SYLLABUS

MAHANT BACHITTAR SINGH COLLEGE OF ENGINEERING & TECHNOLOGY, JAMMU (J&K)

Syllabus of 1st Year

Year – 2022 onwards

BRANCH:

Civil Engineering

(Approved by AICTE, Govt. of J&K and Affiliated to University of Jammu)
Babliana, Jeevan Nagar Road, P.O. Miran Sahib, Jammu (J&K) 181101 (INDIA)
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VISION AND MISSION OF INSTITUTE

Vision of the Institution:

To be globally acclaimed technical institution for aspiring technocrats and continuously striving to explore new vistas of opportunities.

Mission of the Institution:

- Provide contemporary and advance knowledge of engineering & sciences among students in coordinated and integrated manner.
- To develop culture of excellence in teaching, learning and innovation to provide opportunity to the students to become critical thinker and problem solvers.
- To produce finest quality of highly competent skilled manpower/technocrats based on demand of industry, society and corporate world.
- To promote design & research by adopting latest technology and diverse resources for the benefit of society.

S.No.	Departments
1.	Electronics and Communication Engineering
2.	Electrical Engineering
3.	Mechanical Engineering
4.	Computer Science Engineering
5.	Information Technology Engineering
6.	Civil Engineering

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.
PO2:Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.
PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9 : Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10 : Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11 : Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12 : Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

B.E. Civil Engineering

1st Semester

COURSE CODE	COURSE TYPE	COURS E TITLE	LOAD ALLOCATIONS			MARKS DISTRIBUTION		TOTAL MARKS	CREDITS	% CHANGE
			L	T	P	INTERNAL	EXTERNAL			
BST-1101	Basic ScienceCourse	Engineering Mathematics- I	2	1	0	50	100	150	3	100%
BST-1102	Basic ScienceCourse	Applied Engineering Chemistry	2	1	0	50	100	150	3	100%
CET-6101	Engineering Science Course	Energy & Environment	2	1	0	50	100	150	3	100%
CET-6102	Professional Core Course	Structural Analysis-I	2	1	0	50	100	150	3	100%
EET-2101	Engineering Science Course	Principle of Electrical Engg.	2	1	0	50	100	150	3	100%
HMT-1101	Humanities & Management Course	Technical Communication Skills	2	0	0	25	75	100	2	100%
BSP-1112	Basic Science Course	Applied Engineering Chemistry Lab.	0	0	2	50	-	50	1	100%
CEP-6112	Professional Core Course	Structural Analysis Lab.	0	0	2	50	-	50	1	100%
EEP-2111	Engineering Science Course	Principle of Electrical Engg. Lab.	0	0	2	50	-	50	1	100%
HMP-1111	Humanities & Management Course	Technical Communication Skills Lab.	0	0	2	15	-	50	1	100%
TOTAL			**12**	**05**	**08**	**475**	**575**	**1050**	**21**	

ENGINEERING MATHEMATICS-I (BST-1101)

CLASS	Ist SEMESTER					
BRANCH	COMMON TO ALL BRANCHES					
COURSE TITLE	ENGINEERING MATHEMATICS-I					
COURSE TYPE	BASIC SCIENCE COURSE					
COURSE NO.	BST- 1101	L	T	Marks		
DURATION OF EXAM	3 HOURS	2	1	Internal	External	Credits
				100	50	3

Course Objective:

This course is a 3 credits / 50 hours course at UG level to prepare students to solve engineering problems using the concept of Differential calculus, Integral calculus, Complex trigonometry & Matrices.

Course Outcomes:

At the end of the course the students will be able to:	
CO1	Apply the concept of partial differentiation,general theorems of calculus and maximum and minimum value of functions of two variables.
CO2	Apply the concept of definite integrals to solve problems related with Double and Triple integrals.
CO3	Apply the concept of Hyperbolic functions and Logarithmic functions of complex variables to solve engineering problems.
CO4	Apply the concept of matrices to find the solution of the system of linear equations, rank, Eigen value & Eigen vector of a matrix and verify Cayley's-Hamilton theorem.

Mapping of Course Outcomes and Program Outcomes:

CO/PO	PROGRAM OUTCOMES												Level of Bloom's Taxonomy
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1	3	2	1									2	3
CO2	3	2	1									2	3
CO3	3	1	1									1	3
CO4	3	2	1									2	3
AVG	3	1.75	1									1.75	

SYLLABUS

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)**

BOOKS RECOMMENDED:

1.	Calculus and Analytic Geometry	Thomas and Finney, 9th Edition, Pearson, 2002.
2.	Differential Calculus	S. Narayan and P.K. Mittal, S.Chand, New Delhi.
3.	Higher Engineering Mathematics	B.S Grewal, Khanna Publishers, New Delhi
4.	Engineering Mathematics-I	Dr.Bhopinder Singh
5.	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.

APPLIED ENGINEERING CHEMISTRY (BST1102)

CLASS: B.E. 1ST SEMESTER					
BRANCH:MECHANICAL ENGG. / CIVIL ENGG.					
COURSE TITLE: APPLIED ENGINEERING CHEMISTRY	**CREDITS: 3**				
COURSE CODE : BST1102					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				THEORY	**SESSIONAL**
	2	**1**	**0**	**100**	**50**

COURSE OBJECTIVES:

This course is 3 credit / 42 hours course at UG levels to prepare students to develop the interest in the industrial and domestic applications with focus on stereochemistry, Water, Polymers composite materials and alloys with environmental health considerations.

COURSE OUTCOMES:

At the end of the course student will be able to:-	
CO1	Explain the drugs based on mode of action and study the concepts, importance of fuels & green chemistry in day to day life.
CO2	Explain the different types, preparation and uses of Explosives and the importance of Nano particles.
CO3	Identify the structure of compounds with the help of spectroscopy.
CO4	Identify the basic knowledge of various Electrochemical Cells and analysis of metallic corrosion.
CO5	Identify the various problems in the procedure associated with water treatment and impact of lubrication in machinery.

CO/PO	**PROGRAM OUTCOMES**												**Level of Bloom's Taxonomy**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO1	**1**	**1**				**2**	**1**					**1**	**2**
CO2	**1**	**2**				**1**	**2**					**2**	**2**
CO3	**1**	**1**										**1**	**2**
CO4	**1**	**1**				**2**	**1**					**1**	**2**
CO5	**2**	**2**										**2**	**3**
AVG	**1.2**	**1.4**				**1.6**	**1.3**					**1.4**	

SECTION – A

Unit – I GREEN CHEMISTRY, FUEL AND DRUGS

Green Chemistry: Definition andNeed of Green Chemistry, Principles and Applications of Green Chemistry.

Fuels: Characteristics of a good Fuel, calorific value and types of Fuels.

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

a)Tranquilizers b)Antibiotics **8 hrs**

Unit – II NANO CHEMISTRY AND EXPLOSIVES

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

Explosives:- Definition, classification, preparation and uses of TNT and RDX. **6 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. **8 hrs**

SECTION – B

Unit – IV MATERIAL SCIENCE

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

Electrochemistry: Introduction to Electrolysis and Faraday's laws, Electrochemical cells: Galvanic celland its application.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 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: Classification, mechanism and importance of lubricants. **10 hrs**

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.

REFERENCE BOOKS

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

BOOKS RECOMMENDED:

S.NO.	TITLE	AUTHOR
1.	Engineering Chemistry	Jain & Jain
2.	Engineering Chemistry	Sharma, B.K.
3.	Engineering Chemistry	Dara, S.S.
4.	Engineering Chemistry	Shashi, Chawla
5.	Organic Chemistry	Bahl, B.S.
6.	Environmental Chemistry	De, A.K.
7.	Spectroscopy of Organic Compounds	Silverstein
8.	Spectroscopy of Organic Compounds	Kalsi, P.S.
9.	Polymer Science	Gowrikar, V.R. etal
10.	Engineering Chemistry	Dr. Rajinder Kumar

ENERGY AND ENVIRONMENT (CET6101)

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

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

Course Objective:

This course is a 3 credits / 50 hours course at UG level to prepare students to understand the eco-system, population, social issue, energy and environment.

Course Outcomes:

At the end of the course the students will be able to:	
CO1	Gives the brief understanding and knowledge about eco-systems, biodiversity and its conservation.
CO2	Understand the basic concepts of environmental studies and natural resources.
CO3	Discuss and learn about various types of environmental pollutions and their measures to control.
CO4	Learn and gain knowledge about the basics of social issues, population, and the environment.

Mapping of Course Outcomes and Program Outcomes:

CO/PO	PROGRAM OUTCOMES												Level of Bloom's Taxonomy
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1	1					1	3	1				3	2
CO2	1					1	3	1	1			3	2
CO3	1					2	3	1	1			3	3
CO4	1					2	3	1				3	3
AVG	1					1.5	3	1	1			3	

DETAILED SYLLABUS

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, effectsand 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 ConservationAct. **(10 hrs)**

REFERENCE BOOKS

1. Environmental engineering by peavy, rowe and tchobanoglous, mc graw – hill international edition.
2. Elements of environmental science and engineering, p. Meenakshi, 2nd edition, phi publishers.
3. Environmental studies by kaushik and kaushik, new age publisher.
4. A basic course in environmental studies by deswal and deswal, dhanpat rai & co.
5. Textbook of environmental sciences and technology by m. Anji reddy, bs publication.
6. Text book of environmental studies by deeshita dave & p. Udhaya bhaskar, cengage learning.

Note: There shall be total eight questions, four from each section. Five questions will have to be attempted selecting atleast two from each section. Use of calculator is allowed.

PROFESSIONAL CORE COURSE (CET6102)

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

CLASS	Ist SEMESTER					
BRANCH	CIVIL ENGG.					
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	2

Course Objective:

This course is a 3 credits / 50 hours course at UG level to prepare students to understand the eco-system, population, social issue, energy and environment.

Course Outcomes:

At the end of the course, students demonstrate the ability.	
CO1	To determine the resultants in Planar force systems associated with static frame work.
CO2	To calculate te centre 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.

Mapping of Course Outcomes and Program Outcomes:

CO/PO	PROGRAM OUTCOMES												Level of Bloom's Taxonomy
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1													
CO2													
CO3													
CO4													
AVG													

DETAILED SYLLABUS

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 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 : Force 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 Princple, Energy Principles.

Unit-4

SIMPLE STRESS AND STRAIN : Stress, strain, Stress strain diagrams, Hook'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. **(8 Hrs.)**

REFERENCE BOOKS

1. Engineering Mechanics — Beser 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 question selecting at least two questions from each section. Use of calculation is allowed.

PRINCIPLES OF ELECTRICAL ENGINEERING (EET- 2101)

CLASS	**Ist SEMESTER**					
BRANCH	**ELECTRICAL ENGG. / CIVIL ENGG.**					
COURSE TITLE	**PRINCIPLES OF ELECTRICAL ENGINEERING**					
COURSE NO.	**EET-2101**	**L**	**T**	**Marks**		
DURATION OF EXAM	**3 HOURS**	**2**	**1**	**Theory**	**Sessional**	**Credit**
				100	**50**	**3**

Course Objective:

This course is a 3 credits / 50 hours course at UG level to prepare students to solve engineering problems using the concept of kirchoff's laws, ohm's law, network theorems, ac and dc electrical circuits.

Course Outcomes:

At the end of the course the students will be able to:	
CO1	Understand the concept of electric circuit terminology, kirchoff's laws, ohm's law and energy sources.
CO2	Analyse different network theorems to solve electrical circuit problems.
CO3	Apply the basic concept of electrical AC circuits to solve electrical circuits.
CO4	Understand the working principle of single-phase transformer, losses, regulation and transformer test.

Mapping of Course Outcomes and Program Outcomes:

CO/PO	PROGRAM OUTCOMES												Level of Bloom's Taxonomy
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1	2	1										2	2
CO2	3	2										2	3
CO3	3	1										2	3
CO4	2	1										2	2
AVG	2.5	1.25										2	

DETAILED SYLLABUS

SECTION-A

UNIT - I ELECTRIC CIRCUIT LAWS & ENERGY SOURCES (08 hrs)

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.

SECTION- B

UNIT - III A.C. CIRCUIT (10 hrs)

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.

UNIT - IV TRANSFORMERS (08 hrs)

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.

BOOKS RECOMMENDED:

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

NOTE: There shall 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 scion. Use of calculator is allowed.

TECHNICAL COMMUNICATION SKILLS (HMT1101)

CLASS: B.E. 1ST SEMESTER					
BRANCH: MECHANICAL ENGG. / CIVIL ENGG.					
COURSE TITLE: TECHNICAL COMMUNICATION SKILLS	**CREDITS: 2**				
COURSE CODE :HMT1101					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				THEORY	**SESSIONAL**
	2	**0**	**0**	**50**	**25**

COURSE OBJECTIVES:

This course is 2 credit course at UG level to prepare students to empower students to carry out day to day communication at the work place by adequate understanding of various types of communication to facilitate efficient interpersonal communication.

COURSE OUTCOMES:

At the end of the course student will be able to:-	
CO 1	Demonstrate communication skills required for effective business communication.
CO 2	Use Linguistic capabilities for Group discussion and public speaking.
CO 3	Exhibit professional etiquettes
CO4	To encourage all round development of students by focusing on soft skills

CO-PO MAPPING													**Level of Bloom's Taxonomy**
CO/PO	**PROGRAM OUTCOMES**												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO 1								**1**		**3**		**2**	**2**
CO 2								**1**	**1**	**3**		**2**	**3**
CO 3								**1**		**3**		**2**	**3**
CO4								**1**	**1**	**2**		**2**	**2**
AVG								**1.00**	**1.00**	**2.75**		**2.00**	

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**.** **(9hrs)**

UNIT-2: Listening &Speaking 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. **(9 hrs)**

SECTION-B

UNIT-3: Personality development–Introduction, importance of personality development, personality development tips, different types of personality, personality traits, personality disorder, and personality traits of a good manager.

(7hrs)

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. **(7 hrs**)

BOOKS RECOMMENDED:

S.NO.	TITLE	AUTHOR
1.	Communication Skills (Second Edition)	Sanjay Kumar&PushapLata, Oxford University Press.
2.	Functional Aspects of Communication Skills	Dr. Prajapati Prasad, Published by S.K. Kataria& Sins
3.	An Approach to Communication Skills	Indrajit Bhattacharya, Published by Dhanpati Rai & Co. Ltd.
4.	Communication Skills	Varinder Kumar and Bodh Raj, Published by Kalyani Publishers
5.	An Approach to Communication Skills	BhanuRanjan.
6.	Master of Life Management	Dr.DantuMurali Krishna, published by Invincible Publishers

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

APPLIED ENGINEERING CHEMISTRY LAB (BSP1112)

CLASS: B.E. 1ST SEMESTER					
BRANCH: MECHANICAL ENGG. / CIVIL ENGG.					
COURSE TITLE: APPLIED ENGINEERING CHEMISTRY LAB	**CREDITS: 1**				
COURSE CODE : BSP1112					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				THEORY	**PRACTICAL**
	0	**0**	**2**	**0**	**50**

COURSE OBJECTIVES:

This course is 1 credit / 20 hours lab course at UG levels to enable students to acquire knowledge of engineering chemistry on volumetric analysis, identification, synthesis, fluid mechanics used in the industry.

COURSE OUTCOMES	
CO	At the end of the course student will be able to:-
CO1	Determine the alkali content in antacid tablets.
CO2	Determine the percentage of cu in CuSO4 titration.
CO3	Determine the percentage of CaCO3 in precipitated chalk.
CO4	Estimate the hardness of water by EDTA complexometric method.
CO5	Determine volumetrically no of moles of water of crystallization in sample of Mohr's salt.
CO6	Analyze an overview of preparation and identification of organic compound.
CO7	Identify the organic compound using qualitative analysis technique.
CO8	Apply analytical techniques to evaluate chemical components related to fluid and practical mechanics.

CO-PO MAPPING													**Level of Bloom's Taxonomy**
CO/PO	**PROGRAM OUTCOMES**												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO1	2							1				1	2
CO2	2							1					2
CO3	2							1					2
CO4	2	1						1				2	2
CO5	2							1					2
CO6	2	1						2				1	2
CO7	2	1						2				1	2
CO8	2	1						2				1	2
Average	2.00	1.00						1.38				1.20	

S. NO.	TITLE OF EXPERIMENT
1.	To Determine Volumetrically the number of molecules of water of crystallization present in the given sample of Mohr's salt, x gms. of which have been dissolved per litre provided N/10 $K_2Cr_2O_7$ (using an external indicator).
2.	To Determine Volumetrically the percentage of Cu in a sample of $CuSO_4$ crystals, Z gms of which have been dissolved per litre, provided 0.IN $Na_2S_2O_3$.
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.

BOOKS RECOMMENDED:-

S.NO.	TITLE	AUTHOR
1.	A manual of practical Engineering Chemistry	(Dr. Rajinder Kumar)
2.	Experimental Engineering chemistry	(Shashi Chawla)

STRUCTURAL ANALYSIS LAB. (CEP-6112)

CLASS: B.E. 1ST SEMESTER					
BRANCH: MECHANICAL / CIVIL ENGINEERING					
COURSE TITLE: STRUCTURAL ANALYSIS LAB.	**CREDITS: 1**				
COURSE CODE : CEP-6112					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				THEORY	**PRACTICAL**
	0	**0**	**2**	**0**	**50**

COURSE OBJECTIVES:

This course is 1 credit / 20 hours lab course at UG levels to enable students to acquire knowledge of engineering chemistry on volumetric analysis, identification, synthesis, fluid mechanics used in the industry.

COURSE OUTCOMES	
CO	At the end of the course student will be able to:-
CO1	Understand the characteristics of selected Civil Engineering Materials like metals, Timber, etc.
CO2	Learn standard principles and procedure of testing materials & prepare specimems for tests.
CO3	Learn practical applications of the test and writing technical reports.

CO-PO MAPPING													**Level of Bloom's Taxonomy**
CO/PO	**PROGRAM OUTCOMES**												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO1													
CO2													
CO3													
Average													

LIST OF EXPERIMENTS :

1. To verify Parallelogram Law of forces.
2. To verify LAMI'S theorem.
3. To determine the support reactions in case of a simply supported beam.
4. To understand the behavior of (a) mild steel (b) Tor steel bar under tension by plotting stress strain curve.
5. To determine Brinell's hardness number.
6. To determine the impact value of the standard specimens izod impact testing machine.
7. To determine strain in a beam using strain Guage.

NOTE : A minimum of five experiments to be performed.

PRINCIPLES OF ELECTRICAL ENGINEERING LAB (EEP 2111)

CLASS	I[st] SEMESTER						
BRANCH	ELECTRICAL ENGG. / CIVIL ENGG.						
COURSE TITLE	PRINCIPLES OF ELECTRICAL ENGINEERINGLAB						
COURSE NO.	EEP-2111	L	T	P	Marks		
DURATION OF EXAM	2 HOURS	0	0	2	Theory	Sessional	Credit
					-	50	1

Course Objective:

This course is a 1 credit course at UG level to prepare students to experimentally verify the kirchoff's laws, ohm's law, network theorems and transformer tests.

Course Outcomes:

At the end of the course the students will be able to:	
CO1	To verify the basic electrical circuit laws and theorems
CO2	Measurement of current in series parallel circuits
CO3	Determination of polarity test , open circuit and short circuit test of a single phase transformer.

Mapping of Course Outcomes and Program Outcomes:

CO/PO	PROGRAM OUTCOMES												Level of Bloom's Taxonomy
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1	2	2							3			2	2
CO2	2								3			2	2
CO3	2								3			2	2
AVG	2	2							3			2	

Lab Experiments:

Experiment 1: Verification **of** Kirchhoff's Laws

Experiment 2: Verification of Superposition Theorem

Experiment 3: Verification of Thevenin's Theorem

Experiment 4: Verification of Norton's Theorem

Experiment 5: Verification of Reciprocity Theorem

Experiment 6: Verification of Maximum Power Transfer Theorem

Experiment 7: Measurement of current in various branches of RLC Series parallel circuit.

Experiments 8: Study of three phase a.c circuits with star delta connected load.

Experiment 9: Study of single-phase transformer. Determination of polarity test of given single phase transformer

Experiment 10: To perform open and short circuit test on single phase transformer

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

TECHNICAL COMMUNICATION SKILLS LAB (HMP1111)

CLASS: B.E. 1ST SEMESTER					
BRANCH: MECHANICAL/ CIVIL ENGINEERING					
COURSE TITLE: COMMUNICATION SKILLS	**CREDITS: 1**				
COURSE CODE : HMP1111					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				THEORY	**SESSIONAL**
	0	**0**	**2**	**0**	**50**

COURSE OBJECTIVES:

This course is a 1 credit course at UG level to prepare students to enable them to learn better pronunciation through stress on word accent, intonation, and, to train them to use language effectively to face interviews, group discussions, public speaking.

COURSE OUTCOMES	
At the end of the course student will be able to:-	
CO 1	Demonstrate communication skills required for effective business communication.
CO 2	Use Linguistic capabilities for Group discussion and public speaking.
CO 3	Analyze and demonstrate professional etiquettes and interpersonal skills.

CO-PO MAPPING													**Level of Bloom's Taxonomy**
CO/PO	**PROGRAM OUTCOMES**												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO 1					**2**			**1**	**1**	**3**		**3**	**3**
CO 2								**1**	**1**	**3**		**2**	**3**
CO 3					**1**			**1**	**1**	**2**		**2**	**3**
AVG					**1.5**			**1.0**	**1.0**	**2.6**		**2.3**	

List of Practical's:

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 summery, and be able to answer comprehension questions from the passage read aloud.

Speaking skills

3. Conversation Skills
4. Presentation Skills

Personality Development

5. Types of Personality
6. Personality Disorder

Interpersonal Skill

7. Group Discussion
8. Interviews, Mock Interviews

Career Building & Resume writing

9. SWOT Analysis
10. Resume Writing

Note: 1. Eligibility to appear in Practical Test: 8 practicals
2. Simulation/ virtual labs are used to enhance the practical ability of students.

SYLLABUS

MAHANT BACHITTAR SINGH COLLEGE OF ENGINEERING & TECHNOLOGY, JAMMU (J&K)

Syllabus of 2ND Semester

Year – 2022 to 2025

Branch:
Civil Engineering

(Approved by AICTE, Govt. of J&K and Affiliated to University of Jammu)
Babliana, Jeevan Nagar Road, P.O. Miran Sahib, Jammu (J&K) 181101 (INDIA)
Phone : 0191-2262896, Fax : 2262896
Website : www.mbscet.org

B.E. Civil Engineering
2nd Semester

Contact Hrs.: 25 Hours/week

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATIONS			MARKS DISTRIBUTION		TOTAL MARKS	CREDITS	% CHANGE
			L	T	P	INTERNAL	EXTERNAL			
BST1201	Basic Science Course	Engineering Mathematics- II	2	1	0	50	100	150	3	100%
BST1203	Basic Science Course	Advanceed Engineering Physics	2	1	0	50	100	150	3	100
CST3201	Engineering Science Theory	Fundamentals of Programming using C	2	1	0	50	100	150	3	100%
MET5201	Engineering Science Theory	Basic Mechanical Engineering	2	1	0	50	100	150	3	100%
MET5202	Engineering Science Course	Engineering Drawing	3	0	0	50	100	150	3	100%
HMT1201	Humanities & Management Courses	Universal Human Values & Professional Ethics	2	1	0	50	100	150	3	100%
BSP1213	Basic Science Course	Advanceed Engineering Physics (Lab)	0	0	2	50	-	50	1	100%
CSP3211	Engineering Science Practical	Fundamentals of Programming using C- Lab	0	0	2	50	-	50	1	100%
MEP-5212	Engineering Science Course	Workshop Manufacturing Practices	0	0	3	50	-	50	1.5	100%
TOTAL			**13**	**5**	**7**	**450**	**600**	**1050**	**21.5**	

ENGINEERING MATHEMATICS-II (BST1201)

CLASS: B.E. 2ND SEMESTER					
BRANCH: COMMON TO ALL BRANCHES					
COURSE TITLE: ENGINEERING MATHEMATICS-II	**CREDITS: 3**				
COURSE CODE : BST1201					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				THEORY	**SESSIONAL**
	2	**1**	**0**	**100**	**50**

Course Objective: This course is a 3 credits / 50 hours course at UG level to prepare students to solve engineering problems using the concept of Infinite series, Fourier series, Differential equations& Partial differential equations.

Course Outcomes:

CO	**At the end of the course student will be able to: -**
CO1	Apply the concept of p-test, Comparison test, Cauchy's root test, D'Alembert ratio test, Raabe's test, Logarthmic test, Gauss test & Lebnitz's test to check the convergence and divergence of the infinite series.
CO2	Solve problems using Fourier series.
CO3	Solve the differential equations of first order and higher order.
CO4	Apply concept of Partial differential equation to find solution of Linear, Non-Linear, Homogeneous and Non- Homogeneous equations.

CO-PO MAPPING													**Level of Bloom's Taxonomy**
CO/PO	**PROGRAM OUTCOMES**												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO 1	**3**	**1**	**1**									**1**	**3**
CO 2	**3**	**1**	**1**									**2**	**3**
CO 3	**3**	**2**	**1**									**1**	**3**
CO4	**3**	**2**	**1**									**2**	**3**
AVG	**3**	**1.5**	**1**									**1.5**	

DETAILED SYLLABUS

SECTION A

UNIT-I: INTRODUCTION TO INFINITE SERIES

Convergence and divergence of a Series: p-test, Comparison Test, Cauchy Root Test, D'Alembert Ratio Test,Raabe's Test, Gauss Test, Logarithmic Test, Leibnitz Test for alternating series. **(10 hours)**

UNIT-II: FOURIER SERIES

Euler's formula, sufficient conditions for a Fourier expansion, functions having points of discontinuity, change of intervals. Odd and even functions, Fourier expansion of Odd and even periodic functions, half range series, typical wave forms, Parseval's formula, complex form of Fourier –series. **(10 hours)**

SECTION B

UNIT-III: ORDINARY DIFFERENTIAL EQUATIONS

Differential equations of first order and first degree: Linear and Bernoulli's differential equations, Exact and non-exact differential equations. Higher order linear differential equations: Complementary solution, particular integral and general solution of these equations, variation of parameters technique to find particular integral of second order differential equations

(10 hours)

UNIT-IV: PARTIAL DIFFERENTIAL EQUATIONS

First order linear p.d.e, Non-Linear p.d.e. of 1st order, solution by Charpit's method, Four Standard forms of non-linear p.d.e with reference to Charpit's technique: f (p,q) = 0, f (z, p,q) = 0, f (x,p) = g (y,q) and Clairaut's form. Homogeneous and Non-homogeneous higher order linear partial differential equations with constant coefficients, Rules for finding P.I and C.F, Non-Linear equations of 2nd order **(12 hours)**

BOOKS RECOMMENDED:

1	Advanced Engineering Mathematics	R.K. Jain, S.R.K Iyenger, 2nd edition Narosa New Delhi.
2	Differential Equations	G. F. Simmons
3	Partial differential equations	M. D. Raisinghania
4	Engineering Mathematics-I	Dr. Bhopinder Singh
5	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.

ADVANCED ENGINEERING PHYSICS (BST1203)

CLASS: B.E. 2ND SEMESTER					
BRANCH: CIVIL/MECHANICAL/ELECTRICAL ENGINEERING					
COURSE TITLE: ADVANCED ENGINEERING PHYSICS	CREDITS: 3				
COURSE CODE : BST1203					
DURATION EXAM.: 3 HRS					
	L	T	P	MARKS	
				Theory	Sessional
	2	1	0	100	50

COURSE OBJECTIVES:

This course is a 3 credit course at UG level to make students understand basic concept of electromagnetism, Quantum mechanics, Laser & optical fibers along with their application at initial level.

COURSE OUTCOMES:

CO	At the end of the course student will be able to:-
CO1	Explain the working principle and applications of lasers and optical fiber in engineering applications.
CO2	Express solids on the basis of band theory & conductivity of semiconductors.
CO3	Explain the behavior of harmonic oscillations & their application.
CO4	Explain Moment of Inertia, basic concept of friction & their types.
CO5	Apply principles of Maxwell's equation of Electromagnetic theory to solve the problems.
CO6	Apply vector calculus to solve problems of divergence curl and gradient.

CO-PO MAPPING													Level of Bloom's Taxonomy
CO/PO	PROGRAM OUTCOMES												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO 1	2											1	2
CO 2	2	1				1						1	2
CO 3	2											1	2
CO4	2	1				1						1	2
CO5	2	2										1	2
CO6	2	2										1	3
AVG	2.00	1.00				1.00						1.00	3

Detailed Syllabus

SYLLABUS

SectionA

UNIT 1: ELECTROMAGNETIC FIELDS AND WAVES_

Concepts of Del Operator- gradient, divergence, curl and their physical significances, Displacement Current, Maxwell's equations in integral and differential form, Poynting vector and Poynting theorem, Electromagnetic wave propagation in free space (E M wave equations for electric & magnetic fields for free space) & their solutions (plane wave solution), velocity of E M waves, Relation between Eo& Bo. **(8 hrs)**

UNIT-II: LASER AND FIBRE OPTICS

Concept and principal of Laser action, Spontaneous and Stimulated emission, Einstein's co-efficient, coherence and characteristics of laser light, Ruby, CO2 laser, Applications of lasers, Optical Fiber, Physical structure and basic theory, critical angle, Acceptance angle & acceptance cone. Numerical Aperture, characteristics and general applications of optical fibers. **(9 hrs)**

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

Definition Moment of Inertia for areas-Parallel axis theorem-Perpendicular axis theorem-Moment of inertia for composite area-product of inertia form, mass moment of inertia. **(5 hrs)**

SECTION - B

UNIT-IV: WAVES & OSCILLATIONS

Simple harmonic oscillations, damped oscillations and differential equations, logarithmic decrement, relaxation time and quality factor, ultrasonic waves and their production, applications of ultrasonic waves. **(5 hrs)**

UNIT-V: SEMICONDUCTOR PHYSICS

Structure of Atoms, Energy band diagram, Metal, Insulator and Semiconductor, Intrinsic and Extrinsic semiconductors, Direct & Indirect semiconductors (E-k diagrams), Electron and hole concentration in intrinsic semiconductors, Charge densities in semiconductor, Generation & Recombination of charge carrier, Law of mobility & conductivity, Current densities in semiconductors, Fermi levels, Mass action law, Drift & Diffusion current and Einstein relation for a p-n junction. Hall effect, Hall co-efficient & its applications. **(9 hrs)**

UNIT -VI: FRICTION

Laws of coulomb friction -Coefficient of Friction -Dry Friction -sliding Friction -ladder friction -Belt friction –Rolling Resistance. **(6 hrs)**

Books Recommended:

1. Fundamentals of Electricity & Magnetism: Duggal & Chabbra
2. Fibre Optics: Ghatak, Tyagrajan
3. Lasers: K.R. Nambiyar
4. Engineering Mechanics: A. K. Tayal
5. Sound: Gupta & Gupta
6. Semiconductor Physics and devices: | Donald A. Neamen

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions will have to be attempted, selecting at least two from each section. Use of a Scientific calculator is allowed.

Note: There will be eight questions of 20 marks each uniformly covering the entire syllabus. Students are required toattemptfivequestions; selectingatleasttwoquestionsfrom eachsection.UseofCalculatorisallowed.

FUNDAMENTALS OF C PROGRAMMING(CST3201)

CLASS	**2nd SEMESTER**					
BRANCH	**CIVIL/ELECTRICAL**					
COURSE TITLE	**COMPUTER PROGRAMMING**					
COURSE TYPE	**BASIC COMPUTER COURSE**					
COURSE NO.	**CST-3201**	**L**	**T**	**Marks**		
DURATION OF EXAM	**3 HOURS**	**2**	**1**	**Theory**	**Sessional**	**Credit**
				100	**50**	**3**

Course Objective: Students will be able to develop logics which will help them to create programs, applications in C. Also by learning basic programming they can easily switch over to any other language in future.

Course Outcomes:

CO's	At the end of the course the students will be able to:
CO1	Design and represent a solution for the given problem using basic constructs, algorithms and flowcharts
CO2	Apply various control statements in C to solve the given problems
CO3	Design a modular programs to solve the given program in C language
CO4	Develop a program to solve a given problems using various derived data types such as arrays , pointers , structures and union in C language
CO5	Write a program to solve the given problem using file handling features in C language

Mapping of Course Outcomes and Program Outcomes:

CO/PO	**PROGRAM OUTCOMES**												**Level of Bloom's Taxonomy**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO1	2	-	-	-	1	-	-	1	-	-	-	2	2
CO2	2	2	1	-	2	-	-	1	-	-	-	2	2
CO3	2	2	1	2	3	-	-	1	1	2	-	2	3
CO4	2	2	2	2	3	-	-	1	2	2	-	2	3
CO5	2	2	2	2	3	-	-	1	2	2	-	3	3
AVG	**2.00**	**2.00**	**1.50**	**2.00**	**2.40**			**1.00**	**1.66**	**2.00**		**2.2**	**2.6**

DETAILED SYLLABUS

SECTION-A

Introduction to Programming (Flow chart pseudo code, compilation etc.)

Evolution of programming languages, the compilation process, object code, source code, executable code, fundamentals of algorithms, flow charts. **(4 Hours)**

Introduction to C, Data Types, Constants, Variables, Expressions, Statements, Operators, Data Input and Output Character set, Identifiers, Keywords, Data Types, Constant and Variables, Statements, Expressions,Operators, Precedence of operators, Input-output Assignments. **(6 Hours)**

Control Statements, Storage Classes, Library Functions

Control structures, Decision making and Branching, Decision making & looping Storage Classes: Types of storage classes, Scoping rules Standard Library Functions, advantages and use of various library functions (I/O functionsString Character, Mathematics, Time and Date, functions) **(6 Hours)**

SECTION- B

Functions, Arrays, Recursion, User Defined Data Types, Structures, Unions, Passing Structure toFunctions.

User defined and standard functions, Formal and Actual arguments, Functions category, function prototypes, parameter passing, Call-by value, Call-by-reference, Nested function, Recursion.

One dimensional Array, One dimensional Array, 2- dimensional arrays: declaration and their applications,Searching in an array Linear search and Binary search

Sorting in an array. Bubble sort, Selection sort, Insertion sort, String Manipulation functions, Passing array to a Function, Declaration of structures, declaration of unions, pointer to structure & unions **(10 Hours)**

Pointers, Operation on Pointers, Passing Pointers to Functions, Data Files - Opening. Closing, Creating Data Files

Pointer variable and its importance, Pointer Arithmetic, passing parameters by reference, pointer to painter, pointers to functions, Dangling pointer dynamic memory allocation. Console input output functions.Disk input output functions, opening closing and creating Data files

BOOKS RECOMMENDED:

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

NOTE: There shall 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 scion. Use of calculator is allowed

BASIC MECHANICAL ENGINEERING (MET5201)

CLASS: B.E. 2ND SEMESTER					
BRANCH: CIVIL/ELECTRICAL ENGINEERING					
COURSE TITLE: BASIC MECHANICAL ENGINEERING	**CREDITS: 3**				
COURSE CODE : MET5201					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				Theory	**Sessional**
	2	**1**	**0**	**100**	**50**

Course Outcomes:

CO	At the end of the course student will be able to: -
CO 1	Describe the basics of engineering mechanics and engineering materials
CO 2	Understand the production processes like casting, welding etc.
CO 3	Explain the various measuring methods of physical quantities in linear metrology
CO 4	Explain the properties of thermodynamics and their uses.
CO 5	Understand the properties of fluids and their uses.

Mapping of Course Outcomes and Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2									1
CO2	3	1	1									1
CO3	3	2	2									1
CO4	3	3	2	2								1
CO5	3	3	2									1

DETAILED SYLLABUS

SECTION-A

Mechanics and Materials

Basic principles, Equivalent force system, Equations of equilibrium, free body diagram, Equilibrium of rigid bodies. Friction: Dry friction, description and applications of friction.

Classification of engineering materials, Composition of Cast iron and Carbon steels, Alloy steels their applications. Mechanical properties like strength, hardness, toughness, ductility, brittleness, malleability etc. of materials, tensile test stress- strain diagram of ductile and brittle materials.

Measurement

Concept of measurements, errors in measurements, Temperature, pressure, velocity, flow strain, force and torque: measurement, vernier calliper, Micrometer, Dial gauge, Slip gauge, Sine-bar and Combination set.

Production Engineering

Elementary and theoretical aspects of production processes like casting, carpentry, welding etc. **(19 hrs.)**

SECTION-B

Fluids

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

Thermodynamics

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

Internal Combustion (I.C.) Engines

Working principle of steam Engine, Carnot, Otto, Diesel and Dual cycles P-V and T-S diagrams and its efficiency, working of Two- stroke and Four- stroke Petrol and Diesel Engines.

Friction: Dry friction; Description and applications of friction. Working Principle of Compressors,

(20 hrs)

Reference Books:

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

NOTE: There shall be total eight questions of 20 marks ench, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

ENGINEERING DRAWING (MET5202)

CLASS: B.E. 2ND SEMESTER					
BRANCH: CIVIL/MECHANICAL/ELECTRICAL ENGINEERING					
COURSE TITLE: ENGINEERING DRAWING	**CREDITS: 3**				
COURSE CODE : BST1203					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				Theory	**Sessional**
	2	**1**	**0**	**100**	**50**

Prerequisite: Geometry and Drawing skills.

Course Objectives:

1. Understanding the fundamentals of Technical Drawing and its uses.
2. Develop the skills to draw different orthographic views and isometric views of various objects
3. Develop the skills for presenting or recognizing ideas and design of engineering products.
4. Prerequisite for higher semester courses like Machine drawing, Theory of Machines, Building Drawing and various software's.

Courseutcomes:

CO	At the end of the course student will be able to: -	Bloom's Taxonomy
CO1	Demonstrate the use of Drawing standards and constructing various curves	3
CO2	Draw projection of points and straight lines	3
CO3	Draw projection of Planes	3
CO4	Draw projection of Prisms, Pyramid, Cylinder, Cone, section of solids.	3
CO5	Develop the lateral surfaces of Prism, Pyramids, Cylinder and Cone.	3
CO6	Draw the Isometric and Orthographic Projection of solids and simple blocks	3

CO-PO MAPPING													Level of Bloom's Taxonomy
CO/PO	PROGRAM OUTCOMES												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO 1	2	3										1	**3**
CO 2	2	3										1	**3**
CO 3	2	3										1	**3**
CO4	2	3										1	**3**
CO5	2	3										1	**3**
CO6	2	3										1	**3**
AVG	**2.0**	**3.0**										**1.0**	

Course Content

Section A

Lettering, Dimensioning and Curves: Introduction, Lines, types of lines, Lettering, Single stroke Lettering, Dimensioning, placing of dimensions, Alligned and unidirectional. Curves used in Engineering Practice: Cycloidals, Involutes, Spirals and Hellices. Scale types, plain and diagonal.

Projection of Points: Introduction to quadrant system, Concept of first angle third angle projection, Projection of points in first quadrant, second quadrant, third quadrant and fourth quadrant with conclusions.

Projection of Straight Lines: introduction, projection of lines in various quadrants and with conditions like parallel, perpendicular and inclined cases.

Projection of Planes: Projections of a plane w.rt, the principle planes in simple and inclined positions. Rotation method and the Auxiliary plane method. **(20 hrs)**

Section B

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

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

Development of Surfaces: Classification of surfaces, Methods of development -Straight line method and Radialline method, Development of solids and hollow sections in full or part development of transition pieces.

Orthographic Projections: Orthographic projection of simple blocks (First & Third angles), to draw the thirdview from given two views. Missing lines in projection. **(21 hrs)**

NOTE: There shall be total eight questions, four from each section. Five questions will have to be attempted selecting at least two from each section. Use of calculator is allowed.

Books/ References:

1. Engineering Drawing by PS Gill
2. Engineering Drawing by N D Bhatt
3. Principles of Engineering Graphics by P.E Giesecks
4. Engineering Graphics by Frederic & Michelle

UNIVERSAL HUMAN VALUES & PROFESSIONAL ETHICS(HMT1201)

CLASS: B.E. 2ND SEMESTER					
BRANCH:CIVIL/ MECHANICAL ENGINEERING					
COURSE TITLE: UNIVERSAL HUMAN VALUES & PROFESSIONAL ETHICS	**CREDITS: 3**				
COURSE CODE : HMT1201					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				Theory	**Sessional**
	2	**1**	**0**	**100**	**50**

COURSE OUTCOMES	
At the end of the course student will be able to:-	
CO1	Understand the meaning of happiness and prosperity for a human being.
CO2	Comprehend the holistic approach about the family and society
CO3	Understand the harmony in nature and self regulation in nature.
CO4	Apply the understanding of harmony in existence in their profession.

CO-PO MAPPING													**Level of Bloom's Taxonomy**
CO/PO	**PROGRAM OUTCOMES**												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO 1						2	2	2	2	**1**		**3**	2
CO 2						2	2	**2**	**2**	**1**		3	2
CO 3						2	2	2	2	**1**		3	2
CO4						2	2	2	2	**1**		3	5
AVG						1.00	1.00	1.00	1.00	1.00		1.00	

SYLLABUS

SECTIONA

UNIT1:CourseIntroduction -Need,BasicGuidelines,ContentandProcessforValueEducation

1. Understandingtheneed, basicguidelines, content andprocess forValueEducation
2. Self-Exploration–whatisit? –itscontentandprocess;„NaturalAcceptance"andExperientialValidation-asthemechanism forself-exploration.
3. ContinuousHappinessandProsperity-AlookatbasicHumanAspirations
4. Rightunderstanding, Relationship andPhysicalFacilitiesthe basicrequirementsforfulfillmentofaspirationsofeveryhumanbeingwiththeircorrectpriority. **(11hours)**

UNIT2:UnderstandingHarmonyintheHumanBeingHarmonyinMyself!

1. Understandinghumanbeingasaco-existenceofthesentiment('I') andthematerial'Body'
2. UnderstandingtheneedsofSelf('I')and 'Body'–Happinessandphysicalfacility.
3. UnderstandingtheBodyasaninstrumentof'I'(Ibeingthedoer,seerandenjoyer)
4. Understandingthecharacteristicsandactivitiesof'I'andharmonyin'I' **(9hours)**

SECTIONB

UNIT3:UnderstandingHarmonyintheFamilyandSociety-HarmonyinHuman-HumanRelationship

1. UnderstandingHarmonyinthefamily–thebasicunitof humaninteraction
2. Understandingvaluesinhuman-Humanrelationship:meaningofjustice(*Nyaya)*andprogramforitsfulfillmenttoensuremutualhappiness(*Ubhay-tript)*Trust(*Vishwas)*andRespect(*Saman)*as thefoundationalvaluesofrelationship
3. Understandingthemeaningoftrust(*Vishwas)*:Differencebetweenintentionandcompetence
4. Understanding themeaning of respect(*Samman)*,Difference between respect and differentiation; theothersalient valuesin relationship. **(10hours)**

UNIT4:UnderstandingHarmonyintheNatureandExistence-WholeexistenceasCo-existence

1. UnderstandingtheharmonyintheNature
2. Interconnectednessandmutualfulfillmentamongthefourordersofnature-recyclabilityandself-regulationinnature.
3. Understandingexistence asco-existenceofmutuallyinteractingunitsinallpervasivespace
4. Holisticperceptionofharmonyatalllevelsofexistence. **(10hours)**

BOOKS RECOMMENDED:

R.RGaur,RSangal,GPBagaria,AfoundationcourseinHumanValuesandprofessional Ethics, Excel books,NewDelhi,

REFERENCE BOOKS :

1. PLDhar,RRGaur,ScienceandHumanism,CommonwealthPublishers .
2. SubhasPalekar,2000,How to practice Natural Farming, Pracheen (Vaidik) Krishi TantraShodh,
3. ANagraj,1998,JeevanVidyaekParichay,DivyaPathSansthan,Amar kantak.
4. B.Mahadevan,VinayakRajatBhat,NagendraPavanaR.N,IndianKnowledgeSystem,PHIPublisher.

Note: There will be eight questions of 20 marks each uniformly covering the entire syllabus. Students are required toattemptfivequestions; selectingatleasttwoquestionsfromeachsection.Use of Calculatorisallowed.

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ADVANCED ENGINEERING PHYSICS LAB (BSP1213)

CLASS: B.E. 2ND SEMESTER					
BRANCH:CIVIL/MECHANICAL ENGINEERING					
COURSE TITLE: ENGINEERING PHYSICS LAB	**CREDITS: 1**				
COURSE CODE : BSP1213					
DURATION EXAM.: 3 HRS					
	L	**T**	**P**	**MARKS**	
				THEORY	**PRACTICAL**
	0	**0**	**2**	**0**	**50**

COURSE OBJECTIVES:

This Lab course is of 1 credits course at UG Level to prepare the students to understand the Basic Concepts of Engineering Physics, to co-relate it with the theoretical studies and to develop in them critical thinking through analyzing and interpreting experimental data.

COURSE OUTCOMES:

CO	At the end of the course student will be able to:-
CO1	Demonstrate the phenomenon of Electromagnetic Induction.
CO2	Determine the rotation of sugar/glucose using Polarimeter, find the dispersive power of prism using spectrometer & particle detector using GM counter.
CO3	Verify the characteristics of transistor.
CO4	Determine the wavelength of monochromatic light using Newton's ring apparatus & Sodium light using a plane transmission diffraction grating.
CO5	Demonstrate the frequency of AC mains & find the moment of Inertia of bar pendulum.

CO-PO MAPPING													Level of Bloom's Taxonomy
CO/PO	PROGRAM OUTCOMES												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO 1	2	2						1	2			2	2
CO 2	2	2						1	2			2	2
CO 3	2	2						1	2			2	2
CO4	2	2						1	2			2	2
CO5	2	2						1	2			2	2
AVG	2.00	2.00						1.00	2.00			2.00	

Experiment No.	Title of Experiment
EXP-I	To find the frequency of AC mains using a sonometer.
EXP-II	To determine the wavelength of Sodium light using a plane transmission diffraction grating.
EXP-III	To find the co-efficient of self-induction of a coil by Anderson's Bridge using headphones.
EXP-IV	To find the wavelength of monochromatic light using Newton's rings apparatus.
EXP-V	To plot a graph between the distance of knife- edges from the center of gravity and the time period of a compound pendulum. From the graph find (a) the acceleration due to gravity (b) the radius of gyration (c) the moment of inertia of the bar about its axis passing through the center of gravity.
EXP-VI	To determine the plateau and optimal operating voltage of Geiger Muller (GM) Counter
EXP-VII	To study the variation of Magnetic field by using Stewart and Gee's Tangent galvanometer.
EXP-VIII	To find the dispersive power of a given prism using a spectrometer.
EXP-IX	To find the impedance of LCR circuit.
EXP-X	To study the Common base/ common emitter characteristics of PNP/NPN junction transistor.
EXP-XI	To determine the specific rotation of sugar/glucose using Laurent's half shade Polarimeter.

NOTE: Aminimumofsixexperimentsistobeperformed coveringthediverseaspectsofengineeringphysics

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FUNDAMENTALS OF C PROGRAMMING LAB (CSP3211)

CLASS	**2nd SEMESTER**						
BRANCH	**CIVIL/ELECTRICAL**						
COURSE TITLE	**COMPUTER PROGRAMMING LAB**						
COURSE TYPE	**BASIC COMPUTER COURSE**						
COURSE NO.	**CSP-3211**	**L**	**T**	**P**	**Marks**		
DURATION OF EXAM	**2 HOURS**	**0**	**0**	**2**	**Theory**	**Sessional**	**Credit**
					-	**50**	**1**

Course Objective:

Students will be able to develop logics which will help them to create programs, applications in C. Also by learning basic programming they can easily switch over to any other language in future.

Course Outcomes:

At the end of the course the students will be able to:	
CO1	Discuss the working of different editors and compilers for writing the C program
CO2	Implement the basic operators and control statements in C language
CO3	Develop a program to solve the given problem using functions
CO4	Write a program to solve the given problem using array, structures and unions
CO5	Design a program using pointers to access variables and different file handling operations

Mapping of Course Outcomes and Program Outcomes:

CO/PO	PROGRAM OUTCOMES												Level of Bloom's Taxonomy
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO1	2	2	-	-	2	-	-	2		-	-	2	2
CO2	2	2	-	-	2	-	-	2		-	-	2	2
CO3	2	2	2	-	2	-	-	2	2	-	-	2	3
CO4	2	2	2	-	3	-	-	2	2	-	-	2	3
CO5	2	2	2	-	3	-	-	2	2	-	-	2	3
AVG	**2.00**	**2.00**	**2.00**		**2.40**			**2.00**	**2.00**			**2.00**	**2.6**

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DETAILED SYLLABUS

Lab Experiments:

Experiment1: Problem solving using computers: Familiarization with programming environment.

Experiment2: Variable types and type conversions: simple computational problems using arithmeticexpressions.

Experiment3: Branching and logical expressions: Problems involving if-then-else structures.

Experiment4: Loops, while and for loops Iterative problems e g. sum of series

Experiment5:1D Arrays: searching, sorting:ID Array manipulation

Experiment6: 2Darrays and Strings, memory structure: Matrix problems, String Operations

Experiment 7: Functions: call by value, call by reference: Simple functions

Experiments 8: Recursion, structure of recursive calls: Recursive functions

Experiment9: Pointers, structures and dynamic memory allocation: Pointers and Structures

Experiment10: File handling: File creation, writing and reading a file, File manipulation Operations.

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

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WORKSHOP TECHNOLOGY (MEP5212)

CLASS: B.E. 2nd SEMESTER					
BRANCH: CSE/IT/E&C/CIVIL					
COURSE TITLE: WORKSHOP MANUFACTURINF PRACTICES	**CREDITS: 1.5**				
COURSE CODE : MEP5212					
DURATION EXAM: 3 HRS					
	L	**T**	**P**	**MARKS**	
				THEORY	**PRACTICAL**
	0	**0**	**3**	**0**	**50**

COURSE OBJECTIVES:

To develop a skill in dignity of labour precision, safety at workplace, team work and right attitude. To identify various hand fools, measuring skills and general safety precautions in workshop.

COURSE OUTCOMES	
At the end of the course student will be able to:-	
CO1	**Prepare different joints, wooden patterns by using carpentry tools.**
CO2	**Prepare the mould using natural foundry sands.**
CO3	**Perform smith forging operation in preparing different parts.**
CO4	**Carry out fabrication of different joints by welding processes.**
CO5	**Assemble flat pieces using fitting tools.**

CO-PO MAPPING													**Level of Bloom's Taxonomy**
CO/PO	**PROGRAM OUTCOMES**												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO 1	3	1			2			2	2	1		2	3
CO 2	3	1			2			2	2	1		2	3
CO 3	3	1			2			2	2	1		2	3
CO4	3	1			2			2	2	1		2	3
CO5	3	1			2			2	2	1		2	3
AVG	3.0	1.0			2.0			2.0	2.0	1.0		2.0	

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Shop Practice:-

Unit I:- CARPENTRY:-

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

Unit II :- Foundry:-

Moulding of open bearing (simple pattern)
Moulding of sliding job of Bench Vice (split piece pattern)

Unit III:- SMITHY :-

Upsetting drawings & Bending operation.

Unit IV :- WELDING :-

Preparation of single V – Butt joint by gas / arc welding processes
Preparation of Double V-Butt joint by gas / arc welding
Corner Joint by gas / arc welding
Lap joint by gas / arc welding

Unit V:- FITTING :-

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

BOOKS RECOMMENDED:-

S.NO.	TITLE	AUTHOR
1.	Workshop Technology	Hajra and Chowdhary
2.	Manufacturing Technology Vol I& II	Rao. P.N
3.	Manufacturing Technology	Gowri .P. Hariharan and A. Suresh Babu