

SCHEME OF EXAMINATION

And

SYLLABI

For

BACHELOR OF VOCATION

In

(MOBILE COMMUNICATION)

3rd SEMESTER & 4th SEMESTER

Offered by

University School of Engineering and Technology



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

www.ipu.ac.in

NOMENCLATURE OF CODES GIVEN IN THE SCHEME OF B.VOC

1. **ET** stands for Engineering and Technology.
2. **V** stands for Vocation.
3. **MC** stands for Mobile Communication.
4. **SD** stands for Software Development.
5. **AE** stands for Automobile.
6. **CE** stands for Consumer Electronics.
7. **PT** stands for Printing Technology.
8. **CT** stands for Construction Technology.
9. **RA** stands for Refrigeration & Air-Conditioning.
10. **PD** stands for Power Distribution Management.
11. **ID** stands for Interior Design.
12. **AA** stands for Applied Arts.
13. **CS** stands for Computer Science.
14. **MS** stands for Management Studies.
15. **EN** stands for Environmental Engineering
16. **AS** stands for Applied Science.
17. **HS** stands for Humanities and Social Sciences.
18. **SS** stands for Social Services.
19. **L/T** stands for Lecture and Tutorial
20. **P** stands for Practicals.
21. **S/D** stands for Drawing/Studio
22. **P/D** stands for Practical/Drawing



**GURU GOBIND SINGH
INDRAPRASTHA
UNIVERSITY**

**BACHELOR OF VOCATION
(MOBILE COMMUNICATION)
THIRD SEMESTER EXAMINATION
(LEVEL-VI)**

Paper Code	Paper ID	Paper	L	T/P	Credits
THEORY PAPERS					
ETVMC-601		Telecom Infrastructure and Grounding	3	0	3
ETVMC-603		Electromagnetics & Transmission Lines	3	0	3
ETVSD-609		Programming in Java	3	0	3
ETVSD-611		Database Management Systems	3	0	3
ETVSD-613		Data Communication & Networks	3	0	3
OPEN ELECTIVE-III (Select any one)					
ETVMS-613		Organizational Behaviour	3	0	3
ETVMS-615		Operations Research	3	0	3
ETVMS-617		Industrial Management	3	0	3
PRACTICAL/VIVA VOCE					
ETVMC-651		Telecom Infrastructure and grounding Lab	0	3	3
ETVSD-659		Programming in Java Lab	0	3	3
ETVSD-661		Database Management Systems Lab	0	3	3
ETVSD-663		Data Communication & Networks Lab	0	3	3
ETVMC-655		Industrial Training-II	0	2	4
TOTAL			18	14	34

NOTE:

There are five industrial trainings to be carried out by the student(s) in B.Voc course. Industrial Trainings I, III and V will be with weightage of two credits each. These trainings are to be carried out during winter vacations for the duration of two weeks. Industrial Trainings II and IV will be with weightage of four credits each. These trainings are to be carried out during summer vacations for the duration of four to six weeks. These training may be done from industry/Skill Knowledge Providers (SKPs) /Sector Skill Councils (SSCs) / Training Centers/Institutes. Student should submit training report during evaluation. Industrial Training done at the end of the semester will be evaluated in the subsequent semesters.

GURU GOBIND SINGH
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UNIVERSITY

**BACHELOR OF VOCATION
(MOBILE COMMUNICATION)
FOURTH SEMESTER EXAMINATION
(LEVEL-VI)**

Paper Code	Paper ID	Paper	L	T/P	Credits
THEORY PAPERS					
ETVMC-602		Microprocessors and Microcontrollers	3	0	3
ETVMC-604		Mobile Computing	3	0	3
ETVMC-606		Antenna Theory and Wave Propagation	3	0	3
CORE ELECTIVE-I (Select any one)					
ETVSD-614		Operating System Concepts	3	0	3
ETVSD-616		Introduction to Open Source Software	3	0	3
OPEN ELECTIVE-IV (Select any one)					
ETVCT-614		Global Warming & Climate Change	3	0	3
ETVMS-616		Entrepreneurship Development and Planning	3	0	3
ETVMS-618		Business Informatics	3	0	3
PRACTICAL/VIVA VOCE (Select any one Lab based on theory)					
ETVSD-664		Operating System Concepts Lab	0	3	3
ETVSD-660		Introduction to Open Source Software Lab	0	3	3
PRACTICAL/VIVA VOCE					
ETVMC-652		Microprocessors and Microcontrollers Lab	0	3	3
ETVMC-654		Mobile Computing Lab	0	4	4
ETVMC-656		Industrial Training-III	0	0	2
ETVMC-658		Project-II	0	6	3
TOTAL			15	16	30

NOTE:

There are five industrial trainings to be carried out by the student(s) in B.Voc course. Industrial Trainings I, III and V will be with weightage of two credits each. These trainings are to be carried out during winter vacations for the duration of two weeks. Industrial Trainings II and IV will be with weightage of four credits each. These trainings are to be carried out during summer vacations for the duration of four to six weeks. These training may be done from industry/Skill Knowledge Providers (SKPs) /Sector Skill Councils (SSCs) / Training Centers/Institutes. Student should submit training report during evaluation. Industrial Training done at the end of the semester will be evaluated in the subsequent semesters.

NOTE FOR PROJECT:

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.

TELECOM INFRASTRUCTURE AND GROUNDING

Paper Code: ETVMC-601

Paper: Telecom Infrastructure and Grounding

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 and Pre-requisites: The students should have studied the concept of grounding, aware of different type of tools like Allen key, crimping tools etc. Identify different components of telecom support infrastructure and their role. To train a student in the various aspects of grounding of electrical systems. Starting from the basics of grounding itself, the course attempts to develop an understanding of need grounding in various equipment and telecommunications systems

Learning Outcomes and Deliverables: The student should be well verse with different type of BTS, their installation, safety precautions and the concept of grounding.

UNIT – I

Components of telecom support infrastructure: Identification and their role. Identification of various components of BTS, Method of site selection for BTS, Government norms for BTS. Different type of towers. Methods of installation of ground base and roof top tower.

Fire safety and fire protection system. Safety while working on towers and antenna installation, fall protection system, hand and arm protection, fall prevention and anchorage. Personal protection equipment. Safety precaution while working on high voltage, electrical safety parameters, Device sensitive to static, Safety to RF and Microwave radiation, SAR limit, Ionizing & Non- Ionizing radiation, Biological effect caused by RF radiation.

[T3][No. of Hrs 11]

UNIT – II

Introduction to different types of feeder cables used in telecom, optical connectors and components used in Optical Fibre systems, splitters and their applications. Installing NEC Pasolink microwave Transmitter/Receiver, MUX configuring at cell sites, Concept of measuring VSWR using site master. Major subsystems of a power plant; functions of different components of power plant and their function; Valve-Regulated Lead-Acid Batteries, Determination of State of Charge of VRLA Batteries, Battery Monitoring, Do's and Don'ts for VRLA battery. Working and maintenance of UPS, Inverter, PIU.

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

UNIT – III

Grounding: Basics of grounding, Bonding, Static charges and the need for bonding, , Noise in signalling circuits and shielding. Equipment grounding: Shock hazard, grounding of equipment, Operation of protective devices, Touch Potential during ground faults, Induced voltage problem and its mitigation, EMI suppression, Sensing of ground faults, equi-potential bonding.

Ground electrode system: Grounding electrodes and factors affecting their efficacy, Soil resistance, Measurement of soil resistivity, Resistance of a single rod electrode, Current-carrying capacity of an electrode, Use of multiple ground rods in parallel, Measurement of ground resistance of an electrode, Concrete-encased electrodes, Maintenance of grounding system, Chemical electrodes.

[T1] [No. of Hrs. 11]

UNIT-IV

Lightning: Method of lightning protection (Light Arrestor, HRC Fuses), Effect of lightning strike on electrical lines.

Surge protection of electronic equipment: Introduction, Bonding of different ground systems as a means of surge proofing, Principle of surge protection, Achieving graded surge protection, Positioning and selection of lightning/surge arrestor, practical view of surge protection for sensitive equipment.

[T1] [No. of Hrs. 12]

Text Book(s):

- [T1] “Practical Grounding, Bonding, Shielding and Surge Protection”, G Vijayaraghavan, Mark Brown, Malcolm Barnes, 1st edition, 2004, Newnes, Elsevier

Scheme and Syllabi for B. Voc. (Mobile Communication)(2nd year) w. e. f. batch 2016-17, approved in the BOS of USET/USICT held on 19th July, 2016 & AC Sub Committee Meeting of USET/USICT held on 27th July, 2016.

- [T2] Hans Gumhalter, *Power Supply in Telecommunications*, 3rd Edition, Springer-Verlag Berlin Heidelberg, (1995).
- [T3] Fraidoon Mazda, *Telecommunications Engineer's Reference Book*, 2E, Elsevier, (1998)

Reference Book(s):

- [R1] *Electrical Safety: Safety and health for Electrical Trades, Student Manual*, DHHS (NIOSH) Publication, (2009) www.cdc.gov/niosh/docs/2009-113/pdfs/2009-113.pdf
- [R2] White Paper By Wissam Balshe, Power system considerations for cell tower applications: <https://www.cumminspower.com/www/literature/technicalpapers/PT-9019-Cell-Tower-Applications-en.pdf>
- [R3] Political Economy Research Institute (PERI), *Handbook of International Electrical Safety Practices*, (Wiley-Scrivener) [1 ed.], (2010)
- [R4] EETP/BSNL, Telecom Support Infrastructure, course material. (Telecom Infrastructure power plant, battery, ups and earthing, etc.)
- [R5] “Methodology and Technology for Power System Grounding”, Jinliang He, Rong Zeng, Bo Zhang, 2011 edition, Wiley
- [R6] “*Power System Grounding and Transients: An Introduction*”, A.P. Sakis Meliopoulos, 1988 edition, Marcel Dekker Inc.



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ELECTROMAGNETICS & TRANSMISSION LINES**Paper Code: ETVMC-603****L T/P C****Paper: Electromagnetics & Transmission Lines****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 list Maxwell's equations and solve them for specific regular geometries, understand general electromagnetic wave propagation and how the plane wave solution can be used to approximate real situation, describe the boundary conditions for electric and magnetic fields at dielectric interfaces, interpret the effects of lossy and low loss dielectrics upon the propagation of electromagnetic waves, and predict this process in specific applications and solve the performance of specific transmission lines.

UNIT I

Introduction: Vector representation of surface, Physical interpretation of gradient, divergence and curl, Transformation of vectors in different co-ordinate systems, dirac-delta function.

Electrostatics: Electric field due to point-charges, line charges and surface charges, Electrostatic potential, Solution of Laplace and Poisson's equation in one dimension, Electric flux density, Boundary conditions.

[T1, T2][No. of Hrs. 11]**UNIT II**

Magnetostatics: Magnetic Induction and Faraday's Law, Magnetic Flux Density, Magnetic Field Strength H, Ampere, Gauss Law in the Differential Vector Form, Permeability, Energy Stored in a Magnetic Field, Ampere's Law for a Current Element, Volume Distribution of Current, Ampere's Law Force Law, Magnetic Vector Potential.

[T1, T2][No. of Hrs. 11]**UNIT III**

Electromagnetic Waves: Maxwell's Equations: The Equation of Continuity for Time Varying Fields, Inconsistency of Ampere's Law, Displacement current, Maxwell's Equations in differential and integral form, Conditions at a Boundary Surface.

Plane wave equation and its solution in conducting and non-conducting media, Phasor notation, Phase velocity, Group velocity, Depth of penetration, skin depth, Impedance of conducting medium. Polarization, Reflection and refraction of plane waves at plane boundaries, Poynting vectors, and Poynting theorem.

[T1, T2][No. of Hrs. 11]**UNIT IV**

Transmission Lines: Transmission line equations, Characteristic impedance, Distortion-less lines, Input impedance of a lossless line, Open and Short circuited lines, Standing wave and reflection losses, Impedance matching, Loading of lines, Input impedance of transmission lines, RF lines, Relation between reflection coefficient and voltage standing wave ratio (VSWR), Lines of different lengths – $\lambda/2$, $\lambda/4$, $\lambda/8$ lines, Losses in transmission lines.

[T1, T2][No. of Hrs. 12]**Text Book(s):**

[T1] Matthew N. O. Sadiku, "Elements of Electromagnetics", Oxford University Press

[T2] E. C. Jordan, K. G. Balmain, "Electromagnetic Waves & Radiation System", PHI – 2nd Edition

Reference Book(s):

[R1] William H. Hayt, "Engineering Electromagnetics", TMH

[R2] J.D. Kraus, "Electromagnetics", TMH

[R3] David K. Cheng, "Field and Wave Electromagnetic", 2nd Edition, Pearson Education Asia, 2001

Scheme and Syllabi for B. Voc. (Mobile Communication)(2nd year) w. e. f. batch 2016-17, approved in the BOS of USET/USICT held on 19th July, 2016 & AC Sub Committee Meeting of USET/USICT held on 27th July, 2016.

PROGRAMMING IN JAVA

Paper Code: ETVSD-609
Paper: Programming in Java

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 & Pre-requisites: Knowledge of basics of programming- constructs and principles is a prerequisite to this course. Programming through Java is taught in this course to enable secure development of software.

Learning Outcomes: The student after completing the course will be able to:

- Describe the major features of object oriented programming.
- Use Java programming constructs to develop object based programs.
- Use inbuilt library functions to enable exception handling and create threads for efficient use of system resource.

UNIT-I

Concept of Classes and Objects, Encapsulation, Access Control, Inheritance, Polymorphism.

Introduction to Java, Installing Java, JDK Directory Structure, Java Virtual Machine, World Wide Web and Java, Program Structure, Output in Java.

Datatypes and Variables: Primitive Datatypes, Variable Names, Numeric Literals, Character Literals, Java Tokens, String Literals.

Conversions Between datatypes, Arithmetic Operators, logical operators, Control flow.

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

UNIT-II

JAVA Classes, Working with Objects, Packages and Interfaces: Introduction to Packages, Inheritance, Interfaces, Abstract methods and Classes, Calling Methods, Defining Methods, Method Parameters, Method Overriding, Method Overloading, Constructor.

[T1, T2][No of Hrs 11]

UNIT-III

Exception Handling: Exceptions Overview, Declaring Exceptions, Defining and Throwing Exceptions, Errors and Runtime Exceptions, Catching Exceptions, The finally Block, Exception Methods, I/O Exceptions vs. Runtime Exceptions. Creating Threads, Life Cycle of a Thread, Thread Methods, Using Threads, Synchronization of Threads.

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

UNIT-IV

JAVA Applets: Introduction, Applet Examples, java.applet.* Class, The Five Stages of an Applet's Life Cycle, Methods for Adding UI Components, Methods for Drawing and Event Handling.

JAVA AWT: Introduction, Control Classes.

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

Text Book(s):

[T1] E. Balaguruswamy, "Programming with Java", TMH

[T2] Patrick Naughton and Herbertz Schidt, "Java-2 the complete Reference", TMH

Reference Book(s):

[R1] Sierra & Bates, "Head First Java", O'Reilly

[R2] Horstmann, "Computing Concepts with Java 2 Essentials", John Wiley.

[R3] Decker & Hirshfield, "Programming Java", Vikas Publication.

[R4] Programming With Java – John R. Hubbard, 2nd Edition, TMH.

DATABASE MANAGEMENT SYSTEMS**Paper Code: ETVSD-611****Paper: Database Management 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 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: Introduction and application of DBMS, Data Independence, Database System Architecture – levels, Mapping, Database users and DBA, Entity – Relationship model, constraints, keys, Design issues, E-R Diagram, Extended E-R features- Generalization, Specialization, Aggregation, Translating E-R model into Relational model.

[T1, T2][No. of Hrs. 11]**UNIT-II**

Relational Model: The relational Model, The catalog, Types, Keys, Relational Algebra, Fundamental operations, Additional Operations-, SQL fundamentals, DDL,DML,DCL PL/SQL Concepts, Cursors, Stored Procedures, Stored Functions, Database Integrity – Triggers.

[T2, R3][No. of Hrs. 11]**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.

[T2, R1, R3][No. of Hrs. 11]**UNIT-IV**

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

[T1, T2, R2][No. of Hrs. 12]**Text Book(s):**

- [T1] Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, 5th Edition, Tata McGraw Hill, 2006
- [T2] Elmsari and Navathe, “Fundamentals of Database Systems”, 6th Ed., Pearson, 2013

Reference Book(s):

- [R1] C.J.Date, A.Kannan, S.Swamynathan, “An Introduction to Database Systems”, 8th Edition, Pearson Education, 2006.
- [R2] J. D. Ullman, “Principles of Database Systems”, 2nd Ed., Galgotia Publications, 1999.
- [R3] Vipin C. Desai, “An Introduction to Database Systems”, West Publishing Co.,

DATA COMMUNICATION & NETWORKS**Paper Code: ETVSD-613****Paper: Data Communication & Networks**

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 12.5 marks.

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

Data Communications: Components, standards and organizations, Network Classification, Network Topologies; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.

Physical Layer: Cabling, Network Interface Card, Transmission Media Devices- Repeater, Hub, Bridge, Switch, Router, Gateway.

[T1, T2, R1, R4] [No. of Hrs: 11]**UNIT- II**

Data Link Layer: Framing techniques; Error Control; Flow Control Protocols; Shared media protocols - CSMA/CD and CSMA/CA.

[T1, T2, R1][No. of Hrs: 11]**UNIT- III**

Network Layer: Virtual Circuits and Datagram approach, IP addressing methods – Subnetting; Routing Algorithms (adaptive and non-adaptive); Network Layer Protocols: IPV4 and IPV6.

[T1, T2, R1][No. of Hrs: 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 Hrs: 12]**Text Book(s):**

[T1] A. S. Tannenbum, D. Wetherall, “Computer Networks”, Prentice Hall, Pearson, 5th Ed

[T2] Behrouz A. Forouzan, “Data Communications and Networking”, Tata McGraw-Hill, 4th Ed

Reference Book(s):

[R1] Fred Halsall, “Computer Networks”, Addison – Wesley Pub. Co. 1996.

[R2] Larry L, Peterson and Bruce S. Davie, “Computer Networks: A system Approach”, Elsevier, 4th Ed

[R3] Tomasi, “Introduction to Data Communications & Networking”, Pearson 7th impression 2011

[R4] William Stallings, “Data and Computer Communications”, Prentice Hall, Imprint of Pearson, 9th Ed.

[R5] Zheng , “Network for Computer Scientists & Engineers”, Oxford University Press

[R6] Data Communications and Networking: White, Cengage Learning

ORGANIZATIONAL BEHAVIOR
(Open Elective-III)

Paper Code: ETVMS-613
Paper: Organizational Behavior

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 aim of this paper is to provide managerial skills in the students.

UNIT-I

Introduction: Concept and nature of Organizational Behaviour; Contributing disciplines to the field of O.B.; O.B. Models; Need to understand human behaviour; Challenges and Opportunities, Management functions, Tasks and responsibilities of a professional manager; Managerial skills.

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

UNIT-II

Individual & Interpersonal Behaviour: Biographical Characteristics; Ability; Values; Attitudes-Formation, Theories, Organization related attitude, Relationship between attitude and behaviour; Personality – determinants and traits; Emotions; Learning-Theories and reinforcement schedules, Perception –Process and errors.

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

UNIT-III

Organization Structure and Process: Organizational climate and culture, Organizational Structure and Design, Managerial Communication, Motivation, Stress and its management, Decision Making: Organizational Context of Decisions, Decision Making Models; Problem Solving.

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

UNIT-IV

Interactive Aspects of Organizational Behaviour: Interpersonal Behaviour: Johari Window; Transactional Analysis – ego states, types of transactions, life positions, applications of T.A, Group Dynamics; Management of Organizational Conflicts; Leadership Styles.

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

Text Book(s):

- [T1] Luthans Fred., “Organizational Behaviour”, McGraw Hill, 2010, 12th ed.
[T2] Robbins & Judge (15th ed.), “Essentials of Organizational Behaviour”, Pearson 2012.

References Book(s):

- [R1] Stoner, R. James A.F., Edward Freeman Daniel R Gilbert Jr., Management 6TH Ed, PHI
[R2] George, J. M. & Jones, G.R. (2009). Understanding and Managing Organizational Behaviour, 5th Edition, Pearson Education.
[R3] Green Berg, J. and Baron, R.A. (2008), Behaviour in Organization. Prentice Hall of India.
[R4] Mcshane, S.L., Von Glinow, M.A., Sharma, R.R. (2006) Organizational Behaviour. Tata McGrawHill

OPERATIONS RESEARCH
(Open Elective-III)

Paper Code: ETVMS-615
Paper: Operations Research

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 acquaint the student with mathematical techniques being adopted in industry which help managers in decision taking.

UNIT-I

Linear Programming: Formulation of LP Problem. Graphical method, Simplex method for maximization and minimization LP Problems. Duality in Simplex Problems,

Queuing Theory: Introduction to probability concept for queuing problems. Basic structure, Terminology, Classification, Birth and Death Process. Queuing Models.

[T1][No. of Hrs. 11]

UNIT-II

Transportation Models: MODI method for optimality check, North West Corner Method, Least-cost Method and Vogel's Approximation Method (VAM) for solving balanced and unbalanced transportation problems. Problems of degeneracy and maximization.

Assignment Models: Assignment model for maximization & minimization problems. Travelling Salesman Problems, Industrial Problems.

[T2][No. of Hrs. 11]

UNIT-III

Sequencing Theory: Processing of n-jobs through m-machines with each job having same processing order. Processing of two jobs through m-machines with each job having different processing order.

Decision Theory: Decision making under uncertainty and under risk, Multistage decision making, Multi criteria decision making.

[T1][No. of Hrs. 11]

UNIT-IV

Network Models: Introduction to PERT and CPM. Fundamental concept of Network models and construction of network diagrams. Activity time estimates. Critical path and project time duration. Probability of completing the project on or before specified time. Concept of Float and slack.

Game Theory: Two person zero-sum games. Minimax and Maximin principle. Arithmetic, Algebraic, Matrix Algebra method. Solution by Dominance, Subgame, Graphical method, Linear programming method.

[T2][No. of Hrs. 12]

Text Book(s):

- [T1] Hira and Gupta, "Operation Research" S. Chand Publications
[T2] H.A. Taha, "Operations Research", Prentice-Hall India, 6th Edition, 2004.

Reference Book(s):

- [R1] S.Kalavathy, "Operations Research", Vikas Publication, 4th Edition, 2013.
[R2] N.D. Vohra, "Operations Research", Tata McGraw Hill, 2004.
[R3] Richard Bronson, Govindasami Naadimuthu, "Operations Research", Tata McGraw Hill, 2004
[R4] A.P. Verma, "Operations Research", S.K. Kataria & Sons, 2004.
[R5] J.K. Sharma, "Operation Research", Macmillan India Ltd. 2005.

INDUSTRIAL MANAGEMENT
(Open Elective-III)

Paper Code: ETVMS-617
Paper: Industrial Management

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 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. 11]

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. 11]

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. 11]

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. 12]

Text Book(s):

[T1] Sinha, P.R.N., Sinha I.B. and Shekhar S.M.(2013), Industrial Relations, Trade Unions and Labour Legislation. Pearson Education

[T2] Chary, S.N. (2012), Production and Operations Management. Tata McGraw Hill Education.

Reference Book(s):

[R1] Srivastava, S.C. (2012), Industrial Relations and Labour Laws, Vikas Publishing

[R2] Shankar R (2012), Industrial Engineering and Management. Galgotia Publications

[R3] Telsang, M. (2006), Industrial Engineering and Production Management. S.Chand

[R4] Thukaram, Rao (2004), M.E. Industrial Management. Himalaya Publishing House.

TELECOM INFRASTRUCTURE AND GROUNDING LAB

Paper Code: ETVMC-651	L	T/P	C
Paper: Telecom Infrastructure and Grounding Lab	0	3	3

Note:- The required list of Experiments is provided as under. The example cited here are purely indicative and not exhaustive. Attempt shall be made to perform all experiments. However, at least 8 experiments should be done in the semester. More experiments may be designed by the respective institutes as per their choice.

List of Experiments:

1. Demonstration of different basic installation tools.
2. Identification and understanding the use of different optical components.
3. Demonstration of fire detection and use of fire extinguisher.
4. Installation of sector antenna
5. Installation of microwave antenna
6. Methods of feeder cable routing
7. Study of Installation procedure of internal and external grounding board
8. Tower climbing activity and use of safety kit.
9. Measurement of VSWR using site master.
10. To find the distance to fault in feeder cable using site master.
11. To splice the Optical Fibre using Fusion Arc Splicer.
12. To find the cable loss and cable break in optical fibre using OTDR(Optical Time Domain Reflectometer).
13. Study of Valve Regulated Lead Acid battery (VRLA) and take different measurements.
14. Practical study of uninterrupted power supply.
15. Study of Installation procedure of Power Interface Unit.
16. Concept of series and parallel battery bank, Rating and capacity of cells in battery bank and its connection in power plant.
17. Maintenance procedure in battery bank system.
18. Determining height of the GSM and the MW antenna
19. Measurement of Antenna Height using Altimeter.
20. Measurement of Earth Resistivity using Earth Resistance meter.
21. Study of Installation of different types of grounding systems.
22. Study of Installation procedure of surge arrester.

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INDRAPRASTHA
UNIVERSITY**

PROGRAMMING IN JAVA LAB**Paper Code: ETVSD-659****L T/P C****Paper: Programming in Java Lab****0 3 3**

Note:- The required list of Experiments is provided as under. The example cited here are purely indicative and not exhaustive. Attempt shall be made to perform all experiments. However, at least 8 experiments should be done in the semester. More experiments may be designed by the respective institutes as per their choice.

List of Experiments:

1. Program to Create classes and use of different types of functions.
2. Programming using constructor.
3. Program to show different access level in java.
4. Programming using interfaces.
5. Programming creating packages and their use.
6. Programs using function overloading.
7. Programs using inheritance.
8. Programs using IO streams.
9. Programs using exception handling mechanism.
10. Program to illustrate functioning of multiple threads.
11. Programs to create and use the Applet.
12. Programs on swing to create Forms or GUI.



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DATABASE MANAGEMENT SYSTEMS LAB**Paper Code: ETVSD-661****L T/P C****Paper: Database Management Systems Lab****0 3 3**

Note:- The required list of Experiments is provided as under. The example cited here are purely indicative and not exhaustive. Attempt shall be made to perform all experiments. However, at least 8 experiments should be done in the semester. More experiments may be designed by the respective institutes as per their choice.

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 constrains
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:

1. SQL/ PL/SQL, The programming language of Oracle, Ivan Bayross, 4th Edition BPB Publications

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DATA COMMUNICATION & NETWORKS LAB**Paper Code: ETVSD-663****L T/P C****Paper: Data Communication & Networks Lab****0 3 3**

Note:- The required list of Experiments is provided as under. The example cited here are purely indicative and not exhaustive. Attempt shall be made to perform all experiments. However, at least 8 experiments should be done in the semester. More experiments may be designed by the respective institutes as per their choice.

List of Experiments:

1. Identification of Connectors and Cables:
 - a. Connectors: BNC, RJ-45, I/O box
 - b. Cables: Co-axial, twisted pair, Optical fibre.
2. Identification of various networks components
 - a. NIC (network interface card)
 - b. Hub, Switch, Router.
3. Execution of basic networking Commands:
Netstat, IPConfig, IfConfig, Ping, Arp-a, Nbtstat-a, Netdiag, Nslookup, Traceroute, Pathping
4. Design Ethernet Cables: Cross Cable, Straight Cable, Rollover Cable.
5. Demonstration to connect two computers with/without connecting device.
6. Demonstration of File sharing & Printer sharing.
7. Study of various topologies using topology trainer
8. Detailed study of Network and Internet Settings on PC.
9. Trouble shooting of networks & Installation of network device drivers.
10. Study of Router Configuration.
11. Logging into a router, Editing and Help features and Saving Router configuration.
12. Setting the Hostname, Descriptions, IP Address, and Clock Rate on a Router.
13. Introduction to Discrete Event Simulation
Discrete Event Simulation Tools - ns2/ns3, Omnet++
14. Using Free Open Source Software tools for network simulation – I Preliminary usage of the tool ns3
Simulate telnet and ftp between N sources - N sinks (N = 1, 2, 3). Evaluate the effect of increasing data rate on congestion.
15. Using Free Open Source Software tools for network simulation - II
Advanced usage of the tool ns3
Simulating the effect of queuing disciplines on network performance - Random Early Detection/Weighted RED / Adaptive RED (This can be used as a lead up to DiffServ / IntServ later).

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INDUSTRIAL TRAINING-II

Paper Code: ETVMC-655
Paper: Industrial Training-II

L	T/P	C
0	2	4

The student has to undergo six to eight weeks training in-house/ industry/ Skill Knowledge Provider (SKP)/ Sector Skill Council (SSC) during summer vacation and should submit training report for evaluation during the third semester.

The students will submit a comprehensive training report (in a presentable manner, preferably typed and bound) and give a power point presentation for evaluation by the teacher guide, and an external examiner/ expert from the industry.

The industry for training should be related to Telecom, Mobile Communication, Mobile Application development, Mobile Instruments, Telephone Exchange or any other telecom related field.



MICROPROCESSORS AND MICROCONTROLLERS**Paper Code: ETVMC-602****L T/P C****Paper: Microprocessors and Microcontrollers****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 get an overview of microprocessors and microcontrollers.**Pre-requisites: Students should be well aware of digital devices like logic gates, counters and registers etc.**Learning Outcomes: Able to program 8085 and 8051 for basic applications.***UNIT-I****Microcomputer Organization:** Input/ Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map.**8085 Microprocessor Architecture:** Main features of 8085. Block diagram. Pin-out diagram of 8085. Data and address buses. Registers. ALU. Stack memory. Program counter.**[T1, T2][No. of Hrs. 11]****UNIT-II****8085 Programming:** Instruction classification, Instructions set (Data transfer including stacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. Hardware and software interrupts.**[T1, T2][No. of Hrs. 11]****UNIT-III****8051 microcontroller:** Introduction and block diagram of 8051 microcontroller, architecture of 8051, overview of 8051 family, Program Counter and ROM memory map, Data types and directives, Flag bits and Program Status Word (PSW) register, Jump, loop and call instructions.**8051 I/O port programming:** Introduction of I/O port programming, pin out diagram of 8051 microcontroller, I/O port pins description & their functions, I/O port programming in 8051 (using assembly language), I/O programming: Bit manipulation.**[T1, T2, T3][No. of Hrs. 11]****UNIT-IV****8051 Programming:** 8051 addressing modes and accessing memory locations using various addressing modes, assembly language instructions using each addressing mode, arithmetic and logic instructions, 8051 programming in C: for time delay & I/O operations.**[T3][No. of Hrs. 12]****Text Book(s):**

[T1] Ramesh Gaonkar, "MicroProcessor Architecture, Programming and Applications with the 8085", PHI

[T2] Douglas V Hall, "Microprocessors and Interfacing, Programming and Hardware" Tata McGraw Hill, 2006.

[T3] Muhammad Ali Mazidi, "Microprocessors and Microcontrollers", Pearson, 2006

References Books:[R1] Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. MCKinlay "The 8051 Microcontroller and Embedded Systems Using Assembly and C", 2nd Edition, Pearson Education 2008.

[R2] Kenneth J. Ayala, "The 8086 Microprocessor: Programming & Interfacing The PC", Delmar Publishers, 2007.

[R3] A K Ray, K M Bhurchandi, "Advanced Microprocessors and Peripherals", Tata McGraw Hill, 2007.

[R4] 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.

MOBILE COMPUTING**Paper Code: ETVMC-604****Paper: Mobile Computing**

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: 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 – 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.

Mobile Computing Architecture: Issues in mobile computing, three tier architecture for mobile computing, design considerations. WAP: Architecture, protocol stack, Data gram protocol, application environment, and applications.

[T1, T2, T3][No. of Hrs. 11]**UNIT-II**

Mobile Data Link Layer: Motivation for a specialized MAC, Near & far terminals, Multiple access techniques for wireless LANs such as collision avoidance, polling, inhibit sense, spread spectrum, CDMA.

Local Area Wireless systems: ZigBee, RFID and Wi-Max.

[T1, T2, T3][No. of Hrs. 11]**UNIT-III**

MOBILE IP Network Layer: IP and Mobile IP Network Layer- Packet delivery and Handover Management- Location Management- Registration- Tunnelling and Encapsulation-Route Optimization- Dynamic Host Configuration Protocol, Ad Hoc networks, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), VoIP –IPSec.

Mobile Transport Layer: Transport Layer Protocols-Indirect, Snooping, Mobile TCP.

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

Introduction to Wireless Devices and Operating systems: Windows CE, Android, Mobile Agents. Introduction to Mobile application languages and tool kits.

[T1, T2, T3][No. of Hrs. 12]**Text Book(s):**

- [T1] J. Schiller, “Mobile Communications”, 2nd edition, Pearson, 2011.
 [T2] Raj Kamal “Mobile Computing” Oxford Higher Education, Second Edition, 2012.
 [T3] Dharam prakash Agrawal and Qing-An Zeng, “Introduction to Wireless and Mobile Systems” 3rd edition, Cengage learning 2013.

Reference Book(s):

- [R1] Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal “Mobile Computing”, Tata McGraw Hill Pub, Aug – 2010
 [R2] Pei Zheng, Larry L. Peterson, Bruce S. Davie, Adrian Farrell “Wireless Networking Complete” Morgan Kaufmann Series in Networking, 2009 (introduction, WLAN MAC)
 [R3] Vijay K Garg “Wireless Communications & Networking” Morgan Kaufmann Series, 2010

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- [R4] M. V. D. Heijden, M. Taylor, Understanding WAP, Artech House.
[R5] Charles Perkins, Mobile IP, Addison Wesley.
[R6] Charles Perkins, Ad hoc Networks, Addison Wesley.
[R7] Uwe Hansmann, Lothar Merk, Martin S. Nicklous, Thomas Stober, "Principles of Mobile Computing", Springer.
[R8] Evaggelia Pitoura and George Samarus, "Data Management for Mobile Computing", Kluwer Academic Press, 1998



ANTENNA THEORY AND WAVE PROPAGATION**Paper Code: ETVMC-606**

L	T/P	C
3	0	3

Paper: Antenna Theory and Wave Propagation**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 antenna fundamentals, various types of antennas and wave propagation.***UNIT –I****Introduction of Antenna:** Radiation mechanism, single wire, two wire, dipole, current distribution of thin wire antenna.**Fundamental parameters of Antenna:** radiation pattern, isotropic, directional and Omni directional pattern, principal patterns, radiation patterns lobes, field regions, radian and steradian, Radiation power density, radiation intensity, directivity, gain, antenna efficiency, half power beam width, beam efficiency, bandwidth efficiency, input impedance, antenna radiation efficiency, antenna aperture, effective height.**[T1, T2][No. of Hrs. 11]****UNIT-II**

Vector potential for an electric and magnetic current source, electric and magnetic fields for electric and magnetic current source, far field radiation, Duality theorem, reciprocity theorem.

Linear wire Antenna: infinitesimal dipole, radiation field (with derivation), directivity, near field, intermediate field, far field, power density, small/short dipole, half wavelength dipole, folded dipole.**Antenna Array:** Two element arrays, N-element linear array, broadside array, ordinary end fire array, phased array.**[T1, T2, R1, R2]No. of Hrs. 11]****UNIT-III****Types of Antenna:** Introduction.**Travelling wave Antenna:** Long wire, V antenna, Rhombic antenna.**Broadband Antenna:** Helical antenna, Yagi-Uda antenna.**Frequency independent Antenna:** Log periodic antenna.

Introduction of Micro strip patch antenna (MPA), basic characteristics, feeding method, micro strip rectangular patch antenna and its design using transmission line model, smart antennas.

[T1, T2, R1, R2] [No. of Hrs. 11]**UNIT-IV****Wave propagation:** Ground wave, sky wave, space wave, ionosphere, reflection and refraction by ionosphere, critical frequency, virtual height, MUF (max. usable frequency), skip distance, troposphere and duct propagation.**Antenna measurements:** Measurement of reflection coefficient and radiation pattern, Introduction of Anechoic chamber and Vector Network Analyzer.**[T1, R2][No. of Hrs. 12]****Text Book(s)**

- [T1] Edward Conrad Jordan, Keith George Balmain, Electromagnetic waves and radiating systems, Prentice Hall, 1968
- [T2] J.D. Kraus, R.J. Marhefka and Ahmad S. Khan, "Antennas and Wave Propagation" Tata McGraw Hill Publications, New Delhi, 4th ed., (Special Indian Edition), 2010.
- [T2] Constantine A. Balanis, "Antenna Theory Analysis and Design", 3rd Edition, Wiley Publications.

Reference Book(s)

- [R1] S. Das and A. Das, "Antennas and Wave Propagation", Tata McGraw Hill publications.
- [R2] A.R. Harish and M. Sachidananda, "Antenna and wave Propagation", Oxford Publications.
- [R3] G.S.N. Raju, Antenna Wave Propagation, Pearson Education, 2004

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OPERATING SYSTEM CONCEPTS
(Core Elective-I)

Paper Code: ETVSD-614
Paper: Operating System Concepts

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 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, file systems and shell programming.*

UNIT-I

Introduction: What is an Operating System, Simple Batch Systems, Multi-programmed Batches systems, Time-Sharing Systems, Personal-computer systems, Parallel systems, Distributed Systems, Real-Time Systems, OS – A Resource Manager.

Memory Management: Memory Organization, Memory Hierarchy, Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory.

[T1, T2, R2][No. of Hrs. 11]

UNIT-II

Processes: Introduction, Process states, process management, Interrupts, Inter-process Communication.

Threads: Introduction, Thread states, Thread Operation, Threading Models.

Processor Scheduling: Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies.

Process Synchronization: Mutual exclusion, software solution to Mutual exclusion problem, hardware solution to Mutual exclusion problem, semaphores.

[T1, T2, R3][No. of Hrs. 11]

UNIT-III

Device Management: Disk Scheduling Strategies, Rotational Optimization, System Consideration, Caching, Buffering and spooling.

File System: Introduction, File Organization, Logical File System, Physical File System, File Allocation strategy, Free Space Management, File Access Control, Data Access Techniques, Data Integrity Protection, Case study on file system viz. FAT32, NTFS.

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

UNIT-IV

Shell Introduction and Shell Scripting: What is shell and various type of shell, Various editors present in Linux, Different modes of operation in vi editor, What is shell script, Writing and executing the shell script, Shell variable (user defined and system variables), System calls, Using system calls, Decision making in Shell Scripts (If else, switch), Loops in shell.

[T1, T2, R4][No. of Hrs. 12]

Text Book(s):

[T1] Deitel & Dietel, "Operating System", Pearson, 3rd Ed., 2011

[T2] Silberschatz and Galvin, "Operating System Concepts", Pearson, 5th Ed., 2001

Reference Book(s):

[R1] Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000

[R2] Godbole, "Operating Systems", Tata McGraw Hill, 3rd edition, 2014

[R3] Chauhan, "Principles of Operating Systems", Oxford Uni. Press, 2014

[R4] Dhamdhare, "Operating Systems", Tata McGraw Hill, 3rd edition, 2012

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INTRODUCTION TO OPEN SOURCE SOFTWARE
(Core Elective-I)

Paper Code: ETVSD-616

Paper: Introduction to Open Source Software

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 make the students familiar with the Open Source software. This course focuses on the various common and mostly used free software and languages.*

By the end of this course the students shall be able to understand OSS, use and operate free operating systems, learn programming in Python.

UNIT-I

Introduction: The philosophy of OSS, Applications, usage, FLOSS vs FOSS, commercial software vs OSS, free software vs freeware. Open source development models. Examples of open source projects and software, selecting the right OSS software, OSS Web Design Template, Pros and cons of Open Source Solutions.

History: Free Software Movement, BSD, The Free Software Foundation and the GNU Project, Commercial aspects of Open Source movement. Certification courses issues - global and Indian.

[R1, R2, R4, R6][No. of Hrs. 11]

UNIT-II

Community Building: Importance of Communities in Open Source Movement. JBoss Community. Developing blog, group, forum, social network for social purpose.

[R5, R7][No. of Hrs. 11]

UNIT-III

Open Source Operating Systems: LINUX: Introduction, General Overview, Kernel mode and User mode process. The Shell Basic Commands, Shell Programming: Shell Variables, Branching Control, Structures, Loop-Control Structure, Continue and break Statements, Sleep Command, Debugging Script.

Linux Advanced Concepts: Scheduling, Time Accounting, Personalities, Cloning and Backup your Linux System, Linux Signals, Development with Linux.

Linux Networking: Configuration Files, Red Hat Linux network GUI configuration tools, assigning an IP address, Subnets, Route, Tunneling, Useful Linux network commands, Enable Forwarding.

[T1, R2][No. of Hrs. 11]

UNIT-IV

Basic features of Python: Overview, Installing, Running in windows/Linux.

Variables and Strings: Data types, Operators, Decision Control, Conditional Statements, Loops, Example Programs.

Sequences: Lists: Introduction, Fixed size lists and arrays, Lists and Loops, Assignment and references, Identity and equality, Sorted lists, Tuples: Tuples and string formatting, String functions. Sets: Unordered Collections, Simple programs Dictionaries, File Handling, Exception, Handling exception. Dictionaries: Introduction, combining two dictionaries with UPDATE, Making copies, Persistent variables, Internal dictionaries.

Functions and Files: Functions, File Handling, Exception, Handling Exception. Python v2.7 vs Python v3.x.
[T2, R3, R8][No. of Hrs. 12]

Text Books:

[T1] Neil Matthew and Richard Stones “Beginning Linux Programming, 4th Ed”, John Wiley & Sons.

[T2] How to Think Like a Computer Scientist: Learning with Python, Allen Downey, Jeffrey Elkner, Chris Meyers, Dreamtech Press, 2015.

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Reference Books:

- [R1] https://tavaana.org/sites/default/files/introduction_to_opensource.pdf
- [R2] The Linux Kernel Book, Rem Card, Eric Dumas and Frank Mevel, Wiley Publications sons, 2003
- [R3] Learning to Program Using Python, by Cody Jackson (e-book)
- [R4] http://www.gov.pe.ca/photos/original/IPEI_ebiz_oss.pdf
- [R5] http://www.providersedge.com/docs/km_articles/An_Introduction_to_Online_Communities.pdf
- [R6] http://www.ijcim.th.org/past_editions/2005V13N1/IJCIM-V131-pp7.pdf
- [R7] JBoss Application Server Official Documentation webpage.
- [R8] Introduction To Computation And Programming Using Python, John V Guttag, PHI (2014).



GLOBAL WARMING & CLIMATE CHANGE
(Open Elective-IV)

Paper Code: ETVCT-614

Paper: Global Warming & Climate Change

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 12.5 marks.

Objectives & Pre-requisites: To study concepts of global warming & climatic change. To study factors responsible for global warming, impact of climatic change, national and international policies. To study and understand Kyoto mechanism. Basic knowledge of environmental studies subject is a pre requisite.

Learning outcomes: Understanding of philosophy of global warming and climatic change. Able to realize the factors responsible for global warming and corresponding climatic change. Understanding the importance and nuances of Kyoto mechanism.

UNIT-I

The Climate system: Sun, Atmosphere, Ocean, Ice and energy balance of the earth, history of climate change, human-caused climate change, impacts of climate change on human well-being and the natural world.

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

UNIT-II

Key concepts of global warming, climate change, greenhouse gas effect, Interrelationship between these three phenomenon, Green-House Effect as a Natural Phenomenon and increase in Greenhouse gas effect because of anthropogenic activities, Green House Gases (GHGs) and their Emission Sources, Global Warming Potential (GWP) of GHGs, Past Present and Future trends of global warming.

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

UNIT-III

Impacts of climate change Extreme weather events, Temperature Rise, Sea Level rise, Coastal Erosion and landslides; future impacts of global warming, global warming and the hydrological cycle, climate change impact on ecosystems and agriculture.

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

UNIT-IV

Possible remedies of global warming- various mitigation and adaptation measures taken/ proposed to combat global warming; National and International policies to combat global warming and climate change-UNFCC-Kyoto Protocol, Paris agreement its role in Climate Change; IPCC- its role in global climate protection Role of countries and citizens in containing Global Warming.

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

Text Books

- [T1] Current trends in Global Environment by A.L. Bhatia (2005) Energy Sources
 [T2] Global Warming – A Very Short Introduction, Mark Maslin, oxford.
 [T3] UNFCC & IPCC reports (www.unfccc.int & <http://www.ipcc.ch/>)

Reference Books

- [R1] Global Warming The Complete Briefing - John T Houghton Cambridge press
 [R2] Climate Change: A Multidisciplinary Approach, by William James Burroughs, Cambridge press
 [R3] Contemporary climatology-Robinson, Taylor and Francis group

NOTE: Seminars/ discussions should be carried out on issues pertaining to global warming and climate change among the students.

ENTREPRENEURSHIP DEVELOPMENT AND PLANNING
(Open Elective-IV)

Paper Code: ETVMS-616

Paper: Entrepreneurship Development and Planning

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:** The Course Aims at Instituting Entrepreneurship Skills in the Students by giving an overview of the process of entrepreneurship. The Course aims at inculcating entrepreneurial spirit among the students.*

UNIT-I

Foundations of Entrepreneurship: What is an Entrepreneur? The benefits of Entrepreneurship. The power of small business. Class exercise- case discussion on entrepreneurs like - Dhirubhai Ambani, Karsenbhai Patel, Ramesh Babu, Kailash Katkar, Patricia Narayan etc.

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

UNIT-II

Launching Entrepreneurial Ventures: Creativity and innovation. Methods to initiate ventures. Legal challenges in Entrepreneurship ventures. The search for Entrepreneurial capital. Class exercise- Survey your locality and come up with at least one entrepreneurial venture. Discuss in class about ways to enhance the business in most innovative manner.

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

UNIT-III

Formulation of the Entrepreneurial Plan: The assessment functions with opportunities. The marketing Aspects of new ventures. Business plan preparation for new ventures. Class Exercise- Building your own Business Plan.

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

UNIT-IV

Institutions Supporting Small Business Enterprises: Central level institutions. State level institutions. Other agencies. Industry Associations. Class exercise- discussions on current government schemes supporting entrepreneurship and finding out which scheme will most suit the business plan devised by the student.

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

Text Books

[T1] Kuratko, D.F. & Rao T.V. (2012). Entrepreneurship: A South Asian Perspective. Cengage

[T2] Charantimath, P. (2009). Entrepreneurship Development: Small Business Enterprises. Pearson

References Books

[R1] Naggendra S.and Manjunath V.S. (2009). Entrepreneurship and Management. Pearson

BUSINESS INFORMATICS
(Open Elective-IV)

Paper Code: ETVMS-618
Paper: Business Informatics

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 and pre-requisite: The objective of this paper is to provide understanding of business processes and managing these processes through improved information management and better use of business intelligence systems

Learning Outcomes: After this course the student is expected to understand how the information in the organizations can be handled effectively using various information types of information systems

UNIT-I

Foundations of Information Systems in Business: Data, Information and Knowledge, Information system and its components, Uses of IS in Business, Types of Information systems, Using Information Systems for competitive advantage, Porter's competitive forces model

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

UNIT-II

Functional Business Systems: Overview of system analysis and design; Role of Information systems in marketing, Human Resource Management, Accounting and Finance, manufacturing.

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

UNIT-III

Enterprise Business Systems: Customer Relationship Management -Benefits and Challenges of CRM, Trends in CRM; Supply Chain Management-Benefits and Challenges of SCM, Trends in SCM; Enterprise Resource Planning-Benefits and Challenges of ERP, Causes of ERP failures, Trends in ERP; e-Commerce-Categories of e-commerce, Essential e-Commerce processes, Electronic payment processes

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

UNIT-IV

Decision Support in Business: Management Information Systems, Decision Support Systems, Online Analytical Processing, Executive Information Systems, Knowledge Management Systems, Expert Systems

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

Text Book(s):

- [T1] James A O'Brien, George M Marakas and Ramesh Behl (2013). Management Information Systems, Tenth Edition, Tata McGraw Hill Education, New Delhi.
- [T2] Ken Laudon and Jane Laudon (2014). Management Information Systems, Twelfth Edition, Pearson, New Delhi.

Reference Book(s):

- [R1] D.P.Goyal (2014). Management Information Systems-Managerial Perspectives, Fourth Edition, Vikas Publishing House, New Delhi.
- [R2] Waman S Jawadekar(2009). Management Information Systems. Fourth Edition, Tata McGraw Hill, New Delhi

INTRODUCTION TO OPEN SOURCE SOFTWARE LAB**Paper Code: ETVSD -660****L T/P C****Paper: Introduction to Open Source Software Lab****0 3 3**

Note:- The required list of Experiments is provided as under. The example cited here are purely indicative and not exhaustive. Attempt shall be made to perform all experiments. However, at least 8 experiments should be done in the semester. More experiments may be designed by the respective institutes as per their choice.

List of Experiments:**Part A**

1. Installation of Linux, and Customization of Linux.
2. To Study basic & User status UNIX/ Linux Commands.
3. To Study & use commands for performing arithmetic operations with Unix/Linux.
4. Creating a Text file in Linux. Writing and appending in that file.
5. Study & use of the Command for changing file permissions.
6. Execute shell commands through vi editor.
7. To use control statements in shell programming.
8. To assign and use IP addresses in Linux.

Part B

9. Installation of python and its related libraries.
10. write programs in python which:
 - a. Obtain program user input for integer, floating point and string variables.
 - b. Carry out different actions using if, elif and else blocks.
 - c. Test, compare and operate on numbers and strings.
 - d. Combine tests using Boolean operators: and, or and not.
 - e. Read and write simple number and string objects from and to text files.
 - f. Combine any of the above operations.
11. Write and execute a program in python involving the use of tuples and lists to assign and hold multiple values.
12. Write and execute a program in python involving the use of slices to obtain parts of lists and to manipulate lists.
13. Write and execute a program in python involving the use of range() to generate lists containing sequences of integers.
14. Write and execute a program in python involving the use of for loops to iterate through predefined lists of objects.
15. Write and execute a program in python involving the use of try-except statements for exception handling.
16. Write and execute a program in python for creating a GUI dialog box which can store the user information in a text file.

OPERATING SYSTEM CONCEPTS LAB**Paper Code: ETVSD-664****Paper: Operating System Concepts Lab**

L	T/P	C
0	3	3

Note:- The required list of Experiments is provided as under. The example cited here are purely indicative and not exhaustive. Attempt shall be made to perform all experiments. However, at least 8 experiments should be done in the semester. More experiments may be designed by the respective institutes as per their choice.

List of Experiments:

Following exercises can be performed using Linux or Unix.

1. Study of hardware and software requirements of different operating systems (UNIX, LINUX, WINDOWS XP, WINDOWS 7/8).
2. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.
3. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.
4. Usage of following commands: chmod, grep, tput (clear, highlight), bc.
5. Write a shell script to check if the number entered at the command line is prime or not.
6. Write a shell script to modify “cal” command to display calendars of the specified months.
7. Write a shell script to modify “cal” command to display calendars of the specified range of months.
8. Write a shell script to accept a login name. If not a valid login name display message – “Entered login name is invalid”.
9. Write a shell script to display date in the mm/dd/yy format.
10. Write a shell script to display on the screen sorted output of “who” command along with the total number of users.
11. Write a shell script to display the multiplication table any number.
12. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.
13. Write a shell script to find the sum of digits of a given number.
14. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.
15. Write a shell script to find the LCD (least common divisor) of two numbers.
16. Write a shell script to perform the tasks of basic calculator.
17. Write a shell script to find the power of a given number.
18. Write a shell script to find the factorial of a given number.
19. Write a shell script to check whether the number is Armstrong or not.
20. Write a shell script to check whether the file have all the permissions or not.
21. Program to show the pyramid of special character “*”.

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MICROPROCESSORS AND MICROCONTROLLERS LAB

Paper Code: ETVMC-652	L	T/P	C
Paper: Microprocessors and Microcontrollers Lab	0	3	3

Note:- The required list of Experiments is provided as under. The example cited here are purely indicative and not exhaustive. Attempt shall be made to perform all experiments. However, at least 8 experiments should be done in the semester. More experiments may be designed by the respective institutes as per their choice.

List of Experiments:

At least 05 experiments each from Section-A and Section-B

Section-A: Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).

Section-B: Experiments using 8051 microcontroller:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's.
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left.
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.

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MOBILE COMPUTING LAB

Paper Code: ETVMC-654
Paper: Mobile Computing Lab

L	T/P	C
0	4	4

Note:- The required list of Experiments is provided as under. The example cited here are purely indicative and not exhaustive. Attempt shall be made to perform all experiments. However, at least 8 experiments should be done in the semester. More experiments may be designed by the respective institutes as per their choice.

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.

Text Book(s):

[T1] The Busy Coder's Guide to Android Development, by Mark Murphy

Reference Book(s):

[R1] Donn Felker, "Android Application Development for Dummies", Wiley, 2010

[R2] Reto Meier, "Professional Android 2 Application Development", Wrox's Prog. To Programmer Series.

[R3] Ed Burnette, 'Hello, Android: Introducing Google's Mobile Development Platform' third edition' Pragmatic Programmers, 2012

[R4] Jerome (J.F) DiMarzio "Android A programmer's Guide" Tata McGraw-Hill 2010 Edition.

[R5] Reza B'Far, "Mobile computing principles: Designing and Developing Mobile Applications with UML and XML", Cambridge University press, 2005.

[R6] R.Riggs, A. Taivalsaari, M.VandenBrink, "Programming Wireless Devices with Java2 Platform, Micro Edition", ISBN: 0-201-74627-1, Addison Wesley., 2001.

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PROJECT-II**Paper Code: ETVMC-658****L T/P C****Paper: Project-II****0 6 3**

The student has to 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.

Project means, for solving live problems faced by telecom industries, or developing an application or hardware prototype, by applying the knowledge and skills obtained through the vocational course in the relevant field.

The students will submit a project report in a presentable manner (printed copy) and give a power point presentation for evaluation by the teacher guide, and an external examiner/ expert from the industry.

