, purpose and types of listening, process of listening, difference between hearing and listening, Barriers to effective listening. Traits of a good listener, Tips for effective listening. Analytical thinking; Speech, Rhetoric, Polemics; Audience analysis. Telephone Skills - making and receiving calls, leaving a message, asking and giving information, etiquettes.

Presentations: Mode, mean and purpose of presentation, organizing the contents, nuances of delivery, voice and body language in effective presentation, time dimension.

Group Discussion: Purpose, types of GDs, strategies for GDs, body language and guidelines for group discussion.

Interview Skills: Purpose, types of interviews, preparing for the interview, attending the interview, interview process, employers expectations, general etiquettes.
Text Books:


References Books:


ALGORITHMS DESIGN AND ANALYSIS LAB

Paper Code: ETCS 351

| Paper: Algorithms Design and Analysis Lab | 0 | 2 | 1 |

List of Experiments:

1. To implement following algorithm using array as a data structure and analyse its time complexity.
   a. Merge sort
   b. Quick sort
   c. Bubble sort
   d. Bucket sort
   e. Radix sort
   f. Shell sort
   g. Selection sort
   h. Heap sort
2. To implement Linear search and Binary search and analyse its time complexity.
3. To implement Matrix Multiplication and analyse its time complexity.
4. To implement Longest Common Subsequence problem and analyse its time complexity.
5. To implement Optimal Binary Search Tree problem and analyse its time complexity.
6. To implement Huffman Coding and analyse its time complexity.
7. To implement Dijkstra’s algorithm and analyse its time complexity.
8. To implement Bellman Ford algorithm and analyse its time complexity.

NOTE:- At least 8 Experiments out of the list must be done in the semester.
SOFTWARE ENGINEERING LAB

Paper Code: ETCS-353
Paper: Software Engineering Lab

Tool Required: Rational Rose Enterprise Edition

List of Experiments:

1. Write down the problem statement for a suggested system of relevance.
2. Do requirement analysis and develop Software Requirement Specification Sheet (SRS) for suggested system.
3. To perform the functional model diagram: Data Flow Diagram (DFD) and Structured chart.
4. To perform the use case analysis for the suggested system: Use case diagram.
5. To draw the structural view diagram for the system: Class diagram, object diagram.
6. To draw the behavioral view diagram: State-chart diagram, Activity diagram.
7. To perform the behavioral view diagram for the suggested system: Sequence diagram, Collaboration diagram.
8. To perform the implementation view diagram: Component diagram for the system.
9. To perform the environmental view diagram: Deployment diagram for the system.
10. To perform various testing using the testing tool unit testing, integration testing for a sample code of the suggested system.
11. To perform estimation of effort using FP Estimation for chosen system.
12. To Prepare Time line Chart/Gantt Chart/PERT Chart for selected software project.

Text Books:

NOTE:- At least 8 Experiments out of the list must be done in the semester.
Java Programming Lab

Paper Code: ETCS-357
Paper: Java Programming Lab

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<tr>
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<td>0</td>
<td>2</td>
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</table>

List of Experiments:

1. Create a Java program to implement stack and queue concept.
2. Write a Java package to show dynamic polymorphism and interfaces.
3. Write a Java program to show multithreaded producer and consumer application.
4. Create a customized exception and also make use of all the 5 exception keywords.
5. Convert the content of a given file into the upper case content of the same file.
6. Develop an analog clock using Applet.
7. Develop a scientific calculator using Swings.
8. Create an editor like MS-Word using Swings.
9. Create a Servlet that uses Cookies to store the number of times a user has visited your Servlet.
10. Create a simple Java bean having bound and constrained properties.

NOTE:- At least 8 Experiments out of the list must be done in the semester.
COMMUNICATION SYSTEMS LAB

Paper Code: ETIT-357
Paper: Communication Systems Lab

List of Experiments:

2. Practical study of amplitude demodulation by linear diode detector
3. Generation of SSB AM signal
4. Practical study of envelope detector for demodulation of AM signal and observation diagonal peak clipping effect.
5. To generate FM signal using voltage controlled oscillator.
6. To generate a FM Signal using Varactor & resistance modulation.
8. Practical study of Super heterodyne AM receiver and measurement of receiver parameters viz. sensitivity, selectivity, fidelity and SNR.
9. Practical study of Pre-emphasis and De-emphasis in FM.
10. Generation of phase modulated and demodulated signal.

Simulations study of some of the above experiments using P-spice or Multisim softwares

NOTE: - At least 8 experiments out of the list must be done.
COMMUNICATION SKILLS FOR PROFESSIONALS LAB

Paper Code: ETHS-351
Paper: Communication Skills for Professionals Lab

Objective: To develop communication competence in prospective engineers so that they are able to communicate information as well as their thoughts and ideas with clarity and precision. These activities will enhance students’ communication skills with a focus on improving their oral communication both in formal and informal situations. They will develop confidence in facing interviews and participating in group discussions which have become an integral part of placement procedures of most business organisations today.

Lab Activities to be conducted:

1. **Listening and Comprehension Activities** – Listening to selected lectures, seminars, news (BBC, CNN, etc.). Writing a brief summary or answering questions on the material listened to.
2. **Reading Activities** – Reading different types of texts for different purposes, with focus on the sound structure and organisation; terms of English. Emphasis on correct pronunciation.
3. **Conversation Activities** – Effective Conversation Skills; Formal/Informal Conversation; Addressing higher officials, colleagues, subordinates, a public gathering; Participating in a video conference.
4. **Making an Oral Presentation** – Planning and preparing a model presentation; Organising the presentation to suit the audience and context; Connecting with the audience during presentation; Projecting a positive image while speaking; Emphasis on effective body language.
5. **Making a Power Point Presentation** – Structure and format; Covering elements of an effective presentation; Body language dynamics.
6. **Making a Speech** – Basics of public speaking; Preparing for a speech; Features of a good speech; Speaking with various speeches may be played as model speeches for learning the art of public speaking; Features of various speeches: Barack Obama, John F Kennedy, Nelson Mandela, Mahatma Gandhi, Jawaharlal Nehru, Bhimrao Ramji Ambedkar, Subhash Chandra Bose, Martin Luther King, Jr., Winston Churchill, Mahatma Gandhi, Jawaharlal Nehru.
7. **Participating in a Group Discussion** – Structure and dynamics of a GD; Techniques of effective participation in group discussion; Preparing for group discussion; Accepting others’ views / ideas; Arguing against others’ views or ideas, etc.
8. **Participating in Mock Interviews** – Job Interviews: purpose and process; How to prepare for an interview; Language and style to be used in an interview; Types of interview questions and how to answer them.

Suggested Lab Activities:

1. Interview through telephonic or video conferencing.
2. Extempore, Story Telling, Poetry Recitation.
3. Mock Situations and Role Play; Enacting a short skit.
4. Debate (Developing an Argument), News Reading and Anchoring.

Reference Books:


Note: The Communication Skills Lab should be equipped with computers, microphones, an internet connection, overhead projector, screen, sound system, audio/video recording facilities, and seating arrangement for GDs and mock interviews. The student activities may be recorded and students may replay them to analyse and improve their pronunciation, tone, expressions, body language, etc.

Traditional language lab softwares are not mandatory and may be used by students to practice and enhance their language competence. Such softwares are usually elementary in nature and are mostly based on British/American English (pronunciation, accent and expression). They should preferably be in Indian English.
Objective: This course aims to teach students the principles involved in compiler design. It will cover all the basic components of a compiler, its optimizations and machine code generation. Students will be able to design different types of compiler tools to meet the requirements of the realistic constraints of compilers.

UNIT-I
Brief overview of the compilation process, structure of compiler & its different phases, lexical analyzer, cross compiler, Bootstrap, quick & dirty compiler, shift-reduce parsing, operator precedence parsing, top-down parsing, predictive parsing, LL(1) and LL(k) grammar, bottom up parsing, SLR, LR(0), LALR parsing techniques.

UNIT-II
Design and implementation of a lexical analyzer and parsing using automated compiler construction tools (eg. Lex, YACC, PLY), Syntax-directed translation schemes, implementation of syntax-directed translations, intermediate code in three address code, quadruples and triples, translation of assignment statements, Boolean expressions, control statements, Semantic Analysis, Type Systems, Type Expressions, Type Checker, Type Conversion.

UNIT-III
Symbol table, data structures and implementation of symbol table, representing scope information. Run Time Storage Administration, implementation of a simple stack allocation scheme, storage allocation in block structured languages and non block structured languages, Error, lexical phase errors, syntactic phase errors, semantic errors.

UNIT-IV
The principle sources of optimization, loop optimization, the DAG representation of basic blocks, value number and algebraic laws, global dataflow analysis, Object programs, problems in code generation, a machine model, a single code generator, register allocation and assignment, code generation from DAGs, peephole optimization.

Text Books:

Reference Books:
R1) Kakde O.G., “Compiler Design”, Laxmi Publication
R2) Trembley and Sorenson, “Theory and Practice of Compiler Writing”, McGraw Hill
R3) Vinu V. DAS, “Compiler Design Using FLEX and YACC”, PHI
Objective: The goal of this course is to provide an introduction to the internal operation of modern operating systems. The course will cover processes and threads, mutual exclusion, CPU scheduling, deadlock, memory management, and file systems.

UNIT I

Memory Organization & Management: Memory Organization, Memory Hierarchy, Memory Management Strategies, Contiguous versus non-Contiguous memory allocation, Partition Management Techniques, Logical versus Physical Address space, swapping, Paging, Segmentation, Segmentation with Paging.


UNIT II
Processes: Introduction, process management, interrupts, Interprocess Communication

Processor Scheduling: Scheduling levels, pre emptive vs no pre emptive scheduling, priorities, scheduling objective, scheduling criteria, scheduling algorithms, dead band, scheduling, real time scheduling.

Process Synchronization: Mutual exclusion, software solution to Mutual exclusion problem, hardware solution to Mutual exclusion problem, semaphores, Critical section problems, Case study of Dining philosophers problem, Barber shop problem etc.

UNIT III
Deadlocks: examples of deadlock, resource concept, necessary conditions for deadlock, deadlock solution, deadlock prevention, deadlock avoidance with Banker’s algorithm, deadlock detection, deadlock recovery.

Device Management: Disk Scheduling, Magnetic Tape, Rotational Optimization, System Consideration, Caching and Buffering

UNIT IV

Text Books:

Text Books:

Scheme and Syllabi for B. Tech-IT, 1st year (Common to all branches) w.e.f batch 2014-15 and (2nd, 3rd & 4th years) w.e.f batch 2013-14 approved in the 22nd BOS of USET on 30th June, 2014 and approved in the 37th AC Sub Committee Meeting held on 10th July, 2014.
Objectives: The objective of this paper is to provide an introduction to the fundamental concepts on data communication and the design, deployment, and management of computer networks.

UNIT- I

Switching: circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and Datagram approach), message switching.

UNIT- II

UNIT- III

UNIT- IV
Transport Layer: Process to Process Delivery: UDP; TCP, congestion control and Quality of service.
Application Layer: Client Server Model, Socket Interface, Domain Name System (DNS): Electronic Mail (SMTP), file transfer (FTP), HTTP and WWW.

Text Books:

Reference Books:
WEB ENGINEERING

Paper Code: ETCS-308
Paper: Web Engineering

L T/P C
3 1 4

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

Objective: This paper gives understanding of web designing to the students.

UNIT – I

History of the Internet, basic internet protocols, World Wide Web (W3C), HTTP: Hypertext Transfer Protocol.
Markup languages: HTML: Introduction to HTML, basics of XHTML, HTML elements, HTML tags, lists, tables, frames, forms, defining XHTML's abstract syntax, defining HTML documents.
CSS style sheets: Introduction, the core syntax, text properties, CSS box model, normal flow box layout, other properties like lists, tables, DHTML, XML, XML documents & vocabulary, XML versions & declarations, Introduction to XML.

UNIT – II

Client Side Programming: JavaScript, basic syntax, variables & data-types, literals, functions, objects, arrays, built-in objects, event-driven programming, Intrinsic event handling, modifying element style, document trees.
Server Side Programming: Java Servlets: Servlet architecture, life cycle, parameter data, sessions, cookies, servlets capabilities, Jakarta, Apache, Tomcat, Cyanix, server-side security tools, Web Application Firewalls (WAFs) and fuzzers.

UNIT – III

Client-side security, Cookies security policy, HTTP security extensions, Engines, extensions, and web apps, Web user tracking.

Server-side security tools, Web Application Firewalls (WAFs) and fuzzers.

UNIT – IV


Text Books:


Reference Books:


GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY

Scheme and Syllabi for B. Tech-IT, 1st year (Common to all branches) w.e.f batch 2014-15 and (2nd, 3rd & 4th years) w.e.f batch 2013-14 approved in the 22nd BOS of USET on 30th June, 2014 and approved in the 37th AC Sub Committee Meeting held on 10th July, 2014.
ARTIFICIAL INTELLIGENCE

Paper Code: ETCS-310
Paper: Artificial Intelligence

L T/P C
3 1 4

Objective: To learn the basics of designing intelligent agents that can solve general purpose problems, represent and process knowledge, plan and act, reason under uncertainty and can learn from experiences.

UNIT-I
Introduction: Introduction to Intelligent Agents.

UNIT-II
Logical Reasoning: Logical agents, propositional logic, inferences, first-order logic, inferences in first order logic, forward chaining, backward chaining, unification, resolution.

UNIT-III
Game Playing: Scope of AI - Games, theorem proving, natural language processing, vision and speech processing, robotics, expert systems, AI techniques - search knowledge, abstraction.

UNIT-IV
Learning from Observations: Inductive learning, learning decision trees, computational learning theory, explanation based learning.
Applications: Environmental Science, Space, Medical Sciences etc.

Text Book:

Reference Books:
[R1] KM Fu, "Neural Networks in Computer Intelligence", Tata McGraw Hill

INSTRUCTIONS TO PAPER SETTERS:
MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.
Objective: The objective of the paper is to facilitate the student with the knowledge of microprocessor systems and microcontroller.

UNIT-I
[T1][No. of hrs. 10]

UNIT-II
8086 Microprocessor: 8086 Architecture, difference between 8085 and 8086 architecture, generation of physical address, PIN diagram of 8086, Minimum Mode and Maximum mode, Bus cycle, Memory Organization, Memory Interfacing, Addressing Modes, Assembler Directives, Instruction set of 8086, Assembly Language Programming, Interfacing and Software Interrupts.
[T2][No. of hrs. :12]

UNIT-III
Interfacing of 8086 with 8255, 8254/8253, 8251, 8259: Introduction, Generation of I/O Ports, Programmable Peripheral Interface (PPI)-Intel 8255, Sample-and-Hold Circuit and Multiplexer, Keyboard and Display Interface, Keyboard and Display Controller (8279), Programmable Interval timers (Intel 8253/8254), USART (8251), PIC (8259), DAC, ADC, LCD, Stepper Motor.
[T3][No. of hrs. :12]

UNIT-IV
Overview of Microcontroller 8051: Introduction, Architecture, Memory organization, Special function registers, Port Operation, Memory Interfacing, I/O Interfacing, Programming 8051 resources, interrupts, Programmer’s model of 8051, Operands, addressing, Data transfer instructions, Arithmetic instructions, Logic instructions, Control transfer instructions, Timer & Counter Programming, Interrupt Programming.
[T4][No. of hrs. 11]

Text Books:
T3 Ramesh Gaonkar, “Microprocessor Architecture, Programming and Applications with the 8085”, PHI

References Books:
OPERATING SYSTEMS (LINUX PROGRAMMING AND ADMINISTRATION) LAB

Paper Code: ETCS-352
Paper: Operating Systems (Linux Programming and Administration) Lab

List of Experiments:

1. Write a program to implement CPU scheduling for first come first serve.
2. Write a program to implement CPU scheduling for shortest job first.
3. Write a program to perform priority scheduling.
4. Write a program to implement CPU scheduling for Round Robin.
5. Write a program for page replacement policy using a) LRU b) FIFO c) Optimal.
6. Write a program to implement first fit, best fit and worst fit algorithm for memory management.
7. Write a program to implement reader/writer problem using semaphore.
8. Write a program to implement philosopher’s algorithm for deadlock avoidance.

NOTE: At least 8 Experiments out of the list must be done in the semester.
DATA COMMUNICATION & NETWORKS LAB

Paper Code: ETEC-358

Paper: Data Communication & Networks Lab

List of Experiments:

1. PC to PC Communication
2. Parallel Communication using 8 bit parallel cable & Serial communication using RS 232C
3. Ethernet LAN protocol
4. To create scenario and study the performance of CSMA/CD protocol through Simulation
5. To create scenario and study the performance of token bus and token ring protocols through simulation
6. To create scenario and study the performance of network with CSMA/CD protocol and compare
7. CSMA/CD protocols
8. Implementation and study of stop and wait protocol
9. Implementation and study of Go back-N and selective repeat protocols
10. Implementation of distance vector routing algorithm
11. Implementation of link state routing algorithm

*All Practical can be conducted using C-Language and LAN Emulator.

NOTE:- At least 8 Experiments out of the list must be done in the semester.
Web Engineering Lab experiment based on syllabus of (ETCS-308).

NOTE:- At least 8 Experiments from the syllabus must be done in the semester.
List of Experiments:

1. Write a program to add and subtract two 16-bit numbers with/without carry using 8086.
2. Write a program to multiply two 8 bit numbers by repetitive addition method using 8086.
3. Write a Program to generate Fibonacci series.
4. Write a Program to generate Factorial of a number.
5. Write a Program to read 16 bit Data from a port and display the same in another port.
6. Write a Program to generate a square wave using 8254.
7. Write a Program to generate a square wave of 10 kHz using Timer 1 in mode 1 (using 8051).
8. Write a Program to transfer data from external ROM to internal (using 8051).
9. Design a Minor project using 8086 Microprocessor (Ex: Traffic light controller, temperature controller, etc).
10. Design a Minor project using 8051 Microcontroller.

NOTE: - At least 8 Experiments out of the list must be done in the semester.