



**Baba Ghulam Shah Badshah University
Rajouri (J&K)-185131**

**Syllabus Second Semester
B. Tech. Degree Course**

**Department of Electrical Engineering
College of Engineering and Technology
School of Mathematical Sciences & Engineering
Baba Ghulam Shah Badshah University
Rajouri (J&K)-185131**

Curriculum Structure

Semester – II

Theory Courses

Course Code	Title	Scheme of Exam				Hrs./Week		
		Duration (Hrs.)	IA	UE	Total Marks	L	T	P
ERE-221/ ERE-121	Communication Skills/ Fundamentals of Mech. Engg.	3	40	60	100	4	0	0
ERE-222	Mathematics-II	3	40	60	100	3	1	0
ERE-223	C Programming	3	40	60	100	3	1	0
ERE-124/ ERE-224	Basic Electrical Engineering/ Basic Electronics	3	40	60	100	3	1	0
ERE-225	Engineering Mechanics	3	40	60	100	3	1	0
ERE-226	Engineering Drawing	3	40	60	100	3	1	0
Total			240	360	600			

Laboratory Courses

ERE-231	C Programming	2	25	25	50	0	0	2
ERE-132/ ERE-232	Basic Electrical Engineering/ Basic Electronics	2	25	25	50	0	0	2
ERE-233	Engineering Mechanics	2	25	25	50	0	0	2
ERE-234	Workshop Practice	2	50	0	50	0	0	2
Total			125	75	200			
Total (Theory + Lab)			365	435	800			

Assessment Procedure: For each theory course the assessment pattern will be as shown in table 1.

Table 1 Distribution of Weightage for theory courses of 100 marks.

Continuous Assessment		University Exam	
Component	Weightage	Component	Weightage
Cyclic Test 1	15	Written Exam	60
Cyclic Test 2	15		
Assignment 1	5		
Assignment 2	5		
Total	40		60
Note: 75 % Attendance is compulsory for each theory as well as lab course.			

For laboratory courses the assessment pattern will be as shown in table 2.

Table 2: Distribution of Weightage for laboratory courses of 50 marks.

Continuous Assessment		University Exam	
Component	Weightage	Component	Weightage
Continuous assessment of practical work, timely submission of lab records.	15	Lab experiment/procedure/ writing /tabulation/ innovation as applicable	15
Test	10	Viva Voce	10
Total	25		25

Semester II

Course Title: Communication Skills-I

Course Code: ERE-221

Duration of Exam: 3 hours

Max Marks: 100

University Exam: 60

Internal Assessment: 40

Objective: In this world of globalization English language is the first and foremost criteria to acquire job in reputed companies .This course is designed to hone the soft skills of students to make them proficient in English Language(writing & speaking).

Unit-I

Communication: Scope & importance of communication, types of communication, barriers of communication and techniques to improve communication, presentations, group discussions, seminars.

Unit-II

Phonetics: Speech mechanism, organs of speech, phonetic transcription, effective speaking.

Unit-III

Applied Grammar: Articles, prepositions, modal auxiliaries, verbs, antonyms, and synonyms, précis writing, paragraph writing.

Unit-IV

Recruitment and employment Correspondence: Applications, curriculum Vitae, letter of acceptance, letter of rejection, resignation, reference, interview.

Unit-V

Business Correspondence: Memorandum, Notices, Agendas, Meetings and Minutes, sales letters, enquiries, claims, adjustment letters.

Text Books:

1. **Lesikar R.V.** and **Pettit Jr.** Business Communication Theory and Applications, Irwin, 2002 Ed.
2. **Bansal R. K. & Harrison J. B.,** Spoken English, Orient Longman Hyderabad

Reference Books:

1. **Gimson A. C.,** An Introduction to the Pronunciation of English, ELBS (YP).
2. **Pal Rajendra** and **Korihalli, J. S.** Essentials of Business Communication , Sultan C hand & Sons 2007
3. **Rayudu, C. S.** Media and Communication Management, Himalaya Publishing House.

Note for paper setter: The question paper comprises 10 questions. Two questions shall be set from each unit. The students have to attempt five questions, selecting one from each unit.

Semester II

Course Title: Mathematics-II
Course Code: ERE-222
Duration of Exams: 3 hours

Max. Marks: 100
University Exam: 60
Sessional Assessment: 40

Objective: The course is designed to provide basic knowledge of theory of differential equations to engineering students.

Unit-I

Partial Differential Equations: Partial differential equations and its formation, Linear and non-linear partial differential equations of first order and their solutions, Charpit's method, Homogenous and non-homogenous linear partial differential equations with constant coefficients and their solutions.

Unit-II

Applications of Partial Differential Equations: Applications of Partial Differential Equations with initial and boundary conditions, Solution by the method of separation of variables, Partial differential equations of physical sciences and Engineering and their solution viz: vibration of a stretched string, wave equation, heat flow and electric transmission lines in one dimension, Two dimensional heat flow and Laplace's Equation.

Unit-III

Fourier series and Practical Harmonic Analysis: Periodic functions, Fourier series and Euler's formulae, Expansion of periodic functions in Fourier series, conditions for a Fourier expansion, Functions having points of discontinuity, Change of Interval, Expansion of even and odd functions, Half range series, Parseval's formula, Complex form of Fourier series and practical harmonic analysis.

Unit-IV

Vector Space and Matrices: Introduction to vector spaces, linear independence and dependence of vectors, subspaces, basis and dimensions. Rank of a matrix, Elementary transformation of a matrix, Inverse of a matrix, Normal form of a matrix, Characteristic equation, Eigen value and eigen vectors, properties of eigen values, Caley-Hamilton theorem, Diagonalization of matrices, Orthogonal, Symmetry, Unitary, Hermitian and Skew-Hermitian matrices.

Unit-V

Vector Analysis: Scalar and vector products of three and four vectors. Scalar and vector fields, Gradient of scalar field, Divergence and Curl of vector field. Line, Surface and Volume Integrals. Theorems of Green, Stoke, Gauss of Vector analysis.

Text Books:

1. **B. S. Grewal**, Higher Engineering Mathematics, Khanna Publication, 40th Ed.
2. **Piaggio H.T. H.**, An Elementary Treatise on Differential Equations, Barman Press.

Reference Books:

1. **Weatherburn C. E.**, Vector Calculus, Ellis Horwood Publication.

Note for paper setter: The Question paper shall comprise of 10 questions. Two questions will be set from each unit. The student has to attempt five questions at least one from each unit.

Semester II

Course Title: C Programming
Course Code: ERE-223
Duration of Exam: 3 hours

Max Marks: 100
University Exam: 60
Internal Assessment: 40

Objective: To enhance the logical skills of students with the basic programming concepts and implementation in C.

Unit-I

Introduction to C Programming: History of C, Structure of a C Program, Compiling & Executing a C program. Flow Charts, Constants, Variables and Data Types, Operators and Expressions, Data Input and Output.

Unit-II

Control Statements: Decision making and branching, IF statement, IF-ELSE statement, nested IF-ELSE statement, Switch statement, break statement, continue statement. Decision making and Looping, while statement, do-while statement, for statement.

Unit-III

Functions: Types of functions, function declaration, calling a function, passing arguments to functions, return values and their types, nesting of functions, recursion.

Unit -IV

Introduction to arrays: One dimensional arrays, Two dimensional arrays and Multidimensional arrays, basic operations on arrays, arrays and strings, basic string operations. Introduction to Unions, Structures and enumerated data types.

Unit-V

Introduction to Files & Pointers: Operations on pointers, pointers & multidimensional arrays, pointers & character strings. Dynamic Memory Allocation in C: malloc, calloc, realloc and free functions. Operations on files like open, close, read and write.

Text Books:

1. **Balaguruswamy**, Programming in ANSI C, TMH.
2. **Yashwant Kanitkar**, Let us C, TMH.

Reference Books:

1. **Gottfried, Programming** with C, TMH.
2. **Venugopal**, C Programming, TMH.
3. **Yashwant Kanitkar**, Pointers in C, TMH.

Note for paper setter: The Question paper shall comprise of 10 questions. Two questions will be set from each unit .The student has to attempt five questions at least one from each unit.

Semester II

Course Title: Basic Electronics
Course Code: ERE-224
Duration of Exam: 3 hours

Max Marks: 100
University Exam: 60
Internal Assessment: 40

Objective: This course aims to provide students with solid background of semiconductors and some basic solid state electronic devices used in circuits.

Unit-I

Semiconductors: Classification, semiconductor bonds, Energy band description, Semiconductor types, Energy band diagram for Semi conductors, Drift and Diffusion Current, Mobility of Charged particles, Current density and Conductivity, Conductivity of Semi conductors, Hall Effect.

Unit-II

Introduction to p-n Junction: Current components in p-n junction, Diodes and Characteristics, temperature dependence, equivalent circuits. Rectifiers, half wave, full wave rectifiers, bridged rectifiers (efficiency, ripple factor). Clipping and clamping circuits. Basic operations of Zener, Avalanche and Photo Diodes.

Unit-III

Transistors: Types of transistors, operation & characteristics, CE, CB and CC configurations, Input output characteristics and graphical analysis of basic amplifier circuits, biasing and bias stability, use of transistor as a switch.

Unit-IV

Field Effect Transistors: Operation and characteristics. JFET, MOSFET, types of MOSFET, operation and characteristics of JFET and MOSFET, biasing of JFET and MOSFET. Introduction to feedback, Types of feedbacks, Sinusoidal Oscillators, Hartley, Collpitts and Phase Shift oscillators (transistor version only and no derivation).

Unit-V

Biasing Techniques and biasing stability (BJT/FET):- Need for biasing, operating point, load line analysis, fixed bias configuration, emitter bias configuration, voltage divide bias configuration analysis of these biasing techniques , and bias stability.

Text Books:

1. **Millman & Halkias**, Electronic Devices & Circuits, TMH
2. **Boylestad and Nashelky**, Electronic Devices & Circuits, PHI.

Reference Books:

1. **Floyd T. L.**, Electronic Devices, Pearson Education.
2. **Theodore Bogart Jr.**, Electronic Devices & Circuits, Pearson Education.
3. **Mehta V. K.**, Electronic Devices, S. Chand and Sons, New Delhi

Note for Paper Setter: The Question paper shall comprise of 10 questions. Two questions will be set from each unit .The student has to attempt five questions at least one from each unit

Semester II

Course Title: Engineering Mechanics
Course Code: ERE-225
Duration of Exam: 3 hours

Max Marks: 100
University Exam:60
Internal Assessment:40

Objective: The course introduces students to the analysis of dynamic and static systems encountered in engineering design practice.

Unit-I

Two Dimensional force System: Basic Concepts, principal of transmissibility, resultant of a force System, free body Diagrams, Equilibrium and equation of equilibrium Applications. Moment of a force about a point, varignon theorem friction, law of friction, equilibrium of body lying on horizontal and inclined plane. Ladder friction applications.

Unit-II

Members forces in trusses: planer truss structure, trust joint identification, strategy for planer truss analysis. Statical determinacy and stability of planer trusses. Numerical truss analysis (Method of joints and method of selection)

Unit-III

Kinematics of particles: Velocity and acceleration in rectilinear motion along a plane and curved path. Tangential and normal components of velocity and acceleration motion curves. Kinematics of rigid bodies rotation, absolute motion, relative motion.

Unit-IV

Introduction to centroid and centre of gravity: Centroid and moment of inertia; centroid of plane area and solid bodies. Moment of inertia of plane area. Theorem of parallel axis, Theorem of perpendicular axis, radius of gyration, composite ideas.

Unit-V

Analysis of stress and strains: Forces and stress normal stress and strain under axial loading, ultimate and allowable stresses, mechanical properties, Hooke's law, modulus of elasticity. Factor of safety, deformation of members under axial loading, thermal stresses, Poisson's ratio multi axial loading, bulk modulus, shearing Strain, Relation among shear modulus, Young's Modulus and Bulk Modulus.

Text Books:

1. **S. Ramamrutham**, Strength of Materials, Dhanpal Rai & Co,.
2. **R.S Khurmi**, Engineering Mechnaics, PHI.

RefEEnce Books:

1. **R. K. Bansal**, Engineering Mechanics and Strength of Materials, Laxmi Publication.

Note for Paper Setter: The Question paper shall comprise of 10 questions. Two questions will be set from each unit .The student has to attempt five questions at least one from each unit.

Semester II

Course Title: Engineering Drawing
Course Code: ERE-226
Duration of Exam: 3 hours

Max Marks: 100
University Exam: 60
Internal Assessment: 40

Objective: The course is designed to develop the ability to visualize and communicate three-dimensional shapes and train the students to create drawings following the engineering graphics conventions.

Unit-I

Introduction to Engineering Graphics: Engineering drawing as language of Engineers. Drawing instruments and their uses. **Projections:** The planes of projections, first and third angle projections, projection of points lying in any quadrant. Scale; needs and importance, to find representative factor of a scale, drawing of simple and diagonal scales.

Unit-II

Projection of straight line and their traces: projection of planes. Planes parallel to reference plane; plane perpendicular to both reference planes; planes perpendicular to one and inclined to other reference plane. Projection of solids with their axes perpendicular or inclined to one reference plane but parallel to other.

Unit-III

Section of Solids & Development of surfaces: Definition of sectioning and its purpose, Procedure of sectioning, Illustration through examples, types of sectional planes. Purpose of development, Parallel line, radial line and triangulation method, Development of prism, cylinder, cone and pyramid surface for both right angled and oblique solids.

Unit-IV

Orthographic Projections: Theory of orthographic projections (Elaborate theoretical instructions) Drawing 3 views of given objects (Non symmetrical objects and blocks may be selected for this exercise) Exercises on both first angle and third angle.

Unit-V

Isometric Projection: Classification of pictorial views, Basic Principle of Isometric projection, Difference between isometric projection and drawing, Isometric projection of solids such as cube, prism, pyramid and cylinder.

Text Books:

1. **Bhat, N. D. & Panchal, V. M.**, Engineering Drawing, Charotar Publishers, Anand.
2. **Narayana, K. L. and Kannaiah, P.**, Engineering Graphics, Tata McGraw Hill, New Delhi.

Reference Books:

3. **Gill P. S.**, Engineering Graphics and Drafting, Katria and Sons, Delhi.
4. **Luzzadde Warren J.**, Fundamentals of Engineering Drawing, PHI.

Note for paper setter: The Question paper shall comprise of 10 questions. Two questions will be set from each unit. The student has to attempt five questions at least one from each unit. Question will be set accordingly so that student can be able to answer 5 questions within 3 hours.

Semester II

Course Title: C Programming
Course Code: ERE-231
Duration of Exam: 3 hours

Max Marks: 50
University Exam: 25
Internal Assessment: 25

List of Experiments:

1. Basic program in Sequential Statement in C
2. Program of multiway control structure (Switch Case)
3. Program of different types of loops nested loops.
4. Program on function (Parameter passing - call by value)
5. Programs on recursion.
6. Programs on string manipulation with or without string function.
7. Program on 1-Dimensional Arrays.
8. Program on 2-Dimensional Arrays.
9. Programs on pointers
10. Programs on file handling.

Note: This is only the suggested list of experiments. Instructor may add or change some experiments relevant to the course contents

Semester II

Course Title: Basic Electronics Engineering
Course Code: ERE-232
Duration of Exam: 3 hours

Max Marks:50
University Exam:25
Internal Assessment:25

List of Experiments:

1. To plot the Resonance curve for a series & parallel resonance.
2. To determine and plot operating characteristics of a PN junction diode
3. To study the input / output waveforms of Half wave and bridge wave rectifiers
4. To suppress the ripple in rectifiers using RC filters.
5. To study the clipper and clamper circuits.
6. To study the Zener characteristics and its application as voltage regulator
7. To plot characteristics of transistor in CE/CB configuration
8. To plot characteristics of a BJT.
9. To plot MOSFET characteristics.
10. To study frequency response of RC Coupled Oscillators.

Note: These are only the suggested list of experiments. Instructor may add or change some experiments relevant to the course contents.

Semester II

Course Title: Engineering Mechanics
Course Code: ERE-233
Duration of Exam: 3 hours

Max Marks: 50
University Exam: 25
Internal Assessment: 25

List of Experiments:

1. To conduct tensile test and determine the ultimate tensile strength, percentage elongation and reduction.
2. To conduct the compression test and determine the ultimate compressive strength for a specimen.
3. To determine centroid of Lamina.
4. To determine the hardness of a given specimen using vicker/brinel/Rockwell hardness testing machine.
5. To verify Lami's theorem.
6. To verify polygon law of forces.
7. Friction experiment on inclined plane.
8. Experiment on screw Jack.
9. To verify reactions at the supports of a simply supported beam.
10. To determine moment of inertia of various shapes.

Note: These are only the suggested list of experiments. Instructor may add or change some experiments relevant to the course contents.

Semester II

Course Title: Workshop Practice
Course Code: ERE-234
Duration of Exam: 3 hours

Max Marks:50
University Exam:25
Internal Assessment:25

Carpentry Shop:

- Study of tools & operations and carpentry joints
- Simple exercise using jack plane
- To prepare half-lap corner joint, mortise & tenon joints
- Simple exercise on woodworking lathe.

Fitting Shop:

- Study of tools & operations
- Simple exercises involving fitting work
- Make perfect male-female joint
- Simple exercises involving drilling/tapping/dyeing

Smithy Shop:

- Study of tools & operations
- Simple exercises base on black smithy operations such as upsetting, drawing down, punching, bending, fullering & swaging

Welding Shop:

- Study of tools & operations of Gas welding & Arc welding
- Simple butt and Lap welded joints
- Oxy-acetylene flame cutting

Sheet-Metal Shop:

- Study of tools & operations
- Making Funnel complete with 'soldering'
- Fabrication of tool-box, tray, electric panel box etc

Machine Shop:

- Study of machine tools and operations
- Plane turning
- Step turning
- Taper turning
- Threading
- Single point cutting tool grinding

Foundry Shop:

- Study of tools & operations
- Pattern making
- Mould making with the use of a core.
- Casting

Note: This is only the suggested list of experiments. Instructor may add or change some experiments relevant to the course contents

Reference Books:

1. **Kapoor V.** Work Shop Practice.
2. **Raghuwanshi B. S.,** Workshop technology.
3. **Bawa H. S.,** Workshop practice.
4. **Gupta, B. R.,** Production Technology.