UNIVERSITY OF JAMMU

(NAAC ACCREDITED A++ GRADE UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)
Email: academicsectionju14@gmail.com

NOTIFICATION

(05/May/Adp/13)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, has been pleased to authorize the adoption of revised/ updated Syllabi of **Semester I & II of B.Tech (Mechanical Engineering) Programme** under the Credit Based System as per the model curriculum of the AICTE (as given in the Annexure) for the candidates of University Institute of Engineering & Technology (UIET) **and** all Engineering Colleges affiliated with the University of Jammu from the Academic Session 2026-27 onwards.

Branch	Semester	Examination to be held in the years
Mechanical Engineering	**Semester-I**	**December. 2026, 2027, 2028 and 2029**
	Semester-II	**May. 2027, 2028, 2029 and 2030**

The Syllabi of the said course is available on the University Website: www.jammuuniversity.ac.in

-SD-
Dean Academic Affairs

No.F.Acd/III/26/ 1639-48
Dated: 22**/05/2026**

Copy for information & necessary action to:-

1. Sr.P.A to Dean Faculty of Engineering.
2. Principal, UIET, Kathua Campus.
3. Principal/Coordinator,MBSCET/YCET
4. C. A to C.E
5. Joint/Deputy/Assistant Registrar (Exams. Prof. /Confidential/ Evaluation Prof.)
6. Office copy

21/5/26.
Joint Registrar (Academic)

21/5/26 21/5/26

UNIVERSITY OF JAMMU

DEPARTMENT OF MECHANICAL ENGINEERING

PROPOSED SYLLABUS FOR B.TECH.

BATCH 2026 ONWARDS

COURSE SCHEME FOR FIRST SEMESTER MECHANICAL ENGINEERING

SEMESTER- I (FIRST) L= Lectures, T = Tutorials, P = Practicals										
S. No.	**Course Code**	**Course Type**	**Name of the Course**	**Teaching Scheme**			**Evaluation Scheme**		**Grand Total Marks**	**Total Credits**
				L	**T**	**P**	**Internal**	**External**		
1	UBST101	Basic Science Course	Applied Engineering Math-I	02	01	-	25	75	100	03
2	UBST103	Basic Science Course	Engineering Chemistry	02	01	-	25	75	100	03
3	UHMT102	Humanities and Social Sciences including Management Course	Communication Skills and Personality Development	02	-	-	25	75	100	02
4	UEST101	Engineering Science Course	Fundamentals of Electrical Engineering	02	01	-	25	75	100	03
5	UEST102	Engineering Science Course	Engineering Graphics with CAD	03	-	-	25	75	100	03
6	UEST103	Engineering Science Course	Energy and Environment	03	-	-	25	75	100	03
7	UESP111	Engineering Science Course	Lab Course on Fundamentals of Electrical Engineering	-	-	02	50	-	50	01
8	UHMP111	Humanities and Social Sciences including Management Course	Communication Skills and Personality Development in Practice	-	-	02	50	-	50	01
9	UBSP113	Basic Science Course	Lab Course on Engineering Chemistry	-	-	02	50	-	50	01
10	UESP112	Engineering Science Course	Workshop Practices	-	-	03	50	-	50	1.5
			Total	**14**	**03**	**09**	**350**	**450**	**800**	**21.5**

COURSE SCHEME FOR SECOND SEMESTER MECHANICAL ENGINEERING

SEMESTER- II (SECOND) L= Lectures, T = Tutorials, P = Practicals										
S. No.	**Course Code**	**Course Type**	**Name of the Course**	**Teaching Scheme**			**Evaluation Scheme**		**Grand Total Marks**	**Total Credits**
				L	**T**	**P**	**Internal**	**External**		
1	UBST201	Basic Science Course	Applied Engineering Math-II	02	01	-	25	75	100	03
2	UBST202	Basic Science Course	Engineering Physics	02	01	-	25	75	100	03
3	UEST201	Engineering Science Course	Engineering Mechanics	02	01	-	25	75	100	03
4	UEST204	Engineering Science Courses	Fundamentals of C Programming	02	01	-	25	75	100	03
5	UEST202	Engineering Science Courses	Basic Electronics Engineering	02	01	-	25	75	100	03
6	UHMT201	Humanities and Social Sciences including Management Course	Universal Human Values	03	-	-	25	75	100	03
7	UESP211	Engineering Science Course	Lab Course on Engineering Mechanics	-	-	02	50	-	50	01
8	UBSP212	Basic Science Course	Lab Course on Engineering Physics	-	-	02	50	-	50	01
9	UESP214	Engineering Science courses	Lab Course on Fundamentals of C Programming	-	-	02	50	-	50	01
			Total	**13**	**05**	**06**	**300**	**450**	**750**	**21**

B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: CSE/ECE/EE/ME/CE/IT
Semester: 1st
Course Name: Applied Engineering Math-I
Course Code: UBST101
Course Type: Basic Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
2	1	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Solve problems related to Differential Calculus.
2. Understand and apply integral calculus to functions of several variables.
3. Apply series expansions in the study of complex trigonometry.
4. Solve problems associated to Matrix theory.

Unit-I: Differential Calculus (11 hrs)
Limit, continuity and differentiability of functions of several variables. Partial Differentiation, Eular's theorem on homogeneous functions, Rolle's Theorem, Mean value theorem, Taylor's and Maclaurin's series with remainder, Taylor series in two variables, Maxima and minima of functions of two variables, Method of Lagrange's multiplier.

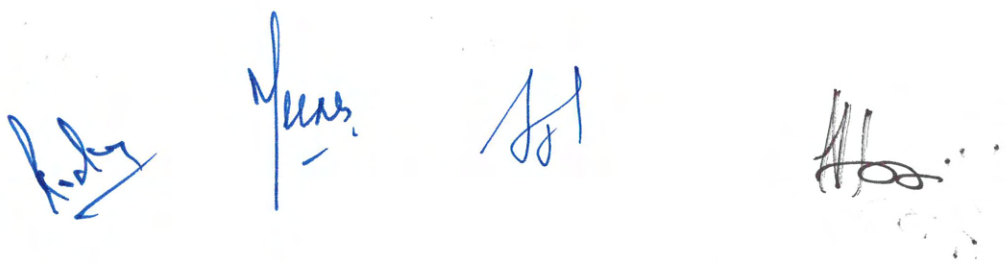
Unit-II: Integral Calculus (10 hrs)
Evaluation of definite and indefinite integrals, differentiation under integral sign, Gamma, Beta and Error functions with problems, application of definite integral to obtain area and volume.

Unit-III: Complex Trigonometry: (10 hrs)
Circular, hyperbolic and inverse hyperbolic functions of a complex number, Separation of real and imaginary parts, Logarithmic of complex number, C+iS form.

Unit-IV: Linear Algebra (11 hrs)
Rank of a matrix, Elementary transformations, Inverse using elementary transformation, Normal form, Eigen values and Eigen vector, Cayley- Hamilton Theorem, Reduction to diagonal form.

Text Books & Reference Books:

1. Advanced Engineering Mathematics, E. Kreyszig, 10th Edition, John Wiley & Sons, 2006
2. Higher Engineering Mathematics, B.S. Grewal, Khanna Publishers, 36th Edition, 2010, New Delhi.
3. Linear Algebra: A Modern Introduction, D. Poole 2nd Edition, Brooks/Cole 2005.
4. Linear Algebra, Kenneth Hoffmann and Ray Kunze, Prentice Hall of India, 2003.



Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

- Final Theory Paper shall be of 03 hours duration and consist of following sections:

Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.

Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

Note: *Use of Scientific Calculator is allowed.*

B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: EE/ME/CE | IT
Semester: 1st
Course Name: Engineering Chemistry
Course Code: UBST103
Course Type: Basic Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
2	1	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Analyze the structure-property relationship of materials and apply electrochemical principles to solve corrosion in engineering applications.
2. Know the importance of Green Chemistry and Nano chemistry and develop the knowledge to design Explosives.
3. Understand the types, properties and applications of drugs and polymeric materials.
4. Get acquainted with various chemical processes in water softening and knowledge of lubricants in engineering applications.

Unit-I: Material Science and Electrochemistry (10 hrs)

Material Science: Types, properties and importance of materials, Metals, Semiconductors and Insulators, Superconductors.

Electrochemistry: Electrochemical cells, Introduction to Electrolysis and Faradays Law, Fuel cell.

Corrosion: Dry and wet corrosion, factors affecting rate of corrosion, Remedial measures against corrosion.

Unit-II: Green Chemistry, Nanochemistry And Explosives (10 hrs)

Green Chemistry: Definition and need of green chemistry, Principles of green chemistry, Microwave-Assisted Organic Synthesis of Aspirin (Esterification) and Coumarin (Knoevenagel Condensation), Synthesis of Biodiesel.

Nano chemistry: Introduction, properties and applications of nanoparticles, Structure, Properties and Uses of Graphene and Fullerenes.

Explosives: Definition and classification of explosives, preparation, structure and uses of TNT and RDX.

Unit-III: Engineering Polymers and Drugs (10 hrs)

Engineering Polymers: Types of engineering polymers: Thermoplastics, Thermosets, Polyethylene, Polypropylene, High Performance Polymers and Polymeric Biomaterials.

Drugs: Definition, structure and applications of the following drugs: Tranquilizers and Antibiotics, (2 examples each).

Unit-IV: Treatment of Water and Lubricants (12 hrs)

Treatment of Water: 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.

Lubricants: Introduction, Classification, Properties, mechanism of lubricants: Thick Film or Fluid Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure (or Temperature) Lubrication, Industrial applications of lubricants.

Text Books & Reference Books:

1. Callister's Materials Science and Engineering by R. Balasubramaniam, Wiley India Pvt. Ltd.
2. Engineering Chemistry by N. Krishnamurthy (revised).
3. Green Chemistry: Theory and Practice by Paul T. Anastas and John C. Warner, OUP USA, 2005
4. A text book of Engineering Chemistry by Sashi Chawala, Dhanpat Rai & Co. 2017
5. Engineering Chemistry by S. Vairam and S. Ramesh, Wiley India 3ed, 2019.
6. Engineering Chemistry by Dr. B.S. Chauhan, Laxmi Publications Private Limited.

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

• Final Theory Paper shall be of 03 hours duration and consist of following sections:

Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.

Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

Note: *Use of Scientific Calculator is allowed.*

B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: EE/ME/CE/IT
Semester: 1st
Course Name: Communication Skills and Personality Development
Course Code: UHMT102
Course Type: Humanities and Social Sciences including Management Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	02
2	-	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Acquire proficiency in reading, writing, speaking & listening skills.
2. Equip themselves with professional development skills.
3. Learn interpersonal communication and self-confidence.
4. Learn the basics and essentials of Life skills education for successful life.

Unit-I: Communication Skills & Writing Practice (10 hrs)

Communication- Introduction, Elements of Business Communication, Media of Verbal Communication (Oral & Written), Barriers to Communication, Technology-Enabled Business Communication

Writing Practice- Tenses, Subject-Verb Agreement, Parts of Speech, Homophones and Homonyms; Types of letter- Inquiry letter, reply to an inquiry, Claims letter, Adjustment and Sales letter, Job letter; Tips for writing Scripts and Speeches

Unit-II: Listening & Speaking Skills (10 hrs)

Process of Listening, Listening versus hearing, Types of Listening, Barriers to Listening, Techniques to improve listening ability,

Group Discussion- Advantages, Purpose, Group Dynamics, and Guidelines for Effective Group discussion.

Speaking Skills- Skills for Effective speaking

Unit-III: Personality Development (08 hrs)

Introduction, Importance of Personality Development, Personality Development tips,

Different types of Personality, Personality Traits, Personality Disorder, Personality traits of a Good Manager

Unit-IV: Life Management Skills (08 hrs)

Introduction, Need and importance of Life Management Skills, Concept of Hard and Soft skills; Difference between Hard and Soft Skills, Interviews- Meaning, Types of Interview, tips for giving an Interview and handling questions.

Text Books & Reference Books:

1. Communication Skills (Second Edition) by Sanjay Kumar& Pushap Lata, published by Oxford University Press.
2. Functional Aspects of Communication Skills by Dr. Prajapati Prasad, published by S.K Kataria&Sons.
3. An Approach to Communication Skills by Indrajit Bhattacharya, published by Dhanpat Rai& Co Ltd
4. Communication Skills by Varinder Kumar and Bodh Raj, published by Kalyani Publishers
5. Integrated Life Skills by Payel Basu, published by Notion Press

6. Manuals of Life Skills Key to Excel by Alka Seth, Prof. Novrattan Sharma, published by Global Vision Publishing House
7. Professional Development by Sally J . Zepeda, published by Taylor & Francis Ltd
8. Master of Life Management by Dantu Murali Krishna, published by Invincible Publishers
9. Personality Development by Kagan Jerome, published by Paperback

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

• Final Theory Paper shall be of 03 hours duration and consist of following sections:
Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.
Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: ECE/EE/ME/CE/IT
Semester: 1st
Course Name: Fundamentals of Electrical Engineering
Course Code: UEST101
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
2	1	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Understand the basic concepts of electric circuit terminology, Kirchhoff's and Ohm's laws.
2. Analyze circuits using electrical theorems.
3. Apply basic terminologies in single phase AC circuits.
4. Apply basic terminologies in 3 phase AC circuits.
5. Understand the working principle of single-phase transformer.

Unit-I: Electric Circuit Laws & Energy Sources (10 hrs)
Classification of network elements, 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.

Unit-II: D.C. Circuit Analysis (10 hrs)
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.

Unit-III: Single Phase A.C. Circuits (10 hrs)
Introduction, Average and Effective values of periodic function and determination of form factor, Peak Factor, instantaneous and average power, Power factor in ac circuits. Symbolic notation in polar and rectangular form. A.C. series and parallel circuits (RL, RC, RLC). Phasor representation of RL RC and RLC circuits. Analysis of simple RLC-series circuits, Solution of parallel circuits - resonance, Q factor.

Unit-IV: Three Phase A.C. Circuits and Single Phase Transformers (12 hrs)
Three Phase A.C. Circuits: Three -phase EMF generation, Delta and star connection, Line and phase quantities and relations, Solution of 3-phase circuits – balanced voltage and balanced load, Phasor diagrams, Power in 3 phase ac circuits.
Transformers: Construction, principal 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

Text Books & Reference Books:

1. D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. L.S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
3. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
4. J. B. Gupta, "Electrical Engineering", Kataria and Sons.
5. C L Wadhwa, "Basic Electrical Engineering", New Age International.
6. W.H. Hayt and J.E. Kimerly, "Engineering Circuit Analysis", Mc Graw Hill.

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

- Final Theory Paper shall be of 03 hours duration and consist of following sections:

Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.

Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

Note: *Use of Scientific Calculator is allowed.*

B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: EE/ME/CE
Semester: 1st
Course Name: Engineering Graphics with CAD
Course Code: UEST102
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
3	-	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to
1. Apply basic concepts of Geometrical Constructions to create Engineering Curves.
2. Apply the basic principles of projections in Projection of Lines, Planes and Solids.
3. Apply the basic principles of sectional views in Section of solids.
4. Apply the basic principles of projections in converting pictorial views into Orthographic Views.
5. Have knowledge on Computer Aided Design (CAD).

Unit-I: (08 hrs)
Introduction to Engineering Drawing: Introduction to Engineering Graphics and its significance in engineering domain. Types of Lines, Dimensioning Systems as per IS conventions. Introduction to plain and diagonal scales. Engineering Curves: Basic construction of Cycloid, Involutes and Helix (cylinder only)
Projections of Points, Lines: Projections of points in any quadrants as well as resting on planes. Projections of lines inclined to both the reference planes (Excluding Traces of lines). Simple application-based problems on projection of lines.

Unit-II: (12 hrs)
Projections of planes: Projections of planes (Triangular, Square, Rectangular, Pentagonal, Hexagonal and Circular) inclined to both the Reference Planes. (Exclude composite planes).
Projections of Solids: Projections of solids with the axis inclined to one and both reference planes. (Prism, pyramid, cylinder and cone only).

Unit-III: Sections of Solids and Development of Surfaces (10 hrs)
Sections of Prism, Pyramid, Cylinder, & Cone cut by plane perpendicular to at least one reference plane (Exclude Curved Section Plane). Use change of position or Auxiliary plane method. Development of lateral surface (only) of prism, pyramid, cylinder and cone (except oblique solids).

Unit-IV: (12 hrs)
Orthographic Projections: Fundamentals of orthographic projections, Different orthographic views, First and Third angle method of projection. Different views of a simple machine parts as per the first angle projection.
Introduction to CAD: Introduction to CAD (CAD Theory), User Interface and Drawing Basics, Editing & Modifying Tools, Annotation, Applications and Benefits.

Text Books & Reference Books:

1. N.D. Bhatt, "Engineering Drawing (Plane and solid geometry)", Charotar Publishing House Pvt. Ltd.
2. N.D. Bhatt & V.M. Panchal, "Machine Drawing", Charotar Publishing House Pvt. Ltd.

Gupta
Virendra Gupta

3. Engineering Drawing by P.S.Gill.
4. Engineering Drawing by P.J.Shah.
5. Narayana, K.L. & P Kannaiah (2008), Textbook on Engineering Drawing, Scitech Publisher.
6. Dhananjay A Jolhe, "Engineering Drawing" Tata McGraw Hill.
7. AutoCAD 2024: A Problem Solving Approach by Sham Tickoo
8. AutoCAD 2015 and AutoCAD LT 2015 Bible by Ellen Finkelstein

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

• Final Theory Paper shall be of 03 hours duration and consist of following sections:
Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.
Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

Note: *Use of Scientific Calculator is allowed.*

B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: EE/ME/CE
Semester: 1st
Course Name: Energy and Environment
Course Code: UEST103
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
3	-	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Understand the basic concepts of environmental studies and natural resources.
2. Understand the fundamentals of social issues, population and the environment.
3. Learn about different types of environmental pollution and their control measures.
4. Learn about the Ecosystem and Hazardous Waste.

Unit-I: Overview (08 hrs)

Environment and Natural Processes: Development (Resource Utilization & Waste Generation); Environmental issues; Concept of Sustainable Development; Issues affecting future development (population, urbanization, health, water scarcity, energy, climate change, toxic chemicals, finite resources etc.)

Unit-II: Renewable and Non-renewable resources (12 hrs)

Different types of resources. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems.

Unit-III: Ecosystem: Structure and function (10 hrs)

Energy flow in ecosystem; Material flow in ecosystem; Biodiversity and ecosystem health; Bio-amplification and bio- magnification

Unit-IV: Pollution (12 hrs)

Hazardous Waste: Definition; Classification; Storage and management; Site remediation; Environmental Risk: assessment, and management

Pollution: Definition, Cause, effects and control measures. Air pollution- Sources, effects, control, air quality standards, air pollution act, air pollution measurement, Effect of air pollution on human beings, animals and materials. Water Pollution-Sources and impacts, Soil Pollution-Sources and impacts, disposal of solid waste. Greenhouse gases – effect, acid rain, Ozone layer depletion. Noise pollution- Definition, Cause, effects and control measures.

Text Books & Reference Books:

1.Masters G. M., Joseph K. and Nagendran R. "Introduction to Environmental Engineering and Science", Pearson Education, New Delhi. 2/e

2.Anubhakaushik and C.P kaushik "Perspectives in Environmental Studies", New Age International

3.Davis M. L. and Cornwell D. A., "Introduction to Environmental Engineering", McGraw Hill, New York 4/e

4.P.D Sharma "Ecology and Environment", Rastogi Publications

5.A. Deswal and S. Deswal "A Basic Course In Environmental Studies", DhanpatRai& Co

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

- Final Theory Paper shall be of 03 hours duration and consist of following sections:

Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.

Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: ECE/EE/ME/CE/IT
Semester: 1st
Course Name: Lab Course on Fundamentals of Electrical Engineering
Course Code: UESP111
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	01
-	-	2	50	-	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Experimentally verify the basic circuit theorems.
2. Measure current in series-parallel RLC circuits.
3. Measure load of 3 phase ac circuits connected in star and delta
4. Understand the basic characteristics of single-phase transformer.

List of Experiments:

1. Verification of Kirchhoff's Laws.
2. Verification of Superposition Theorem.
3. Verification of Thevinin'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.

Evaluation scheme for Practical examinations

A minimum of 08 practicals are required to be performed in each lab course. Practical Tests shall be conducted after MST-2. Viva-Voce shall be conducted after performance test. The practical courses shall be evaluated from 50 marks with following weightage:

EVALUATION SCHEME- PRACTICALS		
S.No	**Evaluation Elements**	**Marks Weightage**
1.	Performance Test	10
2.	Viva	10
3.	Practical File	10
4.	Day to Day Performance	10
5.	Attendance	10
	Total	**50**

B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: EE/ME/CE/IT
Semester: 1st
Course Name: Communication Skills and Personality Development in Practice
Course Code: UHMP111
Course Type: Humanities and Social Sciences including Management Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	01
-	-	2	50	-	

Course Outcomes (COs): After the completion of this course, students will be able to
1. Acquire proficiency in reading, writing, speaking & Listening skills
2. Develop presentation, interview and interpersonal skills

List of Experiments:

Listening Skills

1. Listen to text read aloud in normal speed with focus on intonation,
2. After listening the student can fill in blanks, choose a suitable title, make a summary, and be able to answer comprehension questions from the passage read aloud.

Speaking skills

3. Formal and Informal Conversation
4. Presentation Skills

Life skill activities

5. Self Management
6. Role Play

Interpersonal Skills

7. Group Discussion
8. Interviews, Mock Interviews

Career Building

9. SWOT Analysis

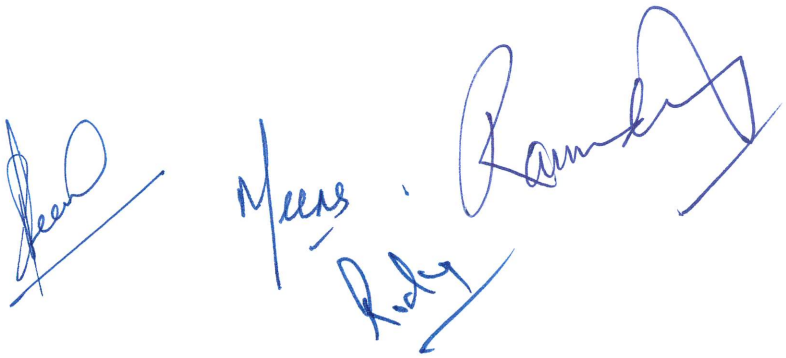
Writing Skills

10. Resume Writing
11. E-mail Writing
12. Report Writing
13. Notice Writing

Evaluation scheme for Practical examinations

A minimum of 08 practicals are required to be performed in each lab course. Practical Tests shall be conducted after MST-2. Viva-Voce shall be conducted after performance test. The practical courses shall be evaluated from 50 marks with following weightage:

EVALUATION SCHEME- PRACTICALS		
S.No	**Evaluation Elements**	**Marks Weightage**
1.	Performance Test	10
2.	Viva	10
3.	Practical File	10
4.	Day to Day Performance	10
5.	Attendance	10
	Total	**50**



B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: EE/ME/CE/IT
Semester: 1st
Course Name: Lab Course on Engineering Chemistry
Course Code: UBSP113
Course Type: Basic Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	01
-	-	2	50	-	

Course Outcomes (COs): The experiments will make the student gain skills on

1. Estimation of surface tension and viscosity of given unknown liquids.
2. Determination of concentrations or equivalence points of acids and bases using conductometer.
3. Preparation of polymers like Bakelite.
4. Determination of parameters like hardness of water.
5. Analysis of different functional groups in given organic compounds

List of Experiments:

1. Determine the surface tension of a given liquid using Stalagmometer.
2. Determine the relative viscosity of a given liquid using Ostwald's Viscometer.
3. Prepare a pure and dry sample of Glucosazone/Aspirin.
4. To determine the alkali content of antacid tablets using HCl.
5. Determination of the strength of a given HCl solution by titrating it with standard NaOH solution using conductometer.
6. To determine the calcium and magnesium or temporary and permanent hardness of a given water sample by EDTA method.
7. Determine volumetrically the number of molecules of water if crystallization present in the given sample of Mohr's salt, x grams of which have been dissolved per litre provided N/10 $K_2Cr_2O_7$ (using an external indicator).
8. Determine volumetrically the percentage of Cu in a sample of $CuSO_4$ crystals, Z grams of which have been dissolved per litre, provided 0.1 N $Na_2S_2O_3$.
9. Preparation of Biodiesel from vegetable oil.
10. Determine the percentage of $CaCO_3$ in a given sample of a chalk.
11. Preparation of Bakelite Plastic.
12. Organic Analysis: Identification of given organic compounds (Any five).

Text Books & Reference Books:

1. Engineering chemistry by B. Ramadevi and P. Aparna, S Chand Publications, New Delhi.
2. A manual of practical Engineering Chemistry by Dr. Rajinder Kumar
3. Experimental Engineering Chemistry by Shashi Chawla.

Evaluation scheme for Practical examinations

A minimum of 08 practicals are required to be performed in each lab course. Practical Tests shall be conducted after MST-2. Viva-Voce shall be conducted after performance test. The practical courses shall be evaluated from 50 marks with following weightage:

EVALUATION SCHEME- PRACTICALS		
S.No	**Evaluation Elements**	**Marks Weightage**
1.	Performance Test	10
2.	Viva	10
3.	Practical File	10
4.	Day to Day Performance	10
5.	Attendance	10
	Total	**50**

B. Tech. Mechanical Engineering First Semester Examination to be held in the Year December 2026, 2027, 2028, 2029

Branch: CSE/ECE/EE/ME/CE/[redacted]
Semester: 1st
Course Name: Workshop Practices
Course Code: UESP112
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	1.5
-	-	3	50	-	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Understand different manufacturing methods in different fields of engineering.
2. Understand relative advantages/disadvantages of manufacturing techniques with respect to different applications.
3. Acquire a minimum practical skill with respect to different materials.
4. Create simple components using different materials.

List of Experiments:

Carpentry

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

Foundry

4. Moulding of open bearing (simple pattern)
5. Moulding of Sliding Job of Bench Vice (Split piece pattern)

Smithy

6. Upsetting, drawing and bending operation

Welding

7. Preparation of single and double V-Butt joint by arc/gas welding.
8. Lap Joint by arc/gas Welding.
9. To prepare a strong and reliable electrical joint using the soldering process.

Fitting

10. Assembly of snap fitting of MS-Flat pieces.
11. Preparation of a Dove Tail Joint.

Machining

12. To study the parts of lathe machine, cutting speed, feed and depth of cut.
13. To perform turning, taper turning and knurling operations on lathe machine.
14. Drilling of holes of different diameters on wooden block/ metal sheet.
15. To manufacture a simple component using a CNC lathe machine.

PCB Manufacturing

16. To design and fabricate a simple Printed Circuit Board (PCB) using the etching method.

Injection moulding

17. To produce a plastic component using the injection moulding machine.

Product Development through Scrap Accumulation

18. To design and develop a useful product by utilizing accumulated scrap material.

Vinodh Gupta Gupta

Text Books & Reference Books:

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

Evaluation scheme for Practical examinations

A minimum of 08 practicals are required to be performed in each lab course. Practical Tests shall be conducted after MST-2. Viva-Voce shall be conducted after performance test. The practical courses shall be evaluated from 50 marks with following weightage:

EVALUATION SCHEME- PRACTICALS		
S.No	**Evaluation Elements**	**Marks Weightage**
1.	Performance Test	10
2.	Viva	10
3.	Practical File	10
4.	Day to Day Performance	10
5.	Attendance	10
	Total	**50**

B. Tech. Mechanical Engineering Second Semester Examination to be held in the Year May 2027, 2028, 2029, 2030

Branch: CSE/ECE/EE/ME/CE/IT
Semester: 2nd
Course Name: Applied Engineering Math-II
Course Code: UBST201
Course Type: Basic Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
2	1	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to
1. Apply appropriate mathematical tools to analyze the convergence and divergence of series.
2. Understand and expand functions using Fourier series.
3. Solve problems associated to ordinary differential equations.
4. Solve partial differential equations by various methods.

Unit-I: Sequence and Series (10 hrs)
Introduction to sequence and series, Convergence of sequence and series, tests for convergence and divergence (Comparison test, D'Alembert's Ratio test, Cauchy root test, Logarithmic test, Raabe's test and Gauss test).

Unit-II: Fourier Series (8 hrs)
Introduction, Fourier-Euler Formula, Dirichlet's conditions, Change of intervals, Fourier series for even and odd functions, Half range sine and cosine series, Parseval's formula.

Unit-III: Ordinary Differential equations (12 hrs)
First order ordinary differential equations: 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, Euler-Cauchy equations; initial and boundary value problems.

Unit-IV: Partial Differential Equations (12 hrs)
First order Partial Differential equations: Linear and non-linear partial differential equations of 1st order. Solution by Charpit's method, Four standard forms of non-linear partial differential equations with reference to Charpit's techniques: $f(p,q)=0$, $f(z,p,q)=0$, $f(x,p)=g(y,q)$ and Clauraut's form.
Higher order linear partial differential: Homogeneous and non-homogeneous higher order linear partial differential with constant coefficient rules for finding P.I. and C.F, nonlinear equation of 2nd order.
Application of partial differential equations: First and second order one-dimensional wave equation and two-dimensional Laplace equation.

Text Books & Reference Books:

1. Advanced Engineering Mathematics, E. Kreyszig, 10th Edition, John Wiley & Sons 2006.
2. Higher Engineering Mathematics, B.S. Grewal, Khanna Publishers, 36th Edition, 2010, New Delhi.
3. Partial differential equations, M.D Rai Singhania, S Chand, New Delhi
4. A text book of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Publications, Reprint, 2008.
5. Ordinary Differential Equations, E. L. Ince, Dover Publications, 1958.

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

- Final Theory Paper shall be of 03 hours duration and consist of following sections:

Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.

Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

Note: *Use of Scientific Calculator is allowed.*

B. Tech. Mechanical Engineering Second Semester Examination to be held in the Year May 2027, 2028, 2029, 2030

Branch: EE/ME/CE/IT
Semester: 2nd
Course Name: Engineering Physics
Course Code: UBST202
Course Type: Basic Science Course
Exam Duration: 3 Hours

HOURS/ WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
2	1	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Understand the significance of vector calculus and the importance of Maxwell's equations as the basis of electromagnetic theory.
2. Acquire the principles of lasers and optical fibers and their applications in various fields.
3. Apply the quantum mechanical principles for solving engineering problems.
4. Understand the concept of solids, their types and defects.

Unit-I: Electromagnetic Fields and Waves (10 hrs)

Concepts of Del Operator, gradient, divergence, curl and their physical significances, solenoidal, rotational and irrotational field, Displacement current, Maxwell's equations, characteristics of Maxwell's equations, Poynting vector and Poynting Theorem, EM waves, characteristics of EM waves EM wave equations for electric and magnetic fields and their solutions, velocity of EM waves, relation between E_0 and B_0.

Unit-II: Lasers & Optical Fibers (10 hrs)

Basic theory of Laser, Einstein coefficients, characteristics of Laser, pumping mechanisms; basic components of Laser system, construction and working of Ruby, laser, He-Ne Laser, engineering applications of Lasers.

Optical fiber: Basic structure and principle, propagation of light in optical fibres, critical angle, acceptance angle, acceptance cone, numerical aperture, single mode and multimode fibres, applications in communications and sensors.

Unit-III: Quantum Mechanics (12 hrs)

Need of quantum mechanics, Compton effect, de Broglie hypothesis of matter waves, Heisenberg uncertainty principle, wave packet, group velocity and phase velocity, concept of wave function, operators in quantum mechanics, Eigen function and Eigen values, expectation values, Schrodinger's time dependent equation, Schrodinger's time independent equation, continuity equation, particle in one-dimensional box and concept of zero-point energy.

Unit-IV: Solid State Physics (10 hrs)

Classification of solids, basis and lattice, unit cell and Wigner-Seitz cell, lattice parameters, crystal systems (SC, BCC, FCC), Miller indices, production of X-rays, Bragg's law, semiconductor basics: mobility, resistivity and Hall Effect, band theory of solids, magnetic properties of solids, superconductivity, Meissner effect, Type-Iand Type-II superconductors.

Text Books & Reference Books:

1. Fundamentals of Physics by Halliday, Resnic and Walker, John Wiley, 2011, Ninth Edition.
2. M.N. Avadhanulu, P.G. Khirsagar, A Textbook of Engineering Physics 2011, 9th edition.
3. Engineering Electromagnetics by William H. Hayt Jr. and John A. Buck.
4. Electromagnetic Waves and Radiating Systems by E.C. Jordan and K.G. Balmain.
5. Introduction to Fiber Optics by Ajoy Ghatak and K. Thyagarajan.

6. Lasers: Fundamentals and Applications by K. Thyagarajan and Ajoy Ghatak.
7. Introduction to Quantum Mechanics by David J. Griffiths.
8. Quantum Mechanics for Scientists and Engineers by David A.B. Miller.
9. Solid State Physics by S.O. Pillai.
10. Introduction to Solid State Physics by Charles Kittel.

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

- Final Theory Paper shall be of 03 hours duration and consist of following sections:

Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.

Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

Note: *Use of Scientific Calculator is allowed.*

B. Tech. Mechanical Engineering Second Semester Examination to be held in the Year May 2027, 2028, 2029, 2030

Branch: EE/ME/CE
Semester: 2nd
Course Name: Engineering Mechanics
Course Code: UEST201
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
2	1	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Acquire basic knowledge related to Forces and Equilibrium conditions.
2. Understand and apply the concepts of Centroid and Moment of Inertia on areas and rigid bodies.
3. Analyse various systems existing in static equilibrium, e.g., blocks, wedges, ladders, trusses, etc.
4. Acquire basic knowledge related to stress and strain for ductile and brittle materials.

Unit-I: (10 hrs)

Force and Force Systems: Periods Coplanar, Concurrent and Non-Concurrent Force Systems, Resultant and Resolutions, Forces in Space, Moment of Force, Varignon's Theorem, Couple and Its Properties, Resultant of a Spatial Force System. Concept of free body diagrams, Equilibrium of a Particle, External & Internal Forces, Equilibrium of a Rigid Body.

Unit-II: (12 hrs)

Types of Supports, Structural Members and Beams, Reactions of Beams.
Centre of Gravity, Centroid of Lines (Basic and Composite Areas), Built-Up Sections, Product of Inertia, Mass Moment of Inertia.
Virtual Work, Principle of virtual work and its applications

Unit-III: (10 hrs)

Trusses and Frames: Two Force and Three Force Members, Trusses, Method of Joints, Method of Sections
Friction: Type of Friction, Characteristics of Dry Friction, Equilibrium on Rough Inclined Plane, Wedge Friction, Ladder Friction.

Unit -IV: (10 hrs)

Dynamics of Rigid Bodies: Newton's laws, DAlembert's Principle, Energy Principles
Simple Stress and Strain: Stress, Strain, Stress Strain Diagrams, Hook's Law, Modulus of Elasticity, Lateral Strain, Volumetric Strain, Poisson's Ratio, Bulk Modulus, Shear Stress Concept, Modulus of Rigidity, Relationship between Elastic Constants

Text Books & Reference Books:

1. Jurnarkar, S.B. and Shah, H.J.–Applied Mechanics, Charotar
2. Merium and Kraige–Engineering Mechanics, John Wiley & Sons.
3. Engineering Mechanics by A.K Tayal.
4. Strength of Materials by S. Ramamutham.
5. Sharma, S.M.–Engineering Mechanics, Kirti Publications, Jammu.

Vinudh Gupta Gupta

6. Beer and E.R. Johnson–Engineering Mechanics, McGraw-Hill, New York
7. Engineering Mechanics (Statics and Dynamics)- Sarbjeet Singh and Pardeep Singh
8. Engineering Mechanics- Ferdinand L. Singer
9. A Textbook of Engineering Mechanics- Dr. R.K. Bansal

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

• Final Theory Paper shall be of 03 hours duration and consist of following sections:
Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.
Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

Note: *Use of Scientific Calculator is allowed.*

B. Tech. Mechanical Engineering Second Semester Examination to be held in the Year May 2027, 2028, 2029, 2030

Branch: EE/ME/CE
Semester: 2nd
Course Name: Fundamentals of C Programming
Course Code: UEST204
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
2	1	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to

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

Unit-I: (12 hrs)
Introduction to Programming: Evolution of programming languages, fundamentals of algorithms, flowcharts and pseudocode, Structure of C program, compilation process: object code, source code, executable code.
Basics of C Programming
Character set, Identifiers, Keywords, Data Types, Constant and Variables, Storage classes: types and scope rules, Operators: types, precedence and associativity, Input-Output Assignment.

Unit-II: (10 hrs)
Control Statements and Preprocessing: Decision making: if, if-else, nested if, Switch statements, looping: for, while,do-while, break and continue statements.
Standard Library Functions, advantages and use of various library functions (I/O functions, String, Character, Mathematics, Time and Date, functions).

Unit-III: (10 hrs)
Arrays and Strings: Introduction to arrays, One-dimensional arrays: declaration, initialization, Two-dimensional arrays and applications, String operations: length, compare, concatenate, copy, Searching: linear search, binary search.
Sorting in an array: Bubble sort, Selection sort, Insertion sort, String Manipulation functions.

Unit-IV: (10 hrs)
Functions: Function prototype, definition, and call, Types of functions, Parameter passing: call by value and call by reference, Nested Function
Pointers: Pointer Variable and its importance, Pointer Arithmetic, Pointer to functions, Dynamic Memory Allocation

Text Books & Reference Books:

1.	C How to Program, 7/e	Paul J. 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.

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

• Final Theory Paper shall be of 03 hours duration and consist of following sections:
Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.
Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

B. Tech. Mechanical Engineering Second Semester Examination to be held in the Year May 2027, 2028, 2029, 2030

Branch: EE/ME/IT
Semester: 2nd
Course Name: Basic Electronics Engineering
Course Code: UEST202
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
2	1	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to
1. Explain the fundamental concepts of semiconductor physics and their underlying principles.
2. Describe the operation, characteristics, and applications of various semiconductor devices.
3. Analyze the working principles and practical applications of transistors.
4. Understand and interpret the basic concepts and components of communication systems.

Unit-I: Semi-Conductors and Diodes (10 hrs)
Introduction, Insulators, Semiconductors and Metals, Mobility and Conductivity, Intrinsic and Extrinsic Semiconductors, Charge Density, Current Components in Semiconductors, Continuity Equation, Mobility and Conductivity. 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.

Unit-II: Diode Applications (10 hrs)
Rectifiers and Filter Circuit: Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier and their Analysis, LC and Pi Filters; Series and Shunt Diode Clippers, clipping at Two Independent Levels, Clamping Operation, Clamping Circuit, Practical Clamping Circuits.

Unit-III: Bipolar Junction Transistors (10 hrs)
Symbol, Construction, and Characteristics of BJT, reach through phenomenon and Base width modulation, Transistor Configuration: CB, CE, CC Configuration with necessary current equations. Transistor as an amplifier and switch.

Unit-IV: Basics of Communication System (8 hrs)
Introduction to Analog and Digital Communication Systems, Block Diagram Representation of Communication System, the Basic idea of Transmitter and Receiver used for radio communication, Various Frequency bands used for Communication, Need of Modulation and Introduction to Cellular Communication.

Text Books & Reference Books:

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.
5. Electronic Communication Systems by G. Kennedy, McGraw Hill Education, India.

Evaluation scheme for Theory examinations
- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.

- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

- Final Theory Paper shall be of 03 hours duration and consist of following sections:

Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.

Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

Note: *Use of Scientific Calculator is allowed.*

B. Tech. Mechanical Engineering Second Semester Examination to be held in the Year May 2027, 2028, 2029, 2030

Branch: EE/ME/CE/IT
Semester: 2nd
Course Name: Universal Human Values
Course Code: UHMT201
Course Type: Humanities and Social Sciences including Management Course
Exam Duration: 3 Hours

HOURS/WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	03
3	-	-	25	75	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Distinguish between values and skills, and understand the need, basic guidelines, content and process of value education.
2. Initiate a process of dialog within themselves to know what they 'really want to be' in their life and profession.
3. Understand the meaning of happiness and prosperity for a human being.
4. Understand harmony at all the levels of human living and live accordingly.
5. Apply the understanding of harmony in existence in their profession and lead an ethical life.

Unit-I: Introduction to Value Education (10 hrs)
Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education) Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity – the Basic Human Aspirations, Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations.

Unit-II: Harmony in the Human Being (11 hrs)
The understanding human being as a co-existence of the sentient 'T' and the material 'Body, Understanding the needs of Self ('T') and 'Body' – Sukh and Suvidha, Understanding the Body as an instrument of 'T' (I being the doer, seer, and enjoyer), Understanding the characteristics and activities of 'T' and harmony in T, Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail, Programs to ensure Sanyam & Swasthya.

Unit-III: Harmony in the Family & Society (11 hrs)
Understanding harmony in the Family- the basic unit of human interaction, Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay tripti; Trust (Vishwas) and Respect (Samman) as the foundational vales of relationship, Understanding the meaning of Vishwas; Difference between intention and competence, Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship., Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals, Visualizing a universal harmonious order in society, Undivided Society (Akhand Samaj), Universal Order (SarvabhaumVyawastha) – from family to world.

Unit-IV: Harmony in the Nature & Existence (10 hrs)
Understanding the harmony in the Nature, Interconnectedness and mutual fulfillment among the four orders of nature – recyclability and self-regulation in nature, Understanding Existence as Co-existence (Sah-Astitva) of mutually interacting units in all-pervasive space, Holistic perception of harmony at all levels of existence.

Text Books & Reference Books:

1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
2. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and Harper Collins, USA
3. P L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
4. A N Tripathy, 2003, Human Values, New Age International Publishers.
5. SubhasPalekar, 2000, How to practice Natural Farming, Pracheen (Vaidik) KrishiTantraShodh, Amravati.
6. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.
7. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.

Evaluation scheme for Theory examinations

- Internal Examination for theory courses in all semesters shall be of 25 marks and external examination shall be of 75 marks.
- Internal Examination shall now consist of MST-1, MST-2, Assignment and Quiz as per following weightage:

INTERNAL EXAMINATION- THEORY		
S. No	**Evaluation Elements**	**Marks Weightage**
1.	MST-1 (from Unit I and Unit II)	05
2.	MST-2 (from Unit III and Unit IV)	05
3.	ASSIGNMENT (Entire Syllabus)	05
4.	QUIZ (Entire Syllabus)	05
5	ATTENDANCE	05
	Total	**25**

Each MST shall be of 1.5 hours duration and it will firstly be evaluated from 50 marks and then proportionately be awarded from 05 Marks as mentioned in the above table. Each MST shall comprise of two sections-Section A and Section B spreading through both Units that are being included in the respective MST. Section A shall comprise of total 05 questions of 5 marks each out of which student has to attempt any 04 questions i.e. (04 questions × 5 marks = 20 marks). Section B shall comprise of 03 questions of 15 marks each out of which student has to attempt any 02 questions i.e. (02 questions × 15 marks = 30 marks). Each MST should also include **at least** 30% numerical content in numerical based courses.

Assignment shall comprise of 05 questions each spreading through the entire syllabus. Concerned faculty shall prepare the assignment questions from all 04 Units at least one from each Unit. Assignment shall be circulated with students prior to MST-1 and shall be collected from students prior to MST-2.

Quiz shall be conducted in an offline mode and comprise of total of 10 MCQs and one word questions of 0.5 marks each spreading through the entire syllabus. Concerned faculty shall prepare the quiz questions from all 04 Units at-least two from each Unit. Quiz shall be conducted by the concerned faculty on any day of a week (as per convenience) prior to MST-2 at the time of his/her class.

• Final Theory Paper shall be of 03 hours duration and consist of following sections:

Section A shall comprise of 05 questions spread over entire syllabus of 03 marks each. There shall be no choice in this section.

Section B shall comprise of total 08 questions, 02 questions from each Unit out of which student has to attempt any one question within each unit. Each question will carry 15 marks.

B. Tech. Mechanical Engineering Second Semester Examination to be held in the Year May 2027, 2028, 2029, 2030

Branch: ME/CE
Semester: 2nd
Course Name: Lab Course on Engineering Mechanics
Course Code: UESP211
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	01
-	-	2	50	-	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Understand and implement fundamentals of statics and motion principles of engineering problem.
2. Acquire knowledge on finding stable structures of engineering practice and bending of beams.
3. Understand, analyze and solve engineering problems related to motion.
4. Demonstrate the knowledge on basic calculation of forces and their resultant and resolution.

List of Experiments:

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.
9. To determine strain in a beam using strain gauge.
10. To understand the behaviour of Mild Steel under tension by plotting stress strain curve

Evaluation scheme for Practical examinations

A minimum of 08 practicals are required to be performed in each lab course. Practical Tests shall be conducted after MST-2. Viva-Voce shall be conducted after performance test. The practical courses shall be evaluated from 50 marks with following weightage:

EVALUATION SCHEME- PRACTICALS		
S.No	**Evaluation Elements**	**Marks Weightage**
1.	Performance Test	10
2.	Viva	10
3.	Practical File	10
4.	Day to Day Performance	10
5.	Attendance	10
	Total	**50**

Vivudh Gupta Gupta

B. Tech. Mechanical Engineering Second Semester Examination to be held in the Year May 2027, 2028, 2029, 2030

Branch: EE/ME/CE/IT
Semester: 2nd
Course Name: Lab Course on Engineering Physics
Course Code: UBSP212
Course Type: Basic Science Course
Exam Duration: 3 Hours

HOURS/WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	01
-	-	2	50	-	

Course Outcomes (COs): After the completion of this course, students will be able to

1. Gain knowledge about the scientific methods of measuring different physical parameters based on concepts of physics.
2. Develop the experimentation skills by displaying minimized measurement errors.
3. Acquire the practical skills to obtain the solutions pertaining to different physics experiments.
4. Acquire essence of scientific temper infused with innovation and creativity.

List of Experiments:

1. To find coefficient of self-induction of a coil by Anderson's bridge using headphone.
2. To determine the number of lines on diffraction grating using He-Ne laser.
3. To determine the Hall coefficient (R_H) and carrier concentration (n) of a given semiconductor sample using the Hall Effect.
4. To evaluate the value of Planck's constant using a photocell.
5. To study, measure and analyze the attenuation (power loss) mechanism in optical fibers.
6. To determine Young's Modulus of a given material using beam bending method.
7. To find the resistivity of a semiconductor by four probe method at different temperatures.
8. To study the variation of magnetic field by using Stewart's and Gee's Tangent Galvanometer.
9. To determine the capacitance of an unknown capacitor using de sauty bridge.
10. To determine the energy gap of a semiconductor material.
11. To determine numerical aperture of an optical fiber.
12. To study the phenomenon of superconductivity in materials at low temperatures.

Evaluation scheme for Practical examinations

A minimum of 08 practicals are required to be performed in each lab course. Practical Tests shall be conducted after MST-2. Viva-Voce shall be conducted after performance test. The practical courses shall be evaluated from 50 marks with following weightage:

EVALUATION SCHEME- PRACTICALS		
S.No	**Evaluation Elements**	**Marks Weightage**
1.	Performance Test	10
2.	Viva	10
3.	Practical File	10
4.	Day to Day Performance	10
5.	Attendance	10
	Total	**50**

B. Tech. Mechanical Engineering Second Semester Examination to be held in the Year May 2027, 2028, 2029, 2030

Branch: EE/ME/CE
Semester: 2nd
Course Name: Lab Course on Fundamentals of C Programming
Course Code: UESP214
Course Type: Engineering Science Course
Exam Duration: 3 Hours

HOURS/WEEK			MARKS		CREDITS
L	T	P	INTERNAL	EXTERNAL	01
-	-	2	50	-	

Course Outcomes (COs): After the completion of this course, students will be able to
1. Understand the working of different compilers and editors for writing programs in C.
2. Exercise basic syntax, operators and control statements to write C programs.
3. Execute programs based on user defined functions and recursive functions.
4. Implement arrays, pointers to access variables and functions.
5. Write programs that perform operations using derived data types and files.

List of Experiments:

1. Problem solving using computer: Familiarization with programming environment.
2. Variable types and type conversions: simple computational using arithmetic expressions.
3. Branching and logical expressions: Problems involving if-then-else structures.
4. Loops, while and for loops: Iterative problems e.g., sum of series.
5. Program to find string length without library function.
6. 2D Arrays and Strings, memory structure: Matrix problems, String Operations.
7. Functions: call by value, call by reference class: Simple functions.
8. Program to use binary search.
9. Pointers and Structures: Write a program to swap two number using pointers.
10. File handling: File creation, writing and reading a file, File manipulation Operations.

Evaluation scheme for Practical examinations
A minimum of 08 practicals are required to be performed in each lab course. Practical Tests shall be conducted after MST-2. Viva-Voce shall be conducted after performance test. The practical courses shall be evaluated from 50 marks with following weightage:

EVALUATION SCHEME- PRACTICALS		
S.No	**Evaluation Elements**	**Marks Weightage**
1.	Performance Test	10
2.	Viva	10
3.	Practical File	10
4.	Day to Day Performance	10
5.	Attendance	10
	Total	**50**