# B.E. GEOINFORMATICS

## I & II SEMESTERS CURRICULUM AND SYLLABI

### SEMESTER - I

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AIM:

To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

OBJECTIVES:

- To enable students improve their vocabulary and employ the words appropriately in different academic and professional contexts.
- To make students comprehend classroom lectures and technically oriented passages.
- To enable students develop suitable reading strategies that could be adopted while reading science related texts.
- To enable students acquire the ability to speak effectively in English in real life situations and work-related situations.
- To train students in academic and professional writing.

UNIT I 9+3
Vocabulary - using words in context - use of suffixes to form nouns from verbs and adjectives – adjectives, adverbs - matching words with meanings – Active and passive voices – tenses - simple present, present continuous - comparative adjectives – adverbial forms - Reading text: skimming for general information - specific details - note making - cloze reading – Listening and transferring of information from text to graphic forms - bar charts, flow-charts - Paragraph writing - descriptions using descriptive words and phrases - organising information - Role play - conversational techniques – discussions - oral reporting.

UNIT II 9+3
Vocabulary items - words with prefixes (“multi-“, “under-“) - Asking and answering questions, error correction - spelling and punctuation - Reading Comprehension - scanning for information – inferring meaning from context - Listening and guided note-taking - paragraph writing - using notes – giving suitable headings / subheadings for paragraphs – Comparing and contrasting using expressions of comparison - Discussion using creative ideas

UNIT III 9+3
Compound nouns - negative prefixes – antonyms – Use of modal verbs – making sentences using phrases – tenses – simple past and present perfect - Reading and guessing meanings in context - Listening and note taking - Channel conversion from text to chart - Writing comparisons - making recommendations - coherence using discourse markers - Discussion - role-play (explaining and convincing)

UNIT IV 9+3
Expanding nominal compounds – words with multiple meanings – Error correction - prepositions - use of the prefix “trans-“ - compound adjectives - modal verbs to express probability - simple past and present prefect - Reading – prediction of content - understanding advertisements - scanning the text and comprehension check - Listening
UNIT V
Formation of nouns, verbs and adjectives from root words – some useful phrases and expressions - cloze exercises - 'If' conditional clauses – gerunds (verbal nouns) - Reading for comprehension - intensive reading - Accuracy in listening – listening to discussion on specific issues - Group discussion - role-play (stating, discussing problems and proposing solutions) - Planning a tour - Writing an itinerary - Writing formal letters - letter to the editor

LECTURE – 45  TUTORIAL – 15  TOTAL – 60 PERIODS

TEXTBOOKS

REFERENCES
3. Website: www.uefap.co.uk

MA 9111 MATHEMATICS – I 
(Common to all branches of B.E. / B.Tech. Programmes) 3 1 0 4

AIM:
To make available the basic concepts of engineering mathematics, to prepare the student for new concepts to be introduced in the subsequent semesters and to provide the necessary mathematical skills that are needed in modeling physical processes by an engineer.

OBJECTIVES:
- To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
- To make the student knowledgeable in the area of infinite series and their convergence so that he/ she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling
- To familiarize the student with functions of several variables which is needed in many branches of engineering
- To introduce the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage
UNIT I  MATRICES  9+3
Characteristic equation – Eigenvalues and Eigenvectors of a real matrix – Properties of
eigenvalues and eigenvectors – Cayley-Hamilton Theorem – Diagonalization of
matrices – Reduction of a quadratic form to canonical form by orthogonal transformation
– Nature of quadratic forms.

UNIT II  INFINITE SERIES  9+3
Sequences – Convergence of series – General properties – Series of positive terms –
Tests of convergence (Comparison test, Integral test, Comparison of ratios and
D’Alembert’s ratio test) – Alternating series – Series of positive and negative terms –
Absolute and conditional convergence – Power Series – Convergence of exponential,
logarithmic and Binomial Series.

UNIT III  FUNCTIONS OF SEVERAL VARIABLES  9+3
Limit and Continuity – Partial derivatives – Homogeneous functions and Euler’s theorem
– Total derivative – Differentiation of implicit functions – Change of variables – Jacobians
– Partial differentiation of implicit functions – Taylor’s series for functions of two variables
– Errors and approximations – Maxima and minima of functions of two variables –
Lagrange’s method of undetermined multipliers.

UNIT IV  IMPROPER INTEGRALS  9+3
Improper integrals of the first and second kind and their convergence – Evaluation of
integrals involving a parameter by Leibnitz rule – Beta and Gamma functions –

UNIT V  MULTIPLE INTEGRALS  9+3
Double integrals – Change of order of integration – Double integrals in polar coordinates
– Area enclosed by plane curves – Triple integrals – Volume of Solids – Change of
variables in double and triple integrals – Area of a curved surface.

L: 45, T: 15, TOTAL : 60 PERIODS

TEXT BOOKS
   Delhi (2007).
   Delhi (2007).

REFERENCES
OBJECTIVE:
To introduce the basic physics concepts relevant to different branches of Engineering and Technology

UNIT I PROPERTIES OF MATTER

UNIT II ACOUSTICS AND ULTRASONICS

UNIT III THERMAL PHYSICS

UNIT IV APPLIED OPTICS

UNIT V SOLID STATE PHYSICS
Nature of bonding – growth of single crystals (qualitative) - crystal systems - crystal planes and directions – expressions for interplanar distance – coordination number and packing factor for simple structures: SC, BCC, FCC and HCP – structure and significance of NaCl, ZnS, diamond and graphite – crystal imperfections: point defects, dislocations and stacking faults.

TOTAL : 45 PERIODS
TEXT BOOKS:

REFERENCES:

CY9111 ENGINEERING CHEMISTRY L T P C
(Common to all branches of Engineering and Technology) 3 0 0 3

AIM:
To gain a sound knowledge of thermodynamics, phase rule, surface chemistry and
catalysis, basic organic reaction mechanisms and principles and applications of
spectroscopy and nanochemistry.

OBJECTIVES:
To make the student conversant with the
- Applications of second law of thermodynamics.
- Phase rule and various types of alloys
- Surface chemistry and its importance in adsorption and catalysis.
- Basic principles in organic reaction mechanisms and principles and applications
  of spectroscopy
- Nanochemistry and its applications

UNIT I THERMODYNAMICS 9
Statement of second law of thermodynamics – Clausius and Kelvin – definition of
entropy – entropy change for a reversible process – entropy change for flow of heat in
an irreversible process – entropy change for an isothermal expansion of an ideal gas –
problems – entropy of phase transitions- problems – definition of free energy and work
function – Gibbs Helmholtz equation – applications – problems – derivation of Maxwell
relations – van’t Hoff isotherm and isochore – applications – problems – chemical
potential – variation of chemical potential with temperature and pressure - significance.

UNIT II PHASE RULE 9
Phase rule – statements and explanation of the terms involved – condensed phase rule
– construction of phase diagram – water system – sulphur system – phase rule for two
component alloy systems- thermal analysis – eutectic system - Lead-Silver system –
simple eutectic formation – Zinc-Magnesium alloy system – Iron-Carbon alloy system-
solved examples.
UNIT III SURFACE CHEMISTRY AND CATALYSIS

UNIT IV ORGANIC REACTIONS AND SPECTROSCOPY

UNIT V NANOCHEMISTRY

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES

GE 9111 ENGINEERING GRAPHICS L T P C
(Common to All branches of B.E. / B.Tech. Programmes) 2 0 3 4

OBJECTIVES:
To develop in students the graphic skills that would enable them to communicate the concepts, ideas and design of engineering products
To provide an exposure to the national/international standards related to technical drawings
INTRODUCTION
Importance of graphics in engineering applications – use of drafting instruments – BIS specifications and conventions – size, layout and folding of drawing sheets – lettering and dimensioning

UNIT I FREE HAND SKETCHING OF ENGG OBJECTS AND CONSTRUCTION OF PLANE CURVE 3+9=12
Pictorial representation of engineering objects – representation of three dimensional objects in two dimensional media – need for multiple views – developing visualization skills through free hand sketching of three dimensional objects.

Polygons & curves used in engineering practice– methods of construction– construction of ellipse, parabola and hyperbola by eccentricity method – Cycloidal and involute curves- construction - drawing of tangents to the above curves.

UNIT II ORTHOGRAPHIC PROJECTION: PROJECTION OF POINTS, LINES AND PLANE SURFACES 6+9=15
General principles of orthographic projection – first angle projection – layout of views – projections of points, straight lines located in the first quadrant – determination of true lengths of lines and their inclinations to the planes of projection – traces – projection of polygonal surfaces and circular lamina inclined to both the planes of projection

UNIT-III ORTHOGRAPHIC PROJECTION: PROJECTION OF SOLIDS AND SECTIONS OF SOLIDS 6+9=15
Projection of simple solids like prism, pyramid, cylinder and cone when the axis is inclined to one plane of projection –change of position & auxiliary projection method-sectioning of above solids in simple vertical positions by cutting plane inclined to one reference plane and perpendicular to the other and above solids in inclined position with cutting planes parallel to one reference plane – true shapes of sections

UNIT IV DEVELOPMENT OF SURFACES AND INTERSECTION OF SOLIDS 6+9=15
Need for development of surfaces – development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cones – development of lateral surfaces of the above solids with square and circular cutouts perpendicular to their axes. Intersection of solids and curves of intersection –prism with cylinder, cylinder & cylinder, cone & cylinder with normal intersection of axes and with no offset.

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS 4+9=13
Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones – principles of perspective projections – projection of prisms, pyramids and cylinders by visual ray and vanishing point methods.

COMPUTER AIDED DRAFTING (DEMONSTRATION ONLY) 3
Introduction to computer aided drafting software packages and demonstration of their use.

L=30   P=45 TOTAL: 75 PERIODS
TEXT BOOKS


REFERENCES


Codes from Bureau of Indian Standards

2. IS 9609 (Parts 0 & 1) -2001: Technical Products Documentation – Lettering
4. IS 11669-1986 & SP 46-2003: Dimensioning of Technical Drawings
   IS 15021(Parts 1 to 4)-2001: Technical Drawings-Projection Methods

Special points applicable to University Examinations on Engineering Graphics:

1. There will be five questions one from each unit covering all units of the syllabus
2. All questions will carry equal marks of 20 each making a total of 100
3. Answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solutions within A3 size
4. The examination will be conducted in appropriate sessions on the same day

GE 9112 FUNDAMENTALS OF COMPUTING
(Common to all branches of B.E / B.Tech. Programmes) 3 0 0 3

AIM:
To introduce the basics of computing and the fundamentals of C programming.

OBJECTIVES:

- To introduce the fundamentals of computing systems.
- To introduce the concepts of internet and WWW.
- To teach programming in C.
UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V
Pointers – Dynamic memory allocation – linked list - Applications

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES

PH 9112
PHYSICS LABORATORY
(Common to ALL Branches of B.E. / B.Tech. Programmes)
L T P C
0 0 2 1

1. Torsional Pendulum- Determination of rigidity modulus of wire and moment of Inertia of disc.
2. Non-uniform bending - Determination of Young’s modulus.
3. Lees’ disc- Determination of thermal conductivity of a bad conductor.
4. Potentiometer - Determination of thermo e.m.f of thermocouple
5. Air wedge- Determination of thickness of a thin sheet of paper.
6. i. Optical fibre - Determination of Numerical Aperture and
i. Compact disc - Determination of width of the groove using laser.
7. Acoustic grating - Determination of velocity of ultrasonic waves in liquids.
8. Post office box - Determination of Band gap
9. Spectrometer - Determination of wavelength using grating
10. Viscosity of liquid- Determination of co-efficient of viscosity of a liquid by Poiseuille’s flow.

TOTAL: 30 PERIODS

I. WEIGHING AND PREPARATION OF STANDARD SOLUTIONS
   i) Preparation of molar and normal solutions of the following substances oxalic acid, sodium carbonate, sodium hydroxide, and hydrochloric acid.
   ii) Preparation of buffer solutions: borate buffer, phosphate buffer using Henderson equation.

2. WATER ANALYSIS
   i) Determination of total hardness, temporary & permanent hardness of water by EDTA method.
   ii) Determination of DO content by Winkler’s method.
   iii) Determination of alkalinity in a water sample.
   iii) Determination of chloride content of water sample by argentometric method.

3. PH-METRY
   To find out the strength of given hydrochloric acid by sodium hydroxide.

4. CONDUCTOMETRY
   i) Conductometric titration of mixture of acids
   ii) Conductometric precipitation titration using BaCl₂- Na₂SO₄

5. POTENCIOMETRY
   i) Redox titration – Iron Vs. dichromate

6. SPECTROPHOTOMETRY
   i) To determine \( \lambda \) max of a colored solution such as potassium permanganate.
   ii) To determine the iron content of an unknown solution (1,10- phenanthroline/thiocyanate method)

7. FLAME PHOTOMETRY
   i) To determine sodium and potassium in water.

8. VISCOMETRY
   i) Determination of molecular weight of a polymer
9. **WATER POLLUTION**
   i) COD analysis of a waste water by dichromate method.

10. **KINETICS**
    i) Determination of reaction rate constant of acid catalyzed hydrolysis of ester.

11. ** ADSORPTION**
    i) Adsorption of acetic acid on activated charcoal.

**TOTAL: 30 PERIODS**

**REFERENCE BOOKS**


**GE 9113 ENGINEERING PRACTICES LABORATORY**

(Common to all Branches of B.E. / B.Tech. Programmes)

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**OBJECTIVE**

To provide exposure to the students with hands-on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

**GROUP – A (CIVIL & ELECTRICAL)**

1. **CIVIL ENGINEERING PRACTICE**

   **Plumbing**

   Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.

   Laying pipe connection to the suction side of a pump – inlet.

   Laying pipe connection to the delivery side of a pump – outlet.

   Practice in mixed pipe connections: Metal, plastic and flexible pipes used in household appliances.

   **Wood Work**

   Sawing, planning and making common joints: T-Joint, Mortise and Tennon joint, Dovetail joint.
Study

Study of joints in door panels, wooden furniture
Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICE

Basic household wiring using switches, fuse, indicator – lamp etc.,
Preparation of wiring diagrams
Stair case light wiring
Tube – light wiring
Study of iron-box, fan with regulator, emergency lamp

GROUP – B (MECHANICAL AND ELECTRONICS)

3. MECHANICAL ENGINEERING PRACTICE

Welding
Arc welding of butt joints, lap joints, tee joints
Gas welding Practice.
Basic Machining
Simple turning, drilling and tapping operations.
Machine assembly Practice.
Study and assembling the following:
Centrifugal pump, mixies and air conditioners.
Demonstration on
(a) Smithy operations like the production of hexagonal bolt.
(b) Foundry operation like mould preparation for grooved pulley.
4. ELECTRONIC ENGINEERING PRACTICE

Soldering simple electronic circuits and checking continuity.

Assembling electronic components on a small PCB and testing.

Study of Telephone, FM radio, low-voltage power supplies.

TOTAL: 45 PERIODS

GE 9114 COMPUTER PRACTICE LABORATORY
(Common to all branches of B.E. / B.Tech. Programmes) 0 0 3 2

AIM:
The aim is to teach the use of computer applications related to office automation and to teach implementation of C programs.

OBJECTIVES:

- To introduce office automation software packages.
- To teach the fundamentals in C programming.

1. Simple OS commands and simple editors for file operations.
2. Word processors for more complex operations, like formatting documents, creating tables and so on.
3. Simple data base packages for creating and manipulating databases.
4. Spread sheet packages for data preparation and analysis.
5. Preparation of reports involving mathematical functions (Income Tax Statement, Mark sheets, Payroll etc.,)
6. C Programs using one dimensional arrays.
7. C Programs using multi-dimensional arrays and pointer data types.
8. Programs using structures, nested structures and union.
10. Programs for passing aggregate data types as parameters between functions.
11. Programs for dynamic memory allocation / deallocation.

12. Programs for self-referential structure – Implementing linked list.

**TOTAL: 45 PERIODS**

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**HS 9161**

**TECHNICAL ENGLISH II**

(For all branches of B.E. / B.Tech. Programmes)

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**AIM:**

To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

**OBJECTIVES:**

- To enable students develop their critical thinking skills.
- To enable students develop higher order reading skills such as interpreting, evaluating and analysing.
- To enable students develop their active listening skills.
- To enable students participate successfully in Group Discussions.

**UNIT I**


**UNIT II**


**UNIT III**


**UNIT IV**

Numerical adjectives - Prepositions – use of intensifying prefixes – phrasal verbs - different grammatical forms of the same words – cloze exercise - Reading a text and evaluating the content - advertisements – analysing style and language - Listening and
entering classified information – Intensive listening and completing the steps of a process - Role-play - Group discussion expressing opinions and convincing (agreeing and disagreeing) - Giving oral instructions – Descriptive writing - writing based on hints – writing argumentative paragraphs – formal letter writing – letter of application with biodata / CV Writing safety instructions - warnings and notices – preparing checklist – email communication.

UNIT V
Identifying problems, their causes and finding solutions using case studies – creative and critical thinking – levels of thinking – thinking strategies – brainstorming - analytical reasoning skills – evaluative essay – decision making – conflict resolution

English Language Lab (30 Periods)
1. Listening: (10)
Recognising English sounds – accents - listening & answering questions - gap filling - listening & note making - listening to telephonic conversations - listening to speeches.

2. Speaking: (10)
Pronouncing words & sentences correctly - word stress - conversation practice.

3. Reading: (5)
Cloze test - Reading and answering questions - sequencing of sentences.

4. Writing: (5)
Correction of errors - Blogging.

TOTAL : 60 PERIODS

TEXTBOOK

REFERENCES
4. Website: www.englishclub.com
LAB REQUIREMENTS

1. Teacher – Console and systems for students
2. English Language Lab Software
3. Tape Recorders

MA 9161 MATHEMATICS - II
(Common to all branches of B.E. / B.Tech Programmes) L T P C 3 1 0 4

AIM:
To introduce the effective mathematical tools needed for solving engineering problems and to emphasize the underlying mathematical principles in specific situations confronting practicing engineers.

OBJECTIVES:

- To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems
- To acquaint the student with the concepts of vector calculus, needed for problems in all engineering disciplines
- To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current
- To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated

UNIT I DIFFERENTIAL EQUATIONS 9+3
Method of variation of parameters – Method of undetermined coefficients – Homogenous equation of Euler’s and Legendre’s type – System of Simultaneous linear differential equations with constant coefficients.

UNIT II VECTOR CALCULUS 9+3
Gradient and directional derivative – Divergence and Curl – Irrotational and Solenoidal vector fields – Line integral over a plane curve – Surface Integral and Volume Integral - Green’s, Gauss divergence and Stoke’s theorems – Verification and Application in evaluating line, surface and volume integrals.
UNIT III ANALYTIC FUNCTION 9+3
Analytic functions – Necessary and sufficient conditions for analyticity - Properties – Harmonic conjugates – Construction of analytic function - Conformal Mapping – Mapping by functions \( w = z + c, \ az, \ \frac{1}{z}, \ z^2 \) - Bilinear transformation.

UNIT IV COMPLEX INTEGRATION 9+3
Line Integral - Cauchy’s theorem and integral formula – Taylor’s and Laurent’s Series – Singularities – Residues – Residue theorem – Application of Residue theorem for evaluation of real integrals – Use of circular contour and semicircular contour with no pole on real axis.

UNIT V LAPLACE TRANSFORMS 9+3

L: 45, T: 15, TOTAL : 60 PERIODS

TEXT BOOKS

REFERENCES

PH9162 PHYSICS FOR GEOINFORMATICS L T P C 3 0 0 3

OBJECTIVE:
To make the students understand the basic concepts of physics related to geoinformatics.

UNIT I ELECTROMAGNETIC RADIATION 9

UNIT II INTERACTION OF EMR WITH ATMOSPHERE AND EARTH’S SURFACE 9

UNIT III  OPTICS FOR REMOTE SENSING  9

UNIT IV  GRAVITATION AND SATELLITES  9
Newton’s law of gravitation – gravitational field and potential – determination of gravity, variation of acceleration due to gravity of the earth with depth and with altitude – Variation of acceleration due to gravity due to rotation of the earth – Escape velocity – Kepler’s law of planetary motion – Satellites – types of satellites – Earth observation satellites, communications satellites, Navigation satellites, weather satellites, military satellites and scientific satellites.

UNIT V  ELECTRO-OPTIC NON-IMAGING AND IMAGING SENSORS  9

TOTAL: 45 PERIODS

TEXT BOOKS


REFERENCES

AIM

- To impart knowledge on the Applied Chemistry topics important in Civil Engineering Practice.

OBJECTIVES

- The students should be conversant with
- Treatment of water for domestic and industrial purpose
- The formation of polymers and their compounding into different end-use products
- Types and mechanism of corrosion and control measures
- The chemical nature of building materials and composites
- Chemistry of adhesives and their applications.

UNIT I WATER TREATMENT


UNIT II POLYMER CHEMISTRY


UNIT III CORROSION AND CORROSION INHIBITION


UNIT IV CHEMISTRY OF BUILDING MATERIALS

magnesite bricks, carbon bricks, zirconia bricks and carborundum – composites –
definition of composites – characteristics – constituents of composites – types – fibre
reinforced plastic (FRP) – metal matrix composites (MMC) – ceramic matrix composites
(CMC) – properties and applications.

**UNIT V**  ADHESIVES  
**9**  
Definition – adhesive action – development of adhesive strength – physical and chemical
factors influencing adhesive action – bonding process of adhesives – adhesives for
building & construction: animal glues, casein glues, phenol formaldehyde resins,
polyurethane, epoxy resins, urea formaldehyde

**TOTAL : 45 PERIODS**

**TEXT BOOKS:**

   Company (P) Ltd., New Delhi, 2002.
   Delhi, 2003.

**REFERENCE S:**


**GE 9151**  ENGINEERING MECHANICS  
(Common to Civil, Geoinformatics and Agriculture & Irrigation Engineering)  
**L T P C**  
**3 1 0 4**

**OBJECTIVE:**
At the end of this course the student should be able to understand the vectorial and
scalar representation of forces and moments, static equilibrium of particles and rigid
bodies both in two dimensions and also in three dimensions. Further, the student should
understand the principle of work and energy. The student should be able to comprehend
the effect of friction on equilibrium. The student should be able to understand the laws of
motion, the kinematics of motion and the interrelationship. The student should also be
able to write the dynamic equilibrium equation. All these should be achieved both
conceptually and through solved examples.

**UNIT I**  BASICS & STATICS  
**12**
Introduction - Units and Dimensions - Laws of Mechanics – Lame’s theorem,
Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces
and moments – Vector operations on forces, dot product and cross product - Coplanar
Forces – Resolution and Composition of forces – Equilibrium of a forces – Forces in
space - Equilibrium in space - Equivalent systems of forces – Principle of transmissibility
– Single equivalent force
UNIT II  EQUILIBRIUM OF RIGID BODIES  12
Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon’s theorem - Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples

UNIT III  PROPERTIES OF SURFACES AND SOLIDS  12

UNIT IV  DYNAMICS OF PARTICLES  12

UNIT V  CONTACT FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS  12

L: 45+T=15  TOTAL : 60 PERIODS

TEXT BOOK

REFERENCES
UNIT I  SEMICONDUCTORS AND RECTIFIERS  

UNIT II  TRANSISTOR AND AMPLIFIERS  

UNIT III  POWER AND CONTROL ELECTRONIC DEVICES  
FET – Configuration and characteristics – FET amplifier – SCR, Diac, Triac, UJT – Characteristics and simple applications.

UNIT IV  SIGNAL GENERATORS AND LINEAR ICs  

UNIT V  DIGITAL ELECTRONICS  

TOTAL : 45 PERIODS

TEXT BOOK

REFERENCES
AIM:

- To introduce the concepts of remote sensing process and its components
- To expose the various remote sensing platform and sensors
- To introduce the elements of data interpretation

UNIT I REMOTE SENSING AND ELECTROMAGNETIC RADIATION (EMR) 9

UNIT II EMR INTERACTION WITH ATMOSPHERE 9
Standard atmospheric profile – main atmospheric regions and its characteristics – interaction of radiation with atmosphere - Scattering (Rayleigh, Mie, non-selective scattering) absorption and refraction – Atmospheric effects on visible, infrared, thermal and microwave spectrum – Atmospheric windows.

UNIT III EMR INTERACTION WITH EARTH MATERIAL 9

UNIT IV PLATFORMS AND SENSORS 10

UNIT V DATA PRODUCTS AND VISUAL INTERPRETATION 8
Photographic (film and paper) and digital products – quick look products - High Resolution data products data ordering – interpretation – basic characteristics of image elements – interpretation keys (selective and elimination) – visual interpretation of natural resources.

TOTAL: 45 PERIODS

TEXT BOOKS


REFERENCES

AIM:
The aim is to introduce working in UNIX environment.

OBJECTIVES:

- To introduce the basic commands in UNIX.
- To teach UNIX shell programming.
- To introduce programming in C with UNIX system calls.

1. Basic Unix commands
2. Simple editors for file operations.
3. Filters-Grep, sed, awk
4. Simple shell programming.
5. Shell programming using complex control structures.
6. C Programs using file system related system calls.
7. C Programs using process related system calls.
8. Programs for inter process communication using pipes, FIFOs.
9. Programs using signals.
10. Programs using shared memory.

TOTAL: 60 PERIODS

TEXT BOOK

EXERCISE DESCRIPTION
1. Spectral reflectance observation of the Vegetation, Soil, Water, etc., using hand held Spectroradiometer.
2. Construction of spectral reflectance curve for vegetation, soil, water and other features
3. Ground truth observation with the help of GPS
4. Interpretation of topographic map
5. Base Map preparation using Survey of India Toposheet
6. Visual interpretation of different satellite data and aerial photographs for preparation of different thematic maps.

TOTAL: 30 PERIODS