



Govt. College of Engineering and Technology, Jammu

(Autonomous College)

COURSE SCHEME

**B.Tech.1st Semester Electronics and Communication Engineering
Batch 2025 & Onwards**

Contact Hrs/Week: 21

COURSE CODE	COURSE TYPE	COURSE TITLE	CREDITS	LOAD ALLOCATION			MARKS/DISTRIBUTION					
				L	T	P	CWA	PRS	MSE	ESE	PRE	TOTAL
BMAT11	Basic Science Course	Engineering Mathematics-I	3	2	1	0	20	-	20	60	----	100
BPHT11	Basic Science Course	Applied Engineering Physics	2	1	1	0	20	-	20	60	----	100
BMET12	Engineering Science Course	Engineering Graphics with CAD	3	2	1	0	20	-	20	60	----	100
BCET11	Engineering Science Course	Energy and Environment	3	2	1	0	20	-	20	60	----	100
BCST11	Engineering Science Course	Computer Programming	3	2	1	0	20	-	20	60	----	100
BHST11	Humanities & Social science & Management Courses	Universal Human Values and Ethics	3	2	1	0	20	-	20	60	----	100
BPHL11	Basic Science Course	Applied Engineering Physics lab	1	0	0	2		40			60	100
BCSL11	Engineering Science Course	Computer Programming Lab	1	0	0	2		40			60	100
	TOTAL		19	11	6	4						

CWA: Class work Assessment; **PRS** : Practical Sessional; **PRE:** Practical Exam; **MSE:** Mid Semester Exam; **ESE:**End Semester Exam



Government College of Engineering & Technology, Jammu
(Autonomous College)

Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	CSE/ECE/ME/CE/EE		
Semester	Ist		
Name of the Course	ENGINEERING MATHEMATICS-1		
Course Code	BMAT11	Credits- 3	L- 2, T-1, P-0
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)	Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)	
CO1	Apply general theorems of calculus to analyse the behaviour of real-valued functions and determine maxima and minima of functions of two variables.
CO2	Understand fundamental concepts of integration, special functions, and techniques for evaluating double and triple integrals.
CO3	Analyse and solve problems involving complex trigonometric functions.
CO4	Determine rank, eigen values and eigen vectors of matrices using matrix operations.

Section-A

DIFFERENTIAL AND INTEGRAL CALCULUS

Partial differentiation, Euler's theorem on homogeneous functions, Rolle's theorem, Mean value theorem
(7 Hrs)

Taylor's and Maclaurin's series in two variables, Maxima and Minima of functions of two variables, Method of Lagrange's multiplier.
(7 Hrs)

Definite integrals with important properties, differentiation under the integral sign, Gamma, Beta and error functions with simple problems, double and triple integrals with simple problems.
(7 Hrs)

Section-B

COMPLEX TRIGONOMETRY AND MATRICES

Hyperbolic functions of a complex variable, Inverse Hyperbolic functions, Logarithmic function of a complex variable, Summation of series by C+IS method.
(7 Hrs)

Matrices.: Rank of a matrix, Elementary transformations, Elementary matrices, Inverse using elementary transformations, Normal form of a matrix
(7 Hrs)

Eigen values and Eigen vectors, Properties of Eigen values, Cayley Hamilton Theorem, Inverse using Cayley Hamilton Theorem, Diagonalization of matrix.
(7 Hrs)

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BOOKS RECOMMENDED:

Calculus and Analytic Geometry
Edition, Pearson, 2002.

Differential Calculus
Chand, New Delhi.

Higher Engineering Mathematics
Publishers, New Delhi

Engineering Mathematics-I

Engineering Mathematics-II

Engineering Mathematics-I

Thomas and Finney, 9th

S. Narayan and P.K. Mittal, S.

B.S Grewal, Khanna

Dr. Bhopinder Singh

Dr. Bhopinder Singh

Dr. Ambika Bhat

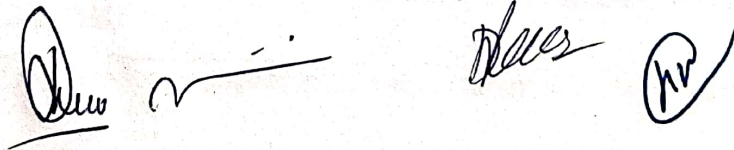
INSTRUCTIONS (End Semester Examinations)

NOTE: The question paper shall consist of three sections (I, II & III).

Section-I will be compulsory of 12 marks consisting of conceptual/ analytical/ objective type/short answer questions, covering the entire syllabus (sections A & B).

Sections II & III of the question paper will have three questions each from the respective sections (A & B) of the syllabus and each question will carry 12 marks. The candidate has to attempt four questions, selecting two from each section.

Use of scientific calculators (non-programmable), standard data/ log books are permitted, wherever required.

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Government College of Engineering & Technology, Jammu
(Autonomous College)

Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	CSE/ECE/EE		
Semester	I st		
Name of the Course	APPLIED ENGINEERING PHYSICS		
Course Code	BPHT11	Credits-	2
			L- 1, T- 1, P-0
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)	Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)	
CO1	Comprehend the basic laws governing electric and magnetic fields and their interrelation through electromagnetic induction.
CO2	Understand the significance of vector calculus and Maxwell's equations as the basis of Electromagnetic theory.
CO3	Learn the key ideas of laser physics and quantum mechanics, and how these are used in various scientific and engineering fields
CO4	Acquire knowledge of semiconductor physics along with different aspects of applied optics & their applications

Section A

UNIT1: LAWS OF ELECTRICITY AND MAGNETISM

Electrostatics field, Electric flux, Gauss's theorem of electrostatics, Magnetic effect of current and Magnetic field, Magnetic flux, Biot-Savart's law, Amper's circuit law & its modified form, Electromotive force, Faraday's Laws of Electromagnetic Induction (Integral & Differential form), Lenz's law

(06 hours)

UNIT-2: ELECTROMAGNETIC FIELDS AND WAVES

Concepts of Del Operator- gradient, divergence, curl and their physical significances, Displacement Current. Maxwell's equations in integral and differential form, Poynting vector and Poynting theorem, Electromagnetic wave propagation in free space (Em wave equations for electric & magnetic fields for free space) & their solutions (plane wave solution), velocity of Em waves, Relation between E_0 & B_0 .

(07 hours)

UNIT-3: LASER PHYSICS

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Concept and principle of Laser action, Spontaneous and Stimulated emission, Einstein's Co-efficient and relations, three and four level laser system, coherence and characteristics of laser light, He-Ne, Applications of lasers. **(04 hours)**

Section B

UNIT -4: QUANTUM MECHANICS

Need of quantum mechanics, Compton effect, concept of wave function, Eigen function and Eigen values, operators in quantum mechanics, Schrodinger's wave equation (Steady- state and Time-dependent) for one-dimensional case. **(05 hours)**

UNIT-5: SEMICONDUCTOR PHYSICS

Structure of Atoms, Energy band diagram, Metal, Insulator and Semiconductor, Intrinsic and Extrinsic semiconductors, Direct & Indirect semiconductors (E-k diagrams), Electron and hole concentration in Intrinsic semiconductors, Charge densities in semiconductor, Generation & Recombination of charge carrier, Law of mobility & conductivity, Current densities in semiconductors, Fermi levels, Mass action law, Drift & Diffusion current and Einstein relation for p-n junction. **(09 hours)**

Books Recommended

- Fundamentals of Electricity & Magnetism
- Lasers Fundamentals and applications
- Semiconductor Physics and Devices
- Quantum Mechanics

Duggal & Chhabra
A. K. Ghatak
Donald A. Neamen
N.Zetilli

INSTRUCTIONS (End Semester Examinations)

NOTE: The question paper shall consist of three sections (I, II & III).

Section-I will be compulsory of 12 marks consisting of conceptual/ analytical/ objective type/short answer questions, covering the entire syllabus (sections A & B).

Sections II & III of the question paper will have three questions each from the respective sections (A & B) of the syllabus and each question will carry 12 marks. The candidate has to attempt four questions, selecting two from each section.

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**Government College of Engineering & Technology, Jammu
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Department of Electronics and Communication_Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	CSE/ECE/EE		
Semester	Ist		
Name of the Course	ENGINEERING GRAPHICS with CAD		
Course Code	BMET12	Credits-	3
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)	L-2, T-1, P-0 Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)	
CO1	Understand and use engineering scales with accuracy and interpret missing views.
CO2	To have knowledge of Industrial practices and standards.
CO3	To understand the principles of engineering drawings.
CO4	Knowledge of computer Aided design and drafting
CO5	To interpret, and represent three-dimensional engineering objects through accurate projection of points, lines, planes, and solids, including sectional views using rotation and auxiliary plane methods.

Section-A

Unit I Lettering and dimensions: Introduction, Lines types of lines, Lettering, Single stroke lettering, dimensioning, placing of dimensions, aligned and unidirectional.

Engineering Curves: Curves used in Engineering Practice: Cycloidals, Involutes, Spirals, and Hellices, Locus of a point on simple mechanisms. **(12 Hrs)**

Unit II Projection of Planes: Projections of a plane w.r.t. the principle planes in simple and inclined positions. Rotation method and the Auxiliary plane method. Space relation of a plane. To locate a point on a plane given its projections. Parallel relation of planes. Projection of planes inclined to different plane.

Projection of Solids: Classification and main features-Prisms and Pyramids. Projection of solids inclined to both the reference planes by (1) Rotation Method, and (I) Auxiliary plane method. Projection of solids in combination (Co-axial) in simple and inclined positions. **(10 Hrs)**

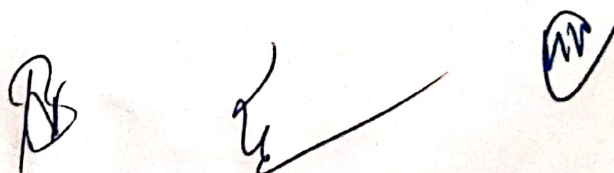
Section-B

Unit III Sectioning of Solids: Object of sectioning, Types of cutting planes, True shape of section, Auxiliary views of sections of multiple co-axial solids in simple and titled conditions.

Development of Surfaces: Classification of surfaces, Methods of development -Straight line method and Radial line method, Development of solids and hollow sections in full or part development of transition pieces. To draw projections from given development. **(10Hrs)**

Unit – IV Overview of Computer Graphics Covering: Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software (such as :The Menu system, Toolbars (Standard, object Properties, Draw, Modify and dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), Different methods of zoom as used in CAD, Select and erase objects.

Orthographic Projections: Orthographic projection of simple blocks (First & Third angles), to draw the third view from given two views. Missing lines in projection. **(12 Hrs)**



RECOMMENDED BOOKS:

1. Engineering Drawing
2. Practical Geometry
3. Engineering Graphics
4. Engineering Graphics with Auto CAD

P.S Gill
V. Laxminarayan & GEV
K.L. Narayanan & P. Kamaish
D.M Kulkarn

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Government College of Engineering & Technology, Jammu
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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards

Branch	CE/ECE			
Semester	I st			
Name of the Course	ENERGY AND ENVIRONMENT			
Course Code	BCET11	Credits-	3	L-2, T-1, P-0
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)		Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs		

COURSE OUTCOMES (COs)

CO1	Identify the structure, functions and significance of different eco-systems.
CO2	Explain the natural resources, biodiversity and their conservation.
CO3	Acknowledge the Environmental Pollution, its impacts and management.
CO4	Educate the masses about environmental issues and their role in Environment Conservation

Section-A

Environment: Introduction, Multidisciplinary nature of environmental studies- Definition, scope and importance, Need for public awareness.

Ecosystem: Concept, Structure and function (Food chain, food web and ecological pyramids). Ecological succession. Types of ecosystems: Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystems. (10 Hrs)

Natural Resources: Renewable and Non-renewable resources. Different types of resources: **Mineral resources**, their uses and exploitation, environmental effects of extracting and using mineral resources.

Food resources: Sources of food, Impact of modern agriculture and overgrazing on environment, fertilizer-pesticide problems. Organic farming.

Biodiversity: Hotspots of Biodiversity in India, Threats to Biodiversity and its conservation (in-situ and ex-situ conservation). (12 Hrs)

Section-B

Environmental Pollution and Management: Definition, Causes, effects and control measures of Air, Water, noise & soil pollution, Greenhouse effect, global warming and its consequences, acid rain, ozone layer depletion. Solid waste management Environment Protection Act (1986), Air (Prevention and Control of Pollution) Act (1981), Water (Prevention and control of Pollution) Act (1974), Wildlife Protection Act (1972) and Forest Conservation Act (1980). (11 Hrs)

Social Issues related to Environment: Ecotourism and Environmental Ethics, Ecomark and Biodegradable Plastics. Sustainable development and Sustainable development goals (SDG's), Environment movements of India –Chipko & Appiko movement, Silent valley movement, Tehri Dam Movement and Narmada bachao movement. (11 Hrs)

RECOMMENDED BOOKS:

- 1 Ecology and Environment P D Sharma
- 2 Environmental Chemistry B K Sharma
- 3 Environmental Studies Kaushik And Kaushik
- 4 A Basic Course In Environmental Studies Deswal And Deswal
- 5 Environmental Law Dr P.S. Jaswal

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Department of Electronics and Communication_Engineering

B. Tech syllabus From Batch-2025 & onwards

Branch	ECE/CSE/ME		
Semester	Ist		
Name of the Course	COMPUTER PROGRAMMING		
Course Code	BCST11	Credits-	3
			L-2, T-1, P-0
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)	Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)

CO1	Understand various software development tools like algorithm, pseudo codes and flow charts for solving problems
CO2	Understand the use of loops and decision-making statements to solve the problems.
CO3	Apply different operations on arrays and user-defined functions to solve real-time problems.
CO4	Analyze the operation of pointers, structures and unions.
CO5	Implement file operations in C programming for a given application.

Section-A

Unit1-Basics of Programming & Fundamentals of C

Evolution of programming Languages, the compilation process, Object code, Source code, Executable code, Concept of Machine level, Assembly level and high-level languages, fundamentals of Algorithms, Flowcharts. Character set, Identifiers, Keywords, Data Types, Constant and Variables, Statements, Expressions, Operators, Precedence of operators, Input-Output Assignments. **(08 Hrs)**

Unit-2 -Decision making & Control structures

Decision making and Branching: Simple if, if-Else, nesting of if -Else, Else if ladder, Switch statement, The ? operator, go to statement. Decision making & looping: while statement, do statement, for statement, jumps in loop, break and continue, Nesting of control structures. Storage Classes: Types of storage classes, Scoping rules, Standard Library Functions, Advantages and use of various library functions (I/O functions, String, Character, Mathematics, Time and Date, functions). **(08 Hrs)**

Unit-3 - Array and String

Concept of array: One dimensional Array, Two- dimensional arrays, declaration and their applications, Character array and string, declaration and initialization, operations on string. **(06 Hrs)**

Section B

Unit-4: Function and Recursion

Concepts of user defined functions: function declaration, function definition, function call, passing parameters, call-by-value, Call by Reference, Passing Array to a function, Recursion **(08 Hrs)**

Unit-5: Structures and Unions

Basics of Structures, structure members, accessing structure members, declaration of unions, Pointer to structures and unions. **(06 Hrs)**

Unit-6: Pointers and File management

Pointer variable and its importance, Pointer Arithmetic, pointer to pointer, pointers to functions, dangling pointer, dynamic memory allocation, Console input-output functions, Disk input output functions, opening closing and creating Data files. **(08 Hrs)**

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BOOKS RECOMMENDED:

1. C How to Program, 7/e
2. Programming With C
3. Programming With C-E
4. C The Complete Reference
5. Let us C

Paul J. Deitel
Byron Gottfried.
Bala Guruswamy.
Herbert Schildt.
Yashwant Kanitkar.

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Government College of Engineering & Technology, Jammu
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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	CSE/ECE/EE		
Semester	I st		
Name of the Course	UNIVERSAL HUMAN VALUES AND ETHICS		
Course Code	BHST11	Credits-	3
			L- 2, T-1, P-0
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)	Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)	
CO1	Comprehend the significance of human values and implement them in both personal and professional settings.
CO2	Comprehend the holistic approach about the family and society.
CO3	Develop an extensive awareness of nature and the ability to self-regulate in nature.
CO4	To make the students realize the significance of ethics in professional environment.

Section-A

Introduction to Value Education

Value Education: Concept, Need, Basic Guidelines and Content of Value Education. Self - Exploration as the Process of Value Education: Meaning, Content, Process and important implications of Self-exploration, Natural Acceptance- The basis for Right Understanding.

Basic Human Aspirations and their Fulfilment: Meaning of Basic Aspiration, Continuous Happiness and Prosperity, Right Understanding, Relationship and Physical Facilities the Basic Requirements for fulfillment of aspirations of every human being with their correct priority. Development of Human Consciousness and Role of Education-Sanskar. (11 Hrs)

Harmony in the Human Being

Human being as a co-existence of Self and Body: Needs, Activities and Response of Self and Body. Self as the Conscious Entity and Body as the Material Entity.

Sources of Imagination-Preconditioning, Sensation and Natural Acceptance

Harmony of Self with the Body: Body as an instrument of 'I' (I am the Seer, Doer and Enjoyer/ Experiencer)

Programme for Self-regulation and Health: Nurturing, Protecting and Right Utilization of Body (10 Hrs)

Section-B

Harmony in the Family and Society-

Harmony in Human- Human Relationship: Understanding of Relationship, Family as the basic unit of Human Interaction, Feelings (Values) in relationship- Nine Value

Trust (Vishwas) as the Foundation Value: Difference between Intention and Competence

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- Justice (Nyaya):** Meaning of Justice and Program for its fulfilment to ensure mutual happiness.
Understanding Universal Human Order: Human Goal, Dimensions (Systems) of Human Order, Harmony from Family Order to World Family Order. **(11Hrs)**
Harmony in the Nature and Existence - Interconnectedness and Mutual Fulfillment among the four orders of nature. Realizing existence as co-existence at all levels, the Holistic Perception of Harmony in existence.

Ethics

Nature, scope and method of ethics. Distinction between values and ethics, Principles of personal and professional ethics, Ability to utilize the professional competence for augmenting universal human order. Corporate Social Responsibility (CSR)- Meaning and Importance **(10 Hrs)**

RECOMMENDED BOOKS:

1. R.R Gaur, R Sangal, G P Bagaria, A foundation course in Human Values and Professional Ethics, Excel books, New Delhi, 2010, ISBN 978-8-174-46781-2
2. PPTs of Lectures and Practice Sessions
3. Audio-visual material for use in the practice sessions.

References:

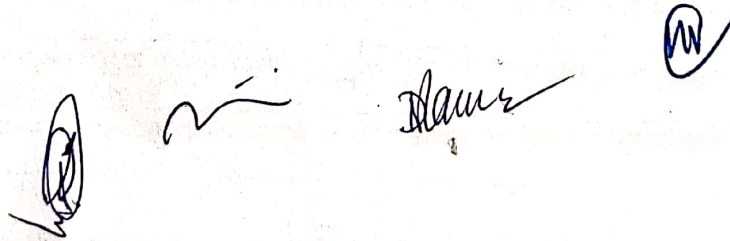
1. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow, Reprinted 2008.
2. PL Dhar, RR Gaur, 1990, Science and Humanism, Common wealth Publishers.
3. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
4. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA

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Government College of Engineering & Technology, Jammu
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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025& onwards			
Branch	CSE/ECE/EE		
Semester	I st		
Name of the Course	APPLIED ENGINEERING PHYSICS LAB		
Course Code	BPHL11	Credits-	1
Practical Sessional (PRS)	Max. Marks = 40		L- 0, T-0, P-2
Practical Examination (PRE)	Max. Marks= 60		

COURSE OUTCOMES (COs)	
CO1	Gain knowledge about the scientific methods of measuring different physical parameters based on the concepts of Physics.
CO2	Develop the experimentation skills by displaying minimized measurement errors
CO3	Acquire the practical skills to obtain the solutions pertaining to different physics' experiments
CO4	Fostering a scientific temper that inspires innovation and creativity.

LIST OF EXPERIMENTS

1.	To find co-efficient of self- induction of a coil by Anderson's Bridge using headphone.
2.	To measure the number of lines on the diffraction grating using He-Ne laser
3.	To study the V-I characteristics of a PN- Junction diode.
4.	To find the wavelength of monochromatic light using Newton's rings apparatus
5.	To evaluate the value of Planck's constant using a photocell.
6.	To study the voice transmission through the optical fiber and measure the numerical aperture.
7.	To find the dispersive power of a given prism using a spectrometer.
8.	To study the variation of Magnetic field by using Stewart and Gee's Tangent galvanometer.
9.	To find the resistivity of a semiconductor by four probe method at different temperatures.
10.	To find the impedance of LCR circuit.
11.	To study the Common base/ common emitter characteristics of PNP/NPN junction transistor.

NOTE: A minimum of eight experiments is to be performed covering the diverse aspects of engineering physics

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Department of Electronics and Communication_Engineering

B. Tech syllabus From Batch-2025& onwards			
Branch	CSE/ECE/EE/ME		
Semester	I st		
Name of the Course	COMPUTER PROGRAMMING LAB		
Course Code	BCSL11	Credits-	1
Practical Sessional (PRS)	Max. Marks = 40		
Practical Examination (PRE)	Max. Marks= 60		
	L-0 , T-0 , P-2		

COURSE OUTCOMES (COs)	
CO1	Understand the working of different compilers and editors for writing programs in C.
CO2	Exercise basic syntax, operators and control statements to write C programs
CO3	Execute programs based on user defined functions and recursive functions.
CO4	Implement arrays, pointers to access variables and functions.
CO5	Write programs that perform operations using derived data types and files.

LIST OF EXPERIMENTS

1.	Problem solving using computers Familiarization with programming environment.
2.	Variable types and type conversions: simple computational problems using arithmetic expressions.
3.	Branching and logical expressions: Problems involving if-then-else structures.
4.	Loops, while and for loops: Iterative problems eg.sum of series
5.	1D Arrays: searching, sorting: 1D Array manipulation
6.	2D arrays and Strings, memory structure: Matrix problems, String Operations

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7.	Functions: call by value, call by reference: Simple functions
8.	Recursion, structure of recursive calls: Recursive functions
9.	Pointers, structures and dynamic memory allocation: Pointer sand Structures
10.	File handling: File creation, writing and reading a file, File Manipulation Operations.

Note: A minimum of Ten experiments is to be performed.

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GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
(Autonomous College)

COURSE SCHEME
B.Tech.2nd Semester Electronics and Communication Engineering
Batch 2025 & Onwards

Contact Hrs/Week:22

Course Code	Course Type	Course Title	Credits	Load Allocation			Marks Distribution					
				L	T	P	CWA	PRS	MSE	ESE	PRE	Total
BMAT21	Basic Science Course	Engineering Mathematics-II	3	2	1	0	20		20	60		100
BCHT21	Basic Science Course	Advanced Engineering Chemistry	2	1	1	0	20		20	60		100
BEET21	Engineering Science Course	Fundamentals of Electrical Engineering	3	2	1	0	20		20	60		100
BECT21	Engineering Science Course	Electronics Circuits-I	3	2	1	0	20		20	60		100
BHST21	Humanities & Social science & management courses	Business Communication and Professional development	1	1	0	0	20		20	60		100
BCHL21	Basic Science Course	Advanced Engineering Chemistry-Lab	1	0	0	2		40			60	100
BEEL21	Engineering Science Course	Fundamentals of Electrical Engineering Lab	1	0	0	2		40			60	100
BHSL21	Humanities & Social science & management courses	Business Communication and Professional development Lab	1	0	0	2		40			60	100
BMEL21	Engineering Science Course	Workshop Manufacturing Practices	1	0	0	2		40			60	100
BECL21	Engineering Science Course	Electronics Circuits-I lab	1	0	0	2		40			60	100
		TOTAL	17	8	4	10						

CWA: Class work Assessment; PRS : Practical Sessional; PRE: Practical Exam; MSE: Mid Semester Exam; ESE:End Semester Exam

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Government College of Engineering & Technology, Jammu
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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	CSE/ECE/CE/EE/ME		
Semester	2 nd		
Name of the Course	ENGINEERING MATHEMATICS-II		
Course Code	BMAT21	Credits-	3
			L-2, T-1, P-0
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)	Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)	
CO1	Analyse an infinite series of positive terms for convergence or divergence, and distinguish between absolute and conditional convergence.
CO2	Understand the concept and formulation of Fourier series and apply it to represent periodic functions.
CO3	Solve ordinary differential equations of the first order and higher order.
CO4	Formulate and solve linear and non-linear partial differential equations.

Section-A

INFINITE SERIES

Convergence and divergence of positive term Series: p-test, Comparison Test, Cauchy Root Test, D'Alembert Ratio Test, Raabe's Test, Gauss Test, Logarithmic Test, Leibnitz Test for alternating series
(7 Hrs)

Alternating series: Leibnitz Test for alternating series, absolute and conditional convergence
(3 Hrs)

Fourier Series: Euler's formula, sufficient conditions for a Fourier expansion, functions having points of discontinuity, Odd and even functions, Fourier expansion of periodic functions.
(4 Hrs)

Half Range Fourier Series: Half range sine series, half range cosine series, Parseval's identity, complex form of Fourier series.
(7 Hrs)

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Section-B

DIFFERENTIAL EQUATIONS

Ordinary Differential equations: First order and first degree, Linear and Bernoulli's differential equations, Exact and non-exact differential equations. Higher order linear differential equations: Complementary solution, particular integral and general solution of these equations. **(7 Hrs)**

Variation of parameters technique to find particular integral of second order differential equations, Cauchy Euler and Lagrange's differential equations **(3 Hrs)**

PARTIAL DIFFERENTIAL EQUATIONS

First order linear p.d.e, Non-Linear p.d.e. of 1st order, solution by Charpit's method, Four Standard forms of non-linear p.d.e with reference to Charpit's technique: $f(p, q) = 0$, $f(z, p, q) = 0$, $f(x, p) = g(y, q)$ and Clairaut's form. **(4 Hrs)**

Homogeneous and non-homogeneous higher order linear partial differential equations with constant coefficients, Rules for finding P.I and C.F, Non-Linear equations of 2nd order.

(7 Hrs)

BOOKS RECOMMENDED:

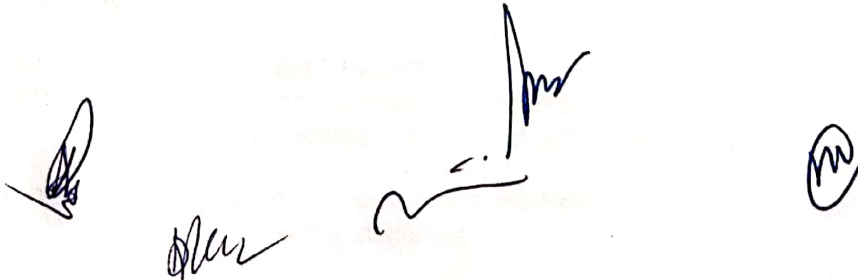
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|-------------------------------------|---------------------------|
| 1. Advanced Engineering Mathematics | R.K. Jain, S.R.K. Iyenger |
| 2. Differential Equations | G. F. Simmons |
| 3. Partial Differential Equations | M.D. Rai Singhania |
| 4. Engineering Mathematics-I | Dr. Bhopinder Singh |
| 5. Engineering Mathematics-II | Dr. Bhopinder Singh |

NOTE: The question paper shall consist of three sections (I, II & III).

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Sections II & III of the question paper will have three questions each from the respective sections (A & B) of the syllabus and each question will carry 12 marks. The candidate has to attempt four questions, selecting two from each section.

Use of scientific calculators (non-programmable), standard data/ log books are permitted, wherever required.





Government College of Engineering & Technology, Jammu
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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	CSE/ECE/EE		
Semester	2 nd		
Name of the Course	ADVANCED ENGINEERING CHEMISTRY		
Course Code	BCHT21	Credits-	2
			L-1, T-1, P-0
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)	Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)	
CO1	Know the importance of green chemistry and apply the knowledge of Drugs in day-to-day life.
CO2	Summarize the different types, preparation and uses of plastics, paints and varnishes.
CO3	Highlight the importance of Nano particles and get acquainted with the basic knowledge of various Electrochemical Cells
CO4	Understand the importance of colloids and the various chemical processes encountered in the water softening.

Section-A

Unit – I: GREEN CHEMISTRY AND DRUGS

Green Chemistry: Definition and need of Green Chemistry, Principles and applications of Green Chemistry.

Drugs: Definition, structure and applications of following drugs: -

- a) Tranquilizers b) Antibiotics

(7 Hrs)

Unit – II: PLASTICS AND PAINTS

Plastics: Introduction and importance of plastics, classification of plastics, moulding constituents of plastics, moulding of plastics into articles (compression, injection, transfer and extraction mouldings).

Paints: Introduction and requisites of a good paint, properties and uses of white pigments such as white lead and lithopone.

(7 Hrs)

Section- B

Unit – III: NANO CHEMISTRY AND MATERIAL SCIENCE

Nano Chemistry: Introduction and properties of nano particles, Nano materials- Graphene and fullerenes.

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Electrochemistry: Electrochemical cells; Galvanic cell and its application. Mass transfer by electroplating (08 Hrs)

Unit – IV WATER TREATMENT AND COLLOIDS

Water Treatment: Introduction, softening of water by Zeolite and ion-exchange processes, priming and foaming, sludge and scale formation, determination of hardness of water by EDTA method, Numerical on hardness and softening of water. (08Hrs)

Books Recommended:

- | | |
|------------------------------------------------------|---------------------|
| 1. Engineering Chemistry | Sharma, B.K. |
| 2. Material Science and Engineering | William Callister |
| 3. An introduction to Nanomaterials and Nano Science | A.K Das & Mahua Das |

Reference Books:

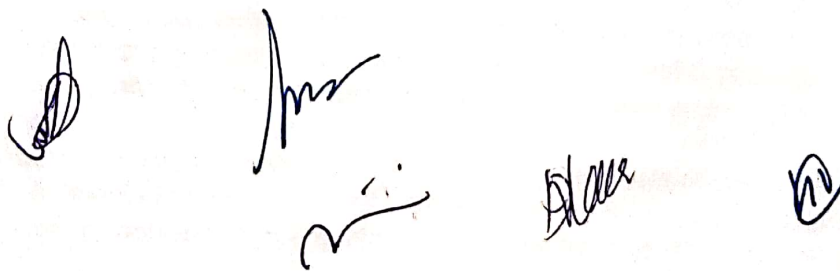
- | | |
|--------------------------------------|------------------|
| 1. Engineering Chemistry | Shashi, Chawla |
| 2. Spectroscopy of Organic Compounds | Silverstein |
| 3. Electrochemistry | Samuel Glasstone |

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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	CSE / ECE		
Semester	2 nd		
Name of the Course	FUNDAMENTALS OF ELECTRICAL ENGINEERING		
Course Code	BEET21	Credits-	3
			L- 2, T-1, P-0
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)	Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)	
CO1	The basic concepts of electric circuit terminology, Kirchhoff's and Ohm's laws.
CO2	The circuits using electrical theorems
CO3	The basic terminologies in AC and star-delta circuits
CO4	The basic concepts of single-phase transformer and installation of low voltage electrical components.

Section-A

Unit-1 Electric Circuit Laws & Energy Sources: Basic electric circuit terminology, Ohm's law, Kirchhoff's laws, Circuit parameters (Resistance, inductance & capacitance), series & parallel combination of resistance, inductance & capacitance. ideal & practical voltage and current sources and their transformation, dependent voltage sources and dependent current sources.

(10 Hrs)

Unit-2 D.C. Circuit Analysis: Power and energy relations, analysis of series parallel D.C. circuits, Mesh & Nodal methods, Star- Delta transformation, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem. Reciprocity Theorem

(12 Hrs)

Section-B

Unit-3 A.C. Circuit: Introduction, Average and effective values of periodic functions, instantaneous and average power, Phasor and complex number representation. Solution of sinusoidally excited R, L, C circuits, Resonance in series and parallel circuits, quality factor. Concept of 3-phase voltage and current in Wye (y), Delta circuits and their relationship.

(11 Hrs)

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Unit-4 Transformers and Electrical Installations: Principle operation of single-phase transformer, ideal and practical transformer (no-load & on-load phasor diagrams), equivalent circuit, losses in transformers, transformer test (open circuit & short circuit), regulation and efficiency, auto transformer. Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of wires and cables **(11 Hrs)**

RECOMMENDED BOOKS:

- | | |
|----------------------------------------|------------------|
| 1. Electrical Engineering Fundamentals | V. Del toro |
| 2. Electrical Technology | H. Cotton |
| 3. Electrical Technology | E. Hughes |
| 4. Basic Electrical Engineering | A.K. Chakrabarti |
| 5. Basic Electrical Engineering | J.B Gupta |

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B. Tech syllabus From Batch-2025 & onwards				
Branch	ECE			
Semester	2 nd			
Name of the Course	ELECTRONICS CIRCUITS-I			
Course Code	BECT21	Credits-	3	L-2, T-1, P-0
Mid Semester Examination	Max. Marks = 20		Class Work Assessment (CWA)	Max. Marks = 20
End Semester Examination	Max. Marks= 60		Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)	
CO1	To understand the fundamentals of semiconductor Physics.
CO2	To introduce the concepts of semiconductor devices with applications.
CO3	To enable the students to understand the working and applications of a transistor
CO4	To understand the basics Techniques of biasing of JFET & MOSFET

Section-A

UNIT-I: Semi-Conductors and Diodes: Introduction, Insulators, Semiconductors and Metals, Mobility and Conductivity, Intrinsic and Extrinsic Semiconductors, Charge Density, Current Components in Semiconductors, Continuity Equation, PN Junction Diode- Volt ampere characteristics, Diode capacitances, Static & dynamic resistances; Types of Diodes- Zener Diode, its breakdown phenomenon and its applications, Photodiodes, LED, Varactor Diode, Tunnel Diodes, Schottky diode. **(12 Hrs)**

UNIT-II: Diode Applications: Rectifiers and Filter Circuit: Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, and their Analysis, L, C, and Pi Filters; Series and Shunt Diode Clippers, Clipping at Two Independent Levels, Clamping Operation, Clamping Circuit; Practical Clamping Circuits. **(10 Hrs)**

Section-B

UNIT-III: Transistor Biasing: Symbol, Construction, and Characteristics of BJT, reach through &avalanche phenomena, Base width modulation, Transistor Configuration: CB, CE, CC Configuration with necessary current equations. Transistor as an amplifier and switch, Derivation related to Transistor Biasing and Bias Compensation Techniques. **(10 Hrs)**

UNIT-IV: Symbol, construction, and Characteristics of JFET, parameters of JFET, Analysis and biasing of JFET, Low-frequency model of JFET, MOSFET, and its characteristic. **(08 Hrs)**

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BOOKS RECOMMENDED:


1. Integrated Electronics by J. Millman and C.C. Halkias, McGraw Hill Education, India.
2. Electronics Devices and Circuit Theory by R. Boylestad and L. Nashelsky, Pearson India.
3. Electronics Devices and Circuits-II by U. A. Bakshi and A. P. Godse, Technical Publications.
4. Electronic principles by L. Malvino, Tata McGraw Hill Education.

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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	EE/ECE/CSE		
Semester	2 nd		
Name of the Course	BUSINESS COMMUNICATION & PROFESSIONAL DEVELOPMENT		
Course Code	BHST21	Credits-	1
			L-1, T-0, P-0
Mid Semester Examination	Max. Marks = 20	Class Work Assessment (CWA)	Max. Marks = 20
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs	

COURSE OUTCOMES (COs)	
CO1	Acquire proficiency in reading, writing, speaking & listening skills.
CO2	Develop Negotiation, Meeting and Presentation Skills.
CO3	Learn professional development skills and interpersonal communication.
CO4	Equip learners with basics of Life skills for a successful life.

Section-A

Communication skills: Introduction, Elements of Business Communication, Barriers to Business Communication, listening skills: Process of listening, types of listening, techniques to improve listening ability. Speaking Skills- Importance of Speaking Skills, components of Speaking skills.

(5Hrs)

Writing Skills: Script writing, Steps to write speech scripts, Tips for writing speeches. Meeting Skills: purpose of meeting, types of meeting, procedure for conducting a meeting. Presentation skills: meaning, importance, types of presentation, steps in preparing a presentation.

(5 Hrs)

Section-B

Professional development- Introduction, Objectives of professional development, Activities that contribute to professional development. Interviews-Meaning, Types of interviews, tips for giving an interview and handling questions. Professional Etiquette: meaning, types and importance of Professional Etiquette.

(5 Hrs)

Life Skills: - Definition and Importance of Life Skills, Life Skills Activities for personality development, Social Skills: need of social skills in communication, Types of social skills, components of social skills, Concept of hard and soft skills: Significance of hard and soft skills, Five important soft skills **(5Hrs)**

Books Recommended:

1. An approach to Communication skills by Indrajit Bhattachary, Dhanpat Rai Publication.
2. Professional Development by Sally J. Zepeda, published by Taylor & Francis Ltd.

References:

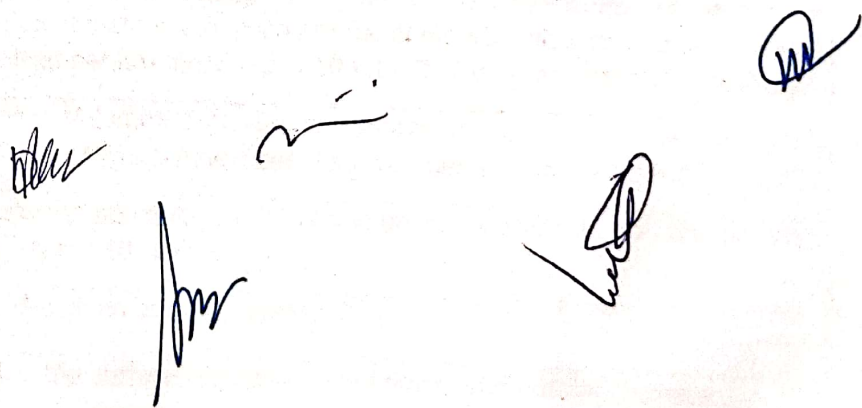
1. Communication Skills (Second Edition) by Sanjay Kumar & Pushap Lata, Oxford University Press.
2. Communication Skills by Varinder Kumar and Bodh Raj, Published by Kalyani Publishers.
3. Integrated Life Skills by Payel Basu, published by Notion Press.
4. Manuals of Life Skills Key to Excel by Alka Seth, Prof. Novrattan Sharma, Published by Global Vision Publishing House.

NOTE: The question paper shall consist of three sections (I, II & III).

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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	EE/ECE/CSE		
Semester	2 nd		
Name of the Course	ADVANCED ENGINEERING CHEMISTRY-LAB		
Course Code	BCHL21	Credits-	1
Practical Sessional (PRS)	Max. Marks = 40		
Practical Examination (PRE)	Max. Marks= 60		
	L-0, T-0, P-2		

COURSE OUTCOMES (COs)	
CO1	The course relies on quantitative analysis and makes use of simple equation to illustrate the concept involved.
CO2	Estimation of total hardness of water by EDTA complexometric method.
CO3	Analyse an overview of preparation and identification of organic compound and detection of various elements and functional groups present in it.

LIST OF EXPERIMENTS

S. No	Title of Experiment
1.	To determine Volumetrically the number of molecules of water of crystallization present in the given sample of Mohr's salt, x gms. of which have been dissolved per litre provided N/10 $K_2Cr_2O_7$ (using an external indicator).
2.	To determine Volumetrically the percentage of Cu in a sample of $CuSO_4$ crystals, Z gms of which have been dissolved per litre, provided 0.1N $Na_2S_2O_3$.
3.	To determine the percentage of $CaCO_3$ in precipitated chalk. You are provided with 1N HCl and 0.1N NaOH.
4.	To analyse the given antacid tablets.
5.	To determine the surface tension of a unknown liquid Stalagmometer.
6.	To prepare a pure and dry sample of Glucosazone.
7.	Determine the method of purification of organic compounds by paper chromatography.

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8.	Organic Analysis: Identify the following organic compounds (preparation of at least one derivative).
9.	Determine the total hardness of a sample of water by complexometric method (using EDTA).
10.	To determine the percentage of calcium oxide in cement.

NOTE: A minimum of eight (08) experiments to be performed by the students

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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards			
Branch	CSE / ECE		
Semester	2 nd		
Name of the Course	FUNDAMENTALS OF ELECTRICAL ENGINEERING LAB		
Course Code	BEEL21	Credits-	1 L-0, T-0, P-2
Practical Sessional (PRS)	Max. Marks = 20		
Practical Examination (PRE)	Max. Marks=60		

COURSE OUTCOMES (COs)	
CO1	Experimentally verify the basic circuit theorems
CO2	Measure current in series-parallel RLC circuits.
CO3	Measure load of 3 phase ac circuits connected in star and delta.
CO4	Understand the basic characteristics of single-phase transformer

LIST OF EXPERIMENTS

S. No	Title of Experiment
1.	Verification of Kirchoff's Laws.
2.	Verification of Superposition Theorem.
3.	Verification of Thevenin's Theorem
4.	Verification of Norton Theorem.
5.	Verification of Reciprocity Theorem.
6.	Verification of Maximum Power Transfer Theorem.
7.	Measurement of current in various branches of RLC series-parallel circuit.
8.	Study of three-phase A.C Circuits with Star and Delta connected Load.
9.	Study of single-phase transformer. Determination of polarity test of given single phase transformer.
10.	To perform open and short circuit test on single phase transformer.
11.	Study of wires, cables, fuses and MCBs.

Note- Minimum of seven experiments are to be performed by each student

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B. Tech syllabus From Batch-2025 & onwards			
Branch	EE/ECE/CSE		
Semester	2 nd		
Name of the Course	BUSINESS COMMUNICATION & PROFESSIONAL DEVELOPMENT LAB.		
Course Code	BHSL21	Credits- 1	L-0, T-0, P-2
Practical Sessional (PRS)	Max. Marks = 40		
Practical Examination (PRE)	Max. Marks= 60		

COURSE OUTCOMES (COs)	
CO1	Acquire proficiency in reading, writing, speaking and listening skills.
CO2	Develop presentation, interview and interpersonal communication skills.

LIST OF EXPERIMENTS

S. No	Title of Experiment
1.	<u>Life Skills</u> 1. Life Management Skills 2. Social Skills (Role play)
2.	<u>Speaking skills</u> 1. Meeting Skills 2. Presentation Skills
3.	<u>Personality Development</u> 1. Types of Personality 2. Personality Disorders
4.	<u>Interpersonal Skills</u> 1. Listening skills activity 2. Interviews, Mock Interviews

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5.	<u>Career Building & Resume writing</u> 9. SWOT Analysis 10. Resume Writing

Note- Minimum of Eight experiments are to be performed by each student

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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025& onwards

Branch	CSE/ECE/CE			
Semester	2 nd			
Name of the Course	WORKSHOP MANUFACTURING PRACTICES			
Course Code	BMEL21	Credits-	1	L-0, T-0, P-2
Practical Sessional (PRS)	Max. Marks = 40			
Practical Examination (PRE)	Max. Marks= 60			

COURSE OUTCOMES (COs)

CO1	Understanding different manufacturing techniques and their relative advantages/disadvantages with respect to different applications.
CO2	Selection of a suitable technique for meeting a specific fabrication need.
CO3	Acquire a minimum practical skill with respect to the different manufacturing methods.
CO4	Creation of simple components using different materials.

LIST OF EXPERIMENTS

1.	Unit -1: - Carpentry 1. Middle/Cross lap joint 2. Mortise and Tenon Joint T -Joint 3. Pattern making of open bearing
2.	Unit II: -Foundry 1. Moulding of open bearing (simple pattern) 2. Moulding of Sliding Job of Bench Vice (Split piece pattern)
3.	Unit -III: - Smithy

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	1. Upsetting, drawing and bending operation
4.	<p style="text-align: center;">Unit -IV: - Welding</p> <p>1. Preparation of single V- Butt joint by arc/gas welding.</p> <p>2. Preparation of Double V-Butt joint by gas /arc welding.</p> <p>3. Corner Joint by arc/gas welding</p> <p>4. Lap Joint by arc/gas welding</p>
5.	<p style="text-align: center;">Unit – V: - Fitting</p> <p>1. Assembly of snap fitting of MS-Flat pieces (Male and Female)</p> <p>2. Assembly and fitting of two L-shaped rectangular MS-flat pieces.</p>

Books Recommended: -

1. Workshop Technology by Hajra and Chowdhary
2. Manufacturing Technology Vol I and II by Rao. P.N
3. Manufacturing Technology by Gowri. Hariharan and A. Suresh Babu

NOTE: A minimum of eight experiments are to be performed by the students.

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Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025& onwards				
Semester	2 nd			
Name of the Course	ELECTRONICS CIRCUITS-I LAB			
Course Code	BECL21	Credits-	1	L-0, T-0, P-2
Practical Sessional (PRS)	Max. Marks = 40			
Practical Examination (PRE)	Max. Marks= 60			

COURSE OUTCOMES (COs)	
CO1	Plot and understand rectifiers and evaluate their performance parameters.
CO2	Plot the characteristics of FET using trainer kits
CO3	Plot V-I characteristics of transistor for various configurations.
CO4	Design basic electronic circuits using soldering techniques.

LIST OF EXPERIMENTS

1.	To study the various active and passive electronic components along with soldering techniques on PCB.
2.	To assemble various electronic circuits on a Breadboard.
3.	To determine and plot the operating characteristics of PN junction diode.
4.	To study the characteristics of Zener diode, photodiode, Tunnel diode and LED.
5.	To study Half wave and Full wave / Bridge Rectifier.

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6.	To study the operation characteristics (Input/Output) of the PNP/NPN Transistor (Common Emitter/Common Base).
7.	To study clipper and clamper circuits using diodes.
8.	To study the characteristics of FET and MOSFET.
9.	Design of self-Bias circuits using BJT.
10.	Design of self-Bias circuits using FET.

NOTE: Minimum of Eight experiments are to be performed by the students.

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