SCHEME OF EXAMINATION

and

SYLLABI

for

Bachelor of Technology
Information Technology

Offered by
University School of Engineering and Technology

1st SEMESTER TO 8th SEMESTER

Guru Gobind Singh Indraprastha University
Dwarka, Delhi – 110078 [INDIA]

www.ipu.ac.in
### BACHELOR OF TECHNOLOGY
(COMMON TO ALL BRANCHES)
FIRST SEMESTER EXAMINATION

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M: Mandatory for award of degree
#NUES (Non University Examination System)

*#NCC/NSS can be completed in any one semester from Semester 1 – Semester 4. It will be evaluated internally by the respective institute. The credit for this will be given after fourth Semester for the students enrolled from the session 2014-15 onwards. The camps/classes will be held either during Weekends/Holidays or Winter/Summer Vacations.
BACHELOR OF TECHNOLOGY  
(COMMON TO ALL BRANCHES)  
SECOND SEMESTER EXAMINATION

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TOTAL 17 15 27

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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.
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M: Mandatory for award of degree

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#NUES(Non University Examination System)
### BACHELOR OF TECHNOLOGY
(Information Technology)
FOURTH SEMESTER EXAMINATION

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**THEORY PAPERS**

**PRACTICAL/VIVA VOCE**

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**TOTAL** 18 15 29

M: Mandatory for award of degree

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NOTE: 4 weeks Industrial / In-house Workshop will be held after fourth semester. However, Viva-Voce will be conducted in the fifth semester.

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

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**PRACTICAL/VIVA VOCE**

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

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<td>ETEC 310</td>
<td></td>
<td>Data Communication and Networks</td>
<td>3</td>
<td>1</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>
<td>1</td>
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<tr>
<td>ETEE-310</td>
<td></td>
<td>Microprocessor and Microcontroller</td>
<td>3</td>
<td>1</td>
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</table>

**THEORY PAPERS**

**PRACTICAL/VIVA VOCE**

<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>
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<tbody>
<tr>
<td>ETCS 352</td>
<td></td>
<td>Operating Systems (Linux Programming and Administration) Lab</td>
<td>0</td>
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<td>ETEC 358</td>
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<td>Web Engineering Lab</td>
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**TOTAL**

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</table>

**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 (ETIT 461).

**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 end of 6th semester.
BACHELOR OF TECHNOLOGY  
(INFORMATION TECHNOLOGY)  
SEVENTH SEMESTER EXAMINATION  

<table>
<thead>
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<th>Code No.</th>
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<th>Credits</th>
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<tbody>
<tr>
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<td>Advanced Computer Networks</td>
<td>3</td>
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<tr>
<td>ETIT-403</td>
<td></td>
<td>Cryptography and Network Security</td>
<td>3</td>
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<td>3</td>
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<td>ETEC-405</td>
<td></td>
<td>Wireless Communication</td>
<td>3</td>
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**ELECTIVE (SELECT ANY TWO, ONE FROM EACH GROUP)**

**GROUP-A**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper ID</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ETEC-401</td>
<td></td>
<td>Embedded Systems</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-403</td>
<td></td>
<td>Optoelectronics and Optical Communication</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-407</td>
<td></td>
<td>Cloud Computing</td>
<td>3</td>
<td>0</td>
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</tr>
<tr>
<td>ETIT-409</td>
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<td>Distributed Databases</td>
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<tr>
<td>ETIT-411</td>
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<td>Semantic Web Technologies</td>
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<td>ETIT-413</td>
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<td>Software Testing</td>
<td>3</td>
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<tr>
<td>ETIT-415</td>
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<td>Digital Signal Processing</td>
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**GROUP-B**

<table>
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<tr>
<th>Code No.</th>
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<tbody>
<tr>
<td>ETIT-419</td>
<td></td>
<td>.NET and C# Programming</td>
<td>3</td>
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<tr>
<td>ETIT-421</td>
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<td>Enterprise Computing in Java</td>
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<td>ETIT-423</td>
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<td>System and Network Administration</td>
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<td>ETIT-425</td>
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<td>Grid Computing</td>
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<td>Probabilistic Graphical Models</td>
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<td>ETHS-419</td>
<td></td>
<td>Sociology and Elements of Indian History for Engineers</td>
<td>3</td>
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**PRACTICAL/VIVA VOCE**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper ID</th>
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<th>L</th>
<th>T/P</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ETIT-453</td>
<td></td>
<td>Advanced Computer Networks Lab</td>
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<td>2</td>
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<tr>
<td>ETIT-455</td>
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<td>Cryptography and Network Security Lab</td>
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<tr>
<td>ETEC-463</td>
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<td>Wireless Communication Lab</td>
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<td>Lab based on Elective Group—A or B</td>
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**TOTAL**  
15 15 24

**Imp:** Elective Paper will be floated if one-third of the total students opt for the same. It is advised that the decision about the elective subject for 8th Semester is done before 15th November every year before end of seventh semester. New Electives may be added as per requirement after getting it duly approved by BOS and AC respectively.

+ The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format, thereafter he/she will have to present the progress of the work through seminars and progress reports.

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)  
EIGHTH SEMESTER EXAMINATION

<table>
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<tr>
<th>Code No.</th>
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<th>Credits</th>
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<td></td>
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<td>THEORY PAPERS</td>
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<td>ETIT 402</td>
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<td>Mobile Computing</td>
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<td>ETEC 406</td>
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<td>Ad hoc and Sensor Networks</td>
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<td>ETHS 402</td>
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<td>Human Values and Professional Ethics-II</td>
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<td></td>
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<td>GROUP A</td>
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<tr>
<td>ETIT-406</td>
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<td>Big Data Analytics</td>
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<td>Soft Computing</td>
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<td>Web Application development using .NET</td>
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<td>VLSI Design</td>
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<td>Information Theory and Coding</td>
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<td>Human Computer Interaction</td>
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<td>Selected Topics of Recent Trends in Information Technology</td>
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<tr>
<td>ETIT 452</td>
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*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format, thereafter he/she will have to present the progress of the work through seminars and progress reports. Seminar related to major project should be delivered one month after starting of Semester. The progress will be monitored through seminars and progress reports.

**Syllabus may be revised after 2 years.

NOTE:
1. The total number of the credits of the B.Tech. (IT) Programme = 215.
2. Student shall be required to appear in examinations of all courses. However, to award the degree a student shall be required to earn a minimum of 200 credits including mandatory papers (M).

FOR LATERAL ENTRY STUDENTS:
1. The total number of the credits of the B.Tech. (IT) Programme = 161.
2. Each student shall be required to appear for examinations in all courses Third Semester onwards. However, for the award of the degree a student shall be required to earn a minimum of 150 credits, including mandatory papers (M).
NOMENCLATURE OF CODES GIVEN IN THE SCHEME OF

B.TECH AND M.TECH

1. ET stands for Engineering and Technology.
2. PE stands for Power Engineering.
3. ME stands for Mechanical Engineering.
4. MT stands for Mechatronics.
5. AT stands for Mechanical and Automation Engineering.
6. EE stands for Electrical and Electronics Engineering.
7. EL stands for Electrical Engineering.
8. IT stands for Information Technology
9. CS stands for Computer Science and Engineering
10. CE stands for Civil Engineering
11. EC stands for Electronics and Communications Engineering.
12. EN stands for Environmental Engineering
13. TE stands for Tool Engineering
14. MA stands for Mathematics
15. HS stands for Humanities and Social Sciences
16. SS stands for Social Services
APPLIED MATHEMATICS-III

Paper Code: ETMA-201
Paper: Applied Mathematics-III

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 12.5 marks.

UNIT-I
Fourier series: Definition, Euler’s formula, conditions for Fourier expansion, functions having points of discontinuity, change of intervals, even and odd functions, half range series, Harmonic analysis. Fourier Transforms: Definition, Fourier integral, Fourier transform, inverse Fourier transform, Fourier sine and cosine transforms, properties of Fourier transforms (linearity, scaling, shifting, modulation). Application to partial differential equations.

UNIT-II
Difference equation: Definition, formation, solution of linear difference equation with constant coefficients, simultaneous difference equations with constant coefficients, applications of difference equations. Z-transform: Definition, Z-transform of basic functions, properties of Z-transform (linearity, damping, shifting, multiplication), initial value theorem, final value theorem, convolution theorem, convergence of Z-transform, inverse of Z-transform, Application to difference equations.

UNIT-III

UNIT-IV

Text Books:

Reference Books:
[R5] Schaum’s Outline on Fourier Analysis with Applications to Boundary Value Problem, Tata McGraw-Hill
FOUNDATION OF COMPUTER SCIENCE

Paper Code: ETCS-203
Paper: Foundation of Computer Science

INSTRUCTIONS TO PAPER SETTERS:

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, the rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, the student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Objective: To give basic knowledge of combinatorial problems, algebraic structures and graph theory.

UNIT- I

UNIT- II
Overview of Sets and set operations, permutation and combination, principle of inclusion, exclusion (with proof) and pigeonhole principle (with proof), Relation, operation and representation of a relation, equivalence relation, POSET, Hasse Diagrams, extremal Elements, Lattices, composition of function, inverse, binary and n-ary operations.

UNIT- III
Principle of mathematical induction, principle of complete induction, solution methods for linear and non-linear first-order recurrence relations with constant coefficients, Graph Theory: Terminology, isomorphic graphs, Euler’s formula (proof), chromatic number of a graph, five color theorem (with proof), Euler & Hamiltonian paths.

UNIT-IV
Groups, Symmetry, subgroups, normal subgroups, cyclic group, permutation group and cayles’s theorem (without proof), cosets Lagrange’s theorem (with proof) homomorphism, isomorphism, automorphism, rings, Boolean function, Boolean expression, representation & minimization of Boolean function.

Text Books:

Reference Books:
SWITCHING THEORY AND LOGIC DESIGN

Paper Code: ETEC-205
Paper: Switching Theory and Logic Design

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 Logic Systems and Circuits, thereby enabling the student to obtain the platform for studying Digital Systems and Computer Architecture.

UNIT- I
Number Systems and Codes: Decimal, Binary, Octal and Hexadecimal number systems. Codes- BCD, Gray Code, Excess-3 Code, ASCII, EBCDIC. Conversion between various Codes.
Switching Theory: Boolean Algebra- Postulates and Theorems, De’ Morgan’s Theorem, Switching Functions- Canonical Forms- Simplification of Switching Functions- Karnaugh Map and Quine Mc-Clusky Methods.

UNIT- II
Integrated circuits: TTL and CMOS logic families and their characteristics. Brief introduction to RAM and ROM.
Sequential Logic Circuits: Latches and Flip Flops- SR, D, T and MS-JK Flip Flops, Asynchronous Inputs.
Counters and Shift Registers: Design of Synchronous and Asynchronous Counters- Binary, BCD, Decade and Up/Down Counters, Shift Registers, Types of Shift Registers, Counters using Shift Registers- Ring Counter and Johnson Counter.

UNIT- III
Finite state machine- capabilities and limitations, Mealy and Moore models-minimization of completely specified and incompletely specified sequential machines, Partition techniques and merger chart methods-concept of minimal cover table.

UNIT- IV
Algorithmic State Machine: Representation of sequential circuits using ASM charts-synthesis of output and next state functions, Data path control path partition-based design.
Fault Detection and Location: Fault models for combinational and sequential circuits, Fault detection in combinational circuits; Homing experiments, distinguishing experiments, machine identification and fault detection experiments in sequential circuits.

Text Book:

Reference Books:
CIRCUITS & SYSTEMS

INSTRUCTIONS TO PAPER SETTERS:

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 Q. 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 12.5 marks.

Objective: The purpose of this course is for each student to learn and further explore the techniques of advanced circuit analysis. The concepts and analytical techniques gained in this course (e.g., signals, Laplace transformation, frequency response) will enable students to build an essential foundation of many fields within electrical engineering, such as control theory, analog electronic circuits, signal processing.

UNIT-I
Introduction to signals, their classification and properties, different types of systems, LTI systems and their properties, periodic waveforms and signal synthesis, properties and applications of Laplace transform of complex waveform.

UNIT-II

UNIT-III

UNIT IV
Positive real function and synthesis of LC, RC, RL Networks in Foster’s I and II, Cauer’s I& II forms, Introduction of passive filter and their classification, frequency response, characteristic impedance of low pass, high pass, Band Pass and Band reject prototype section.

Text Books:

Reference Books
DATA STRUCTURES

<table>
<thead>
<tr>
<th>Paper Code: ETCS-209</th>
<th>L</th>
<th>T/P</th>
<th>C</th>
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<tbody>
<tr>
<td>Paper: Data Structures</td>
<td>3</td>
<td>1</td>
<td>4</td>
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**INSTRUCTIONS TO PAPER SETTERS:**

<table>
<thead>
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<th>Maximum Marks : 75</th>
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<tr>
<td>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.</td>
</tr>
<tr>
<td>2. Apart from Question No. 1, the rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, the student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.</td>
</tr>
</tbody>
</table>

Objective: To understand the programming and the various techniques for enhancing the programming skills for solving and getting efficient results.

**UNIT – I:**

Introduction to programming methodologies and design of algorithms. Abstract Data Type, array, array organization, sparse array. Stacks and Stack ADT, Stack Manipulation, Prefix, infix and postfix expressions, their interconversion and expression evaluation. Queues and Queue ADT, Queue manipulation. General Lists and List ADT, List manipulations, Single, double and circular lists. 

(T1,T2) [No. of hrs. 12]

**UNIT – II:**

Trees, Properties of Trees, Binary trees, Binary Tree traversal, Tree manipulation algorithms, Expression trees and their usage, binary search trees, AVL Trees, Heaps and their implementation.

(T1,T2) [No. of hrs. 12]

**UNIT – III:**

Multiway trees, B-Trees, 2-3 trees, 2-3-4 trees, B+ and B+ Trees, Graphs, Graph representation, Graph traversal.

(T1,T2) [No. of hrs. 12]

**UNIT – IV:**

Sorting concept, order, stability, Selection sorts (straight, heap), insertion sort (Straight Insertion, Shell sort), Exchange Sort (Bubble, quicksort), Merge sort (only 2-way merge sort). Searching – List search, sequential search, binary search, hashing concepts, hashing methods (Direct, subtraction, modulo-division, midsquare, folding, pseudorandom hashing), collision resolution (by open addressing: linear probe, quadratic probe, pseudorandom collision resolution, linked list collision resolution), Bucket hashing.

(T1,T2) [No. of hrs. 12]

**Text Books:**


**Reference Books:**


[R2] Tanenbaum; “Data Structures using C”, Pearson/PHI.


COMPUTER GRAPHICS & MULTIMEDIA

Paper Code: ETCS-211
Paper: Computer Graphics & Multimedia

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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, the rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, the student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Objective: To understand various aspects of media and to learn the concept of sound, images and videos.

UNIT- I

UNIT- II
Clipping Algorithms, Sutherland-Cohen line Clipping Algorithm Bezier Curves, B-Spline Curves. Parallel Projection, Perspective Projection, Illumination Model for diffused Reflection, Ambient light, Specular Reflection Model, Reflection Vector.

UNIT- III

UNIT- IV
Data Compression: storage space, coding requirements, Basic compression techniques: run length code, Huffman code, Lempel-Ziv JPEG: Image preparation, Lossy sequential DCT, expanded lossy DCT, Lossless mode, Hierarchical mode. MPEG, Media synchronization, Media Integration, Production Standards.

Text Books:

Reference Books:

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.
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Text Books:

Reference Books:
SWITCHING THEORY AND LOGIC DESIGN LAB

Paper Code: ETEC-253
Paper: Switching Theory and Logic Design Lab

L T/P C

0 2 1

List of Experiments:

1. Realize all gates using NAND & NOR gates
2. Realize Half Adder, Full Adder, Half subtracter, Full subtracter
3. Realize a BCD adder
4. Realize a Serial Adder
5. Realize a four bit ALU
6. Realize Masters/Save J K Flip-Flop, using NAND/NOR gates
7. Realize Universal Shift Register
8. Realize Self-Starting, Self Correcting Ring Counter
9. Realize Multiplexer and De-Multiplexer
10. Realize Carry Look ahead Adder / Priority Encoder
11. Simulation of PAL and PLA
12. Simulation Mealy and Moore State machines

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

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 22th BOS of USSET on 30th June, 2014 and approved in the 37th AC Sub Committee Meeting held on 10th July, 2014.
CIRCUITS AND SYSTEMS LAB

Paper Code: ETEE-257       L  T  C
Paper: Circuits and Systems Lab                      0  2  1

List of Experiments

1. Study the transient response of series RLC circuit for different types of waveforms on CRO and verify using MATLAB.
2. Study the time response of a simulated linear system and verify the unit step and square wave response of first order and second order, type 0,1 system.
3. Using MATLAB determine current in various resistors connected in network using mesh current and node voltage analysis.
4. To determine Z and Y parameters of the given two port network.
5. To determine ABCD parameters of the given two port network.
6. To verify Reciprocity Theorem for the given two port network.
7. To determine Hybrid parameters of the given two port network.
8. To design Cascade Connection and determine ABCD parameters of the given two port network.
9. To design Series-Series Connection and determine Z parameters of the given two port network.
10. To design Parallel-Parallel Connection and determine Y parameters of the given two port network.
11. To design Series-Parallel Connection and determine h parameters of the given two port network.
12. Study the frequency response of different filter circuits.

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

Paper Code: ETCS-255
Paper: Data Structures Lab

List of Experiments:

1. Perform Linear Search and Binary Search on an array.
   Description of programs:
   
   a. Read an array of type integer.
   b. Input element from user for searching.
   c. Search the element by passing the array to a function and then returning the position of the element from the function else return -1 if the element is not found.
   d. Display the position where the element has been found.

2. Implement sparse matrix using array.
   Description of program:
   
   a. Read a 2D array from the user.
   b. Store it in the sparse matrix form, use array of structures.
   c. Print the final array.

3. Create a linked list with nodes having information about a student and perform
   I. Insert a new node at specified position.
   II. Delete of a node with the roll number of student specified.
   III. Reversal of that linked list.

4. Create doubly linked list with nodes having information about an employee and perform Insertion at front of doubly linked list and perform deletion at end of that doubly linked list.

5. Create circular linked list having information about a college and perform Insertion at front perform Deletion at end.

6. Create a stack and perform Pop, Push, Traverse operations on the stack using Linear Linked list.

7. Create a Linear Queue using Linked List and implement different operations such as Insert, Delete, and Display the queue elements.

8. Create a Binary Tree (Display using Graphics) perform Tree traversals (Preorder, Postorder, Inorder) using the concept of recursion.

9. Implement insertion, deletion and display (inorder, preorder and postorder) on binary search tree with the information in the tree about the details of a automobile (type, company, year of make).

10. To implement Insertion sort, Merge sort, Quick sort, Bubble sort, Bucket sort, Radix sort, Shell sort, Selection sort, Heap sort and Exchange sort using array as a data structure.

NOTE:- At least 8 Experiments out of the list must be done in the semester.
COMPUTER GRAPHICS & MULTIMEDIA LAB

Paper Code: ETCS-257
Paper: Computer Graphics & Multimedia Lab

List of Experiments:

2. Implementation of Line drawing algorithms: DDA Algorithm, Bresenham's Algorithm.
3. Implementation of Circle drawing algorithms: Bresenham's Algorithm, Mid Point Algorithm.
4. Programs on 2D and 3D transformations.
5. Write a program to implement cohen Sutherland line clipping algorithm.
6. Write a program to draw Bezier curve.
7. Using Flash/Maya perform different operations (rotation, scaling move etc..) on objects.
8. Create a Bouncing Ball using Key frame animation and Path animation.

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

Paper Code: ETMA-202

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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

MAXIMUM MARKS: 75

Objectives: The objective of this course is to teach the students about the difference equation, probability, curve fitting etc. and other numerical methods to solve various engineering problems.

UNIT – I
Partial Differential Equation: linear partial differential equations with constant coefficient, homogeneous and non homogeneous linear equations. Method of separation of variables. Laplace equation, wave equation and heat flow equation in Cartesian coordinates only with initial and boundary value.

UNIT II
Probability Theory: Definition, addition law of probability, multiplication law of probability, conditional probability, Baye’s theorem, Random variable: discrete probability distribution, continuous probability distribution, expectation, moments, moment generating function, skewness, kurtosis, binomial distribution, Poisson distribution, normal distribution.

UNIT-III
Curve Fitting: Principle of least square Method of least square and curve fitting for linear and parabolic curve, Correlation Coefficient, Rank correlation, line of regressions and properties of regression coefficients. Sampling distribution: Testing of hypothesis, level of significance, sampling distribution of mean and variance, Chi-square distribution, Student’s T- distribution, F- distribution, Fisher’s Z- distribution.

UNIT IV

Text Books:

References Books:
[R2] Miller and Freund, “Probability and statistics for Engineers”, PHI
COMPUTER ORGANIZATION & ARCHITECTURE

Paper Code: ETCS-204

Paper: Computer Organization & Architecture

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: To understand the architecture and organization of computer in depth.

UNIT- I
Computer Arithmetic and Register transfer language:
Unsigned notation, signed notation, binary coded decimal, floating point numbers, IEEE 754 floating point standard, Micro-operation, Bus and Memory Transfers, Bus Architecture, Bus Arbitration, Arithmetic Logic, Shift Micro operation, Arithmetic Logic Shift Unit.

UNIT- II
Instruction set architecture & computer organization:
Levels of programming languages, assembly language instructions, 8085 instruction set architecture, Instruction Codes, Computer Registers, Computer Instructions, Timing & Control, Instruction Cycle, Memory Reference Instructions, Input-Output and Interrupts

UNIT- III
Control Design:
Instruction sequencing & interpretation, Hardwired & Micro Programmed (Control Unit), Microprogrammed computers, Microcoded CPU: Pentium processor. Specifying a CPU, Design & implementation of simple CPU, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Internal architecture of 8085 microprocessor.

UNIT- IV
Memory & Input/Output organization:
Memory Technology, Main Memory (RAM and ROM Chips), Virtual memory, High-speed memories
Asynchronous Data Transfers, Programmed I/O, interrupts, Direct memory Access, Serial communication, UARTs, RS-232-C & RS-422 standard

Text Books:

Reference Books:
THEORY OF COMPUTATION

Paper Code: ETCS-206        L  T/P  C
Paper: Theory of Computation  3  1  4

INSTRUCTIONS TO PAPER SETTERS:  MAXIMUM MARKS: 75
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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 understand fundamental requirements for building algorithms of any language.

UNIT- I
Overview: Alphabets, Strings & Languages, Chomsky Classification of Languages, Finite Automata, Deterministic finite Automata (DFA) & Nondeterministic finite Automata (N DFA), Equivalence of N DFA and DFA, Minimization of Finite Automata, Moore and Mealy machine and their equivalence, Regular expression and Kleen’s Theorem(with proof), Closure properties of Regular Languages, Pumping Lemma for regular Languages(with proof).

UNIT- II
Context free grammar, Derivation trees, Ambiguity in grammar and its removal, Simplification of Context Free grammar, Normal forms for CFGs: Chomsky Normal Form & Greibach Normal Form, Pumping Lemma for Context Free languages, Closure properties of CFL(proof required), Push Down Automata (PDA), Deterministic PDA, Non Deterministic PDA ,Equivalence of PDA and CFG, Overview of LEX and YACC.

UNIT- III
Turing machines, Turing Church’s Thesis, Variants and equivalence of Turing Machine, Recursive and recursively enumerable languages, Halting problem, Undecidability, Examples of Undecidable problem.

UNIT- IV
Introduction to Complexity classes, Computability and Intractability, time complexity, P, NP, Co-NP, Proof of Cook’s Theorem, Space Complexity, SPACE, PSPACE, Proof of Savitch’s Theorem, L ,NL ,Co-NL complexity classes.

Text Books:

References Books:
### DATABASE MANAGEMENT SYSTEMS

**Paper Code:** ETCS-208  
**Paper:** Database Management Systems  
**L** 3  
**T/P** 1  
**C** 4

#### INSTRUCTIONS TO PAPER SETTERS:

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**Objective:** The concepts related to database, database techniques, SQL and database operations are introduced in this subject. This creates strong foundation for application data design.

#### UNIT-I: Introductory Concepts of DBMS:

#### UNIT-II: Relational Model:

#### UNIT-III:
- Functional Dependencies, Non-loss Decomposition, First, Second, Third Normal Forms, Dependency Preservation, Boyce/Codd Normal Form, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

#### UNIT-IV:
- Transaction Management: ACID properties, serializability of Transaction, Testing for Serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, Database recovery management.

#### Implementation Techniques:
- Overview of Physical Storage Media, File Organization, Indexing and Hashing, B+ tree Index Files, Query Processing Overview, Catalog Information for Cost Estimation, Selection Operation, Sorting, Join Operation, Materialized views, Database Tuning.

#### Text Books:

#### References Books:
OBJECT ORIENTED PROGRAMMING

Paper Code: ETCS-210
Paper: Object Oriented Programming

INSTRUCTIONS TO PAPER SETTERS:

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 to enhance programming skills.

UNIT – I:
Objects, relating to other paradigms (functional, data decomposition), basic terms and ideas (abstraction, encapsulation, inheritance, polymorphism). Review of C, difference between C and C++, cin, cout, new, delete operators.

UNIT – II:
Encapsulation, information hiding, abstract data types, object & classes, attributes, methods. C++ class declaration, state identity and behavior of an object, constructors and destructors, instantiation of objects, default parameter value, object types, C++ garbage collection, dynamic memory allocation, metaclass/abstract classes.

UNIT – III:
Inheritance, Class hierarchy, derivation – public, private & protected; aggregation, composition vs classification hierarchies, polymorphism, categorization of polymorphic techniques, method polymorphism, polymorphism by parameter, operator overloading, parametric polymorphism, generic function – template function, function name overloading, overriding inheritance methods, run time polymorphism.

UNIT – IV:
Standard C++ classes, using multiple inheritance, persistant objects, streams and files, namespaces, exception handling, generic classes, standard template library, Library organization and containers, standard containers, algorithm and Function objects, iterators and allocators, strings, streams, manipulators, user defined manipulators, vectors, valarray, slice, generalized numeric algorithm.

Text Books:

Reference Books:
CONTROL SYSTEMS

Paper Code: ETEE- 212        L    T/P    C
Paper: Control Systems    3    1    4

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 75
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Objective: To teach the fundamental concepts of Control systems and mathematical modeling of the system. To study the concept of time response and frequency response of the system. To teach the basics of stability analysis of the system

UNIT I : Control Systems -- Basics & Components

UNIT II : Time – Domain Analysis
Time domain performance specifications, transient response of first & second order systems, steady state errors and static error constants in unity feedback control systems, response with P, PI and PID controllers, limitations of time domain analysis.

UNIT III : Frequency Domain Analysis
Polar and inverse polar plots, frequency domain specifications and performance of LTI systems, Logarithmic plots (Bode plots), gain and phase margins, relative stability. Correlation with time domain performance closes loop frequency responses from open loop response. Limitations of frequency domain analysis, minimum/non-minimum phase systems.

UNIT IV : Stability & Compensation Techniques

Text Books:

Reference Books:
APPLIED MATHEMATICS LAB

Paper Code: ETMA-252  L  T/P  C
Paper: Applied Mathematics Lab

List of Experiments:-

1. Solution of algebraic and transcendental equation.
2. Algebra of matrices: Addition, multiplication, transpose etc.
3. Inverse of a system of linear equations using Gauss-Jordan method.
7. Calculation of eigen values and eigen vectors of a matrix.
8. Plotting of Unit step function and square wave function.

It is expected that at least 12 experiments be performed, including the above specified 8 experiments which are compulsory. The remaining experiments may be developed by faculty and students based on applications of Mathematics in Real Life problem.

Text Books:

Reference Books:
4. Byrom Gottfried, “Programming With C” Shaum’s Outline

NOTE:- At least 8 Experiments out of the list must be done in the semester.
### COMPUTER ORGANIZATION & ARCHITECTURE LAB

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Experimental work based upon the course Computer Organization & Architecture (ETCS-204).

**NOTE:** At least 8 Experiments from the syllabus must be done in the semester.
DATABASE MANAGEMENT SYSTEMS LAB

Paper Code: ETCS-256
Paper: Database Management Systems Lab

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LAB BASED ON DBMS

Lab includes implementation of DDL, DCL, DML i.e SQL in Oracle.

List of Experiments:

1. Design a Database and create required tables. For e.g. Bank, College Database
2. Apply the constraints like Primary Key, Foreign key, NOT NULL to the tables.
3. Write a SQL statement for implementing ALTER, UPDATE and DELETE
4. Write the queries to implement the joins
5. Write the queries for implementing the following functions: MAX (), MIN (), AVG (), COUNT ()
6. Write the queries to implement the concept of Integrity constraints
7. Write the queries to create the views
8. Perform the queries for triggers
9. Perform the following operation for demonstrating the insertion, updation and deletion using the referential integrity constraints

TEXT BOOK:

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

Paper Code: ETCS-258
Paper: Object Oriented Programming Lab
L T/P C

List of Experiment:

1. Write a program for multiplication of two matrices using OOP.
2. Write a program to perform addition of two complex numbers using constructor overloading.
   The first constructor which takes no argument is used to create objects which are not
   initialized, second which takes one argument is used to initialize real and imag parts to equal
   values and third which takes two argument is used to initialized real and imag to two different
   values.
3. Write a program to find the greatest of two given numbers in two different classes using friend
   function.
4. Implement a class string containing the following functions:
   - Overload + operator to carry out the concatenation of strings.
   - Overload = operator to carry out string copy.
   - Overload <= operator to carry out the comparison of strings.
   - Function to display the length of a string.
   - Function tolower( ) to convert upper case letters to lower case.
   - Function toupper( ) to convert lower case letters to upper case.
5. Create a class called LIST with two pure virtual function store() and retrieve(). To store a value
   call store and to retrieve call retrieve function. Derive two classes stack and queue from it and
   override store and retrieve.
6. Write a program to define the function template for calculating the square of given numbers
   with different data types.
7. Write a program to demonstrate the use of special functions, constructor and destructor in the
   class template. The program is used to find the bigger of two entered numbers.
8. Write a program to perform the deletion of white spaces such as horizontal tab, vertical tab,
   space ,line feed ,new line and carriage return from a text file and store the contents of the file
   without the white spaces on another file.
9. Write a program to read the class object of student info such as name , age ,sex ,height and
   weight from the keyboard and to store them on a specified file using read() and write() functions. Again the same file is opened for reading and displaying the contents of the file on
   the screen.
10. Write a program to raise an exception if any attempt is made to refer to an element whose
    index is beyond the array size.

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

Paper Code: ETEE-260        L T/P C
Paper: Control Systems Lab

List of Experiments:

1. Comparison of open loop & closed loop control in speed control of D.C. motor & to find the transfer function.
2. To study the characteristics of positional error detector by angular displacement of two servo potentiometers
   a. excited with dc
   b. excited with ac
3. To study synchro transmitter in terms of position v/s phase and voltage magnitude with respect to rotor voltage magnitude/phase.
4. To study remote position indicator systems using synchro transmitter/receiver.
5. To plot speed-torque curves for ac servomotor for different voltages.
6. To study ac motor position control system & to plot the dynamic response & calculate peak time, settling time, peak overshoot, damping frequency, steady state error etc.
7. To study the time response of simulated linear systems.
8. To study the performance of PID Controller.
9. Plot impulse response, unit step response, unit ramp response of any 2nd order transfer function on same graph using MATLAB.
10. To draw the magnetization (Volt Amps) characteristics of the saturable core reactor used in the magnetic amplifier circuits.
11. Plot root locus for any 2nd order system (with complex poles). For Mp=30%, find the value of K using MATLAB.
12. To design lead-lag compensator for the given process using Bode plots in MATLAB.

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

Paper Code: ETCS-301  
Paper: Algorithms Design and Analysis  

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INSTRUCTIONS TO PAPER SETTERS:  
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Objective: The objective of this paper is to teach the students various problem solving strategies like divide and conquer, Greedy method, Dynamic programming and also the mathematical background for various algorithms. After doing this course, students will be able to select an appropriate problem solving strategies for real world problems. This will also help them to calculate the time, complexity and space complexity of various algorithms.

UNIT – I
Asymptotic notations for time and space complexity, Big-Oh notation, Θ notation, Ω notation, the little-oh notation, the little-omega notation, Recurrence relations: iteration method, recursion tree method, substitution method, master method (with proof), subtract and conquer master method(with proof), Data Structures for Disjoint Sets, Medians and Order statistics. Complexity analysis, Insertion sort, Merge Sort, Quick sort. Strassen’s algorithm for Matrix Multiplications.

UNIT – II

UNIT – III

UNIT – IV

NP-Complete Problem: Polynomial-time verification, NP-Completeness and Reducibility, NP-Completeness Proof, NP –hard ,Case study of NP-Complete problems (vertex cover problem, clique problem).

Text Books:

Reference Books:
[R1] Sara Basse, “introduction to Design & analysis”, Pearson

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.
SOFTWARE ENGINEERING

Paper Code: ETCS-303

Paper: Software Engineering

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INSTRUCTIONS TO PAPER SETTERS:

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Objective: To improvise the concept to build any software.

UNIT – I
Introduction:
Software Crisis, Software Processes, Software life cycle models: Waterfall, Prototype, Evolutionary and Spiral models, Overview of Quality Standards like ISO 9001, SEI-CMM.
Software Metrics:
Size Metrics like LOC, Token Count, Function Count, Design Metrics, Data Structure Metrics, Information Flow Metrics.

UNIT – II
Software Project Planning:
Software Requirement Analysis and Specifications:

UNIT – III
Software Design:
Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, User Interface Design.
Software Reliability:
Failure and Faults, Reliability Models: Basic Model, Logarithmic Poisson Model, Calendar time Component, Reliability Allocation.

UNIT – IV
Software Testing:
Software process, Functional testing: Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing: Path testing, Data flow and mutation testing, unit testing, integration and system testing, Debugging, Testing Tools & Standards.
Software Maintenance:

TEXT BOOKS:

Reference:
JAVA PROGRAMMING

Paper Code: ETCS-307        L  T/P  C
Paper: Java Programming  3  1  4

INSTRUCTIONS TO PAPER SETTERS:

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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, inheritance, throw and throws clauses, user defined Exceptions, The String Buffer Class, tokenizers, applets, Life cycle of applet and Security concerns.

UNIT III
Threads: Creating Threads, Thread 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 notify all. AWT Components, Component Class, Container Class, Layout Manager Interface Default Layouts, Insets and Dimensions, BorderLayout, Flow Layout, Grid Layout, Card Layout, Grid Bag Layout, AWT Events, Event Models, Listeners, Class Listener, Adapters, Action Event Methods, Focus Event, Key Event, Mouse Events, Window Event

UNIT IV
Input/Output Stream, Stream Filters, Buffered Streams, Data input and Output Stream, Print Stream, Random Access File, JDBC (Database connectivity with MS-Access, Oracle, MS-SQL Server), Object serialization, Sockets, development of client Server applications, design of multithreaded server. Remote Method invocation, Java Native interfaces, Development of a JNI based application. Collection API Interfaces, Vector, stack, Hashtable classes, enumerations, set, List, Map, Iterators.

Text Books:
[T1] Patrick Naughton and Herbert Schidt, “Java-2 the complete Reference”, TMH
[T2] Sierra & Bates, “Head First Java”, O’reilly

Reference Books:
[R1] E. Balaguruswamy, “Programming with Java”, TMH
**INDUSTRIAL MANAGEMENT**

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<th>Paper Code: ETMS-311</th>
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<tr>
<td>Paper: Industrial Management</td>
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**INSTRUCTIONS TO PAPER SETTERS:**

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 course provides a broad introduction to some aspects of business management and running of business organization.

**UNIT I**

**Industrial Relations**- Definition and main aspects. Industrial disputes and strikes. Collective bargaining.

**Labour Legislation**- Labour management cooperation/worker’s participation in management. Factory legislation: International Labour Organization. [T1,T2][No. of Hrs. 10]

**UNIT II**

**Trade Unionism**- Definition, Origin, Objectives of Trade Unions. Methods of Trade unions. Size and finance of Indian Trade unions-size, frequency distribution, factors responsible for the small size. Finance-sources of income, ways of improving finance. [T1,T2][No. of Hrs. 10]

**UNIT III**

**Work Study**- Method study and time study. Foundations of work study. Main components of method study. Time study standards. Involvement of worker’s unions. Work Sampling. Application of work study to office work. [T1,T2][No. of Hrs. 10]

**UNIT IV**

**Quality Management**- What is Quality? Control Charts. Quality is everybody’s job. Taguchi Philosophy. Service Quality. What is Total Quality Management (TQM)? Roadmap for TQM. Criticism of TQM. Six Sigma. [T1,T2][No. of Hrs. 10]

**Text Books:**


**Reference Books:**


## COMMUNICATION SYSTEMS

**Paper Code:** ETIT-309
**Paper:** Communication Systems

### 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 students with the knowledge of electronic communication there by 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, Marginalized PDF, CDF, WSS wide stationery, strict sense stationery, non stationery signals, UDF, GDF, RDF, Binomial distribution, White process, Poisson process, Wiener process.

(T1, T2) [No. of Hrs. 11]

### 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.

(T1, T2) [No. of Hrs. 11]

### UNIT III


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

(T1, T2) [No. of Hrs. 11]

### UNIT IV


**Advanced Communication Systems:** Introduction to cellular radio telephones. Introduction to satellite Communication.

(T1, T2) [No. of Hrs. 11]

**Text Books:**

**Reference Books:**
COMMUNICATION SKILLS FOR PROFESSIONALS

Paper Code: ETHS-301
Paper: Communication Skills for Professionals

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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 basic 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
Organizational Communication: Meaning, importance and function of communication, Process of communication, Communication Cycle - message, sender, encoding, channel, receiver, decoding, feedback, Characteristics, Media and Types of communication, Formal and informal channels of communication, 7 C’s of communication, Barriers to communication, Ethics of communication (plagiarism, language sensitivity)


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 (posture, gesture, eye contact, facial expressions), Proxemics, Chronemics, Appearance, Symbols.

UNIT III
Letters at the Workplace – letter writing (hard copy and soft copy): request, sales, enquiry, order, complaint. Job Application -- resume and cover letter

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


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

Text Books:


References Books:


ALGORITHMS DESIGN AND ANALYSIS LAB

Paper Code: ETCS 351

Paper: Algorithms Design and Analysis Lab

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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 L T/P C
Paper: Software Engineering Lab 0 2 1

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 function oriented diagram: Data Flow Diagram (DFD) and Structured chart.
4. To perform the user’s view 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. 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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### 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 uppercase 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
L T/P C
0 2 1

List of Experiments:

2. Practical study of amplitude demodulation by linear diode detector
4. Practical study of envelop detector for demodulation of AM signal and observe diagonal peak clipping effect.
5. To generate FM signal using voltage controlled oscillator.
6. To generate a FM Signal using Varactor & reactance modulation.
8. Practical study of Super heterodyne AM receiver and measurement of receiver parameters viz. sensitivity, selectivity & fidelity.
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 in the semester
COMMUNICATION SKILLS FOR PROFESSIONALS LAB

Paper Code: ETHS-351

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 intonation patterns 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; Organizing 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 a microphone. Famous speeches may be played as model speeches for learning the art of public speaking. Some suggested speeches: Barack Obama, John F Kennedy, Nelson Mandela, Mahatma Gandhi, Jawahar Lal Nehru, Atal Bihari Vajpayee, Subhash Chandra Bose, Winston Churchill, Martin Luther King Jr.
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 telephone/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.
COMPILER DESIGN

Paper Code: ETCS-302
Paper: Compiler Design

**INSTRUCTIONS TO PAPER SETTERS:**

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**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, Bootstrapping, 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, postfix notation, 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 tables, 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:**


[R3] Vinu V. DAS, “Compiler Design Using FLEX and YACC”, PHI


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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.
OPERATING SYSTEMS

Paper Code: ETCS-304
Paper: Operating Systems

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: 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
Processor Scheduling: Scheduling levels, pre emptive vs no pre emptive scheduling, priorities, scheduling objective, scheduling criteria, scheduling algorithms, demand 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 on Dining philosopher problem, Barber shop problem etc.

UNIT III
Deadlocks: examples of deadlock, resource concepts, necessary conditions for deadlock, deadlock solution, deadlock prevention, deadlock avoidance with Bankers algorithms, deadlock detection, deadlock recovery.
Device Management: Disk Scheduling Strategies, Rotational Optimization, System Consideration, Caching and Buffering

UNIT IV

Text Books:

Reference 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.
DATA COMMUNICATION & NETWORKS

Paper Code: ETEC-310
Paper: Data Communication & Networks

INSTRUCTIONS TO PAPER SETTERS:

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 12.5 marks.

MAXIMUM MARKS: 75

Objectives: The objective of the 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. [T1, T2, R1, R4] [No. of Hours: 11]

UNIT- II

Medium Access Sub layer: Channel allocation problem, Controlled Access, Channelization, multiple access protocols, IEEE standard 802.3 & 802.11 for LANS and WLAN, high-speed LANs, Token ring, Token Bus, FDDI based LAN, Network Devices-repeaters, hubs, switches bridges. [T1, T2, R1] [No. of Hours: 11]

UNIT- III
Network Layer: Design issues, Routing algorithms, Congestion control algorithms, Host to Host Delivery: Internetworking, addressing and routing, IP addressing (class full & Classless), Subnet, Network Layer Protocols: ARP, IPV4, ICMP, IPV6 ad ICMPV6. [T1, T2, R1] [No. of Hours: 11]

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. [T2, T1, R1, R4] [No. of Hours: 11]

Text Books:

Reference Books:
WEB ENGINEERING

Paper Code: ETCS-308
Paper: Web Engineering

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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

Markup languages-XHTML: 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, CSS core syntax, text properties, CSS box model, normal flow box layout, other properties like list, tables, DHTML, XML, XML documents & vocabulary, XML versions & declarations, Introduction to WML.

UNIT – II
Client Side Programming: JAVA Scripts, basic syntax, variables & data-types, literals, functions, objects, arrays, built-in objects, JAVA Script form programming. Intrinsic event handling, modifying element style, document trees.

Server side programming – Java Servlets: Servlet architecture, life cycle, parameter data, sessions, cookies, servlets capabilities, servlets & concurrency. Introduction to JSP, JSP Tags, JSP life cycle, custom tags.

UNIT - III

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

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

UNIT – IV

Text Books:

Reference Books:
ARTIFICIAL INTELLIGENCE

Paper Code: ETCS-310
Paper: Artificial Intelligence

INSTRUCTIONS TO PAPER SETTERS:

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.

Maximum Marks: 75

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

(T1,T2) [No. of hrs. 12]

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

(T1,T2) [No. of hrs. 10]

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.

(T1,T2) [No. of hrs. 12]

UNIT-IV
Learning from observations: Inductive learning, learning decision trees, computational learning theory, Explanation based learning.

Applications: Environmental Science, Robotics, Aerospace, Medical Sciences etc.

(T1,T2) [No. of hrs. 10]

Text Book:

Reference Books:
[R1] KM Fu, “Neural Networks in Computer Intelligence”, McGraw Hill
Objective: The objective of the paper is to facilitate the student with the knowledge of microprocessor systems and microcontroller.

UNIT- I

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, Hardware and Software Interrupts.

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.

UNIT- IV
Overview of Microcontroller 8051: Introduction to 8051 Micro-controller, Architecture, Memory organization, Special function registers, Port Operation, Memory Interfacing, I/O Interfacing, Programming 8051 resources, interrupts, Programmer’s model of 8051, Operand types,Operand addressing, Data transfer instructions, Arithmetic instructions, Logic instructions, Control transfer instructions, Timer & Counter Programming, Interrupt Programming.

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 Banker’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 / CA protocol and compare with
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

Paper Code: ETCS-356
Paper: Web Engineering Lab

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0 2 1

Web Engineering Lab experiment based on syllabus of (ETCS-308).

NOTE:- At least 8 Experiments from the syllabus must be done in the semester.
MICROPROCESSORS AND MICROCONTROLLERS LAB

Paper Code: ETEE-358
Paper: Microprocessors and Microcontrollers Lab

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 Micro processor (Ex: Traffic light controller/temperature controller etc)
10. Design a Minor project using 8051 Micro controller

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

Paper Code: ETIT-401
Paper: Advanced Computer Networks

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: To understand different network protocols with emphasis on TCP/IP protocol suite.

UNIT-I
Network Layer:
ARP, RARP, ICMP, IPv4 Routing Principles, Routing and overview, DVR and LSR, the IGRP and EIGRP, BGP, Routing Information Protocol (RIP), OSPF (IPv4 / IPv6).
Multicasting in IP Environments—Broadcasting, Multicasting, IGMP and Multicast Listener Discovery (MLD).
The Distance Vector Multicast Routing Protocol (DVMRP), Multicast OSPF (MOSPF), Protocol Independent Multicast (PIM).

UNIT-II
Transport Layer: Transport layer overview, UDP, TCP (Flow Control, Error Control, and Connection Establishment), TCP Protocol: TCP Tahoe, TCP Reno.

UNIT-III
Optical Networking:
Introduction to Optical networking, its benefits and drawbacks, SONET layered architecture, frame format, SONET network configuration, its advantages and benefits. Quality of Service: Introducing QoS, Queue Analysis, Queue Management algorithms, Resource Reservation, Diffserv and Intserv.

UNIT-IV
Overview of latest concepts:
TCP/IP Applications: VoIP, NFS, Telnet, FTP, SMTP, SNMP, Finger, Whois and WWW. IP v6 and Next Generation Networks, xAAS (PAAS, SAAS, HAAS) and Cloud Computing. Big data, Elements of Social Network.

Text Books:

Reference Books:
CRYPTOGRAPHY & NETWORK SECURITY

Paper Code: ETIT-403

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<th>Paper: Cryptography &amp; Network Security</th>
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Objectives: Syllabus should be proposed so as to be covered in 42 to 45 lectures (assuming 14 or 15 weeks session). Syllabus should be evenly divided into 4 Units only.

UNIT- I:

UNIT- II:

UNIT- III:

UNIT- IV:

Text Book:

Reference Book:

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

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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.

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INSTRUCTIONS TO PAPER SETTERS:

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INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

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WIRELESS COMMUNICATION

Paper Code: ETEC-405
Paper: Wireless Communication

INSTRUCTIONS TO PAPER SETTER:

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 course is to introduce various wireless networks, mobile networks and their basic architecture starting from 2G through to 3G and 4G.

UNIT – I
Introduction To Wireless Communication Systems: Evolution of mobile radio communications; examples of wireless comm. systems; paging systems; Cordless telephone systems; overview of generations of cellular systems, comparison of various wireless systems.
Introduction to Personal Communication Services (PCS): PCS architecture, Mobility management, Networks signaling. A basic cellular system, multiple access techniques: FDMA, TDMA, CDMA.
Introduction to Wireless Channels and Diversity: Fast Fading Wireless Channel Modeling, Rayleigh/Ricean Fading Channels, BER Performance in Fading Channels, Introduction to Diversity modeling for Wireless Communications

UNIT - II
2G Networks: Second generation, digital, wireless systems; GSM, IS_136 (D-AMPS), IS-95 CDMA. Global system for Mobile Communication (GSM) system overview: GSM Architecture, Mobility Management, Network signaling, mobile management, voice signal processing and coding. Spread Spectrum Systems-Cellular code Division Access Systems-Principle, Power Control, effects of multipath propagation on code division multiple access.

UNIT - III
2.5G Mobile Data Networks: Introduction to Mobile Data Networks, General Packet Radio Services (GPRS): GPRS architecture, GPRS Network nodes, EDGE, Wireless LANs, (IEEE 802.11), Mobile IP.
Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G, Introduction to 4G.

UNIT – IV
Global Mobile Satellite Systems, Case studies of IRIDIUM and GLOBALSTAR systems.

Text Books:

Reference Books:
EMBEDDED SYSTEMS

Paper Code: ETEC-401
Paper: Embedded Systems

L T/P C
3 0 3

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 enable a student to design an embedded system for specific tasks.

UNIT- I

PIC Microcontrollers: Architecture, Registers, memory interfacing, interrupts, instructions, programming and peripherals.

UNIT- II
ARM Processors: Comparison of ARM architecture with PIC micro controller, ARM 7 Data Path, Registers, Memory Organization, Instruction set, Programming, Exception programming, Interrupt Handling, Thumb mode Architecture.


UNIT- III

UNIT- IV

Text Book:
[T1] Design with PIC Microcontrollers, John B. Peatman, Pearson Education Asia, 2002

References Books:
[R1] The Design of Small-Scale embedded systems, Tim Wilmhurst, Palgrave 2003
OPTOELECTRONICS AND OPTICAL COMMUNICATION

Paper Code: ETEC-403
Paper: Optoelectronics and Optical Communication

L T/P C
3 0 3

INSTRUCTIONS TO PAPER SETTERS:

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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 12.5 marks

Objective: The objective of this paper is to introduce the student about Optical Fiber, Wave propagation, Detectors and its structures and functions.

UNIT - I

UNIT – II
Wave Propagation: Wave propagation in Step-Index & Graded Index Fiber, Overall Fiber Dispersion-Single Mode Fibers, Multimode Fibers, Dispersion-Shifted Fiber, Dispersion, Flattened Fiber, Polarization.

UNIT – III

UNIT – IV

Text Books:

Reference Books:

MAXIMUM MARKS: 75

INSTRUCTIONS TO PAPER SETTERS:                                             MAXIMUM MARKS: 75
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UNIT - I

UNIT – II
Wave Propagation: Wave propagation in Step-Index & Graded Index Fiber, Overall Fiber Dispersion-Single Mode Fibers, Multimode Fibers, Dispersion-Shifted Fiber, Dispersion, Flattened Fiber, Polarization.

UNIT – III

UNIT – IV

Text Books:

Reference Books:

58
Cloud Computing

Paper Code: ETIT-407
Paper: Cloud Computing

L T/P C
3 0 3

INSTRUCTIONS TO PAPER SETTERS:

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 12.5 marks.

Objective: To enable students to understand the basic concepts of Cloud Computing and to apply these concepts for designing, evaluating, simulations and comparing various applications in Cloud Computing.

UNIT I
Introduction to Cloud Computing

UNIT II
Cloud Computing Architecture

UNIT III
Virtualization of Clouds

UNIT IV
Advanced Cloud Applications
Specialized Cloud Architecture: Direct I/O Access, Load Balanced Virtual Switches, Multipath Resource Access, Federated Clouds, Basics of Cloud Mobility, Enterprise cloud computing: Data, Processes, Components, Architectures, applications, Enterprise Software (ERP, SCM, CRM)

Case Studies on Open Source and Commercial available tools and platforms (Microsoft Azure, Google AppEngine, Amazon Web services, Hadoop, Eucalyptus, Cloud SIM etc).

Text Books:

Reference Books:
[R1] Barrie Sosinsky, Cloud Computing Bible, Wiley
[R2] A. Srinivasan and J. Suresh, Cloud computing a practical approach for learning and Implementation, Pearson India 1st edition
[R4] Mukesh Singhal, Niranjani G.Shrivaratri, TMH Edition. (Must be included for the basics of distributed systems basics from which all distributed systems have been originated).
Objective: The objective of this paper is to facilitate the student with principles and foundations of Distributed databases.

UNIT I
Architecture of distributed systems: network operating system, distributed operating systems, Distributed database systems. (a) Federated database systems, (b) multi database systems, and (c) Client/Server systems, Distributed DBMS architecture.

Distributed database design: Top down design- Designing issues, Fragmentation, Allocation, Data dictionary.
Bottom up design- Schema Matching, Schema Integration, Schema Mapping, Data Cleaning

Data and Access Control: views in centralised and distributed DBMS, Data security, Semantic Integrity Control.

UNIT II

Data Localization: Reduction of primary horizontal fragmentation, Reduction of vertical fragmentation, reduction of derived fragmentation, hybrid fragmentation.

Optimization of Distributed Query: Join ordering, Semi join based algorithms, optimization

UNIT III
Transaction Management: Properties of transactions, Types of transactions- flat transactions, nested transactions, workflow.

Distributed Concurrency Control: Serializability theory, Locking based concurrency control Algorithm, Timstamp based algorithms.

Deadlock Management: Prevention, Avoidance, Detection and Resolution

UNIT IV
Distributed DBMS Reliability: Local Reliability protocol, Distributed Reliability protocol- two phase commit protocol, three phase commit protocol.

Parallel Database System: System architecture, Parallel query processing, Load Balancing, Database Clusters.

Web Data Management: Web Search-crawling, indexing ranking, Web Querying, Distributed XML Processing.

Text Books:

Reference Books:
SEMANTIC WEB TECHNOLOGIES

Paper Code: ETIT-411
Paper: Semantic Web Technologies

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INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75
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Objective: This is the aim behind the Semantic Web, which is also being referred to as Web 3.0 and which is heavily embedded in the Artificial Intelligence area. Its long term goal is that of enhancing the human and machine interaction by representing the data in an understandable way for the machine.

UNIT-I
Introduction: Why Semantics-Data integration across the web, Traditional data modelling methods, semantic relationships, metadata, Building models, Calculating with knowledge, Exchanging information, Semantic web technology.

UNIT-II
RDF Formal semantics: Why semantics, Model theoretic semantic for RDF(S), Semantic reasoning with deduction rules, the semantic limits of RDF(S).

UNIT-III
Web Ontology Languages (OWL): OWL syntax and intuitive semantics, owl species, Description logics, Model theoretic semantics of owl, Automated Reasoning with OWL.

UNIT-IV
Rules and Queries: Ontology and Rules-What is Rule, Data log as a first order rule language, Combining Rules with OWL-DL, Rule interchange format RIF.
Query Language: SPARQL-Query language for RDF, Conjunctive queries for OWL-DL.

Text Books:
[T2] Programming The Semantic Web:-Toby Segaran, Colin Evans, Jamie Taylor by O’Reilly Media Publication.

Reference Books:
SOFTWARE TESTING

Paper Code: ETIT-413

Paper: Software Testing

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Objective: To introduce the students about the knowledge of software testing, types of testing and testing tools.

UNIT I

Introduction: What is software testing and why it is so hard?, Error, Fault, Failure, Incident, Test Cases, Testing Process, Limitations of Testing, No absolute proof of correctness, Overview of Graph Theory.

UNIT II

Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique.

Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

UNIT III

Reducing the number of test cases:

Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, Slice based testing


UNIT IV


Text Books:


Reference Books:


DIGITAL SIGNAL PROCESSING

Paper Code: ETIT-415
Paper: Digital Signal Processing

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

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Objectives: The aim of this course is to provide in depth knowledge of various digital signal processing techniques and design of digital filters, learn the concept of DFT FFT algorithms, and design of digital filters using different approximations, DSP processor and architecture. The prerequisites of this subject are basic knowledge of signal and systems.

UNIT–I:
Frequency Domain Sampling: The Discrete Fourier Transform, Properties of the DFT, Linear filtering methods based of the DFT.
Efficient computation of the DFT: Principal Of FFT, Fast Fourier Transform Algorithms, Applications of FFT Algorithms, A linear filtering approach to computation of the DFT.
Application of DFT, Design of Notch filter

UNIT–II:
Design & Structure of IIR filters from analog filters: Impulse Invariance; Bilinear transformation and its use in design of Butterworth and Chebyshev IIR Filters; Frequency transformation in Digital Domain, Direct, Cascade, Parallel & transposed structure
Design & structure of FIR filters: Symmetric and anti-symmetric FIR filters; Design of Linear Phase FIR filters using windows, Frequency Sampling Method of FIR design, Direct, Cascade, Frequency Sampling, transposed structure

UNIT–III:
Implementation of Discrete Time Systems:
Lattice structures, Lattice and Lattice-Ladder Structures, Schur - Cohn stability Test for IIR filters; Discrete Hilbert Transform.
Linear predictive Coding:
Lattice filter design, Levension Darwin Technique, Schur Algorithm

UNIT–IV:
Quantization Errors in Digital Signal Processing: Representation of numbers, Quantization of filter coefficients, Round-off Effects in digital filters.
Multirate Digital Signal Processing: Decimation, Interpolation, Sampling rate conversion by a rational factor; Frequency domain characterization of Interpolator and Decimator; Polyphase decomposition.

Text Books:
[T2] Proakis and Manolakis, Digital Signal Processing, PHI Publication

Reference Books:
.NET AND C# PROGRAMMING

Paper Code: ETIT-419

Paper: .NET and C# Programming

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INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 75

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Objective: This course provides a solid foundation in the C# programming language, and covering the fundamental skills that are required to design and develop object-oriented applications for the web and Microsoft Windows by using Microsoft Visual C#.NET and the Microsoft Visual Studio .NET development environment.

UNIT I

MS.NET Framework Introduction: Framework Components, Framework Versions, Types of Applications which can be developed, Base Class Library, Namespaces, MSIL / Metadata and PE files, The Common Language Runtime (CLR), Managed Code, MS.NET Memory Management / Garbage Collection, Common Type System (CTS), Common Language Specification (CLS), Types of JIT Compilers, Security Manager, control application development

Language basics: Why Datatypes, Global, Stack and Heap Memory, Reference Type and Value Type, Datatypes & Variables Declaration, Implicit and Explicit Casting, Checked and Unchecked Blocks – Overflow Checks, Casting between other datatypes, Boxing and Unboxing, Enum and Constant, Operators, Control Statements, Working with Arrays and methods.

[T1, T2] [No. of Hours: 11]

UNIT II

Introduction to Object Oriented Features: What is an Object, state of an Object, Lifecycle of an Object, relationship between Class and Object, define Application using Objects, Principles of Object Orientation, Encapsulation, Inheritance, Polymorphism. Encapsulation is binding of State and Behaviour together, Inheritance is based on “is a” relationship, Understanding Polymorphism with Examples.

Constructor & Destructor, Working with “static” Members, Constructor in Inheritance, Type Casting of Reference Types, Static and Dynamic Binding and Virtual Methods, Abstract Class Object as Parent of all classes, Interface, Syntax for Implementation of Interface, Explicit Implementation of Interface members, Types of Inheritance, exceptional handling.

[T1, T2] [No. of Hours: 10]

UNIT III

Working with Collections and Generics: IList and IDictionary, typesafety issue with ArrayList and Hashtable classes, IEnumerable and IEnumerator, Sorting Items in the collection using IComparable, custom generic classes, Generic Collection Classes.

Operator Overloading, Partial Classes, Importance of Attributes, working with components/assemblies, data stream and files: text stream, binary stream, working with file system, Serialization & Deserialization, multithreading.

[T1, T2] [No. of Hours: 11]

UNIT IV

WinForms: Introduction, Controls, Menus and Context Menus, MenStrip, Toolbar Strip, Graphics and GDI, SDI and MDI Applications, Dialog box, Form Inheritance, Developing Custom, Composite and Extended Controls, Data Access using ADO.NET, Data Access using ADO.NET- dataset, XML, debugging and tracing, Delegates & Events: Delegate Declaration, Sample Application, Chat Application using Delegates, += and -= Operator (Events), Chat Application using Delegates and Events, General Syntax for Delegates and Events.

[T1, T2] [No. of Hours: 12]

Text Books:

[T1] Stephen Walther, ” ASP.NET 3.5 Unleashed or ASP.NET 4.5 Unleashed,” Pearsons Publication,

[T2] George Shepherd, "Microsoft ASP.NET 3.5 Step by Step", PHI learning Publication Eastern Economy


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.
Reference Books:
[R1] George Shepherd, "Microsoft ASP.NET 4.0 Step by Step", PHI learning Publication Eastern Economy
[R2] Imar Spaanjaars, "Beginning ASP.NET 3.5 In C# and VB," Wiley / Wrox publication, 2009
ENTERPRISE COMPUTING IN JAVA

Paper Code: ETIT-421
Paper: Enterprise Computing in JAVA

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INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 75
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Objective: In this course student will learn about J2EE technology and will be able to develop dynamic websites. This course will explain how Enterprise JavaBeans (EJBs) contain the application's business logic and business data.

Pre-requisites: Core java

UNIT I
Introduction to J2EE and building J2EE applications, MVC architecture, Introduction to servlets and its life cycle, problems with cgi-perl interface, generic and http servlet, servlet configuration, various session tracking techniques, servlet context, servlet configuration, servlet collaboration.

[T1, T2] [No. of Hours: 10]

UNIT II
JSP Basics and Architecture: JSP directives, Scripting elements, standard actions, implicit objects, JSP design strategies.
Struts: Introduction of Struts and its architecture, advantages and application of Struts.

[T1, T2] [No. of Hours: 12]

UNIT III
EJB Fundamentals: Motivation for EJB, EJB Echo system, J2EE technologies, Enterprise beans and types, distributed objects and middleware, developing EJB components, remote local and home interface, bean class and deployment descriptor.

[T1, T2] [No. of Hours: 10]

UNIT IV
Introducing session beans: Session beans life time, statefull and Stateless session beans, lifecycle of session beans.
Introducing Entity beans: Persistence concepts, features of entity beans, entity context, Introduction to JMS & Message driven beans.

[T1, T2] [No. of Hours: 10]

Text Books:

Reference Books:
SYSTEM AND NETWORK ADMINISTRATION

Paper Code: ETIT-423
Paper: System and Network Administration

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INSTRUCTIONS TO PAPER SETTERS:

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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.

MAXIMUM MARKS: 75

Objective: This course is intended for B.Tech students, who wish to improve skills through hands-on experience in System Administration and Network Administration.

System Administration:
UNIT- I
System Hardware: PC and Server Hardware Architecture, Operating System Administration: UNIX, Windows, MAC OS.
Centralization and Decentralization: Centralized Authentication, Active Directories; LDAP;
Storage: RAID, Storage Area Network (SAN), Direct Attached Storage (DAS), Network Attached Storage (NAS); Data Integrity Backup and Recovery.

[T1, T2] [No. of Hours: 11]

UNIT- II
Lab Management: System Configuration, Cloning, Monitoring and Administering them; workstations, server, Data centers Data Center Management: Administering, Surveillance, Access Control,

[T1, T2] [No. of Hours: 11]

Network Administration:
UNIT- III
Network administrator (definition and functions), Network Planning, Routine system maintenance
Computer Networks: OSI & TCP/IP Model, clean architecture;
Switching & Routing: Layer 2 & Layer 3 switching; Routing; VLAN; Cisco L2 and L3 Switch Configuration; DHCP Configuration; IPv6, Wireless LAN: 802.11 a/b/g/n/ac WiFi; Access Point and Wireless Router configuration.

[T1, T2] [No. of Hours: 11]

UNIT-IV
Internet Architecture: ISP Architecture; DNS Resolution; Content Mirroring, Internet Applications: DNS, Web, Mail, Proxy, NTP,
Perimeter Security: Firewall, UTM,
Network Security: LAN and WLAN Security issues; IP Spoofing; Dictionary Attack; DoS and DDoS Attack; Rogue/Misconfigured/External APs; Network Troubleshooting: ping, traceroute, nslookup, dig, tcpdump;
Network Monitoring: SNMP, MRTG.

[T1, T2] [No. of Hours: 11]

Text Books:
[T2] Subramaniam Mani, Subramanian " Network Management: Principles And Practice" Pearson Education India, 2006

References Books:
[R2] Craig Hunt, "TCP/IP Network Administration" "O'Reilly Media, Inc.", 2002
[R3] Bill McCarty Learning Red Hat Linux "O'Reilly Media, Inc.", 2003
GRID COMPUTING

Paper Code: ETIT-425        L  T/P  C
Paper: Grid Computing          3  0  3

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 enable students to understand the basic concepts of Grid computing with performance issues, Web services, monitoring, optimization, security and resource management.

UNIT I

UNIT II
Web Services and Grid Monitoring: OGSA and WSRF: Overview, Services, Schema and architecture. Grid Monitoring Systems: Overview, architecture, GridICE, JAMM, MDS and Other monitoring Systems (Ganglia and GridMon), Grid portals. [T1, T2] [No. of Hours: 11]

UNIT III
Grid Security and Resource Management:
Grid Security: A Brief Security Primer, PKI, X509 Certificates, Grid Security
Grid Scheduling and Resource Management: Scheduling Paradigms, Working principles of Scheduling, A Review of Condor, SGE, PBS and LSF-Grid Scheduling with QoS. [T1, T2] [No. of Hours: 11]

UNIT IV
Data Management and Grid Middleware-

Text Books:

References Books:
ADVANCED DATABASE ADMINISTRATION

Paper Code: ETIT-427
Paper: Advanced Database Administration

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 advancements in the Database Administration that are required for the student to become a DBA.

UNIT-I
Creating a Database – Database configuring Assistant (DBCA), Password management, Using DBCA to delete a database.
Managing the database instance – Management framework, starting and stopping database control, Initialising parameter files, starting up and shutting down database instance.
Managing Database storage structure – Storage structure, How table data is stored? Tablespaces and data files, Space Management in Tablespaces, Tablespace management.

UNIT-II
Database user security – Creating a user, Authenticating users, Unlocking a user account and resetting the password, Privileges and role, System privileges, object privileges.
Managing Schema Objects – Table types, Action with tables, creating views, sequences, What is partition and why use it? Creating a Partition, Partitioning method, Index organised tables and heap tables, creating index-organised tables, cluster, cluster types, sorted hash cluster.
Managing data and concurrency – Manipulating with data through SQL, function procedure, packages, Triggers, locking concepts, detecting and resolving lock conflicts.

UNIT-III
Managing undo Data – Monitoring Undo, Administering Undo, Configuring Undo Retention, Sizing Undo tablespace.
Implementing database security – database transparent encryption (TDE), TDE Process, Implementing TDE.
Performance management - troubleshooting, tuning.

UNIT-IV
Performing Backup and Recovery – Configuring Recovery Manager, using Recovery manager, Recovering from noncritical Losses, recovery from loss of control file, data file and redo file.
Moving data- General Architecture, Loading data with SQL *loader, Data pump, Data pump export and import.

Text Books:
[T2] Darl Kuhn “Pro Oracle Database 11g Administration”, Apress

References Books:
[R1] Ken Simmons, Sylvester, Carstarphren “Pro SQL Server 2012 Administration”, Dreamtech Press
[R2] Sheeri K Cabral, Keith Murphy, “MySQL Administrator's Bible” John Wiley & Sons
[R3] Steve Fogel, Paul Lane, “Oracle Database Administrator’s Guide, 10g” Oracle
[R4] Craig S. Mullins, “Database Administration”, Addison-Wesley
### Objective
The objective of the paper is to facilitate the student probabilistic graphical models, parameter learning, convexity and Bayesian networks.

### UNIT-I
Bayesian network, Examples (HMM, diagnostic system, etc.), Separation and independence, Markov properties and minimalism, Markov network, Examples (Boltzmann machine, Markov random field, etc.), Cliques and potentials, Markov properties

[T1, T2, R1][No. of Hrs. 11]

### UNIT-II
Exact inference, Complexity, Bucket elimination, Junction tree, Belief propagation (message passing), Application to HMM, Sum- and Max-product algorithms.

[T1, R1][No. of Hrs. 11]

### UNIT-III
Parameter learning, Exponential family, Bayesian learning, Expectation-Maximization (EM)

[T1, T2][No. of Hrs. 10]

### UNIT-IV
Approximate inference, Convexity, Mean field approach, Structured variational method, Loopy belief propagation, Characterization of solution spaces, Sampling methods.

[T1, T2, R2][No. of Hrs. 10]

### Text Books:
- [T1] Bayesian Networks and Beyond by Daphne Koller and Nir Friedman
- [T2] An Introduction to Probabilistic Graphical Models by Michael I. Jordan

### Reference Books:
SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Paper Code: ETHS-419
Paper: Sociology and Elements of Indian History for Engineers

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INSTRUCTIONS TO PAPER SETTERS:
MAXIMUM MARKS: 75

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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 this course is to familiarize the prospective engineers with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society. The course would enable them to analyze critically the social processes of globalization, modernization and social change. All of this is a part of the quest to help the students imbibe such skills that will enhance them to be better citizens and human beings at their work place or in the family or in other social institutions.

UNIT I
Module 1A: Introduction to Elements of Indian History: What is History? History Sources-Archaeology, Numismatics, Epigraphy & Archival research; Methods used in History; History & historiography.
Module 1B: Introduction to sociological concepts-structure, system, organization, social institution, Culture, social stratification (caste, class, gender, power). State & civil society.

UNIT II
Module 2A: Indian history & periodization; evolution of urbanization process: first, second & third phase of urbanization; Evolution of polity; early states of empires; Understanding social structures-feudalism debate.
Module 2B: Understanding social structure and social processes: Perspectives of Marx, Weber & Durkheim.

UNIT III
Module 3A: From Feudalism to colonialism-the coming of British; Modernity & struggle for independence.
Module 3B: Understanding social structure and social processes: Perspectives of Marx, Weber & Durkheim.

UNIT IV
Module 4B: Social change in contemporary India: Modernization and globalization, Secularism and communalism, Nature of development, Processes of social exclusion and inclusion, Changing nature of work and organization.

Text Books:

Reference Books:
[R1] Guha, Ramachandra (2007), India After Gandhi, Pan Macmillan
ADVANCED COMPUTER NETWORKS LAB

Paper Code: ETIT-453  
Theoretical: 0  
Practical: 2  
Credit: 1

List of Experiments:

1. Configuration and logging to a CISCO Router and introduction to the basic user Interfaces.  
   Introduction to the basic router configuration and basic commands.
2. Configuration of IP addressing for a given scenario for a given set of topologies.
3. Configure a DHCP Server to serve contiguous IP addresses to a pool of four IP devices with a default gateway and a default DNS address. Integrate the DHCP server with a BOOTP demon to automatically serve Windows and Linux OS Binaries based on client MAC address.
4. Configure, implement and debug the following: Use open source tools for debugging and diagnostics.
   a. ARP/RARP protocols
   b. RIP routing protocols
   c. BGP routing
   d. OSPF routing protocols
   e. Static routes (check using netstat)
5. Configure DNS: Make a caching DNS client, and a DNS Proxy; implement reverse DNS and forward DNS, using TCP dump/Wireshark characterise traffic when the DNS server is up and when it is down.
6. Configure FTP Server on a Linux/Windows machine using a FTP client/SFTP client characterise file transfer rate for a cluster of small files 100kb each and a video file of 700mb. Use a TFTP client and repeat the experiment.
7. Configure a mail server for IMAP/POP protocols and write a simple SMTP client in C/C++/Java client to send and receive mails.
   Extend this to serve a windows client using SMB. Characterise the NAS traffic using wireshark.

NOTE: At least 8 Experiments out of the list must be done in the semester.
CRYPTOGRAPHY & NETWORK SECURITY

Paper Code: ETIT-455
Paper: Cryptography & Network Security

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List of Experiments:

1. Design a program for encryption and decryption using mono-alphabetic substitution or poly-alphabetic substitution.
2. Write a program to implement DES and AES algorithm for Encryption and Decryption.
4. To configure common services like IIS, Apache, Open SSH, WU-FTP.
5. Study of Security analysis tools: Nessus, Microsoft baseline security analyzer.
7. To identify organization’s Firewall IP address.
8. To determine organization’s Firewall Access Control.

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

Paper Code: ETEC-463
Paper: Wireless Communication Lab

List of Experiments:

1. Eight experiments suggested on kits for GSM, CDMA and any possible experiments covering the subjects.
2. Setting up wireless network with and without infrastructure support.
3. Configuring Access Point with bridging mode (Point to Point and Point to Multi Point).
4. Configuring Routing between wired and wireless Networks.

NOTE: At least 8 Experiments from the syllabus must be done in the semester.
EMBEDDED SYSTEMS LAB

Paper Code: ETIT-459(ELECTIVE) 
Paper: Embedded Systems Lab

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List of Experiments:

1. Introduction to microcontroller and interfacing modules.
2. To interface the seven segment display with microcontroller 8051
3. To create a series of moving lights using PIC on LEDs.
4. To interface the stepper motor with microcontroller.
5. To display character ‘A’ on 8*8 LED Matrix.
6. Write an ALP to add 16 bits using ARM 7 Processor
7. Write an ALP for multiplying two 32 bit numbers using ARM Processor
8. Write an ALP to multiply two matrices using ARM processor

NOTE:- At least 8 Experiments out of the list must be done in the semester.
SYSTEM AND NETWORK ADMINISTRATION LAB

Paper Code: ETIT-459(ELECTIVE)  L  T/P  C
Paper: System and Network Administration Lab  0  2  1

List of Experiments:

System Administration:

1. To install two or more operating systems on a computer.
2. Installation of Red Hat Linux using Graphical mode.
3. Installation of Red Hat Linux using command prompt
4. Creating a user in Linux server and assigning rights
   i. Configuring and Troubleshooting of /etc/inittab.
   ii. Configuring and Troubleshooting of /etc/passwd
5. Configuring and Troubleshooting of /etc/grub.conf

Network Administration:

Linux TCP/IP Network Configuration

Practical Examples of Nmap Commands for Linux System/Network Administrators

The Nmap aka Network Mapper is an open source and a very versatile tool for Linux system/network administrators. Nmap is used for exploring networks, perform security scans, network audit and finding open ports on remote machine. It scans for Live hosts, Operating systems, packet filters and open ports running on remote hosts:

1. Scan a System with Hostname and IP Address
2. Scan Multiple Hosts
3. Scan a whole Subnet
4. Scan Multiple Servers using last octet of IP address
5. Enable OS Detection with Nmap
6. Scan a Host to Detect Firewall
7. Scan a Host to check its protected by Firewall
8. Scan Ports Consecutively
9. Print Host interfaces and Routes
10. Scan a TCP Port
11. Scan a UDP Port
DIGITAL SIGNAL PROCESSING LAB

Paper Code: ETIT-459(ELECTIVE)          L    T/P    C
Paper: Digital Signal Processing Lab      0    2     1

List of Experiments:

Software Experiments:
1. Generation of basic signals sine, cosine, ramp, step, impulse and exponential in continuous and
discrete domains using user defined functions.
2. Write a MATLAB program to find convolution (linear/circular) and correlation of two discrete
signals.
3. Perform linear convolution using circular convolution and vice versa.
4. Write a MATLAB program to
   i. Find 8 point DFT, its magnitude and phase plot and inverse DFT.
   ii. Find 16 point DFT, its magnitude and phase plot and inverse DFT.
5. Perform the following properties of DFT:
   i. Circular shift of a sequence.
   ii. Circular fold of a sequence.
6. Write a MATLAB Program to design FIR Low pass filter using
   i. Rectangular window
   ii. Hanning window
   iii. Hamming window
   iv. Bartlett window
7. Write a MATLAB program to
   i. Implement a Low pass / High pass / Band pass / Band stop IIR Filter using
      Butterworth Approximation.
   ii. Implement a Low pass / High pass / Band pass / Band stop IIR Filter using
      Chebyshev Approximation.

Hardware Experiments using Texas Instruments Kits-DSK 6713:
8. Introduction to Code composer Studio.
9. Write a program to generate a sine wave and see the output on CRO
10. Write a Program to Generate ECHO to give audio file.
11. Write a program to demonstrate Band Stop filter by FIR.

Additional Experiments:
12. Write a program to generate a cos wave and see the output on CRO
13. Write a program to blink the LED
14. Write a program to display a string on LCD.

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

Paper Code: ETIT-402
Paper: Mobile Computing

INSTRUCTIONS TO PAPER SETTERS:

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.

MAXIMUM MARKS: 75

Objectives: Should have studied papers such as Communication systems, Data communications and networking and wireless networks. To learn the basic concepts, aware of the GSM, SMS, GPRS Architecture. To have an exposure about wireless protocols –Wireless LAN, Bluetooth, WAP, Zig Bee issues. To Know the Network, Transport Functionalities of Mobile communication. To understand the concepts of Adhoc and wireless sensor networks. Introduce Mobile Application Development environment.

UNIT-I
Mobile Physical Layer: Review of generation of mobile services, overview of wireless telephony, cellular concept, GSM, air-interface, channel structure, location management: HLR-VLR, hierarchical, handoffs, channel allocation in cellular systems, CDMA, GPRS.


UNIT-II
Mobile Data Link Layer: Wireless LAN overview, IEEE 802.11, Motivation for a specialized MAC, Near & far terminals, Multiple access techniques for wireless LANs such as collision avoidance, polling, Inhibit sense, spread spectrum, CDMA, LAN system architecture, protocol architecture, physical layer MAC layer and management, Hiper LAN.

Blue Tooth: IEEE 802.15 Blue tooth User scenarios, physical, MAC layer and link management.
Local Area Wireless systems: WPABX, IrDA, ZigBee, RFID, WiMax.

UNIT-III

Mobile Transport Layer: Traditional TCP/IP, Transport Layer Protocols-Indirect, Snooping, Mobile TCP.

UNIT-IV
Support for Mobility: Data bases, data hoarding, Data dissemination, UA Prof and Caching, Service discovery, Data management issues, data replication for mobile computers, adaptive clustering for mobile wireless networks, Mobile devices and File systems, Data Synchronization, Sync ML.

Course Outcomes:
1. Gain the knowledge about various types of Wireless Data Networks and Wireless Voice Networks. 2. Understand the architectures, the challenges and the Solutions of Wireless Communication.
3. Realize the role of Wireless Protocols in shaping the future Internet.
4. Able to develop simple Mobile Applications Using Toll kit.
Text Books:

Reference Books:

Laboratory session: The student is advised to learn any of the following languages and use any one tool kit for generating mobile applications, such as game, Clock, calendar, Convertor, phone book, Text Editor etc., Language support: XHTML-MP, WML, WML Script.
Mobile application languages- XML, Voice XML, Java, J2ME, Java Card
Tool Kits: WAP Developer tool kit and application environment, Android Mobile Applications Development Tool kit.

ADHOC AND SENSOR NETWORKS

Paper Code: ETEC-406

Paper: Ad Hoc and Sensor Networks

L T/P C
3 0 3

INSTRUCTIONS TO PAPER SETTER:

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Objective: The prerequisites are data communication networks, wireless communication and networks. The objective of the paper is to introduce infrastructure less wireless networking.

UNIT I

Ad Hoc Wireless Networks:

MAC Protocols for Ad Hoc Wireless Networks:

UNIT II

Routing Protocols for Ad Hoc Wireless Networks:

Transport Layer and Security Protocols for Ad Hoc Wireless Networks:

UNIT III

Wireless Sensor Networks:

Hybrid wireless Networks:

UNIT IV

Wireless Geolocation Systems:

Recent Advances in Wireless Networks:
Text Books:

Reference Books
HUMAN VALUES & PROFESSIONAL ETHICS – II

Paper Code: ETHS-402
Paper: Human Values & Professional Ethics-II

L T/P C
1 0 1

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3. Two internal sessional test of 10 marks each and one project report* carrying 5 marks.

Objectives:
1. The main object of this paper is to inculcate the skills of ethical decision making and then to apply these skills to the real and current challenges of the engineering profession.
2. To enable student to understand the need and importance of value-education and education for Human Rights.
3. To acquaint students to the National and International values for Global development

UNIT I - Appraisal of Human Values and Professional Ethics:
Sensitization of Impact of Modern Education and Media on Values:
   a) Impact of Science and Technology
   b) Effects of Printed Media and Television on Values
   c) Effects of computer aided media on Values (Internet, e-mail, Chat etc.)
   d) Role of teacher in the preservation of tradition and culture.
   e) Role of family, tradition & community prayers in value development.

UNIT II – Engineers responsibility for safety:
Some Case Studies: Case Studies, BHOPAL Gas Tragedy, Nuclear Power Plant Disasters, Space Shuttle Challenger, Three Mile Island Accident, etc.

UNIT III – Global Issues:
Globalization and MNCs: International Trade, Issues,
Case Studies: Kelleg’s, Satyam, Infosys Foundation, TATA Group of Companies
Business Ethics: Corporate Governance, Finance and Accounting, IPR.
Corporate Social Responsibility (CSR): Definition, Concept, ISO, CSR.
Environmental Ethics: Sustainable Development, Eco-System, Ozone depletion, Pollution.
Computer Ethics: Cyber Crimes, Data Stealing, Hacking, Embezzlement.

UNIT IV - Engineers Responsibilities and Rights and Ethical Codes:
Collegiality and loyalty, Conflict of interests, confidentiality, occupational crimes, professional rights, responsibilities. To boost industrial production with excellent quality and efficiency, To enhance national economy, To boost team spirit, Work Culture and feeling of job satisfaction, National integration, Examples of some illustrious professionals.
Need for Ethical Codes, Study of some sample codes such as institution of Electrical and Electronics Engineers, Computer Society of India etc., Ethical Audit.
Development and implementation of Codes: Oath to be taken by Engineering graduates and its importance**.

INSTRUCTIONS TO PAPER SETTERS:

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Need for Ethical Codes, Study of some sample codes such as institution of Electrical and Electronics Engineers, Computer Society of India etc., Ethical Audit.
Development and implementation of Codes: Oath to be taken by Engineering graduates and its importance**.
Text Books:
[T1] Professional Ethics, R. Subramanian, Oxford University Press.

References Books:
[R10] Caroline Whitback< Ethics in Engineering Practice and Research, Cambridge University Press

*Any topic related to the experience of the B.Tech student in the assimilation and implementation of human values and professional ethics during the past three years of his/her studies in the institute OR A rigorous ethical analysis of a recent case of violation of professional ethics particularly related to engineering profession.

**All students are required to take OATH in writing prior to submission of major project and the record of the same is to be maintained at the college level and/or, this oath may be administered by the head of the institutions during the graduation ceremonies. The draft for the same is available alongwith the scheme and syllabus.
**BIG DATA ANALYTICS**

Paper Code: ETIT-406

Paper: Big Data Analytics

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---

**Objective:** To introduce the students about knowledge of Data Management, Big Data stacks and Data analysis.

---

**UNIT-I**

**Big Data Introduction:** The Evolution of Data Management, Defining Big Data, Traditional and advanced analytics. Distributed Computing, need of distributed computing for big data, economics of computing, latency problem.

Examining Big Data Types, Structured Data, sources of big structured data, role of relational databases in big data, Unstructured Data, sources of unstructured data, role of a CMS in big data management.

[T1][R1][No. of Hrs. 11]

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**UNIT-II**

**Big Data Stack:** Redundant Physical Infrastructure, Security Infrastructure, Operational Databases. Organizing Data Services and Tools, Analytical Data Warehouses, Big Data Analytics, Big Data Applications. Virtualization and big data: Server virtualization, Application virtualization, Network virtualization, Processor and memory virtualization, Data and storage virtualization, Managing Virtualization with the Hypervisor.

[T1][No. of Hrs. 10]

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**UNIT-III**

MapReduce Fundamentals, Putting map and reduce Together, Optimizing MapReduce Tasks. Hadoop, Hadoop Distributed File System (HDFS), Name Nodes, Data nodes, Hadoop MapReduce.

[T1][T2][R1][No. of Hrs. 11]

---

**UNIT-IV**

**Big Data Analytics:** Basic analytics, Advanced analytics, Operationalized analytics, Monetizing analytics, Text Analytics and Big Data, Social media analytics, Text Analytics Tools for Big Data, Attensity, Clarbridge, OpenText. Integrating Data Sources: Dealing with Real-time Data Streams and Complex Event Processing, Operationalizing Big Data, Applying Big Data within Your Organization, Security and Governance for Big Data Environments.

[T1][No. of Hrs. 11]

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**Text Books:**


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**Reference Books:**

SOCIAL NETWORK ANALYSIS

Paper Code: ETIT-408
Paper: Social Network Analysis

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Objective: To introduce the students about knowledge of social network analysis and framework for network analysis.

UNIT-I

[T1, R1][No. of Hrs. 10]

UNIT-II


[T1][No. of Hrs. 11]

UNIT-III

Lab: Calculating and comparing clustering approaches.

[T1][No. of Hrs. 11]

UNIT-IV


[T1][No. of Hrs. 10]

Text Books:

Reference Books:
[R1] Social Network Analysis (Google eBook), John Scott, SAGE, 2012

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 22th BOS of USET on 30th June, 2014 and approved in the 37th AC Sub Committee Meeting held on 10th July, 2014.
### SOFT COMPUTING

**Paper Code:** ETIT-410  
**Paper:** Soft Computing  

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**Objective:** To understand the various concepts of neural networks and fuzzy logic.

**UNIT-I**

**Neural Networks:**


**UNIT-II**

**Fuzzy Logic:**


**UNIT-III**

**Fuzzy Arithmetic:**


**UNIT-IV**

**Introduction of Neuro-Fuzzy Systems:**

Architecture of Neuro Fuzzy Networks.

**Application of Fuzzy Logic:**

Medicine, Economics etc.

**Genetic Algorithm:**

An Overview, GA in problem solving, Implementation of GA.

**Text Books:**


**Reference Books:**

BIOINFORMATICS

Paper Code: ETIT-412
Paper: Bio Informatics

INSTRUCTIONS TO PAPER SETTERS:

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 basics of Bioinformatics using Machine Learning.

UNIT- I
Introduction: Biological data in digital symbol sequences, genomes, proteins and proteomes, biological sequences, molecular-function and structure. Biological Databases: Sequence databases, mapping databases, information retrieval, genomic databases.

UNIT- II

UNIT- III

UNIT-IV

Text Books:

References Books:
[R1] TK Attwood & DJ Parry-Smith, "Introduction to Bioinformatics", Pearson Education
[R2] Edward Keedwell and Ajit Narayanan, "Intelligent Bioinformatics" John Wiley & Sons, Ltd.
[R5] David Mount, “Bioinformatics: sequence and genome analysis”, Cold spring harbour Lab
WEB APPLICATION DEVELOPMENT USING .NET

Paper Code: ETIT-414
Paper: Web Application Development Using .NET

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3  0  3

INSTRUCTIONS TO PAPER SETTERS:

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MAXIMUM MARKS: 75

Objective: This course teaches how to develop business applications using .NET 3.5. It starts with C# and VB.NET languages and then moves on to developing web applications using ASP.NET. It teaches LINQ and AJAX, new extensions to ASP.NET 3.5

UNIT I
Introduction to .NET 3.5: Introduction to .NET Framework, Components of .NET - CLR and Class Library, MSIL, CTS etc.
Introduction to C# 3.0: Language elements of C#, OOP with C#, Properties and static members, Inheritance, overriding and shadowing, Runtime polymorphism - virtual and abstract methods, Boxing, unboxing, Interfaces and structures, Exception Handling. Introduction to VB.NET 9.0: structure of VB.NET, Control structures, OOP with VB.NET, Properties, Default properties, Inheritance, overriding and shadowing, Interfaces, structures and Exception handling.

UNIT II
MS SQL Server: Architecture of SQL Server, Using Query Analyzer, Working with Transact SQL, stored procedures and functions, creating database triggers.
ADO.NET: Introduction, SQL Connect, SQL Command, SQL Data Reader object to access SQL Server, connect to Ms Access, and Oracle, Data Set, Data Table etc, Retrieving and manipulating data using Grid View, Details View, List View, Form View and Data List, Calling stored procedures of SQL Server.

UNIT III
XML: introduction, well-formed XML and valid XML, DOM and SAX, XML Reader and writer, Validating XML with Schema and DTD, Loading data from XML to Database, Writing data from Database to XML, Transforming XML content using XSLT.
Web Services: introduction, role in web applications, Component and protocols - SOAP, WSDL, Proxy class, create web service, Web services accessing database.

UNIT IV
LINQ: Language Integrated Query: LINQ to Objects, LINQ to SQL, Object-Relational Mapping, LINQ to XML.
AJAX: What is AJAX, related technologies, Using ASP.NET AJAX - Script Manager, Update Panel, Timer, Update Progress etc., Using ASP.NET AJAX Control Toolkit – Always Visible Control, AutoComplete, Confirm Button, Filtered Text Box etc., Calling Web Services using AJAX.

Text Books:
[T1] Stephen Walther," ASP.NET 3.5 Unleashed or ASP.NET 4.5 Unleashed," Sams Pearsons Publication,

INSTRUCTIONS TO PAPER SETTERS:                                             MAXIMUM MARKS: 75

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Objective: This course teaches how to develop business applications using .NET 3.5. It starts with C# and VB.NET languages and then moves on to developing web applications using ASP.NET. It teaches LINQ and AJAX, new extensions to ASP.NET 3.5
Reference Books:
[R2] Imar Spaanjaars, "Beginning ASP.NET 3.5 In C# and VB," Wiley / Wrox publication, 2009

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.
VLSI DESIGN

Paper Code: ETIC-414

Paper: VLSI Design

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Objective: The prerequisite are analog devices, STLD, Digital system design and micro-electronics. The students are introducing to MOS technology, design rules and some applications.

UNIT I
Evolution of VLSI, MOS transistor theory, MOS structure, enhancement & depletion transistor, threshold voltage, MOS device design equations, MOSFET scaling and small geometry effects, MOSFET capacitances, NMOS inverter, CMOS inverter, DC characteristics, static load MOS inverter, pull up/pull down ratio, static & dynamic power dissipation, CMOS & NMOS process technology – explanation of different stages in fabrication, body effect, latch up in CMOS.

UNIT II
Stick diagram and design rules, lambda based design rules, switching characteristics & inter connection effects: rise time, fall time delays, noise margin, CMOS logic gate design: NAND, NOR, XOR and XNOR gates, Transistor sizing, combinational MOS logic circuits: pass transistor and transmission gate designs, Pseudo NMOS logic.

UNIT III
Sequential MOS logic circuits: SR latch, clocked latch and flip flop circuits, CMOS D latch and edge triggered flip flop, dynamic logic circuits; basic principle, non ideal effects, domino CMOS logic, high performance dynamic CMOS circuits, clocking issues, clock distribution.

UNIT IV
VLSI designing methodology, design flow, design Hierarchy, concept of regularity, modularity & locality, VLSI design style, Design quality, computer aided design technology, adder design and multiplier design examples. Low power design concepts using CMOS Technology.

Text Books:

Reference Book:

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.
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INFORMATION THEORY AND CODING

Paper Code: ETIT-416
Paper: Information Theory and Coding

L  T/P  C
3   0   3

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: In this course the students will study a number of efficient encoding/decoding strategies which have proven important in practice with a categorization on the notion of decoding.

UNIT-I

UNIT-II

UNIT-III
Linear Block codes, Repetition Codes, Syndrome Decoding, Hamming Codes, Dual Code, Cyclic Codes, Maximal Length Codes, CRC Codes, BCH Codes, Reed-Solomon Codes, Golay Codes, Convolutional Codes: Code Tree, Trellis and State Diagram.

UNIT-IV
Decoding of Convolutional Codes: Maximum Likelihood decoding, Viterbi’s algorithm, free distance of a convolutional code. Turbo Codes: Turbo Encoder and Decoder, Puncturing, Performance of Turbo Codes. Introduction to Cryptography.

Text Books:

Reference Books:
HUMAN COMPUTER INTERACTION

Paper Code: ETCS-404
Paper: Human Computer Interaction

L  T/P  C
3    0    3

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 introduce the students about the interaction between and computer and human being.

UNIT I

[T1, T2][No. of Hrs. 10]

UNIT II
Models and Theories: Cognitive models, Socio-organizational issues and stakeholder requirements, Communication and collaboration models, Task analysis, Dialogue notations and design, Models of the system, Modelling rich interaction.

[T1, T2][No. of Hrs. 11]

UNIT III
Interaction Styles: Direct Manipulation and Virtual Environments, Menu Selection, Form Filling and Dialog Boxes, Command and Natural Languages, Interaction Devices, Collaboration and Social Media Participation.

[T1, T2][No. of Hrs. 10]

UNIT IV
Outside the Box: Group ware, Ubiquitous computing and augmented realities, Hypertext, Multimedia and the World Wide Web.

[T1, T2][No. of Hrs. 11]

Text Books:

Reference Books:
DIGITAL IMAGE PROCESSING

Paper Code: ETIT-418
Paper: Digital Image Processing

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Objectives: The aim of this course is to provide digital image processing fundamentals, hardware and software, digitization, encoding, segmentation, feature extraction etc. It will enhance the ability of students to apply tools in image restoration, enhancement and compression and to apply the techniques in both the spatial and frequency domains. It will enhance the ability of students to identify the quality characteristics of medical images, differences between computer vision and image processing and help in studying the remote sensing images of the environmental studies.

UNIT- I:

UNIT- II:
Filtering in the Frequency Domain: Introduction to Fourier Transform and the frequency Domain, Smoothening and Sharpening Frequency Domain Filters.

UNIT- III:
Image Compression: fundamentals of compression, coding redundancy, Lossy and lossless compression, Spatial and temporal redundancy, Image compression models. Some basic compression methods
Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Region Oriented Segmentation, Motion based segmentation.

UNIT- IV:
Representation and Description: Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms.
Object Recognition: Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods.

Text Books:

Reference Books:

Instructions to Paper Setters:
Maximum Marks: 75

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Text Books:

Reference Books:
NEXT GENERATION NETWORKS

INSTRUCTIONS TO PAPER SETTERS:

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MAXIMUM MARKS: 75

UNIT I
Converged Services for Next Generation Networks

UNIT II
Wireless Access and Transport Technologies

UNIT III
WPAN, WLAN, WMAN and Broadcast technologies

UNIT IV
Optimization: Theory and Network applications
Graph algorithms, linear programming basics, Introduction to Integer programming, Traffic engineering, Network topology calculus, Network optimal routing and dimensioning, Frequency assignment, Pricing, Game theory.

Text Books:

Reference book:
[R1] Next-Generation Network Services: By Robert Wood, Published Nov 1, 2005 by Cisco Press. Part of the Networking Technology series
GPS AND GIS

Objectives: To study the fundamentals and scope of Global Information System and Global Positioning System.

UNIT-I
Global Information System (GIS): Introduction, scope and benefits of GIS; application areas of GIS; functional components and elements of GIS; geographic objects: scale, accuracy and resolution.
GIS Cartography and Maps: Digital cartography: selection, classification and simplification; exaggeration and symbolization for cartographic abstraction; Types of Maps; map elements: projection, direction, scale and co-ordinates; Geodatabases; GIS map outputs; Topographic mapping.

UNIT-II
Geographic Data: Spatial and attribute data; vector and raster models; points, lines, polygon features; computed and associated attributes; grids, cells and image data; linking spatial and attributed data.
Geoprocessing: Geographic co-ordinate system: latitudes and longitudes; Geoids Spheroids ellipsoids and datum's; projections and transformations.

UNIT-III
Global Positioning System (GPS): Introduction; GPS components: systems, scales and codes; error and accuracy of GPS observation; Differential GPS.
Fundamentals of Satellite Orbits: Orbital Mechanics, Constellation Design
Remote Sensing (RS): Introduction; application of RS; electromagnetic radiation; spectral signatures; aerial/satellite image characteristics: spatial, spectral, radiometric and temporal.

UNIT-IV
Statistics: Spatial statistics; independent and dependent variables; continuous data: sampling, correlation, regression, frequency and descriptive analysis; discrete data.
Interpolation: Characteristic interpolators; deterministic interpolators; evaluating interpolators.

Text Books
Note: There is no single textbook for this course. Suggested Readings:
SATELLITE COMMUNICATION

Paper Code: ETEC-404
Paper: Satellite Communication

INSTRUCTIONS TO PAPER SETTERS:

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Maximum Marks: 75

Objectives: To study the most relevant aspects of satellite communication with emphasis on the most recent application & developments. It covers orbital mechanics, launching techniques, satellite link design, earth & space segment, error control coding and different multiple access techniques.

UNIT- I

UNIT- II
Satellite Link Design
Basic transmission, System noise temperature, G/T ratio, design of down links, uplink design, design of specified C/N, Atmospheric Absorption, Rain induced attenuation.
Space Segment: Power Supply, Altitude Control, Station Keeping, Thermal Control, TT&C sub system, Transponders, Antenna Sub system.
Earth Segment: Subsystem of earth station, Transmit-Receive Earth Station, different types of earth stations, frequency coordination.

UNIT- III
Multiple Access Techniques: FDMA, FDMA down link analysis, TDMA, Satellite-switched TDMA, code division multiple access, DAMA, On board signal processing for FDMA/TDM Operation.
Error Control for Digital Satellite Links: Error detection and correction for digital satellite links, error control coding, Convolutional codes, satellite links concatenated coding and interleaving, Automatic Repeat Request (ARQ).

UNIT- IV
Satellite Applications: Satellite mobile services, VSAT, GPS, Radarsat, INMARSAT, Satellite navigational system. Direct broadcast satellites (DBS)- Direct to home Broadcast (DTH), Worldspace services, Business TV(BTV)

Text Books:

Reference Books:
E-COMMERCE AND M-COMMERCE

Paper Code: ETTT-428
Paper: E-Commerce and M-Commerce

INSTRUCTIONS TO PAPER SETTERS:

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MAXIMUM MARKS: 75

Objective: The objective of the paper is to impart knowledge about the fundamentals and advancements in the fields of Electronic Commerce (E-Commerce) and Mobile Commerce (M-Commerce) with the aim of enabling the students to explore the possibilities of practical applications and research aspects in the field of integrating business with Information Technology.

UNIT I
Introduction and Concepts: Networks and commercial transactions – Internet and other novelties, networks and electronic transactions today, Model for commercial transactions; Internet environment – internet advantage, worlds wide web and other internet sales venues; Online commerce solutions.
Security Technologies: Insecurity Internet; A brief introduction to Cryptography; Public key solution; Key distribution and certification; prominent cryptographic applications.
Electronic Payment Methods: Updating traditional transactions; secure online transaction models; Online commercial environments; digital currencies and payment systems; Offline secure processing; private data networks.

[No. of Hrs. 10]

UNIT II
Protocols for Public Transport of Private Information: Security protocols; secure protocols; Secure hypertext transfer protocols; Secure sockets layers; Integrating security protocols into the web; Non technical provide.
Electronic Payment Systems: Digital payment systems; First virtual internet payment system; cyber cash model.
On-line Commerce Environments: Servers and commercial environments; Netscape product line; Netscape commerce server; Microsoft internet explorer and servers; open market.
Digital Currencies: Optional process of Digicash, Ecash Trail; Using Ecash; Smart cards, Electronic Data Interchange; Its basics; EDI versus Internet and EDI over Internet.
Strategies, Techniques and Tools: Internet Strategies: Internet Techniques, Shopping techniques and online selling techniques; Internet tools.

[No. of Hrs. 11]

UNIT III
Supply chain management: Introduction, What is supply chain management? Focus on the value chain, Option for restructuring the supply chain, Using e-business to restructure the supply chain, Supply chain management implementation.
Implementation and maintenance: Introduction, Alternatives for acquiring e-business systems, Development of web-based content and services, focus on developing dynamic web content, testing, Changeover, Content management and maintenance, Focus on measuring and improving performance of e-business systems.

[No. of Hrs. 10]
UNIT IV
Introduction to M-commerce: Emerging applications, different players in m-commerce, M-commerce life cycle Mobile financial services, mobile entertainment services, and proactive service management.
Management of mobile commerce services, Content development and distribution to hand-held devices, content caching, pricing of mobile commerce services; emerging issues in mobile commerce: The role of emerging wireless LANs and 3G/4G wireless networks, personalized content management, implementation challenges in m-commerce, futuristic m-commerce services.

Text Books:

References Books:
**DISTRIBUTED SYSTEMS**

**Paper Code:** ETIT-430

**Paper:** Distributed Systems

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**Objective:** To understand networking, operating systems and various issues.

**UNIT-I**

**Fundamentals of Distributed Computing:**
Architectural models for distributed and mobile computing systems, Basic concepts in distributed computing.

**Distributed Operating Systems:**
Overview, network operating systems, Distributed file systems, Middleware, client/server model for computing.

**UNIT-II**

**Communication:**
Layered protocols, RPC, RMI, Remote objects, Basic Algorithms in Message Passing Systems, Leader Election in Rings, and Mutual Exclusion in Shared Memory, Message Passing, PVM and MPI.

**Process Concepts:**
Threads, Clients and Servers, Code migration, Agent based systems, Distributed objects, CORBA, Distributed COM.

**UNIT-III**

**Synchronization:**
Clock synchronization, Logical clocks, Election algorithms, Mutual exclusion, Distributed transactions, Naming concepts, Security in distributed systems

**Distributed Databases:**
Distributed Data Storage, Fragmentation & Replication, Transparency, Distributed Query Processing and Optimization, Distributed Transaction Modeling and concurrency Control, Distributed Deadlock, Commit Protocols.

**UNIT-IV**

**Processing:**
Basic Concepts: Introduction to processing, processing terminology, Design of algorithms, Design of Parallel Databases, Parallel Query Evaluation.

**TEXT BOOKS:**

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**REFERENCE BOOKS:**

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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.*
SELECTED TOPICS OF RECENT TRENDS IN INFORMATION TECHNOLOGY

Paper Code: ETIT-432
Paper: Selected Topics of Recent Trends in IT

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INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 75

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Objective: To understand data warehousing and its types, design and concepts of Big Data.

UNIT I Data Warehousing

Introduction to Data Warehousing: Evolution of Data Warehousing, Data Warehousing concepts, Benefits of Data Warehousing, Comparison of OLTP and Data Warehousing, Problems of Data Warehousing.

Data Warehousing Architecture: Operational Data and Data store, Load Manager, Warehouse Manager, Query Manager, Detailed Data, Lightly and Highly summarized Data, Archive/Backup Data, Meta-Data, architecture model, 2-tier, 3-tier and 4-tier data warehouse, end user Access tools.

UNIT II Data Warehousing Tools and Technology

Tools and Technologies: Extraction, cleaning and Transformation tools, Data Warehouse DBMS, Data Warehouse Meta-Data, Administration and management tolls, operational vs. information systems, OLAP & DSS support in data warehouse.

Distributed Data Warehouse: Types of Distributed Data Warehouses, Nature of development Efforts, Distributed Data Warehouse Development, Building the Warehouse on multiple levels.

UNIT III Types of Data Warehouses & Data Warehouse Design

Host based, single stage, LAN based, Multistage, stationary distributed & virtual data-warehouses.

Data warehousing Design: Designing Data warehouse Database, Database Design Methodology for Data Warehouses, Data Warehouse design Using Oracle, OLAP and data mining: Online Analytical processing, Data mining.

UNIT IV Introduction to Big Data


Text Books

[T2] Adam Jorgensen, James Rowland-Jones, John Welch, Dan Clark, Christopher Prices, Brian Mitchell “Microsoft Big Data Solutions” Wley India.

Reference Books

[R2] Kamber and Han, “Data Mining Concepts and Techniques”, Hartcourt India P. Ltd., 2001

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MOBILE COMPUTING LAB

Paper Code: ETIT-452

Paper: Mobile Computing Lab

List of Experiments:

The student is advised to learn any of the following languages and use any one tool kit for generating mobile applications, such as game, Clock, calendar, Converter, phone book, Text Editor etc.,

Language support: XHTML-MP, WML, WML Script.

Mobile application languages- XML, Voice XML, Java, J2ME, Java Card

Tool Kits: WAP Developer tool kit and application environment, Android Mobile Applications Development Tool kit.

For MANETS, use of NS2/NS3 is recommended for two experiments.

Reference Books:


NOTE:- At least 8 Experiments out of the list must be done in the semester.
ADHOC AND SENSOR NETWORKS LAB

Paper Code: ETEC-458
Paper: Ad Hoc and Sensor Networks Lab

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Ad Hoc and Sensor Networks Lab Experiments based on syllabus ETEC-406.

NOTE:- At least 8 Experiments from the syllabus must be done in the semester.
GPS AND GIS LAB

Paper Code: ETIT-458(ELECTIVE-II)  L  T/P  C
Paper: GPS and GIS Lab        0  2  1

Softwares for GPS:
   a. openGTS
   b. GPSTk

Softwares for GIS:
   a. QGIS
   b. GRASS GIS
   c. GeoTools
   d. ArcView GIS

List of Experiments

First Set of Experiments:
1. Using Handheld GPS for location & recording points
2. Recording point positions and data
3. Importing Juno Data into ArcMap
4. Set up a work area with basemap data
5. Entering data into Excel and Adding as Events to ArcMap
6. Using Pathfinder to download saved file from the GPS
7. Execute ArcMap
8. Loading an orthophoto into the Juno

Second Set of Experiments:
1. Introduction to Mapping, Triangulation & Navigation using ArcView GIS
2. GPS/GIS Data Conversion and Map Construction
3. GPS Data Gathering
4. DGPS Post Processing and GIS Data Transfer
5. ArcView processing and map presentation

NOTE:- At least 8 Experiments out of the list must be done in the semester.
**NEXT GENERATION NETWORKS LAB**

**Paper Code:** ETIT-458(ELECTIVE-II)  
**Paper:** Next Generation Networks Lab  
**L T/P C**  
0 2 1

### List of Experiments:

1. Overview of IP Address
2. Design Ethernet Cables : Cross Cable, Straight Cable, Rollover Cable
3. Demonstrate to connect two computer without connecting devices
4. Demonstrate to connect two computer with connecting devices
5. Demonstrate to establish client-server connection with using of windows server 2008
6. Use of policies in Windows Server 2008
7. Overview of Router
8. Demonstrate the use of router to make a connection
9. Introduction to Network Address Translation
10. Overview of different interfaces in router
11. Implement IP Subnetting in IPV4
12. Implement IP routing using RIP
13. Implement IP routing using IGRP
14. Implement IP routing using EIGRP
15. Implement IP routing using OSPF
16. Configuration of VLAN
17. Configuration of VTP
18. Managing traffic with Standard IP Access List
19. Managing traffic with Extended IP Access List
20. Overview of MPLS

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