

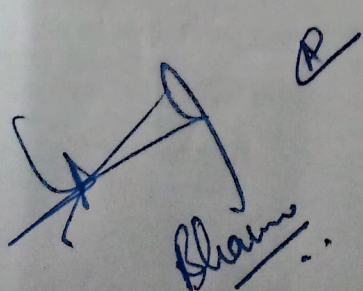


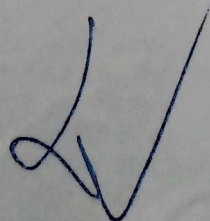
GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
(Autonomous College)

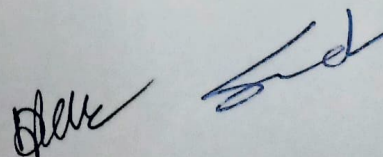
COURSE SCHEME
B.Tech. 1st SEMESTER MECHANICAL ENGINEERING
(Batch 2025 & Onwards)

Contact Hours/week: 24

Course Code	Course Type	Course Title	Credits	Load Allocation			Marks Distribution					Total
				L	T	P	CWA	PRS	MSE	ESE	PRE	
BMAT11	Basic Science Course	Engineering Mathematics -I	3	2	1	0	20	-	20	60	-	100
BCHT11	Basic Science Course	Applied Engineering Chemistry	2	1	1	0	20	-	20	60	-	100
BHST11	Humanities & Management Course	Communication skills & Personality development	1	1	0	0	20	-	20	60	-	100
BMET11	Engineering Science Course	Engineering Mechanics	4	3	1	0	20	-	20	60	-	100
BCST11	Engineering Science Course	Computer Programming	3	2	1	0	20	-	20	60	-	100
BCHL11	Basic Science Course	Applied Engineering Chemistry (Lab)	1	0	0	2	-	40	-	-	60	100
BHSL11	Humanities & Management Course	Communication skills & Personality development (Lab)	1	0	0	2	-	40	-	-	60	100
BMEL11	Engineering Science Course	Engineering Mechanics (Lab)	1	0	0	2	-	40	-	-	60	100
BCSL11	Engineering Science Course	Computer Programming (Lab)	1	0	0	2	-	40	-	-	60	100
BMEL12	Engineering Science Course	Workshop Technology	1.5	0	0	3	-	40	-	-	60	100
		Total	18.5	9	04	11	-	-	-	-	-	1000


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GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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Department of Mathematics

B.Tech. Syllabus From Batch-2025 & Onwards

Branch	CE/CSE/ECE/EE/ME		
Semester	1 st		
Name of the Course	Engineering Mathematics-I		
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): On completion of the course the students will be able to

CO1	Apply general theorems of calculus to analyze 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	Analyze and solve problems involving complex trigonometric functions.
CO4	Determine rank, eigen values and eigen vectors of matrices using matrix operations.

**Syllabus
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 multipliers. (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)

BOOKS RECOMMENDED:

- | | |
|----------------------------------|----------------------------|
| • Calculus and Analytic Geometry | Thomas and Finney |
| • Differential Calculus | S. Narayan and P.K. Mittal |
| • Higher Engineering Mathematics | B.S Grewal, Khanna |
| • Engineering Mathematics-I | Dr. Bhopinder Singh |
| • Engineering Mathematics-II | Dr. Bhopinder Singh |
| • Engineering Mathematics-I | Dr. Ambika Bhat |

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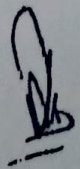
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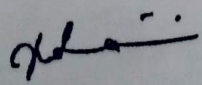
INSTRUCTIONS (End Semester Examinations)

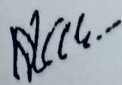
The question paper shall consist of three sections (I, II & III). Section-I will be compulsory consisting of conceptual/analytical/objective type/short type questions with maximum 12 marks, spread over the entire syllabus (both sections A & B).

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 will have to attempt four questions, from sections (II & III) selecting two from each.

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







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GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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Department of Chemistry

B.Tech. syllabus from Batch-2025 & onwards			
Branch	CIVIL/MECHANICAL		
Semester	Ist		
Name of the Course	Applied Engineering Chemistry		
Course Code	BCHT11	Credits- 2	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	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 composites explosives and about Nano particles.
CO3	To get acquainted with the basic knowledge of various electrochemical cells and chemical processes encountered in the water softening

Syllabus

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) Tranquillizers b) Antibiotics

(8 Hrs)

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Unit – II: NANO CHEMISTRY & EXPLOSIVES

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

Explosives:- Definition, classification, preparation and uses of TNT and RDX (7 Hrs)

Section-B

Unit – III : ELECTROCHEMISTRY AND CORROSION

Electrochemistry: Electrochemical cells: Galvanic cell and its application. Mass transfer by electroplating.

Corrosion: Dry and wet corrosion, factors influencing rate of corrosion, Remedial Measures against corrosion –cathodic protection. (8 Hrs)

Unit – IV: WATER TREATMENT

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. (7Hrs)

BOOKS RECOMMENDED

- Engineering Chemistry
- Material Science and Engineering
- An Introduction to nanomaterials and nano science

AUTHOR

Sharma, B.K.
William Callister
A.K Das & Mahua Das

Reference Books

- Engineering Chemistry
- Electrochemistry

Shashi, Chawla
Samuel Giasstone

INSTRUCTIONS (End Semester Examination)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory consisting of conceptual/analytical/objective type/short type questions with maximum 12 marks, spread over the entire syllabus(both sections).

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 will have to attempt four questions, from sections (II & III) selecting two from each.

Use of scientific calculators (non-programmable) are permitted, wherever required.

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**GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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Department of Humanities

B.Tech. syllabus From Batch-2025 & onwards	
Branch	Mechanical/Civil Engineering
Semester	1 st
Name of the Course	Communication Skills and Personality Development
Course Code	BHST11
Mid Semester Examination	Max. Marks = 20
End Semester Examination	Max. Marks = 60
Credits- 1	L-1 , T-0 , P-0
Class Work Assessment (CWA)	Max. Marks = 20
Max. Time- 3 Hrs	

COURSE OUTCOMES (COs): On completion of the course the students will be able to	
CO1	Acquire proficiency in reading, writing, speaking & listening skills.
CO2	Develop Meeting and Presentation Skills.
CO3	Identify the people with different Personality types, traits and disorders.
CO4	Equip learners with basics of Life skills for a successful life.

Syllabus

Section-A

- Communication skills:** Introduction, Elements of Communication, Barriers to 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

- Personality Development**—Introduction, factors influencing personality development, importance of personality development. **Personality Types:** different types of personality, personality disorder.
- Interviews**—Meaning, Types of Interviews, tips for giving an interview and handling questions. **(5Hrs)**
- 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:

- An Approach to Communication Skills by Indrajit Bhattacharya, Published by Dhanpat Rai & Co Ltd
- Personality Development and Soft Skills by Barun K. Mitra. Published by Oxford University Press, 2024.

References:

- Communication Skills (Second Edition) by Sanjay Kumar & Pushpa Lata, Oxford University Press.

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- Communication Skills by Varinder Kumar and Bodh F.a , Published by Kalyani Publishers.
- Manuals of Life Skills Key to Excel by Alka Sethi, Prof. Navrattan Sharma, Published by Global Vision Publishing House.

INSTRUCTIONS (End Semester Examinations)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory consisting of conceptual/analytical/objective type/short type questions with maximum 12 marks, spread over the entire syllabus(both sections). 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 will have to attempt four questions, from sections (II&I.I) selecting two from each.

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GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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B.TECH. 1ST SEMESTER MECHANICAL ENGINEERING
(Course for Mechanical Engineering Branch)
(Batch 2025 & Onwards)

Semester	1 ST SEMESTER			
Name of the Course	ENGINEERING MECHANICS			
Course Code	BMET11	Credits-	4	L-3 , 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 :At the end of this course, students will able to :	
CO1:	Understand and analyze system of units and their conversion from one to another.
CO2:	To demonstrate knowledge on basic forces calculation, their resultants and resolution.
CO3:	To have knowledge and approach to a conclusion of forces causing equilibrium.
CO4:	Be proficient in the use of integral and moment methods for calculating centre of gravity.
CO5:	Able to develop a stable, environment friendly structure for various engineering purpose using various methods.

SECTION-A

Unit – I

Scope and basic concepts (Rigid body, force, units, etc), concept of free body diagram, Resultant of Co-planar concurrent forces in a plane and space, moment of force, Principle of Moments, Coplanar and spatial applications. Virtual work method and its applications. Analysis of trusses, Equilibrium and its equations for a planar and spatial systems, Method of joints and sections. Theory of friction, its laws and applications (inclined plane). Square threaded screws, Belt friction, Centroids and center of gravity, centroids of lines and composite areas, centroids determined by integration. **(14 hrs)**

Unit – II Moment of inertia, Area M.O.I, Transfer theorems, Polar M.O.I, Product of inertia, Principal M.O.I, Mohr's circle for area M.O.I, Transfer theorems and axes M.O.I of composite bodies.

(14 hrs.)

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GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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SECTION-B

Unit – III

Kinematics of a particle rectilinear motion, motion curves, Rectangular components of curvilinear motion, Flight of Projectile, Normal and tangential components of acceleration, Radial and transverse components, Newton's Laws. D'Alembert's Principle. Kinematics of rigid bodies: Types of rigid body motion, Angular motion, fixed axis rotation, Analysis of plane motion and its applications. (14 Hrs)

Unit – IV Kinetics of Particle: Translation, Analysis of a particle as a rigid body. Kinetics of rigid bodies: Equations of plane motion, fixed axis rotation, Rolling bodies, General plane motion, Impulse and momentum in plane motion, Angular momentum. (14 Hrs.)

RECOMMENDED BOOKS:

- | | |
|---|----------------------------------|
| 1. Engineering Mechanics (Statics & Dynamics) | Beer and Johnson |
| 2. Engineering Mechanics (Statics & Dynamics) | Mariam and Kraige |
| 3. Engineering Mechanics (Statics and Dynamics) | Timoshenko and Young |
| 4. Engineering Mechanics (Statics and Dynamics) | Sarbjee Singh and Pardeep Singh. |

INSTRUCTIONS (End Semester Examinations)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory, it consists of conceptual/analytical/objective type and shorty type questions with maximum 12 marks, will cover the entire syllabus.

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 will have to attempt four questions, from sections (II&III) selecting two from each.

Use of scientific calculators (non-programmable), ~~standard calculator~~ permitted, wherever required.

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Department of Computer Science & Engineering

B. Tech Syllabus From Batch-2025 & onwards			
Branch: CSE/ECE/ME			
Semester	I st		
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)	
CO 1	Understand various software development tools like algorithm, pseudo codes and flow charts for solving problems.
CO 2	Understand the use of loops and decision-making statements to solve the problems.
CO 3	Apply different operations on arrays and user-defined functions to solve real-time problems.
CO 4	Analyze the operation of pointers, structures and unions.
CO 5	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 hours)

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 hours)

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 hours)

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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 hours)

Unit-5: Structures and Unions

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

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 hours)

BOOKS RECOMMENDED:

1. C How to Program,7/e – PaulJ. Deitel
2. Programming With C –Byron Gottfried.
3. Programming With C-E. Balaguruswamy.
4. C The Complete Reference - Herbert Schildt.
5. Let us C-Yashwant Kanitkar.

INSTRUCTIONS (End Semester Examinations)

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

Section-I will be compulsory consisting of conceptual/analytical/objective type/short type questions with maximum 12 marks, spread over the entire syllabus (both 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 will have to attempt four questions, from sections (II&III) selecting two from each.

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

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GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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Department of Chemistry

B.Tech syllabus from Batch-2025 & onwards			
Semester	Ist		
Branch	CIVIL/MECHANICAL		
Name of the Course	APPLIED ENGINEERING CHEMISTRY-LAB		
Course Code	BCHL11	Credit	1 L-0, T-0, P-2
Practical Sessional (PRS)	Max. Marks = 40		
Practical Examination (PRE)	Max. Marks= 60		

COURSE OUTCOMES (COs)	
CO1	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 compounds 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 coefficient of viscosity of an unknown liquid using Ostwald Viscometer.

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4.	To prepare a pure and dry sample of Glucosazone.
5.	To analyse the given antacid tablets.
6.	To prepare a pure and dry sample of Asorin.
7.	Determine the method of purification of organic compounds by paper chromatography.
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.	Determine the percentage of calcium oxide in cement.

NOTE: A minimum of Eight (08) experiments to be performed.

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GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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Department of Humanities

B.Tech. syllabus From Batch-2025 & onwards			
Branch	Mechanical/Civil Engineering		
Semester	1 st		
Name of the Course	Communication Skills and Personality Development Lab		
Course Code	BHSL: 1	Credits- 1	L-0 , T-0 , P-2
Practical Sessionals (PRS)	Max. Marks = 40	Practical Examination (PRE)	Max. Marks = 60
Max. Time- 3 Hrs			

COURSE OUTCOMES (COs): On completion of the course the students will be able to	
CO1	Acquire proficiency in reading, writing, speaking and listening skills.
CO2	Develop presentation, interview and Interpersonal communication skills

List of Practicals:

Life Skills

1. Life Management Skills
2. Social Skills (Role play)

Speaking skills

3. Meeting Skills
4. Presentation Skills

Personality Development

5. Types of Personality
6. Personality Disorders

Interpersonal Skills

7. Listening skills activity
8. Interviews, Mock Interviews

Career Building & Resume writing

9. SWOT Analysis
10. Resume Writing

Note: Eligibility to appear in Practical Test: 8 Practicals

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GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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B.TECH. 1ST SEMESTER MECHANICAL ENGINEERING
(Course Common for Mechanical/ Civil Engineering Branches)
(Batch 2025 & Onwards)

Semester	1ST SEMESTER			
Name of course	ENGINEERING MECHANICS LAB			
Course Code	BMEL11	Credits-	1	L-0,T-0, P-2
Practical Sessional (PRS)	Max. Marks= 40			
Practical Examination(PRE)	Max. Marks=60			

COURSE OUTCOMES : At the end of this course, students will able to :	
CO1	Understand and implement fundamentals of statics and motion principles of engineering problems.
CO2	Contain knowledge on finding stable structures of engineering practice and bending of beams.
CO3	Understand, analyse and solve engineering problems related to motion.
CO4	Demonstrate the knowledge on basic calculation of forces and their resultant and resolution.

LIST OF PRACTICALS: -

1. To Verify Parallelogram Law of Forces.
2. To Verify LAMI'S Theorem.
3. To Verify Bending Moment.
4. To Find the Co-efficient of Friction between Glass and Wooden surface on inclined Plane.
5. To find out velocity ratio and mechanical advantage of single/ double purchase winch crab.
6. To Find the Co-efficient of Friction between Glass and steel roller on inclined Plane.
7. To find out velocity ratio and mechanical advantage of worm & worm wheel.
8. To find out support reactions in case of simply supported beam.

NOTE: Minimum of Six experiments to be performed.

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GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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B.TECH. 1ST SEMESTER MECHANICAL ENGINEERING
(Course Common for Computer Science/ Electronics and Communication/ Mechanical
Engineering Branches)
(Batch 2025 & Onwards)

Semester	1ST SEMESTER			
Name of the Course	COMPUTER PROGRAMMING LAB			
Course Code	BCSL11	Credits-	1	L-0, T-0, P-2
Practical Sessional(PRS)	Max. Marks= 40			
Practical Examination(PRE)	Max. Marks=60			

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO 1	Understand the working of different compilers and editors for writing programs in C.
CO 2	Exercise basic syntax, operators and control statements to write C programs.
CO 3	Execute programs based on user defined functions and recursive functions.
CO 4	Implement arrays, pointers to access variables and functions.
CO 5	Write programs that perform operations using derived data types and files.

Lab Experiments

- Experiment 1:** Problem solving using computers Familiarization with programming environment.
- Experiment 2:** Variable types and type conversions: simple computational problems using arithmetic expressions.
- Experiment 3:** Branching and logical expressions: Problems involving if-then-else structures.
- Experiment 4:** Loops, while and for loops: Iterative problems eg.sum of series
- Experiment 5:** 1D Arrays: searching, sorting: 1D Array manipulation
- Experiment 6:** 2D arrays and Strings, memory structure: Matrix problems, String Operations
- Experiment 7:** Functions: call by value, call by reference: Simple functions
- Experiment 8:** Recursion, structure of recursive calls: Recursive functions
- Experiment 9:** Pointers, structures and dynamic memory allocation: Pointer sand Structures
- Experiment10:** File handling: File creation, writing and reading a file, File Manipulation Operations.

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



GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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B.TECH. 1ST SEMESTER MECHANICAL ENGINEERING
(Course Common for Electrical/ Mechanical Engineering Branches)
(Batch 2025 & Onwards)

Semester	1st SEMESTER			
Name of the Course	WORKSHOP TECHNOLOGY			
Course Code	BMEL12	Credits-	1.5	L-0,T-0, P-3
Practical Sessional(PRS)	Max. Marks= 40			
Practical Examination(PRE)	Max. Marks=60			

COURSE OUTCOMES:- At the end of the course, the student will demonstrate the ability to: -

CO1	Introduction to different manufacturing methods in different fields of engineering.
CO2	Understanding different manufacturing techniques and their relative advantages/disadvantages with respect to different applications
CO3	Acquire a minimum practical skill with respect to the different materials.
CO4	Creation of simple components using different materials.

SHOP PRACTICE:-

Unit -1: - Carpentry

1. Middle/Cross lapjoint
2. Mortise and Ten-on Joint T-Joint
3. Pattern making of open bearing

Unit II: -Foundry

1. Moulding of open bearing (simple pattern)
2. Moulding of Sliding Job of Bench Vice (Split piece pattern)

Unit -III: - Smithy

1. Upsetting, drawing and bending operation

Unit -IV: - Welding

1. Preparation of single V- Butt joint by arc/gas welding.
2. Preparation of Double V-Butt joint by gas /arc welding.
3. Corner Joint by arc/gas welding
4. Lap Joint by arc/gas welding

Unit – V: - Fitting

1. Assembly of snap fitting of MS-Flat pieces (Male and Female)
2. Assembly and fitting of two L-shaped rectangular MS-flat pieces.

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. P. Hariharan and A. Suresh Babu.

NOTE: Minimum of Eight experiments to be performed.



GOVT. COLLEGE OF ENGINEERING AND TECHNOLOGY, JAMMU
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COURSE SCHEME

B.Tech. 2nd SEMESTER MECHANICAL ENGINEERING

(Batch 2025 & Onwards)

Contact Hrs/Week: 21 hrs.

Course Code	Course Type	Course Title	Credits	Load Allocation			Marks Distribution					Total
				L	T	P	CWA	PRS	MSE	ESE	PRE	
BMAT21	Basic Science Course	Engineering Mathematics II	3	2	1	0	20	-	20	60	-	100
BHST21	Humanities and Management Course	Universal Human Values & Professional Ethics	3	2	1	0	20	-	20	60	-	100
BCET21	Engineering Science Course	Environmental Science	3	2	1	0	20	-	20	60	-	100
BPHT21	Basic Science Course	Advanced Engineering Physics	2	1	1	0	20	-	20	60	-	100
BMET21	Engineering Science Course	Engineering Drawing with CAD	3	3	0	0	20	-	20	60	-	100
BECT22	Engineering Science Course	Fundamentals of Electronics Engineering	3	2	1	0	20	-	20	60	-	100
BPHL21	Basic Science Course	Advanced Engineering Physics (Lab)	1	0	0	2	-	40	-	-	60	100
BECL22	Engineering Science Course	Fundamentals of Electronics Engineering Lab.	1	0	0	2	-	40	-	-	60	100
		Total	19	12	5	4	-	-	-	-	-	800

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

Department of Mathematics

B.Tech. Syllabus From Batch-2025 & Onwards			
Branch	CE/CSE/ECE/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): On completion of the course the students will be able to	
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 first and higher order.
CO4	Formulate and solve linear and non-linear partial differential equations.

Syllabus
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. (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)

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 first 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)

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BOOKS RECOMMENDED:

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

INSTRUCTIONS (End Semester Examinations)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory consisting of conceptual/analytical/objective type/short type questions with maximum 12 marks, spread over the entire syllabus(both 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 will have to attempt four questions, from sections (II & III) selecting two from each.

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

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

Department of Humanities

B.Tech. syllabus From Batch-2025 & onwards			
Branch	Mechanical/Civil Engineering		
Semester	2 nd		
Name of the Course	Universal Human Values and Professional Ethics		
Course Code	BHST21	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): On completion of the course the students will be able to	
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.

Syllabus

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 ensuring 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 Values

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

Respect (Samman) as Right Evaluation: Over, Under and Otherwise Evaluation

Justice (Nyaya): Meaning of Justice and Program for its fulfillment to ensure mutual happiness.

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Understanding Universal Human Order: Human Goal, Dimensions (Systems) of Human Order, Harmony from Family Order to World Family Order. (11 Hrs)

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.

Professional Ethics

Introduction to professional ethics, Morals Values and ethics, Philosophical approaches to business ethics, Corporate Social Responsibility (CSR)- Meaning and Importance. Ability to utilize the professional competence for augmenting universal human order.

(10 Hrs)

RECOMMENDED BOOKS:

- 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
- PPTs of Lectures and Practice Sessions
- Audio-visual material for use in the practice sessions

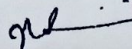
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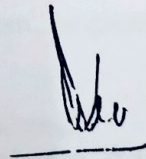
- B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
- PL Dhar, RR Gaur, 1990, Science and Humanism, Common wealth Publishers.
- Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
- Ivan Illich, 1974, Energy & Equity, The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

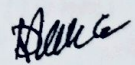
INSTRUCTIONS (End Semester Examinations)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory, consisting of conceptual/analytical/objectives type/short type questions with maximum 12 marks, spread over the entire syllabus (both sections).

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 will have to attempt four questions, from sections (II&III) selecting atleast two from each.









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

B.TECH. 2nd SEMESTER MECHANICAL ENGINEERING
(Course Common for Mechanical/Civil/Computer Science/ Electrical/ Electronics and
Communication Engineering Branches)
(Batch 2025 & Onwards)

Semester	2 nd SEMESTER			
Name of the Course	ENVIRONMENTAL SCIENCE			
Course Code	BCET21	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 : On completion of the course the students will be able to:	
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

Unit – I Ecosystems: Structure and functions, Energy flow in the ecosystem. Food chain, food web and ecological pyramids, —

Ecological succession

Types of ecosystems: Forest, Grassland, Desert and Aquatic ecosystem. Biogeochemical Cycles: Carbon cycle and Nitrogen Cycle.

(10 hrs)

Unit – II Natural Resources : Renewable and Non-renewable resources.

Different types of resources :**Forest resources:** Use and over Exploitation, deforestation, its effects on forest and tribal people.

Land resources – use and over exploitation, soil erosion and desertification, Waste Land reclamation.

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

(10 hrs)

SECTION-B

Unit – III Environmental Pollution: Definition, Cause, effects and control measures of Air, Water , noise & soil pollution, Greenhouse effect and global warming , acid rain, ozone layer depletion. —

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

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).

(10 hrs)

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Unit – IV Social Issues related to Environment

Ecotourism and Environmental Ethics, Ecomark and Biodegradable Plastics.
Sustainable development and Sustainable development goals (SDG's)
Environment treaties : Montreal protocol and kyoto protocol.

(10 hrs)

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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 |

INSTRUCTIONS (End Semester Examinations)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory, it consists of conceptual/analytical/objective type and shorty type questions with maximum 12 marks, will cover the entire syllabus.

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 will have to attempt four questions, from sections (II&III) selecting two from each.

~~Use of scientific calculators (non-programmable), steam table, etc. is permitted,
over a period of 15 minutes.~~

Dr. J. K. Deswal



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

Department of Physics

B.Tech. syllabus From Batch-2025 & onwards			
Branch	Mechanical/Civil Engineering		
Semester	2 nd		
Name of the Course	Advanced Engineering Physics		
Course Code	BPHT21	Credits- 2	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 the significance of vector calculus and Maxwell's equations as the basis of Electromagnetic theory.
CO2	Assimilates the basic principles of Laser Physics, moment of inertia and their applications in various fields.
CO3	Acquire the concepts of semiconductors, types of semiconductors and various properties of semiconductor physics.
CO4	Understand the basic concepts of friction, types of friction and its applications..

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Syllabus

Section-A

UNIT 1: 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 (E M wave equations for electric & magnetic fields for free space) & their solutions (plane wave solution), velocity of EM waves, Relation between E_0 & E_o . **(08 hours)**

UNIT-II: LASER Physics

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)**

UNIT -III: PROPERTIES OF SURFACES, MOMENTS AND PRODUCTS OF INERTIA

Definition Moment of Inertia for areas-Parallel axis theorem-Perpendicular axis theorem Moment of inertia for composite area-product of inertia form, mass moment of inertia. **(04 hours)**

Section-B

UNIT-V: 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 a p-n junction. **(09 hours)**

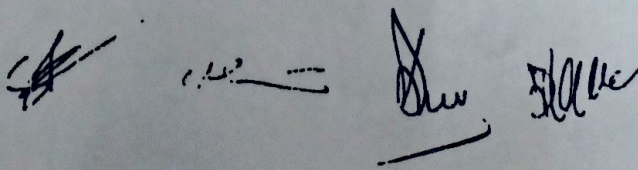
UNIT -VI: FRICTION

Laws of coulomb friction -Coefficient of Friction -Dry Friction -sliding Friction -ladder friction -Belt friction -Rolling Resistance **(06 hours)**

Books Recommended

- Fundamentals of Electricity & Magnetism.
- Lasers
- Engineering Mechanics
- Semiconductor Physics and devices

Duggal & Chhabra
K R.Nambiyar
A.K.Tayal
Donald A. Neamer



INSTRUCTIONS (End Semester Examinations)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory consisting of conceptual/analytical/objective type/short type questions with maximum 12 marks, spread over the entire syllabus(both sections).

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 will have to attempt four questions, from sections (II & III) selecting two from each. Use of scientific calculators (non-programmable), are permitted, wherever required.

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

B.TECH. 2nd SEMESTER MECHANICAL ENGINEERING
(Course Common for Mechanical/Civil Engineering Branches)
(Batch 2025 & Onwards)

Semester	2 nd SEMESTER			
Name of the Course	ENGINEERING DRAWING WITH CAD			
Course Code	BMET21	Credits-	3	L-3 , 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: At the end of the course students will be able to:	
CO 1	Understand and use engineering scales with accuracy and interpret missing views.
CO 2	To have knowledge of Industrial practices and standards.
CO 3	Understand and apply the principles of engineering drawing by using correct types of lines, lettering, dimensioning, and construction of engineering curves and scales.
CO 4	Knowledge of computer Aided design and drafting
CO 5	Develop the ability to visualize, 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 Dimensioning: Introduction, Lines, types of lines, Lettering, Single stroke Lettering, Dimensioning, placing of dimensions, Aligned and unidirectional.

Curves used in Engineering Practice: Cycloidal, Involute, Spirals and Helices. Scale types, plain and diagonal. **(10 Hrs.)**

Unit – II Projection of Points and Straight Lines: Introduction to quadrant system, Concept of first angle third angle projection, Projection of points in first quadrant, second quadrant, third quadrant and fourth quadrant with conclusions. Introduction, projection of lines in various quadrants and with conditions like parallel, perpendicular and inclined cases.

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. **(13 Hrs.)**



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

SECTION-B

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

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. **(12 Hrs.)**

Unit – IV Introduction to CAD:CAD User Interface-Menu system-coordinate systems, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, Tool bars (draw, modify, annotations, layers etc.) ,Status bar (ortho, grid, snap, iso etc.), 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. Generation of points, lines, curves, polygons, dimensioning, layers, blocks etc.

Orthographic Projections: Orthographic projection of simple blocks (First & Third angles), to draw the third view from given two views. Missing lines in projections. **(13 Hrs.)**

RECOMMENDEDBOOKS:

1	Engineering Drawing	P.S Gill
2	Practical Geometry	V. Laxminarayan & GEV
3	Engineering Graphics	K.L.Narayanan&P.Kanaiah
4	Engineering Graphics with AutoCAD	D. M. Kulkarni, A. P. Rastogi

INSTRUCTIONS (End Semester Examinations)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory, it consists of conceptual/analytical/objective type and shorty type questions with maximum 12 marks, will cover the entire syllabus.

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 will have to attempt four questions, from sections (II&III) selecting two from each.

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



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

Department of Electronics and Communication Engineering

B. Tech syllabus From Batch-2025 & onwards				
Branch	Mechanical Engineering			
Semester	2 nd			
Name of the Course	FUNDAMENTALS OF ELECTRONICS ENGINEERING			
Course Code	BECT22	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 introduce the concepts of semiconductor devices with applications.
CO2	To understand the designing of Power supplies using Regulator ICs.
CO3	To enable the students to understand the working and applications of a BJT and FET
CO4	To Understand the basic logic Gates and combinational circuits.

Section-A

UNIT-I: PN junction Diodes and its applications; PN Junction Diode- Volt ampere characteristics, Diode capacitances, Static & dynamic resistances; Types of Diodes- Zener Diode, its breakdown phenomenon and its applications, LED, Tunnel Diodes, Schottky diode. Rectifiers and Filter Circuit: Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, and their Analysis, L, C, and Pi Filters **(13 Hrs)**

UNIT-II: Power supplies and Regulators: Introduction & necessity of voltage regulators, Difference between unregulated & regulated power supply, Factor affecting unregulated power supply, Basic representation of voltage regulators Type of voltage regulators-series & shunt voltage regulators, Monolithic & IC regulators (78XX, 79XX, LM317, LM337) and design, **(10Hrs)**

Section-B

UNIT-III: Transistor Biasing: Symbol, Construction, and Characteristics of BJT, Transistor Configuration: CB, CE, CC Configuration with necessary current equations. Transistor as an amplifier, Derivation related to Transistor Biasing, Working of RC Coupled Amplifier. Symbol, construction, and Characteristics of JFET, parameters of JFET, Analysis and biasing of JFET. **(12Hrs)**

UNIT IV: Number System, Radix conversion, BCD codes, Logic Gates, K-map upto 4 variables. Introduction to combinational circuits: Half and Full Adders, Flip flops. **(10Hrs)**

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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. Digital Electronics by RP Jain
4. Electronic principles by L. Malvino, Tata McGraw Hill Education.

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) are permitted, wherever required.

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Established 1994



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

Department of Physics

B.Tech syllabus from Batch-2025 & onwards				
Branch	Mechanical/Civil Engineering			
Semester	2 nd			
Name of the Course	ADVANCED ENGINEERING PHYSICS-LAB			
Course Code	BPHL21	Credits	1	L-0, T-0, P-2
Practical Sessional (PRS)	Max Marks = 40			
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 experimentation skills by displaying minimized measurement errors
CO3	Demonstrate and improve the practical skills to use the appropriate physical concepts to obtain the solutions pertaining to different physics experiments.
CO4	Acquire the essence of scientific temper infused with innovation and creativity

LIST OF EXPERIMENTS

1.	To find the frequency of AC mains using a sonometer.
2.	To determine the wavelength of Sodium light using a plane transmission diffraction grating.
3.	To find the co-efficient of self-induction of a coil by Anderson's Bridge using headphones.
4.	To find the wavelength of monochromatic light using Newton's rings apparatus.
5.	To plot a graph between the distance of knife-edges from the center of gravity and the time period of a compound pendulum. From the graph find (a) the acceleration

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	due to gravity (b) the radius of gyration (c) the moment of inertia of the bar about its axis passing through the center of gravity
6.	To determine the plateau and optimal operating voltage of Geiger Muller (GM) Counter time period of a compound pendulum. From the graph find (a) the acceleration due to gravity
7.	To study the variation of Magnetic field by using Stewart and Gee's Tangent galvanometer.
8.	To find the dispersive power of a given prism using a spectrometer
9.	To find the impedance of LCR circuit
10.	To study the Common base/ common emitter characteristics of PNP/NPN junction transistor.
11.	To determine the specific rotation of sugar/glucose using Laurent's Half shade Polarimeter.

NOTE: A minimum of seven (07) experiments is to be performed covering the diverse aspects of engineering physics.

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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	Mechanical Engineering			
Semester	2 nd			
Name of the Course	FUNDAMENTAL OF ELECTRONICS ENGINEERING LAB			
Course Code	BECL22	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 characteristics of transistor for various configurations.
CO4	Design and implement various combinational circuits using digital IC's.

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, Tunnel diode and LED.
5	To study Half wave and Full wave / Bridge Rectifier.
6	To study the operation characteristics (Input/Output) of the PNP/NPN Transistor (Common Emitter/Common Base).
7	To study the characteristics of FET
8	Verification of truth tables of Logical Gates AND / OR / NOT, NAND, NOR, EXOR, EXNOR, Gates.
9	To implement Half Adder and Full Adder
10	Study of single stage RC coupled amplifier and to determine gain and bandwidth

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



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

Courses to be offered to the other Disciplines in B.Tech. 1st & 2nd Semester

**B.TECH. 1ST SEMESTER MECHANICAL ENGINEERING
(Course Common for Computer Science/ Electrical/ Electronics and Communication
Engineering Branches)
(Batch 2025 & Onwards)**

Semester	1st SEMESTER			
Name of the Course	Engineering Graphics with CAD			
Course Code	BMET12	Credits-	3	L-2 , T- 1 , P-0
Mid Semester Examination	Max. M arks = 20	Class Work Assessment (CWA)	Max. Marks = 20	
End Semester Examination	Max. Marks= 60	Max. Time- 3 Hrs.		

COURSE OUTCOMES: At the end of the course students will be able to:

CO 1	Understand and use engineering scales with accuracy and interpret missing views.
CO 2	To have knowledge of Industrial practices and standards.
CO 3	To Understand the principles of engineering drawing
CO 4	Knowledge of computer Aided design and drafting
CO 5	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 Dimensioning: 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 Helices, Locus of a point on simple mechanism (12hrs)

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 principal 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)



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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.

(10 hrs)

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), The Status Bar, 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 | P.S Gill |
| 2. Practical Geometry | V. Laxminarayan & GEV |
| 3. Engineering Graphics | K.L. Narayanan & P. Kanaiah |
| 4. Engineering Graphics with AutoCAD | D. M. Kulkarn. |

INSTRUCTIONS (End Semester Examinations)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory, it consists of conceptual/analytical/objective type and shorty type questions with maximum 12 marks, will cover the entire syllabus.

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 will have to attempt four questions, from sections (II&III) selecting two from each.

~~Use of electronic calculators (non-programmable) is permitted.~~
~~Wherever required.~~



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B.TECH. 2nd SEMESTER MECHANICAL ENGINEERING
(Course Common for Electrical/ Civil Engineering)
(Batch 2025 & Onwards)

Semester	2nd SEMESTER			
Name of the Course	Basics of Mechanical Engineering			
Course Code	BMET22	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	
At the end of the course student will be able to:	
CO1:	To have better understanding of fundamental principles of mechanics, including force systems, moments, equilibrium, and truss analysis using graphical and analytical methods
CO2:	Experimental knowledge of modes of heat transfer and basic laws
CO3:	Knowledge of working principles, cycles, and performance of internal combustion engines, compressors, and friction systems, and interpret P-V and T-S diagrams for various cycles
CO4:	Better Understanding of properties of fluids and their uses.
CO5:	Domain knowledge to analyze the performance of Hydraulic Machines.

Section A

Unit I Scope and basic concepts (Rigid body, force, units, etc), concept of free body diagram, Resultant of Co-planar concurrent forces in a plane and space, moment of force, Principle of Moments, Coplanar and spatial applications. Virtual work method and its applications. Analysis of trusses, Equilibrium and its equations for a planar and spatial systems, Method of joints and sections.

(11 hrs.)

Unit II Importance of heat transfer in engineering, Comparison of heat transfer with thermodynamics, Modes of heat transfer: conduction, convection, and radiation, , Basic concepts: temperature gradient, heat flux, and thermal resistance, Fourier's Law of Heat Conduction, Newton's Law of Cooling. Types of convection: natural and forced, Concept of heat transfer coefficient, Basic concepts of thermal radiation, Blackbody and gray body, Heat exchange between two surfaces

(11 hrs.)

Section B



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Unit III Fluid properties, density and viscosity etc. Types of fluids, Newton's law of viscosity, Pascal's law, Bernoulli's equation for incompressible fluids. Archimedes principles, buoyant force, working Principle of Hydraulic machines, pumps, turbines, Reciprocating pumps.

Thermodynamics: Introduction to Thermodynamics, Thermodynamics system (closed, open and isotropic systems), properties, state, process, Zeroth, First and second law of thermodynamics, thermodynamics processes at constant pressure, volume, enthalpy and entropy, thermodynamic Equilibrium and types of equilibrium, Classification and working of boilers, efficiency and performance analysis, Steam properties and use of steam tables.

(12 hrs.)

Unit IV Internal Combustion (I.C.) Engines: Working principle of steam Engine, Carnot, Otto, Diesel and Dual cycles P-V and T-S diagrams and its efficiency, working of Two- stroke and Four- stroke Petrol and Diesel Engines. Friction: Dry friction; Description and applications of friction. Working Principle of Compressors.

(11 hrs.)

Reference Books:

1. Agrawal CM, Basic Mechanical Engineering, Wiley Publication.
2. Achuthan M, Engineering Thermodynamics, PHI.
3. Ganesan, Internal combustion engines, TMH.
4. Nag P.K. Engineering Thermodynamics
5. Nakra & Chaudhary, Instrumentation and Measurements.

INSTRUCTIONS (End Semester Examinations)

The question paper shall consist of three sections (I, II & III). Section-I will be compulsory, it consists of conceptual/analytical/objective type and shorty type questions with maximum 12 marks, will cover the entire syllabus.

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 will have to attempt four questions, from sections (II&III) selecting two from each.

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



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(Course Common for Computer Science/ Electronics & Communication/Civil Engineering
Branches)
(Batch 2025 & Onwards)

Semester	2 nd SEMESTER			
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:- At the end of the course, the student will demonstrate the ability to: -

CO1	Introduction to different manufacturing methods in different fields of engineering.
CO2	Understanding different manufacturing techniques and their relative advantages/disadvantages with respect to different applications
CO3	Acquire a minimum practical skill with respect to the different materials.
CO4	Creation of simple components using different materials.

SHOP PRACTICE:-

Unit -1: - Carpentry

1. Middle/Cross lap joint
2. Mortise and Tenon Joint T-Joint
3. Pattern making of open bearing

Unit II: - Foundry

1. Moulding of open bearing (simple pattern)
2. Moulding of Sliding Jaw of Bench Vice (Split piece pattern)

Unit -III: - Smithy

1. Upsetting, drawing and bending operation

Unit -IV: - Welding

1. Preparation of single V- Butt joint by arc/gas welding.
2. Preparation of Double V-Butt joint by gas /arc welding.
3. Corner Joint by arc/gas welding
4. Lap Joint by arc/gas welding

Unit - V: - Fitting

1. Assembly of snap fitting of MS-Flat pieces (Male and Female)
2. Assembly and fitting of two L-shaped rectangular MS-flat pieces.

Books Recommended: -

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

NOTE: Minimum of Eight experiments to be performed.