# BACHELOR OF TECHNOLOGY
(INFORMATION TECHNOLOGY)

## SEVENTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper ID</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>THEORY PAPERS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETIT-401</td>
<td></td>
<td>Advanced Computer Networks</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>ETIT-403</td>
<td></td>
<td>Cryptography and Network Security</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETEC-405</td>
<td></td>
<td>Wireless Communication</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>ELECTIVE (SELECT ANY TWO, ONE FROM EACH GROUP)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>GROUP-A</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETEC-401</td>
<td></td>
<td>Embedded Systems</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETEC-403</td>
<td></td>
<td>Computer Networks 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>
<td>3</td>
</tr>
<tr>
<td>ETIT-409</td>
<td></td>
<td>Distributed Databases</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-411</td>
<td></td>
<td>Semantic Web Technologies</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-413</td>
<td></td>
<td>Software Testing</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-415</td>
<td></td>
<td>Digital Signal Processing</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>GROUP-B</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETIT-419</td>
<td></td>
<td>.NET and C# Programming</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-421</td>
<td></td>
<td>Computing in Java</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-423</td>
<td></td>
<td>System and Network Administration</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-425</td>
<td></td>
<td>Advanced Database Administration</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-427</td>
<td></td>
<td>Probabilistic Graphical Models</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETHS-419</td>
<td></td>
<td>Sociology and Elements of Indian History for Engineers</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL/VIVA VOCE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETIT-453</td>
<td></td>
<td>Advanced Computer Networks Lab</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ETIT-455</td>
<td></td>
<td>Cryptography and Network Security Lab</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ETEC-463</td>
<td></td>
<td>Wireless Communication Lab</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ETIT-459</td>
<td></td>
<td>Lab based on Elective Group A or B</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ETIT-461</td>
<td></td>
<td>Summer Training / Industrial Work Certification</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>ETIT-463</td>
<td></td>
<td>Minor Project+</td>
<td>0</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>15</td>
<td>15</td>
<td>24</td>
</tr>
</tbody>
</table>

**Imp:** Elective Paper VII is optional if one-third of the total students opt for it. 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 being 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.
<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper ID</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETIT 402</td>
<td></td>
<td>Mobile Computing</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>ETEC 406</td>
<td></td>
<td>Ad hoc and Sensor Networks</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETHS 402</td>
<td></td>
<td>Human Values and Professional Ethics-II</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**THEORY PAPERS**

**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>
</tr>
</thead>
<tbody>
<tr>
<td>ETIT-406</td>
<td></td>
<td>Big Data Analytics</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-408</td>
<td></td>
<td>Social Network Analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETIT-410</td>
<td></td>
<td>Soft Computing</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-412</td>
<td></td>
<td>Bio-Informatics</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-414</td>
<td></td>
<td>Web Application development using .NET</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIC-414</td>
<td></td>
<td>VLSI Design</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT-417</td>
<td></td>
<td>Information Theory and Coding</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETHS-404</td>
<td></td>
<td>Artificial Intelligence</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**GROUP B**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper ID</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETIT418</td>
<td></td>
<td>Digital Image Processing</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT420</td>
<td></td>
<td>Next Generation Networks</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT422</td>
<td></td>
<td>GPS and GIS</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETEC404</td>
<td></td>
<td>Satellite Communication</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT428</td>
<td></td>
<td>E-Commerce and M-Commerce</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT430</td>
<td></td>
<td>Distributed Systems</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ETIT 432</td>
<td></td>
<td>Selected Topics of Recent Trends in Information Technology **</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**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>
</tr>
</thead>
<tbody>
<tr>
<td>ETIT 452</td>
<td></td>
<td>Mobile Computing Lab</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ETIT 458</td>
<td></td>
<td>Ad hoc and Sensor Network Lab</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ETIT 456</td>
<td></td>
<td>Lab based on Elective-I</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ETIT 458</td>
<td></td>
<td>Lab based on Elective-II</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ETIT 460</td>
<td></td>
<td>Major Project</td>
<td>0</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>

**TOTAL**

13  21  26

*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.

**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**

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.
## ADVANCED COMPUTER NETWORKS

**Paper Code:** ETIT-401  
**Paper:** Advanced Computer Networks  
**L T/P C**  
3 1 4

### INSTRUCTIONS TO PAPER SETTERS:

<table>
<thead>
<tr>
<th>MAXIMUM MARKS: 75</th>
</tr>
</thead>
</table>

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, IG, TCP, IP, Routing Principles, Routing and overview, DVR and LSR, the IGRP and EIGRP, BGP, Routing Information Protocol (RIP), BGP (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 options (Sack, Timestamp, 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, QoS Mechanisms, Queue Management algorithms, Resource Reservation, Diffserv and Intserv.

### UNIT-IV

**Overview of latest concepts:**
- TCP/IP Applications: VoIP, NFS, Telnet, FTP, SSH, SMTP, Finger, WHOIS, HTTP, WWW, IP v6 and Next Generation Networks, xAAS (PAAS, SAAS, HAAS), and Cloud Computing, Digital data, Elements of Social Network.

### Text Books:

- **T1** Douglas E. Comer, "Internet networking with TCP/IP", Pearson. TCP/IP, Vol. 2

### Reference Books:

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.

Objectives: Syllabus should be planned so as to be covered in 42-45 lectures (assuming 14 or 15 weeks session). Syllabus should be evenly divided into 4 Units only.

UNIT- I:
Basic Cryptographic Techniques, Computational Complexity, Finite Fields, Number Theory, DES and AES,
Public Key Cryptosystems, Traffic Confidentiality, Cryptanalysis, Intractable (Hard) Problems, Hash Functions,

UNIT- II:
Linear Cryptanalysis, Differential Cryptanalysis, DES, Triple DES, Message Authentication and Digital Signatures, Attacks on Protocols, Elliptic Curve Architecture and Cryptography, Public Key Cryptography and
RSA, , Evaluation of Complex Key Management, Authentication requirements Digital forensics, including digital evidence handling: Media forensics, Cyber forensics, Software forensics, Mobile forensics.

UNIT- III:

UNIT- IV:

Text Book:

Reference Book:
R4 http://www.iiitd.edu.in/~gauravg/
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 communication 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 - 1G, 2G, 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

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 W-CDMA 2000, Quality of services in 3G, Introduction to 4G.

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

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.
Objective: The objective of the course 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

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 Wilmshurst. Palgrave 2003
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:
CLOUD COMPUTING

Objective: To enable students to understand the basic concepts of Cloud Computing and to apply these concepts for designing, evaluating, simulating 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

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, Niranjan G. Shivaratri, TMH Edition. (Must be included for the basics of distributed systems basics from which all distributed systems have been originated).

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.

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.
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, Tim- stamp based algorithms.

Deadlock Management: Prevention, Avoidance, Detection and Resolution.

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

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

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

Text Books:

Reference Books:
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 Resource description language: Simple Ontology’s in RDF and RDF schema- Introduction, syntax for RDF, advanced features in RDF, Ontology’s in RDF schemas.
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

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.
OBJECTIVE: To introduce the student 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

<table>
<thead>
<tr>
<th>INSTRUCTIONS TO PAPER SETTERS:</th>
<th>MAXIMUM MARKS: 75</th>
</tr>
</thead>
<tbody>
<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>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

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 on 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

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

UNIT–II:
Design & Structure of IIR filters from analog filters: Impulse Invariance; Bilinear transformation and its use in design of Butterworth, Chebyshev III filters; Frequency transformation in Digital Domain, Direct, Cascade, Parallel forms.
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 structures

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

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, Levenson Digital Technique, Schur Algorithm

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

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.

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

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

Reference Books:
### INSTRUCTIONS TO PAPER SETTERS:

<table>
<thead>
<tr>
<th>MAXIMUM MARKS:</th>
<th>75</th>
</tr>
</thead>
<tbody>
<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>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

### 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


### 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 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 to model-view-controller architecture, advantages and application of Struts.

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

### UNIT III

**EJB Fundamentals:** Introduction to 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, Singleton and Business 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:


R3 - Austin Sincock, “Java is Easy and Fun”, Apress Publications.


INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

Objective: This 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.

UNIT- II
Lab Management: Workstation Configuration, Cloning, Monitoring and Administering them; Workstations, server, Data centers Data Management; Administering, Surveillance, Access Control.

Network Administration:

UNIT- III
Network administrator (definition and functions); Network Planning, Routine system maintenance.
Switching & Routing: Layer 2 & Layer 3 Switching; Layer 2 and Layer 3 Switch Configuration; DHCP Configuration; IPv6, Wireless LAN: 802.11 a/b/g/n/ac WiFi; Access Point and Wireless Router configuration.

UNIT-IV
Internet Architecture: ISP Architecture; DNS Resolution; 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.

Text Books:
[T2] Subramaniam Mani, Subramaniam "  Network Administration: 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
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

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.

UNIT IV
Data Management and Grid Middleware:
Grid Middleware: List of globally available Middlewares, Globus Toolkit.

Text Books:
T1 Maozhen Li, Mark Baker, The Grid Core Technologies, John Wiley & Sons.

References Books:
R1 C.S. R. Prabhu, ”Grid and Cluster Computing”, PHI 2014
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: 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, setting 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, Actions with tables, creating views, sequences, What is partition and why use it? Creating a Partition, Partitioning method, Indexed indices 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 – MonitoringUndo, Administering Undo, ConfiguringUndo Retention, Sizing Undotablespace.
Implementing database security – database transparent encryption (TDE), TDE process, Implementing TDE.
Performance management – Monitors, booting, 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.
Performing flashback – Flashback database, Flashback database Architecture, Configuring flashback Database using enterprise manager, Monitoring Flashback Database.
Moving data- General Architecture, Loading data with SQL *loader, Data Pump, Data pump export and import.

Text Books:

T2]  Darl Kuhn “Pro Oracle Database Administration”, Apress

References Books:

[R1] Ken Simmons, Sylvester, Carstarphen“ 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

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.
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 systems, etc.), Separation and independence, Markov properties and minimality, Markov network, Examples (Boltzmann machine, Markov random field, etc.), Cliques and potentials, Markov properties

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

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

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

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:
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.
[3 Lectures]
Module 1B: Introduction to sociological concepts: structure, system, organization, social institution, Culture, social stratification (caste, class, gender, power), State & civil society.
[7 Lectures]
[No. of Hrs. 10]

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.
[3 Lectures]
Module 2B: Understanding social structures and social processes: Perspectives of Marx, Weber & Durkheim.
[7 Lectures]
[No. of Hrs. 10]

UNIT III
Module 3A: From Feudalism to colonialism-the coming of British; Modernity & struggle for independence.
[3 Lectures]
Module 3B: Understanding social structure and social processes: Perspectives of Marx, Weber & Durkheim.
[9 Lectures]
[No. of Hrs. 12]

UNIT IV
[3 Lectures]
Module 4B: Social change in contemporary India: Its impact on socialization; Secularism and communalism, Nature of development; Processes of social exclusion in India; Changing nature of work and organization.
[10 Lectures]
[No. of Hrs. 13]

Text Books:

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

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.
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 configuration in a cluster 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. RIPv1 routing protocols
   c. OSPF routing protocols
   d. 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.
   transfer rate transfers small files 100kb each and a video file of 700mb.Use a TFTP client and 
   repeat the experiment.
7. Configure POP/IMAP protocols and write a simple SMTP client in C/C++/Java client to send and receive mails.
8. Implement Open NMS+ SNMPD for checking Device status of devices in community MIB of a Linux 
   PC. Using yellow pages and NIS/NFS protocols implement Network Attached Storage Controller 
   (NAS). 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

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, OpenSSH, 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

<table>
<thead>
<tr>
<th>L</th>
<th>T/P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

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.
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 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:** ETTT-459(ELECTIVE)  
**Paper:** System and Network Administration Lab  
**L T/P C**  
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**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 Systems
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

---

GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY

---

Scheme and Syllabi for B. Tech-IT, 1st year (Common to all branches) *w.e.f batch 2014-15* and (2nd, 3rd & 4th years) *w.e.f batch 2013-14* approved in the 22nd BOS of USET on 30th June, 2014 and approved in the 37th AC Sub Committee Meeting held on 10th July, 2014.
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 find 8 point DFT, its magnitude and phase plot and inverse DFT.
   i. and 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 the Low pass filter using
   i. Rectangular window
   ii. Hanning window
   iii. Hamming window
   iv. Bartlett window
7. Write a MATLAB program to
   a. Low pass / High pass / Band pass / Band stop IIR Filter using
      Butterworth Approximation.
   b. Low pass / High pass / Band pass / Band stop IIR Filter using
      Chebyshev Approximation.

Hardware Experiments using Texas Instruments Kit-DSK 6713:
8. Introduction to Code composer Studio.
9. Write a program to generate sine wave and see the output on CRO.
10. Write a Program to display a string on LCD.
11. Write a program to design a Low Pass 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.
### 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.

---

**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 is also. To Know the Network, Transport Functions within 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.

**Mobile Computing Architecture:** Issues in mobile computing, three tier architecture for mobile computing, design consideration, Mobile System, Mobile databases. WAP: Architecture, protocol stack, Data gram protocol, Wireless transaction protocol, application environment, and WAP: Browser.

[T1] [T2] [T3] [No. of Hrs. 12]

### UNIT-II

**Mobile Data Link Layer:** Wireless LAN over view, 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, I RDA, Zigbee, RFID, WiMax.

[T1] [T2] [T3] [No. of Hrs. 11]

### UNIT-III


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

[T1] [T2] [T3] [No. of Hrs. 11]

### UNIT-IV

**Support for Mobility:** Data management and query data base system, U. Prof and Caching, Service discovery, Data management system, application system for mobile computer, adaptive clustering for mobile wireless networks, Mobile devices and File systems, Data Synchronization, Sync ML.


[T1] [T2] [T3] [No. of Hrs. 11]

### 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:
[R5] Charles Perkins, Mobile IP, Addison Wesley
[R6] Charles Perkins, Ad hoc Networks, Addison Wesley

Laboratory section: 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.

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**


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 students 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:
(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:

UNIT III – Global Issues:

UNIT IV - Engineers Responsibilities and Rights and Ethical Codes:
Collegiality and loyalty, Conflict of interests, confidentiality, occupational crimes, professional rights and 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**.
Text Books:
[T1] Professional Ethics, R. Subramanian, Oxford University Press.

References Books:
[R9] PSR, Satya, Indian Culture Values and Professional Ethics”, BS Publications.
[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 along the scheme and syllabus.
Objective: To introduce the students about knowledge of Data Management, Big Data stacks and Data analysis.

UNIT-I

UNIT-II

UNIT-III
MapReduce Fundamentals, Putting map and reduce together, Optimizing MapReduce Tasks: Hadoop, Hadoop Distributed File System (HDFS), Name Nodes, Data nodes, Hadoop MapReduce.

UNIT-IV
Big Data Analytics: Basic analytics, Advanced analytics, Operationalized analytics, Monetizing analytics, Text Analytics and Big Data, Social media analytics.

Integrating Data Sources: Dealing with Real-time Data Streams and Complex Event Processing, Operationalizing Big Data, Applying Big Data with Big Data - Year, Organization, Security and Governance for Big Data Environments.

Text Books:


Reference Books:

OBJECTIVE: To introduce the students to basic knowledge of social network analysis and framework for network analysis.

UNIT-I

UNIT-II

UNIT-III

UNIT-IV

TEXT BOOKS:

REFERENCE BOOKS:

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

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

UNIT-I
Neural Networks:

UNIT-II
Fuzzy Logic:

UNIT-III
Fuzzy Arithmetic:
Uncertainty based Information:
Information & Uncertainty, Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets.

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:
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, genomic databases.


UNIT - II


UNIT - III

Probabilistic models of evolution: phylogenetic trees.

UNIT - IV

Text Books:

References Books:
R1  TK Attwood & DJ Parry-Smith, “Introduction to Bioinformatics”, Pearson Education
R3  A Tramontano, “Introduction to Bioinformatics”, Chapman & Hall/CRC.
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

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 structuring, 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 Command, DataReader, SQL DataAdapter, object to access SQL Server, connect to Ms Access, and Oracle, 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 and saving XML to Database, Transforming XML content using XSLT.

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 ASPTNET 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 Pearson's Publication,

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:


[R2] Imar Spaanjaars, "Beginning ASP.NET 3.5 In C# and VB," Wiley / Wrox publication, 2009


**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 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 of 12.5 marks.

**Objective:** The prerequisite are analog devices, STLD, Digital system design and micro-electronics. The students are introduced 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, characteristics and 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.

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

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

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

**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 and clock distribution.

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

**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.

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

**Text Books:**

**Reference Book:**
R2 Digital Integrated Circuit Design- Ken Martin, Oxford University Press
R3 The MOS Transistor- Yanisliis B. Yi and Chuan. E. Lu, Oxford University Press, 2013
R6 Neelam Sharma, "Digital Logic Design", Ashirwad Publication 2013-14

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.
INFORMATION THEORY AND CODING

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

INSTRUCTIONS TO PAPER SETTERS:

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

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, 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:

R5 J. H. van Lint.. Introduction to Coding Theory, Springer -Verlag.
**HUMAN COMPUTER INTERACTION**

**Paper Code:** ETCS-404  
**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 will be of 12.5 marks.

**Objective:** To introduce the students about the interaction between a computer and human being.

**UNIT I**

**Introduction:** The Human, The Computer, The interaction, Paradigms, Usability of Interactive Systems, Guidelines, Principles and Theories.

**Design Process:** Interaction design basics, HCI in the software process, Design rules, Interface notation support, Evaluation techniques, Universal design, User Support.

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

**UNIT II**

**Models and Theories:** Cognitive models, Socio-organizational issues and stakeholders 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**

**Design Issues:** Quality of Service, Balancing Function and Fashion, User Documentation and Online Help, Information Search, Information Visualization.

**Outside the Box:** Group ware, Ubiquitous computing, Augmented realities, Hypertext, Multimedia and the World Wide Web.

**Text Books:**


**Reference Books:**


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


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 Descriptions, Influence of Image Morphology, Some Basic Morphological Algorithms.

Object Recognition: Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods.

Text Books:


Reference Books:


NEXT GENERATION 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 of 12.5 marks.

Objectives: The objective of the paper is to introduce the students about the advanced and next generation networks and wireless access and transportation technologies.

UNIT I

Converged Services for Next Generation Networks
GSM/UMTS Network protocols: SS7 and Signaling basics, Supplementary Services, UMTS procedures, Intelligent Network: IN principles, CAMEL, Services: what are the challenges?, Integration, deployment issues, Next Generation Networks: IMS: the convergence, NGN architecture, NGN control architectures and protocols, Multi-access to the services: 3G, WiFi, DSL, Cable, TISPAN, SIP. Service architectures, Transition of networks (PSTN, ISDN, etc.) to NGN, Ip-based NGN, MEA/CAC, H.248, P2P systems, P2P SIP. Social networks: Web, NGN convergence, Telco 2.0, IPTV, RCS, UMTS (standardization at 3GPP), Standardization process and principles. ETSI and 3GPP, The NGN (E, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24), NGN (E, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26). Standardization in UMTS, Standardization from Release 99 to Release 9. Latest 3GPP updates: what happened?

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: Mixed integer programming, Traffic engineering, Network topology calculus, Placement, capacity sharing and dimensioning. Fractional 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


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

Geoprocessing: Geographic coordinate 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 and descriptive analysis; discrete data.

Interpolation: Characteristic interpolators; deterministic interpolators; evaluation of interpolators.

Text Books:
Note: There is no single textbook for this course. Suggested Readings:
T3 Heywood, I. et. al., Introduction to Geographic Information System, Pearson Education, Delhi.
SATELLITE COMMUNICATION

Paper Code: ETEC-404
Paper: Satellite Communication

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.

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

UNIT-I


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

UNIT-II
Satellite Link Design: Basic transmission, System noise temperature, G/T ratio, design of down links, uplink design, design of specified C/N, Attenuation due to rain, earth station antennae.

Space Segment: Power Supply, Attitude 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.

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

UNIT-III
Multiple Access Techniques: FDMA, FDMA down link analysis, TDMA, Satellite-switched TDMA, code division multiple access, DAMA, on board signal processing for FDM/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).

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

UNIT-IV

Satellite Applications: Satellite mobile services, DTH TV, R-dar, Digital Audio TV, Satellite navigational system. Direct broadcast satellites (DBS)- Direct to home Broadcast (DTH), Worldspace services, Business TV(BTV)

T1, R2, R3][No. of Hrs. 10]

Text Books:

Reference Books:
R4 Handbook of Satellite Communication, Wiley.
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 networks; 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 protocols; Online commercial environments; digital currencies and payment systems; Offline secure processing; private data networks.

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 providers.


Electronic Payment Systems: Digital payment systems; First virtual internet payment system; Cyber cash model.

Electronic 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, E-cash Trail; Using E-cash; Smart cards, Electronic Data Interchange; Its basics; EDI versus Internet and EDI on Internet.

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.


Customer relationship management: Introduction, What is e-CRM?, e-CRM model, Focus on customer acquisition management, Focus on marketing communications for e-commerce, e-CRM systems, e-CRM retention management focus on excellence in e-commerce service quality, customer extension Analysis and design: Introduction, process modeling, Data modeling, Design for e-business, Focus on user-centered site design, Focus on security design for e-business.

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.
UNIT IV
Introduction to M-commerce: Emerging applications, different players in m-commerce, M-commerce life cycle
Management of mobile commerce services, Content development and distribution to hand-held devices, content
pricing, 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:
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 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.

[1] No. of Hours 12

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.

[1] No. of Hours 10

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.

[2] No. of Hours 11

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

Text Books:

Reference Books:
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 Store, Federated 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, Meta-Data, Administration and management tools, operational vs. information systems, OLAP & DSS support. 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 Warehousing using Oracle, Oracle, 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
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.

GURU GOBIND SINGH
INDRAPRASTHA UNIVERSITY
ADHOC AND SENSOR NETWORKS LAB

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

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:
- openGTS
- GPSTk

Softwares for GIS:
- QGIS
- GRASS GIS
- GeoTools
- 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. Setting 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. Executing 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 the help 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 the use of Standard IP Access List  
19. Managing the use of Extended IP Access List  
20. Overview

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