

UNIVERSITY OF JAMMU

(NAAC ACCREDITED A + GRADE UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

NOTIFICATION

(22/Nov/Adp/ 71)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Competent Bodies, has been pleased to authorize the adoption of the revised Syllabi and Courses of Studies in **Bachelor of Engineering (Civil Engineering)** for Semester I & II under the **Credit Based System** as per the model curriculum of the AICTE (as given in the Annexure) for the candidates of (Govt./Pvt.) **Engineering Colleges affiliated with the University of Jammu** for the Examinations to be held in the years indicated against each Semester as under:-

Branch	Semester	For the Examination to be held in the years
Civil	Semester-I	December 2022, 2023, 2024 and 2025
	Semester-II	May 2023, 2024, 2025 and 2026

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

Sd/-
DEAN ACADEMIC AFFAIRS

No. F.Acd/III/22/9958-9966

Dated: 22/11/2022

Copy for information & necessary action to:-

1. Dean Faculty of Engineering
2. Principal. GCET/MBSCET/BCET/YCET
3. C.A to the Controller of Examinations
4. Deputy/Assistant Registrar (Exams/Confidential)
5. Incharge University Website

Sumitasharma
Deputy Registrar (Academic)

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22/11/22

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22/11/22

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22/11/2022

UNIVERSITY OF JAMMU, JAMMU
COURSE SCHEME

B.E Ist Semester Civil Engineering

For Examination to be held in the Year December 2022,2023,2024,2025.

Contact hours/week = 25

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL MARKS	CREDITS	% CHANGE
			L	T	P	Internal	External			
BST1101	Basic Science Course	Engineering Mathematics-I	2	1	0	50	100	150	3	100%
BST1102	Basic Science Course	Applied Engineering Chemistry	2	1	0	50	100	150	3	100%
CET6101	Engineering Science Course	Energy and Environment	2	1	0	50	100	150	3	100%
CET6102	Professional Core Course	Structural Analysis- I	2	1	0	50	100	150	3	100%
EET2101	Engineering Science Course	Principles of Electrical Engineering	2	1	0	50	100	150	3	100%
HMT1101	Humanities & Management Course	Technical Communication skills	2	0	0	25	75	100	2	100%
BSP1112	Basic Science Course	Applied Engineering Chemistry Lab	0	0	2	50	-	50	1	100%
CEP6112	Professional Core Course	Structural Analysis- I Lab	0	0	2	50	-	50	1	100%
EEP2111	Engineering Science Course	Principles of Electrical Engineering Lab	0	0	2	50	0	50	1	100%
HMP1111	Humanities & Management Course	Technical Communication skills lab	0	0	2	50	-	50	1	100%
Total			12	5	8	475	575	1050	21	

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For Examination to be held in the Year December 2022, 2023, 2024, 2025

CLASS	1st SEMESTER						
BRANCH	COMMON TO ALL BRANCHES						
COURSE TITLE	ENGINEERING MATHEMATICS - I						
COURSE TYPE	BASIC SCIENCE COURSE						
COURSE NO.	BST1101	L	T	Marks			
DURATION OF EXAM	3 HOURS	2	1	Theory	Sessional	Credit	
				100	50	3	

Course Outcomes: At the end of the course the students will be able to:	
CO1	Learn general theorems of calculus; find maximum and minimum value of functions of two variables.
CO2	Understand the concept of definite integrals.
CO3	Learn basics of complex trigonometry.
CO4	Find the rank, eigen values/ vectors of matrices.

SECTION - A

UNIT-I: DIFFERENTIAL CALCULUS

Partial differentiation, Euler's theorem on homogeneous functions, Rolle's theorem, Mean value theorem, Taylor's and Maclaurin's series with remainder, Taylor's series in two variables, Maxima and Minima of functions of two variables, Method of Lagrange's multipliers. (12 hours)

UNIT-II: INTEGRAL CALCULUS

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 (8 hours)

SECTION - B

UNIT-III: COMPLEX TRIGONOMETRY

Hyperbolic functions of a complex variable, Inverse Hyperbolic functions, Logarithmic function of a complex variable; Summation of series by C+iS method. (8 hours)

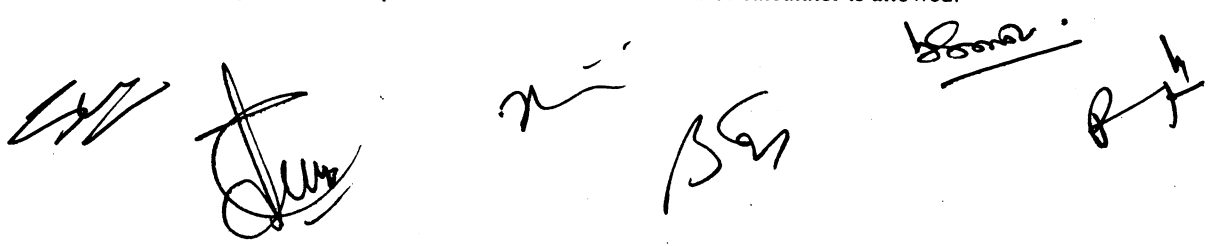
UNIT-IV: MATRICES

Introduction, Rank of a matrix, Elementary transformations, Elementary matrices, Inverse using elementary transformation. Normal form of a matrix, Eigen values and Eigen vector, Properties of Eigen value, Cayley Hamilton Theorem, Diagonalization of matrix. (14-hours)

RECOMMENDED BOOKS:

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

NOTE: There will be total eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.



For Examination to be held in the Year December 2022, 2023, 2024, 2025.

CLASS	Ist SEMESTER					
BRANCH	CIVIL/ MECHANICAL ENGINEERING					
COURSE TITLE	APPLIED ENGINEERING CHEMISTRY					
COURSE TYPE	BASIC SCIENCE COURSE					
COURSE NO.	BST1102	L	T	Marks		
DURATION OF EXAM	3 HOURS	2	1	Theory	Sessional	Credit
				100	50	3

COURSE OUTCOMES: On completion of the course the students will be able to:	
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 explosives and the importance of nano particles.
CO3	Acquire Knowledge about the identification of newly synthesized products through Spectroscopy
CO4	Get acquainted with the basic knowledge of various Electrochemical Cells, metallic corrosion.
CO5	Get acquainted with the various chemical Processes encountered in the water softening and the impact of lubrication in machinery.

SECTION – A

Unit I

GREEN CHEMISTRY, FUEL AND DRUGS

Green Chemistry : Definition & need of Green Chemistry, Principles and Applications of Green Chemistry.

Fuels: Characteristics of a good Fuel, calorific value & types of Fuels

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

(a) Tranquilizers (b) Antibiotics

(08 hrs)

Unit – II

NANO CHEMISTRY AND EXPLOSIVES

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

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

(06 hrs)

Unit – III

SPECTROSCOPIC TECHNIQUES AND APPLICATIONS

UV Spectroscopy: Principle, Band nature of UV Spectrum, types of electronic transitions and applications.

IR Spectroscopy: Principle, molecular vibrations and applications.

NMR Spectroscopy: Principle, shielding and de-shielding, equivalent and non-equivalent protons, chemical shift and applications of NMR.

(08 hrs)

SECTION – B

Unit – IV

MATERIAL SCIENCE

Material Science: Types Properties & importance of materials: Metals, Semiconductors & Insulators.

Electrochemistry: Introduction to Electrolysis & Faraday's laws, Electrochemical cells; galvanic cell its applications, Mass transfer by electroplating and diffusion.

Corrosion: Dry and wet corrosion, factors influencing rate of corrosion, Remedial Measures against corrosion –cathodic protection, Protective Coatings- galvanizing.

(10 hrs)

Unit – V

WATER TREATMENT AND LUBRICANTS

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

Lubricants : Classification, mechanism and importance of lubricants.

(10 hrs)

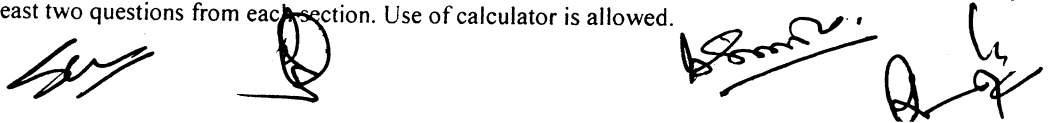
RECOMMENDED BOOKS:

- | | |
|---|---------------------|
| 1. Engineering Chemistry | Sharma, B.K. |
| 2. Material Science and Engineering | William Callister |
| 3. An introduction to nano materials and nano science | A.K Das & Mahua Das |
| 4. Spectroscopy of Organic Compounds | Silverstein |

REFERENCE BOOKS:

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

NOTE: There shall be a total of eight questions 20 marks each, four from each section. Students are required to attempt Five questions, selecting at least two questions from each section. Use of calculator is allowed.



For Examination to be held in the Year December 2022, 2023, 2024, 2025

CLASS	Ist SEMESTER					
BRANCH	CIVIL/ECE ENGINEERING					
COURSE TITLE	ENERGY AND ENVIRONMENT					
COURSE TYPE	ENGINEERING SCIENCE COURSE					
COURSE NO.	CET6101	L	T		Marks	
DURATION OF EXAM	3 HOURS	2	1	Theory	Sessional	Credit
				100	50	3

COURSE OUTCOMES: On completion of the course the students will be able to	
CO1	Understand the eco-systems, biodiversity and its conservation.
CO2	Understand the basic concepts of environmental studies and natural resources.
CO3	Gain knowledge about different types of environmental pollutions and their control measures.
CO4	Understand the fundamentals of social issues, population and the environment.

SECTION-A

Environment: Introduction, Multidisciplinary nature of environmental studies- Definition, scope and importance, Need for public awareness. **Ecosystem:** Concept, Energy flow, Structure and function of an ecosystem. Food chains, food webs and ecological pyramids, Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystems.

(10 hrs)

Natural Resources: Renewable and Non-renewable resources. 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.

(10 hrs)

SECTION-B

Pollution: Definition, Cause, effects and control measures.

Air pollution- Sources, effects, control, air quality standards, air pollution act, air pollution measurement.

Water Pollution-Sources and impacts, **Soil Pollution-**Sources and impacts, disposal of solid waste. Greenhouse gases – effect, acid rain. **Noise pollution-** Definition, Cause, effects and control measures.

(10 hrs)

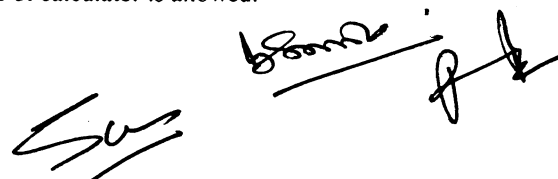
Social Issues and the Environment: Sustainable development and Sustainable use of Resources, Urban problems related to energy, Energy resources: Growing energy needs, renewable and nonrenewable energy sources use of alternate energy sources, Land resources: Land as a resource, land degradation, soil erosion and desertification, Role of an individual in conservation of natural resources. Environment Protection Acts: Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act and Forest Conservation Act.

(10 hrs)

RECOMMENDED BOOKS:

- | | | |
|---|---|-------------------------------|
| 1 | Environmental Engineering | Peavy, Rowe And Tchobanoglous |
| 2 | Elements of Environmental Science And Engineering | P. Meenakshi |
| 3 | Environmental Studies | Kaushik And Kaushik |
| 4 | A Basic Course In Environmental Studies | Deswal And Deswal |

NOTE: There will be total eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.



For Examination to be held in the Year December 2022, 2023, 2024, 2025

CLASS	1st SEMESTER						
BRANCH	CIVIL ENGINEERING						
COURSE TITLE	STRUCTURAL ANALYSIS – I						
COURSE TYPE	PROFESSIONAL CORE COURSE						
COURSE NO.	CET6102	L	T		Marks		
DURATION OF EXAM	3 HOURS	2	1	Theory	Sessional	Credit	
				100	50	3	

COURSE OUTCOMES : At the end of this course, students will demonstrate the ability :	
CO1	To determine the resultants in Planar force systems associated with static frame work.
CO2	To calculate the center of gravity, moment of inertia and forces in members of plane trusses.
CO3	To determine the resultants in planar force systems using energy principles.
CO4	To evaluate stress, strain, their relationship and the stresses due to different types of loading.

SECTION – A

Unit 1

STATICS: Introduction, engineering and S.I. units, accuracy in engineering calculations, Vectors composition and resolution, concept of Rigid Body.

Resultant of a force system: i) Concurrent Coplanar Force System

ii) Non concurrent Coplanar Force System : (a) parallel and (b) non parallel Using analytical as well as graphical methods.

iii) Simple cases of concurrent force system in space.

Concept of internal force, free body diagram. Equilibrium of force system listed above.

Unit 2

Properties of plane surfaces: First moment of area, centroid, second moment of area etc

Plane trusses: Forces in members of a truss by method of joints and method of sections

(20 hrs)

SECTION-B

Unit 3

Virtual Work: Principle of Virtual Work and its application.

Types of Beams, Types of Supports, Support Reaction for statically determinate beams.

Dynamics of Rigid Bodies: Newton's Laws, D'Alembert's Principle, Energy Principles

Unit 4

Simple stress and strain: Stress, strain, Stress-strain diagrams, Hooke's law, Modulus of elasticity (E), Lateral strains, Poisson's ratio, Volumetric strain, Bulk modulus (K), Shear stress concept, Modulus of rigidity (G). Relation between E, G and K..

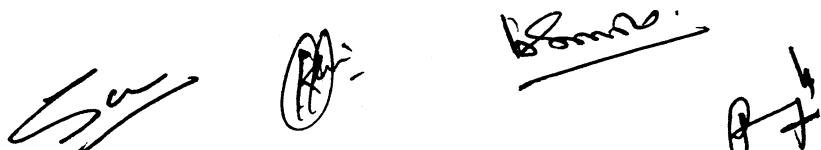
Strain Energy: Strain energy, stresses due to different types of loading- sudden loading, gradually applied loads, impact loads.

(18hrs)

RECOMMENDED BOOKS:

1	Engineering Mechanics	Beaer and Johnson
2	Engineering Mechanics	A.K. Tayal
3	Engineering Mechanics	R.C Hibbeller
4	Strength of Materials	S. Ramamutham
5	Mechanics of Materials	R.C Hibbeller

NOTE: There will be total eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.



For Examination to be held in the Year December 2022, 2023, 2024, 2025

CLASS	Ist SEMESTER					
BRANCH	CIVIL/ELECTRICAL ENGINEERING					
COURSE TITLE	PRINCIPLES OF ELECTRICAL ENGINEERING					
COURSE TYPE	ENGINEERING SCIENCE COURSE					
COURSE NO.	EET2101	L	T	Marks		
DURATION OF EXAM	3 HOURS	2	1	Theory	Sessional	Credit
				100	50	3

COURSE OUTCOMES : At the end of this course, students will be able to understand and analyse	
CO1	The basic concepts of electric circuit terminology, Kirchoff's and Ohm's laws.
CO2	The circuits using the Electrical theorems.
CO3	The basic terminologies in AC and Star-Delta circuits.
CO4	The working principle of single phase transformer.

SECTION – A

Unit-1

Electric Circuit Laws & Energy Sources: Basic electric circuit terminology, Ohm's law, Kirchoff'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. (8 hours)

Unit-2

D.C. Circuit Analysis: Power and energy relations, analysis of series parallel D.C. circuits, Mesh & Nodal methods, Star- Delta transformation, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem. Reciprocity Theorem (10 hours)

SECTION – B

Unit-3

A.C. Circuit: Introduction, Average and effective values of periodic functions, instantaneous and average power, Phasor and complex number representation. Solution of sinusoidally excited R, L, C circuits, Resonance in series and parallel circuits, quality factor. Concept of 3-phase voltage and current in Wye (y), Delta circuits and their relationship. (10 hours)

Unit-4

Transformers

Construction, principle operation of single phase transformer, ideal and practical transformer (no-load & on-load phasor diagrams), equivalent circuit, losses in transformers, transformer test (open circuit & short circuit), regulation and efficiency, auto transformer. (8 hours)

RECOMMENDED BOOKS:

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

NOTE: There will be total eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.



For Examination to be held in the Year December 2022, 2023, 2024, 2025

CLASS	Ist SEMESTER					
BRANCH	CIVIL/MECHANICAL ENGINEERING					
COURSE TITLE	TECHNICAL COMMUNICATION SKILLS					
COURSE TYPE	HUMANITIES & MANAGEMENT COURSE					
COURSE NO.	HMT1101	L	T	Marks		
DURATION OF EXAM	3 HOURS	2	0	Theory	Sessional	Credit
				75	25	2

COURSE OUTCOMES : At the end of this course, students will able to :	
CO1	Acquire proficiency in reading, writing, speaking and listening skills.
CO2	Equip themselves with grammatical and communicative competence.
CO3	To help them to develop positive attitude and personality to deal with the complexities of life.
CO4	To encourage the all-round development of students by focusing on soft skills.

SECTION-A

UNIT-1: Communication skills & writing practice: Introduction, Elements of Business Communication, Media of Verbal Communication (oral & written), Barriers to Communication, Technology-Enabled Business Communication, **Types of letter-** Inquiry letter, Reply to Inquiry, Claims Letter, Adjustment and Sales Letter, Job Letter . (08 hrs)

UNIT-2: Listening skills: Process of Listening, Types of listening, Techniques to improve listening ability, **Group Discussion-** Advantages, Purpose, Group Dynamics, and Guidelines for Effective Group discussion. **Speaking Skills-** Skills of Effective speaking, Tips for writing Scripts and Speeches. (07 hrs)

SECTION-B

UNIT-3: Personality Development–Introduction, Importance of Personality Development, Personality Development tips, Different types of Personality, Personality Traits, Personality Disorder, Personality traits of a Good Manager. (08 hrs)

UNIT-4: Life Management Skills: 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. (07hrs)

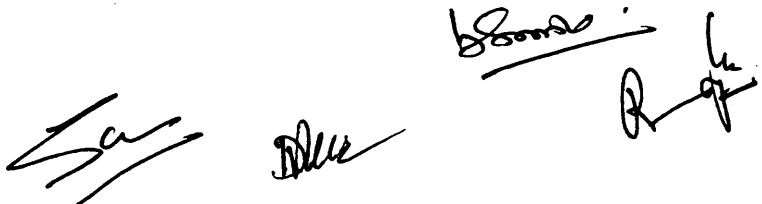
RECOMMENDED BOOKS:

- | | | |
|---|--|----------------------------|
| 1 | Communication Skills Skills (Second Edition) | Sanjay Kumar & Pushap Lata |
| 2 | Functional Aspects of Communication Skills | Dr. Prajapati Prasad |

REFERENCE BOOKS:

- | | | |
|---|-------------------------------------|-----------------------------|
| 1 | An Approach to Communication Skills | Indrajit Bhattacharya |
| 2 | Communication Skills | Varinder Kumar and Bodh Raj |
| 3 | Master of Life Management | Dr.Dantu Murali Krishna |
| 4 | Personality Development | Kagan Jerome |

NOTE: There shall be total eight questions, four from each section. Each question carries 15 marks. Five questions will have to be attempted, selecting at least two from each section



For Examination to be held in the Year December 2022, 2023, 2024, 2025.

CLASS	Ist SEMESTER			
BRANCH	CIVIL/MECHANICAL ENGINEERING			
COURSE TITLE	APPLIED ENGINEERING CHEMISTRY LAB			
COURSE TYPE	BASIC SCIENCE COURSE			
COURSE NO.	BSP1112	P	Marks	Credit
		2	Sessional	1
			50	

COURSE OUTCOMES : At the end of this course, students will able to :	
CO1	Visualize and understand chemical engineering unit, operations related to fluid and practical mechanics and mass transfer.
CO2	Analyse and overview of preparation and identification of organic compound
CO3	Understand the quantitative analysis and makes use of simple equation to illustrate the concept involved.
CO4	Estimation of total hardness of water by EDTA complexometric method.

S. NO. LIST 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.
4. Determine the surface tension of a unknown liquid Stalagmometer.
5. To prepare a pure and dry sample of Aspirin.
6. To prepare a pure and dry sample of Glucosazone.
7. To analyse the given antacid tablets
8. To analyse the trend of absorbance of solution at different concentrations by UV spectrophotometer.
9. Determine the method of purification of organic compounds by paper chromatography.
10. Organic Analysis: Identify the following organic compounds (preparation of at least one derivative).
11. Determine the total hardness of a sample of water by complexometric method (using EDTA).
12. Determine the percentage of calcium oxide in cement.

Note: A minimum of ten experiments to be performed.

