UNIVERSITY OF JAMMU

NOTIFICATION
(18/Oct/Adp/75)

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 **Choice Based Credit System** as per the model curriculum of the **AICTE (as given in the Annexure Pages 01 to 25)** for the candidates of **all (Govt./Pvt./UIET) 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 2018, 2019, 2020 and 2021**
	Semester-II	**May 2019, 2020, 2021 and 2022**

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

s/d-
DEAN ACADEMIC AFFAIRS

No. F.Acd/III/18/10839 - 10850
Dated: 31/10/2018
Copy for information & necessary action to:-

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

Assistant Registrar (Academics)

B.E. Civil Engineering 1ˢᵗ Semester   **Contact Hrs.: 26**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATIONS			MARKS DISTRIBUTION		TOTAL MARKS	CREDITS	% CHANGE
			L	T	P	INTERNAL	EXTERNAL			
BSC-101	Basic Science Course	Engineering Mathematics-I	3	2	0	50	100	150	5	100
BSC-103	Basic Science Course	Engineering Chemistry	3	1	0	50	100	150	4	100
BSC-113	Basic Science Course	Engineering Chemistry (Lab)	-	-	3	50	-	50	1.5	100
HMC-101	Humanities & Social Science & Management Courses	Communication Skill	2	-	-	25	50	75	2	100
HMC-111	Humanities & Social Science & Management Courses	Communication Skill (Lab)	-	-	2	25	-	25	1	100
ESC-103	Engineering Science Course	Engineering Mechanics	3	1	0	50	100	150	4	100
ESC-113	Engineering Science Course	Engineering Mechanics (Lab)	-	-	2	50		50	1	100
ESC-112	Engineering Science Course	Workshop Technology	1	-	3	50	-	50	2.5	100
TOTAL			**12**	**4**	**10**	**350**	**350**	**700**	**21**	

CLASS: B.E. 1ST SEMESTER
BRANCH: COMMON TO ALL BRANCHES
COURSE TITLE: ENGINEERING MATHEMATICS-I   **CREDITS: 5**
COURSE No.: BSC-101
DURATION EXAM.: 3 HRS

	L	T	P	MARKS	
				THEORY	SESSIONAL
	3	2	0	100	50

Course Outcomes: At the end of the course the Student will be able to

CO 1   Learn the rules of nth derivative, to find maximum and minimum value of any function, to trace the curves.

CO 2   Understand the concept of definite integrals and find arc length, area, surface area and volume of various curves.

CO 3   Solve the differential equations of first order and higher order.

CO 4   differentiate the concept of scalars , vectors, gradient, divergence and curl.

CO 5   Evaluate the complex no. in polar form and understand the idea of hyperbolic functions

Detailed Syllabus

UNIT - I   Differential Calculus – I   (07 hrs)

Leibnitz theorem (without proof) , Partial differentiation, Euler's theorem on homogeneous functions, Asymptotes, Double points, curvature, Curve tracing in Cartesian, polar and parametric forms.

UNIT – II   Differential Calculus – II   (07 hrs)

Rolle's theorem , Mean value theorem , Taylor's and Maclaurin's series with remainder , Indeterminate forms , Taylor's series in two variables , Maxima and Minima of functions of two variables , Method of Lagrange's multiplier's.

UNIT – III   Integral Calculus   (08 hrs)

Definite integrals with important properties, differentiation under the integral sign, Gamma, Beta and error functions with simple problems, applications of definite integrals to find length, area, volume and surface area of revolutions, transformation of coordinates, double and triple integrals with simple problems.

UNIT –IV   Vector Calculus   (06 hrs)

Scalar and vector product of vectors, Derivatives of vectors, Partial derivatives of vectors, Directional derivatives and Gradient, Divergence and Curl of a vector, Vector Integration ; Gauss's Divergence theorem,Green's theorem, Stoke's theorem,

UNIT – V   Complex Trigonometry   (05 hrs)

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

UNIT – VI   Ordinary Differential Equations   (08 hrs)

 Differential equations of first order and first degree: Exact and non-exact differential equations, Linear and Bernoulli's 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, Cauchy's and Lagrange's differential equations. Applications of ordinary differential equations to simple Electrical and Mechanical Engg. Problems.

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. Vector Calculus   S. Narayan andP.K. Mittal, S.Chand, New Delhi.
4. Higher Engineering Mathematics   B.S Grewal, Khanna Publishers, New Delhi
5. Engineering Mathematics-I   Dr. Bhopinder Singh
6.

NOTE: (I) There shall be total seven questions. Question no.1 is compulsory and short answer/ objective type .It will consists of 10 questions each of 01 mark (Total: 10 marks)

(II) There will be two questions from each unit. Attempt one question from each unit. Each question carry 15 marks.

CLASS: B.E. 1ST SEMESTER

BRANCH:CIVIL/MECHANICAL/ELECTRICAL ENGINEERING

COURSE TITLE: ENGINEERING CHEMISTRY   **CREDITS: 4**

COURSE No.: BSC-103

DURATION EXAM.: 3 HRS

	L	T	P	MARKS THEORY	SESSIONAL
	3	1	0	100	50

Course Outcomes : At the end of the course the student will be able to -

CO 1 Know the importance of stereochemistry in organic compound and apply the knowledge gain in this course to the variety of chemical compounds.

CO 2 Summarize the chemical structure, molecular properties, vulcanization process and application of major type of rubber.

CO 3 The different polymerisation processes used to make thermoplastic and thermosetting plastics.

CO 4 Through Spectroscopy, One could acquire Knowledge about the identification of newly synthesized products.

CO 5 Explain the air quality, emission, pollution control and Environmental health.

CO 6 Define basic knowledge on cement, its production, characteristics, properties etc.

CO 7 Recognise the common physical, chemical process encountered in treatment process of water.

SECTION – A

Module – I   **STEREOCHEMISTRY AND DRUGS**

Optical isomerism, enantiomerism and diastereoisomerism, racemisation, Methods for resolution of racemic mixture, asymmetric synthesis.

Definition and synthesis of a drug, structure and applications of following drugs:-

(a) Antipyretic
(b) Narcotics
(c) Tranquilizers
(d) Antibiotics

6hrs

Module – II   **PLASTICS, RUBBER AND PAINTS**

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

Rubber :   Introduction, types of rubber, treatment of latex, vulcanization of rubber.

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

9hrs

Module – III   **SPECTROSCOPIC TECHNIQUES AND APPLICATIONS**

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

I R Spectroscopy :   Principle, molecular vibrations, applications.

NMR Spectroscope :   Principle and applications.   8hrs

SECTION – B

Module – IV   **ENVIRONMENTAL SCIENCE**

Concepts of Environmental Chemistry, Segments of environment (a brief idea about atmosphere, hydrosphere and Lithosphere).

Air Pollution : Types and control of Air Pollution.

Water Pollution: Classification and control of Water Pollution.

Chemical Toxicology :Biochemical effects of Pb, Hg, As, Zn & CN.   8hrs

Module – V   **ALLOYS AND CEMENT**

Alloys : Introduction, purpose of making alloys, preparation of alloys, classification of alloys (Ferrous & Non-Ferrous alloys), alloy steels and copper alloys (Brass & Bronze).

Cement & its types, manufacture of Portland cement, setting and hardening of cement.   5hrs

Module – VI

WATER TREATMENT

Introduction, softening of water by Lime-Soda, zeolite & ion-exchange processes, priming and foaming, sludge & scale formation, determination of hardness of water by EDTA method, Numericals on hardness and softening of water.   6hrs

NOTE: The paper will be divided into two sections. There shall be a total of eight questions, four from each section A and B, selecting at least one question from each module. Each question carries 20. Five questions will have to be attempted, selecting at least two questions from each section. marks Use of calculator is allowed.

Books Recommended:

S.No.	BOOKS RECOMMENDED	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

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER
BRANCH:CIVIL/MECHANICAL/ELECTRICAL ENGINEERING
COURSE TITLE: ENGINEERING CHEMISTRY LAB   CREDITS: 1.5
COURSE No.: BSC-113
DURATION EXAM.: 3 HRS

	L	T	P	MARKS	
				THEORY	PRACTICAL
	0	0	3	0	50

Course Outcomes : At the end of the course the student will be able to -

CO 1   Capability to visualize and understand chemical engineering unit, operations related to fluid and practical mechanics and mass transfer.

CO 2   To provide an overview of preparation and identification of organic compound.

CO 3   This course relies on quantitative analysis and makes use of simple equation to illustrate the concept involved.

CO 4   Handling different types of instruments for analysis of materials, using small quantity of material involved for quick and accurate results.

CO 5   Estimation of total hardness of water by EDTA complex metric method.

CO 6   Detection of various elements and functional groups in unknown organic compound.

CO 7   To determine the alkali content in antacid tablets.

S. No.	TITLE OF EXPERIMENT
1.	Determine the percentage of $CaCO_3$ in precipitated chalk. You are provided with IN HCI and 0.IN NaOH.
2.	To analyse the given antacid tablets.
3.	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).
4.	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 $Na_2S_2 O_3$.
5.	To determine the coefficient of viscosity of an unknown liquid using Ostwald Viscometer.
6.	Determine the surface tension of a unknown liquid Stalagmometer.
7.	To prepare a pure and dry sample of Aspirin.
8.	To prepare a pure and dry sample of Glucosazone.
9.	Determine the method of purification of organic compounds by coloumn 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:-

TITLE	AUTHOR
1. A manual of practical Engineering Chemistry	(Dr. Rajinder Kumar)

CLASS: B.E. 1ST SEMESTER

BRANCH: MECHANICAL/CIVIL ENGINEERING

COURSE TITLE: COMMUNICATION SKILLS   CREDITS: 2

COURSE No.: HMC-101

DURATION EXAM: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
2	0	0	50	25

COURSE OUTCOME OF COMMUNICATION SKILLS
The student would be able to:
1. Acquire proficiency in reading, speaking and writing skills.
2. Equip themselves with grammatical and communicative competence.
3. Adept in communication skills required for the competence in present scenario.
4. Acquire proficiency in listening skills and professional etiquettes.
5. Enhance their linguistic competence for Group Discussions and public speaking.

SECTION-A

UNIT I
Writing Practice: Comprehension, Notices, Memos,Précis writing, Types of Letter- Enquiry letter, Reply to enquiry, Claims letter, Adjustment and sales letter, Job letter; E-mail writing.
5 hrs

UNIT II
Introduction to grammar: Use of phrase and clauses in sentences, use of proper punctuationConcept of word formation, Synonyms, Antonyms, Prefix, Suffix; Articles, Prepositions, Clichés, Subject-verb Agreement.   6 hrs

SECTION-B

UNITIII
Communication: Introduction, Elements of Business Communication, Media of verbal communication (oral & written), Barriers of Communication, Guidelines to improve Business communication.
5 hrs

UNIT IV
Professional Etiquettes- Meaning and types. **Listening skills:** Process of listening, types of listening, techniques to improve listening ability, skills of effective listening,**Group Discussion**-Advantages, Purpose, Group Dynamics, and Guidelines for Effective Group discussion.
5 hrs

UNIT V
Speaking Skills- Skills of Effective speaking, Components of Effective talk and body language; **Interviews**-Meaning, Types of interview, tips for giving an interview and handling questions. **Meeting skills**: purpose of meeting- procedures, notices, agenda, venue of meeting; minutes of meeting. **Brain Storming**-Purpose and techniques.
5 hrs

NOTE: The question paper shall consist of two questions from each unit (total 10 questions). Students have to attempt one question from each unit (total no. of questions to be attempted shall be five) i.e there shall be internal choice within each unit. Students have to attempt two questions from Section A and three questions from section B. Each question carries equal marks (10 marks).

BOOKS RECOMMENDED

- Communication Skills by Dr. Nageshwar Rao & Dr. Rajendra Prasad.
- Functional Aspects of Communication Skills by Dr. Prajapati Prasad, Published by S.K Kataria &Sons.
- An Approach to Communication Skills by Indrajit Bhattacharya, Published by Dhanpat Rai & Co. Ltd.
- Communication Skills by Varinder Kumar and Bodh Raj, Published by Kalyani Publishers.
- An Approach to Communication Skills by Bhanu Ranjan
- Communication Skills and Functional Grammar by Sadhna Gupta.
- Remedial English Grammar by F.T.Wood. Macmillan
- On Writing Well. William Zinsser. Harper resource Book

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH: MECHANICAL/CIVIL ENGINEERING

COURSE TITLE: COMMUNICATION SKILLS   CREDIT: 1

COURSE No.: HMC-111

DURATION EXAM: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	2	0	25

COURSE OUTCOME OF COMMUNICATION SKILLS LAB

The student would be able to:
1. Identify difficult sounds, words and phrases and shall acquire proficiency in pronouncing the words correctly with proper stress and intonations.
2. Equip themselves with art of making resume/cv which can aptly highlight their self-introduction and their strongest attributes.
3. Make use of latest technology to communicate effectively in various settings and contexts.
4. Face their interviews confidently and shall acquire proficiency in Group Discussions and public speaking.
5. Acquire the art of holding meetings as well as preparing the annual reports of the organizations.

List of Practical:
1. Listening Comprehension.
2. Pronunciation, Intonation, Stress & Rhythm.
3. Common everyday situations and conversations & Dialogues.
4. Power point presentation
5. Resume/Bio data preparation including SWOT analysis.
6. Vocabulary improvement programs, Role play
7. Mock interviews
8. Group discussions
9. Minutes of Meeting
10. Annual Reports

CLASS: B.E. 1ST SEMESTER

BRANCH:CIVIL/MECHANICAL ENGINEERING

COURSE TITLE: ENGINEERING MECHANICS   **CREDITS: 4**

COURSE No.: ESC-103

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	1	0	100	50

Course Outcomes: At the end of this course, students will demonstrate the ability to:-
1. Analyze the system of units and the conversion of units from one to another.
2. Demonstrate knowledge on basic calculation of forces and their resultant and resolution.
3. Approach to a conclusion of forces causing equilibrium.
4. Be proficient in the use of integral and moment methods for calculating centre of gravity.
5. Develop a stable, environment friendly structure for various engineering purpose using various modern tools.

SECTION-A
(STATICS)

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

Theory of friction, its laws and applications (inclined plane)., Centroids and center of gravity, centroids of lines and composite areas, centroids determined by integration.

Moment of inertia, Area M.O.I, Transfer theorems, Polar M.O.I, Product of inertia, Principal M.O.I.Transfer theorems and axes M.O.I of composite bodies. Moment of inertia of standard sections and composite sections.

SECTION-B
(DYNAMICS)

Kinematics of a particle rectilinear motion, motion curves, Rectangular components of curvilinear motion, Flight of Projectile, Normal and tangential components of acceleration, Radial and transverse components, Newton's Laws. D'Alembert's Principle.

Kinematics of rigid bodies: Types of rigid body motion, Angular motion, fixed axis rotation, Analysis of plane motion and its applications, Instantaneous center and Instantaneous axis of rotation.

Kinetics of Particle: Translation, Analysis of a particle as a rigid body.

Kinetics of rigid bodies: Equations of plane motion, fixed axis rotation, Rolling bodies, General plane motion, Impulse and momentum in plane motion, Angular momentum.

RECOMMENDED BOOKS:

1.	Engineering Mechanics (Statics & Dynamics)	Beer and Johnson
2.	Engineering Mechanics (Statics & Dynamics)	Mariam and Kraige
3.	Engineering Mechanics (Statics and Dynamics)	Timoshenko and Young
4.	Engineering Mechanics (Statics and Dynamics)	Ferdinand L Singer.
5.	Engineering Mechanics (Statics and Dynamics)	Sarbjeet Singh and Pardeep Singh
6	Engineering Mechanics (Statics and Dynamics)	A.K Tayal

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.

CLASS: B.E. 1ST SEMESTER

BRANCH: CIVIL/MECHANICAL ENGINEERING

COURSE TITLE: ENGINEERING MECHANICS LAB   CREDIT: 1

COURSE No.: ESC-113

DURATION EXAM: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	2	0	50

ENGINEERING MECHANICS PRACTICAL:

1. To verify Parellogram law of forces.
2. To verify LAMIS THEOREM.
3. To verify bending Moment.
4. To find out the coefficient of friction between Glass and wooden surface on an incline plane.
5. To find out the velocity ratio, and Mechanical Advantage of Single/Double purchase Winch Crab
6. To find the coefficient of friction between Glass and steel roller on an inclined plane.
7. To find the velocity ratio, and Mechanical advantage of a worm & Worm Wheel.
8. To find the reactions at supports in case of simply supported beam.

CLASS: B.E. 1ST SEMESTER

BRANCH: CIVIL/MECHANICAL ENGINEERING

COURSE TITLE: WORKSHOP TECHNOLOGY

CREDITS: 2.5

COURSE No.: ESC-112

DURATION EXAM: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
1	0	3	0	50

Course Objectives:-

1. To train the students in various manufacturing practices and to impart basic knowledge of workshop technology .
2. To develop right attitude, team work, precision and safety at work place.
3. To explain the construction, function, use and application of different working tools, Equipment and machines
4. To have practical exposure to various manufacturing practices such as welding ,fitting, carpentry, pattern making, casting, smithy and machining.

Course Outcomes:-

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

1. Understanding different manufacturing techniques and their relative Advantages/disadvantages with respect to different applications.
2. Selection of a suitable technique for meeting a specific fabrication need.
3. Acquire a minimum practical skill with respect to the different manufacturing methods and develop the confidence to design& fabricate small components for their project work and also to participate in various national and international technical competitions.
4. Introduction to different manufacturing methods in different fields of engineering.
5. Practical exposure to different fabrication techniques
6. Creation of simple components using different materials. Exposure to some of the advanced and latest manufacturing techniques being employed in the industry.

Shop Practice :-

Unit I   CARPENTRY:-
1. Different joints :- a) Middle/cross lap joint
               b) Mortise and Tenon T –joint
2 . Pattern making of open bearing

Unit II   CASTING:-
1. Casting of open bearing (single piece pattern)
2. Casting of split piece pattern

Unit III SMITHY:-
1. Cubical block from a cylindrical section
2. L – shaped hook from cylindrical section

Unit IV WELDING:-
1. Preparation of single V – Butt joint by gas and arc welding processes
2. Preparation of Double V-Butt joint , T-joint and corner joint by gas and arc welding

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

Unit VI   MACHINE SHOP:-
1. Operation like turning, step turning on MS round
2. Operation like taper turning , Knurling on MS round
3. Introduction to CNC machines

Books Recommended :-
*   Workshop Technology by Hajra and Chowdhary
*   Manufacturing Technology Vol I & II by Rao. P.N
*   Manufacturing Technology by Gowri .P. Hariharan and A. Suresh Babu

B.E. Civil Engineering Second Semester Examination to be held in the Year May 2019,2020,2021,2022

B.E. Civil Engineering 2nd Semester

Contact Hrs.: 24

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits	% Change
			L	T	P	Internal	External			
BSC-201	Basic Science Course	Engineering Mathematics-II	3	2	-	50	100	150	5	100
BSC-202	Basic Science Course	Engineering Physics	3	1	-	50	100	150	4	100
BSC-212	Basic Science Course	Engineering Physics (Lab)	-	-	3	50	-	50	1.5	100
ESC-201	Engineering Science Course	Computer Programming	3	1	-	50	100	150	4	100
ESC-211	Engineering Science Course	Computer Programming (Lab)	-	-	2	50	-	50	1	100
ESC-202	Engineering Science Course	Engineering Graphics	1	-	3	50	100	150	2.5	100
NCC-201	Non-Credit Course	Mentoring and Professional Development	-	-	2	Satisfactory / Un-Satisfactory			Non-Credit	-
NCC-202		Environmental Sciences								
NCC-203		Indian Constitution								
TOTAL			**10**	**4**	**10**	**300**	**400**	**700**	**18**	

CLASS: B.E. 2ND SEMESTER

BRANCH: COMMON TO ALL BRANCHES

COURSE TITLE: ENGINEERING MATHEMATICS-II   **CREDITS: 5**

COURSE No.: BSC-201

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	0	100	50

Course Outcomes: At the end of the course the Student will be able to

CO 1   Learn the rules of nth derivative, to find maximum and minimum value of any function, to trace the curves.

CO 2   Understand the concept of definite integrals and find arc length, area, surface area and volume of various curves.

CO 3   Solve the differential equations of first order and higher order.

CO 4   differentiate the concept of scalars , vectors, gradient, divergence and curl.

CO 5   Evaluate the complex no. in polar form and understand the idea of hyperbolic functions

Detailed Syllabus

UNIT- I Introduction to infinite series & sequences   **(06 hrs)**

Convergence and divergence of a series, p-test, comparison test, Cauchy's root test, D' Alembert Ratio Test, Raabe's Test, Guass test, Logarithmic test, Leibnitz test on alternating series.

UNIT- II Fourier series and Power Series Solutions of Second order O.d.e   **(10 hrs)**

(i)   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.

(ii)   Power series: Analytic function, ordinary point, singular point, regular and irregular singular points of o.d.e. $Y'' + P(x) Y' + Q(x) Y=0$, Series solution of differential equations about an ordinary point, Frobenius series solution about a regular singular point. Examples of Legendre and Bessel's differential equations.

Unit – III First Order partial differential equations   **(05 hrs)**

Formation of p.d.e, 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 Clauraut's form.

Unit – IV Higher Order Linear p.d.e   **(07 hrs)**

Homogenous and Non-homogenous higher order linear partial differential with   constant coefficients Rules for finding P.I and C.F, Non-Linear equations of 2nd order. Application of p.d.e, method of separation of variables to solve equations of vibrations of strings (or one dim wave equation), one dim heat flow equations, Laplace equations.

Unit – V Matrices   **(08 hrs)**

Introduction, Rank of matrix, Elementary transformations, Elementary matrices, Inverse using elementary transformation, Normal form of a matrix, Linear dependence and independence of vectors, consistency of linear system of equations, Guass Jordan method, Gauss elimination method, Eigen values and Eigen vector, Properties of Eigen value, Cayley Hamilton Theorem, Reduction to diagonal form, Reduction of quadratic form to canonical form.

Unit – VI Vector Spaces **(5 hrs)**

Definition, Linear transformation, basis, dimensions of a vector space, Range and Kernel of a linear transformation, Rank, Nullity, Rank-Nullity theorem, Matrix associated with a linear transformation.

NOTE: (I) There shall be total seven questions. Question no.1 is compulsory and short answer/ objective type. It will consist of 10 questions each of 1 mark (Total: 10 marks)

   (II) There will be two questions from each unit. Attempt one question from each unit. Each question carry 15 marks.

BOOKS RECOMMENDED:

1.	Advanced Engineering Mathematics	E. Kreyszig, 2006
2.	Higher Engineering Mathematics	Dr. B.S. Grewal, Khanna Publication, New Delhi
3.	Engineering Mathematics -II	Dr. Bhopinder Singh
4.	Partial differential equations	M.D.RaiSinghania
5.	Linear Algebra	D.Poole,2nd Edition, 2005

Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER
BRANCH:CIVIL/MECHANICAL/ELECTRICAL ENGINEERING
COURSE TITLE: ENGINEERING PHYSICS   **CREDITS: 4**
COURSE No.: BSC-202
DURATION EXAM.: 3 HRS

L	T	P	MARKS THEORY	SESSIONAL
3	1	0	100	50

Course Outcomes (CO) : At the end of the course the Student will be able to -

CO 1   Understand the significance of Maxwell's equations as the basis of Electromagnetic theory.
Gain the knowledge on the basic concepts of Quantum Mechanics and its applications.
Acquire the concepts of different types of oscillations.

CO 2   Assimilates the basic concepts of Semiconductor Physics.
Get familiar with different aspects of applied optics & their applications.
Understand the working principle of various lasers and optical fibres and their applications in various fields.

SECTION – A

Module -I: ELECTROMAGNETIC FIELDS AND WAVES

Concepts of Del Operator- gradient, divergence, curl and their physical significances, Displacement Current. Maxwell's equations in vacuum and non conducting medium, 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 E_o & B_o , definition of Poynting vector, Poynting theorem.

8hrs, Weightage = 20%

Module –II : QUANTUM MECHANICS

Inadequacies of Classical Mechanics ,De-broglie's concept of Matter waves, Wave-packet (Wavegroup), Phase and Group velocity, Heisenberg's uncertainty Principle, Experimental illustration of Uncertainty   principle using single slit,   Wave-function definition, interpretation and significance of wave-function, Schrodinger's wave equation (Steady-state and Time dependent) for one- dimensional case, Concept of   Operators and Expectation values, Applications of Schrodinger's equation (Time independent) to ;
i) Particle in a one-dimensional box of infinite height, ii) Single step potential barrier, iii) Tunnel effect,

9hrs, Weightage = 20%

Module-III : OSCILLATIONS
Damped and Forced oscillations and their differential equations , Logarithmic decrement, Relaxation time & Quality factor,Ultrasonic waves and their production by Piezoelectric method and general applications.

4hrs,   Weightage = 10%

SECTION – B

Module –IV: SEMICONDUCTOR PHYSICS

Structure of Atoms, Energy Band diagram, Metal, Insulator and Semiconductor, Intrinsic and Extrinsic semiconductors , Direct & Indirect semiconductors , Bond in semiconductor & effect of temperature on semiconductors, Hole & Electron description , Charge densities in semiconductor , Generation & Recombination of charge carrier, Law of mobility & conductivity, Current densities in semiconductors , Fermi levels, Mass action law, Drift & Diffusion currents, Hall effect, Hall co-efficient & its applications .

9hrs, Weightage = 20%

Module –V : APPLIED OPTICS

Interference in thin films (by reflection and transmission of light), Theory of Newton's rings by reflected light, Determination of wavelength and refractive index of monochromatic light by Newton's rings theory.

Fraunhoffer & Fresnel's diffractions, Fresnel's half period zones and rectilinear propagation of light, Fraunhoffer diffraction due to a single slit , Plane diffraction grating& its theory for secondary maxima & minima.

Unpolarised and polarised light, Double refraction phenomenon, Nicol Prism, Mathematical representation of elliptically and circularly polarized light, Quarter and Half wave plates.

7hrs, Weightage = 20%

Module VI : LASERS AND FIBRE OPTICS

Principal of Laser action , Einstein's co-efficients, Ruby & CO_2 Lasers, Holography , Propagation of Light in Optical fibres, Acceptance angle & acceptance cone, Numerical Aperture, Single mode & Multimode fibres, Characteristics and General applications of Lasers & Optical fibres.

5hrs, Weightage = 10%

TUTORIALS

S.No	TOPICS
T-1	Numerical Problems pertaining to topics in Unit-I
T-2	Numerical Problems based on topics in Unit-II
T-3	Numerical Problems related to topics in Unit-III
T-4	Numerical Problems based on topics in Unit- IV
T-5	Numerical Problems associated with topics in Unit-V
T-6	Numerical Problems related to topics in Unit-VI

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

Books Recommended:

TITLE	AUTHOR
1. Physics	Reisnick & Halliday
2. Fundamentals of Electricity & Magnetism	Duggal & Chabbra
3. Modern Physics	Beiser
4. Modern Physics	Blatt
5. Modern Physics	Gupta & Gupta
6. Sound	Subramaniam
7. Basic Electronics	Millman & Halkias
8. Semi conductor Physics and Devices: Basic Principles	Donald A. Neamen
9. Optics	Brijlal & Subramaniam
10. Fibre Optics	Ghatak, Tyagrajan
11. Lasers	K.R. Nambiyar
12. Modern Engineering Physics	A.S. Vasudeva

CLASS: B.E. 2ND SEMESTER

BRANCH:CIVIL/MECHANICAL/ELECTRICAL ENGINEERING

COURSE TITLE: ENGINEERING PHYSICS   **CREDITS: 1.5**

COURSE No.: BSC-212

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	3	0	50

Course Outcomes: At the end of the course the Student will be able to -

CO-1   Gain knowledge about the scientific methods of measuring different physical parameters based on the concepts of Physics.

CO-2 Develop the experimentation skills by displaying minimized measurement errors.

CO-3 Demonstrate & improve the practical skills to use the appropriate physical concepts to obtain the solutions pertaining to different physics experiments.

CO-4 Acquire a sense of scientific temper infused with innovation & creativity.

Experiment No.	Title of Experiment
Exp- I	To find the frequency of A.C. mains using an electrical vibrator.
Exp-II	To study the variation of magnetic field.
Exp-III	To verify the Faraday's laws.
Exp-IV	To find the co-efficient of self induction of a coil by Anderson's bridge using head phone.
Exp-V	To find the impedance of LCR circuit.
Exp-VI	To evaluate the value of Planck's constant using a photo-cell.
Exp-VII	To study the characteristics of a Solar cell.
Exp-VIII	To draw the V-I characteristics of a P-N junction diode.
Exp-IX	To study the common base/ common emitter characteristics of PNP/NPN junction transistor.
Exp-X	To study the Zener diode characteristics.
Exp-XI	To find the dispersive power of a given prism using a spectrometer.
Exp-XII	To find the wavelength of monochromatic light using Newton's rings apparatus.
Exp-XIII	To determine the wavelength of sodium light using a plane transmission grating.
Exp-XIV	To determine the specific rotation of sugar/glucose using Laurent's Half shade Polarimeter.
Exp-XV	To find the wavelength of He-Ne laser.

NOTE : A MINIMUM OF EIGHT EXPERIMENTS IS TO BE PERFORMED COVERING THE DIVERSE ASPECTS OF ENGINEERING PHYSICS.

BOOKS RECOMMENDED:

	TITLE	AUTHOR
1.	B.Sc. Practical Physics	C.L. Arora
2.	Practical Physics	Warsnop & Flint
3.	Practical Physics	Chauhan & Singh (Vol. I & Vol. II)

CLASS: B.E. 2ND SEMESTER

BRANCH: CIVIL/MECHANICALENGINEERING

COURSE TITLE: COMPUTER PROGRAMMING   **CREDITS: 4**

COURSE No.: ESC-201

DURATION EXAM.: 3 HRS

	L	T	P	MARKS	
				THEORY	SESSIONAL
	3	1	0	100	50

Course Outcomes : At the end of the course the student will be able to-

CO 1   Understand, analyze and implement software development tools like algorithm, pseudo codes and flow charts.

CO 2   Understand the use of loops and decision making statements to solve the problems.

CO 3   Apply different operations on arrays and user-defined functions to solve real-time problems.

CO 4   Analyze the operation of pointers, structures and unions.

CO 5   Implement file operations in C programming for a given application.

Detailed Syllabus
Section-A

Introduction to Programming (Flow chart/pseudocode, compilation etc.
Evolution of programming languages, structured programming, the compilation process, object code, source code, executable code, operating systems, fundamentals of algorithms, flow charts.
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.   **(10 hrs)**

Control Statements, Storage Classes, Library Functions.
Control structures, Decision making and Branching, Decision making & looping.
Storage Classes: Types of storage class, Scoping rules.
Standard Library Functions, advantages and use of various library functions (I/O functions, String, Character, Mathematics, Time and Date, functions)   **(10 hrs)**

Section-B

Functions, Arrays, Recursion, User Defined Data Types, Structures, Unions, Passing Structure to Functions.
User defined and standard functions, Formal and Actual arguments, Functions category, function prototypes, parameter passing, Call-by-value, Call-by-reference, Nested functions.
One dimensional Array, Multidimensional Array declaration and their applications, String Manipulation, Recursion, Passing array to a function. Declaration of structures, declaration of unions, pointer to structure & unions.   **(10hrs)**

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 pointer, pointers to functions, Dangling pointer, dynamic memory allocation.

Console input output functions, Disk input output functions, opening closing and creating Data files.

(10 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 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.

6. Programming in C : A Practical Approach   - Ajay Mittal

CLASS: B.E. 2ND SEMESTER

BRANCH: CIVIL/MECHANICALENGINEERING

COURSE TITLE: COMPUTER PROGRAMMING LAB   CREDIT: 1

COURSE No.: ESC-211

Duration Exam: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	2	0	50

Laboratory Outcomes : After Completion of this course the student will be able to --

CO 1	Read, understand and trace the execution of programs written in C language.
CO 2	Exercise conditional and iterative statements to write C programs.
CO 3	Implement Programs using operators, arrays and pointers to access functions.
CO 4	Write programs that perform operations using derived data types and files.

Lab Experiments

Experiment 1: Problem solving using computers: Familiarization with programming Environment.

Experiment 2: Variable types and type conversions: Simple computational problems using arithmetic expressions.

Experiment 3: Branching and logical expressions: Problems involving if-then-else Structures.

Experiment 4: Loops, while and for loops: Iterative problems e.g., sum of series

Experiment 5: 1D Arrays: searching, sorting: 1D Array manipulation

Experiment 6: 2D arrays and Strings, memory structure: Matrix problems, String Operations

Experiment 7: Functions, call by value: Simple functions

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

Experiment 9: Pointers, structures and dynamic memory allocation: Pointers and Structures

Experiment 10: File handling: File creation, writing and reading a file, File manipulation   Operations

CLASS: B.E. 2ND SEMESTER

BRANCH:CIVIL/MECHANICAL ENGINEERING

COURSE TITLE: ENGINEERING GRAPHICS   **CREDITS: 2.5**

COURSE No.: ESC-202

DURATION EXAM.: 3 HRS

L	T	P	MARKS THEORY	SESSIONAL
1	0	3	100	50

Course Outcomes (COs): At the end of the course the Student will be able to-

CO 1	Draw orthographic projections of sections.
CO 2	Use architectural and engineering scales with accuracy.
CO 3	Work with zeal of office practices and standards.
CO 4	Convert sketches to engineered drawing.
CO 5	Perform auto cad two dimensional drawing.

SECTION A

Engineering Curves: Conventional lines and signs used in Engineering Drawing, Dimension and Tolerances, Printing and Lettering, Curves used in Engineering Practice: Cycloidals, Involutes, Spirals and Hellices,

Loci-Conic section: Terms used in conic-conic curves curved defined as Loci, Practical application of conics, Ellipse,Parabola ,Hyperbola

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

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

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

SECTION B

Interpenetration of Solids and Intersection of Surface: Intersection of geometrical solids/hollow sections, Tracing of lines of intersection by line method and by section method.

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

Isometric Projection: Isometric scale, Isometric axes and Isometric planes, Isometric projection of solids and simple machine blocks.

Overview of Computer Graphics covering:

Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

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

Text/ Reference Books

1. Engineering Drawing by P.S GILL
2. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House
3. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
4. Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
5. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers 5.
6. (Corresponding set of) CAD Software Theory and User Manuals

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.

Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: MECHANICAL/CIVIL ENGINEERING

COURSE TITLE: MENTORING & PROFESSIONAL DEVELOPMENT   CREDIT: Non-Credit

COURSE No.: NCC-201   L   T   P

DURATION EXAM: 3 HRS   0   0   2

Detailed Syllabus

iv. Mentoring: - Meaning and importance of mentoring, Stress management, Conflict management, Time management .Role of mentor in: mitigating stress and conflict in time management, in confidence building, in overall personality development, in developing life skills and emotional intelligence.

(7)

v. Meaning and components of personality, Personality development models – Johari Window and Transactional analysis, Motivation – meaning and approaches, Leadership –meaning and style.

(8)

Note: -   i. There shall be a case study, viva –voce of the students by internal examiner consisting of 40 marks each.

ii.   There will be an Internal MCQ/Objective type Questions based examination of 40 marks.
iii.   Evaluation: Satisfactory>= 40%: Unsatisfactory<40%.

Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: MECHANICAL/CIVIL ENGINEERING

COURSE TITLE: ENVIRONMENTAL SCIENCES   CREDIT: Non-Credit

COURSE No.: NCC-202   L   T   P

DURATION EXAM: 3 HRS   0   0   2

Detailed Syllabus

1. **Introduction**
   Definition and scope and importance of multidisciplinary nature of environment. Need for public awareness.   (2)

2. **Natural Resources**
   Natural Resources and associated problems, use and over exploitation.   (2)

3. **Ecosystems**
   Concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers, biodiversity and importance.   (2)

4. **Environmental Pollution**
   Definition, Causes, effects and control measures of air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, nuclear hazards. Solid waste Management: Causes, effects and control measure of urban and industrial wastes. Disaster Management: Floods, earthquake, cyclone and landslides.   (4)

5. **Social Issues**
   Water conservation, rain water harvesting, Climate change, global warming, acid rain. Environment Protection Act: Air (Prevention and Control of Pollution) Act, Water (Prevention and control of pollution) Act, Wildlife Protection Act, Forest Conservation Act.   (3)

6. **Human Population and the Environment**
   Population growth, Population explosion. Environment and human health, Human Rights. Role of Information Technology in Environment and human health.   (2)

Note:

i.   There will be an Internal MCQ/Objective type Questions based examination of 40 marks.

ii. Evaluation: Satisfactory>= 40%: Unsatisfactory<40%.

iii. A field visit of students to make them aware about the environmental issues is compulsory.

BOOKS RECOMMENDED:

1.	Environmental Sciences	- Basak, A
2.	Environmental Studies	- Benny Joseph
3.	Environment Pollution Control Engineering	- Rao, C.S.
4.	Perspectives in Environmental Studies	- Kaushik, A.
5.	Elements of Environment Science & Engineering	- Meenakshi.
6.	Elements of Environment Engineering	- Duggal.

Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: MECHANICAL/CIVIL ENGINEERING

COURSE TITLE: INDIAN CONSTITUTION   CREDIT: Non-Credit

COURSE No.: NCC-203   L   T   P

DURATION EXAM: 3 HRS   0   0   2

Detailed Syllabus

1. Indian Constitution-Sources and Features, Preamble   (2)

2. Fundamental Rights, Fundamental Duties   (2)

3. Directive Principles of state policy   (2)

4. Structure of State and Central Government   (4)

5. Judiciary-Supreme court, High court, Judicial Review and Judicial Activism (5)

Note:

i)   There will be an Internal MCQ/Objective type Questions based examination of 40 marks.
ii) Evaluation: Satisfactory>= 40%: Unsatisfactory<40%.

UNIVERSITY OF JAMMU

NOTIFICATION
(19/Aug/Adp/31)

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 revised Syllabus of **Bachelor of Engineering (Civil Engineering)** for Semester III & IV under the **Choice Based Credit System** as per the model curriculum of the **AICTE (as given in the Annexure)** for the candidates of **all (Govt./Pvt./UIET) 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-III	December 2019, 2020, 2021 and 2022
	Semester-IV	May 2020, 2021, 2022 and 2023

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

Sd/-
DEAN ACADEMIC AFFAIRS

No. F.Acd/III/19/4793-4804
Dated:20/08/2019
Copy for information & necessary action to:-
1. Dean Faculty of Engineering
2. Principal, GCET/MIET/MBSCET/UIET/BCET/YCET
3. C.A to the Controller of Examinations
4. Assistant Registrar (Exams/Confidential)
5. Section Officer (Confidential)
6. Incharge University Website

Assistant Registrar (Academics)
19/08/19

B.E. Civil Engineering 3rd Semester   **Contact hours: 26**

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits	%Change
			L	T	P	Internal	External			
PCE-301	Professional Core Course	Building Materials and Construction	3	0	0	25	100	125	3	100
PCE-302	Professional Core Course	Surveying	2	1	0	25	100	125	3	100
PCE-303	Professional Core Course	Building Drawing	1	0	0	25	100	125	1	100
PCE-304	Professional Core Course	Engineering Geology	3	0	0	25	100	125	3	100
EEE-301	Engineering Science Course	Basic Electrical Engg.	2	1	0	25	100	125	3	100
HMC-301	Humanities & Social Science Course	Engineering Economics	2	1	0	25	100	125	3	100
PCE-311	Professional Core Course	Material testing Lab	0	0	2	50	0	50	1	100
PCE-312	Professional Core Course	Surveying Lab	0	0	2	75	0	75	1	100
PCE-313	Professional Core Course	Building Drawing Lab	0	0	2	75	0	75	1	100
PCE-314	Professional Core Course	Engineering Geology Lab	0	0	2	25	0	25	1	100
MOC-315	Massive Open Online Course	MooCs*								100
EEE-311	Engineering Science Course	Basic Electrical Engg. Lab	0	0	2	25	0	25	1	100
Total			**13**	**3**	**10**	**400**	**600**	**1000**	**21**	

B.E. Civil Engineering 4thSemester   **Contact hours:26**

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits	%Change
			L	T	P	Internal	External			
PCE-401	Professional Core Course	Structural Analysis ó I	2	1	0	50	100	150	3	100
PCE-402	Professional Core Course	Fluid Mechanics	2	1	0	50	100	150	3	100
PCE-403	Professional Core Course	Estimation & Costing	2	1	0	50	100	150	3	100
BSC-402	Basic Science Course	Mathematics ó III	2	1	0	50	100	150	3	100
EEC-401	Engineering Science Course	Basic Electronics	2	1	0	50	100	150	3	100
EME-405	Engineering Science Course	Mechanical Engineering	2	1	0	50	100	150	3	100
NCC-402	Non- Credit Course	Organization Behavior	2	0	0	Satisfactory/Unsatisfactory			Non Credit	100
PCE-412	Professional Core Course	Fluid Mechanics Lab	0	0	2	50	0	50	1	100
EEC-411	Engineering Science Course	Basic Electronics Lab	0	0	2	25	0	25	1	100
EME-415	Engineering Science Course	Mechanical Engg. Lab	0	0	2	25	0	25	1	100
Total			**14**	**6**	**6**	**400**	**600**	**1000**	**21**	

3ʳᵈSemester Examination to be held in the Year December 2019,2020,2021,2022.

CLASS : B.E. 3ʳᵈ SEMESTER
BRANCH : CIVIL ENGINEERING   **CREDITS: 3**
COURSE TITLE : BUILDING MATERIALS AND CONSTRUCTION
COURSE NO. : PCE- 301   **L   T   P**   **Marks**
DURATION OF EXAM : 3 HOURS   **3   0   0   Theory   Sessional**
                                                                                                   100   25

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Identify the various building materials with symbols
CO2	Identify properties of building materials
CO3	Made acquainted with the manufacturing process of basic construction material
CO4	Made acquainted with the masonry construction and finishes

Detailed syllabus
Module- I (Materials)

BUILDING STONES: Origin, Classification and Engineering Properties.Essential requirements.Dressed stones and their role in Export market.   **(04 hrs)**

BRICKS: Selection of suitable soil for brick manufacture. Various methods of manufacturing of building bricks, brick classification, essential requirements of good building bricks.Tiles-their manufacture and requirements. Bricks used in Modern construction-hollow, glazed bricks.   **(04hrs)**

TIMBER: Felling of trees, growth of trees, Various Classifications of trees, Common structural Timbers. Seasoning of Timber, Defects and Decay in Timber and prevention.Processed Timber.   **(04 hrs)**

PORTLAND CEMENT: Methods of manufacture of Portland Cement, Various types of Cement and their use. Engineering Properties of Cement, Storage and Testing.   **(04hrs)**

Module-II (Construction)

Basic Principles underlying the Planning and Construction of Buildings.
BRICK MASONARY: Types of Bricks, Types of Bonds, Defects in Brick Masonry, Reinforced Brick work.   **(03 hrs)**

FOUNDATIONS: Purpose, site exploration, Methods of Testing Bearing Capacity of Soils, Types of Foundations, Combined Footing and Raft Foundation. Piers, Excavation of Foundations in water logged sites. Pile Foundation, Concrete Piles, Pile Driving, Cofferdams.   **(03hrs)**

DAMP PROOFING: Problems of dampness, Causes, Sources of Dampness. Methods of Damp Proofing Materials.Damp Proofing treatment in Building.Treatment to Flat Roofs and Floors.   **(03 hrs)**

SHORING: Shoring, Types, Undermining, Scaffolding, Types.   **(03 hrs)**

FLOORING: Brick flooring, Mud Flooring, cement Concrete Flooring, Mosaic flooring, Marble flooring.   **(03 hrs)**

LINTELS &ARCHES: Lintels, Brick Lintels, R.B. Lintels, R.C.C. Lintels, Types of Arches.   **(03 hrs)**

DOORS AND WINDOWS: Location of Doors and Windows, Size, Types of Doors and Windows, Fixtures and Fittings**. (03 hrs)**

PLASTERING, PAINTING: Plastering, Lime Plaster, Cement Plaster, Finishes, Defects in Plaster Work**.**

PAINTS: Oil Paints, Characteristics of Good Paint. Bases, Vehicle, Thinners Pigments. Types of Paints, Process of Painting.

                                                                                                                   (03 hrs)

BOOKS RECOMMENDED:

1.	BUILDING MATERIAL	BY SUSHIL KUMAR
2.	BUILDING MATERIAL	BY PARBIN SINGH
3.	BUILDING CONSTRUCTION	BY KOUL, B.N., SHARMA, S.K.
4.	A BETTER BUILDING	BY BERI, K.S.
5.	BUILDING CONSTRUCTION	BY SINGLA JUNEJA AND KUMAR.

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

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022.

CLASS : B.E. 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   **CREDITS: 3**
COURSE TITLE : SURVEYING
COURSE NO. : PCE- 302   **L   T   P   Marks**
DURATION OF EXAM : 3 HOURS   **2   1   0   Theory   Sessional**
                                                                   100   25

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Carry out Surveying in the field for various Civil Engineering projects.
CO2	Understand Traverse surveying and its adjustments by various methods.
CO3	Take accurate measurements with different surveying instruments
CO4	Prepare a contour plan and map of the area

Detailed syllabus

Module-I

Introduction, Principles of surveying, Measurement of distance.
Chain Surveying, Field Equipment, Methods of Chain Surveying, Plotting from the Field Books and Degree of Accuracy, Tape corrections.   **(10 hrs)**

Module-II

Compass, Compass and Chain Surveying, Traversing - Instruments used and procedure followed, Types of Traverse, Correction and Plotting Errors.

Plane Table Surveying, Field Equipment, Methods of Plane Tabling, Two Point and Three Point Problems, Precautions and Accuracy in Plane Tabling.   **(10hrs)**

Module-III

Levelling, Instruments used and field book recording, Methods of Levelling height of Instrument method and Rise and Fall method, Testing of temporary and permanent adjustments in levels, Sensitivity of Bubble Tube.

Theodolite Surveying- Introduction and adjustments of theodolite.   **(10 hrs)**

Module-IV

Computation of areas and volumes by different methods.Methods of contouring, plotting of contours.

Introduction to Total Station and its applications.   **(10 hrs)**

BOOKS RECOMMENDED:

1. SURVEYING AND LEVELLING VOL.-I   BY KANETKAR & KULKARNI.

2. SURVEYING VOL.- I   BY B.C PUNMIA.

3. SURVEYING VOL.- I   BY ARORA.

4. SURVEYING   BY CLARK.

5. TEXT BOOK OF SURVEYING   BY HUSSAIN, S.K. &NAGARAJ.

6. SURVEYING VOL.- I   BY MODI & MODI.

NOTE: There shall be total Eight questions, two from each Module. Five questions have to be attempted, selecting at least one question from each Module. Use of calculator is allowed.

3ʳᵈSemester Examination to be held in the Year December 2019,2020,2021,2022.

CLASS : B.E. 3ʳᵈ SEMESTER
BRANCH : CIVIL ENGINEERING   **CREDITS: 1**
COURSE TITLE : BUILDING DRAWING
COURSE NO. : PCE- 303   **L   T   P   Marks**
DURATION OF EXAM : 3 HOURS   **2   1   0   Theory   Sessional**
                                                        100   25

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Understand the basic principles of building design and planning.
CO2	Develop ideas for residential and commercial buildings.
CO3	Draw the elevation and section of buildings.
CO4	Draw the plan and sections for various structural components .

Detailed syllabus

Module-I

Standard conventions and drawings.Principles of Planning and Design. Drawing of Plan, Elevations, Sections of small buildings including drawings of a Hostel/School building.   **(15hrs)**

Module-II

Drawing of Plans and Sections of Wooden Doors & Windows.Drawing of Timber Truss with joint details.

Drawing of R.C.C. Slabs, Beams, Columns & their footings with Reinforcement Details, Staircases.

Drawing of Elementary Structural Steel work like:
  i)   Riveted lap and butt joint
  ii)   Typical joint of a roof truss
  iii)   Connection beam to column
  iv)   Cross section and elevation of plate girder.   **(20 hrs)**

BOOKS RECOMMENDED:
  1. BUILDING CONSTRUCTION   BY KAUL, B.N. & SHARMA, S.K.
  2. A BETTER BUILDING   BY BERI, R.S.
  3. BUILDING CONSTRUCTION   BY SINGLA, JUNEJA AND KUMAR.
  4. BUILDING DRAWING   BY GURCHARAN SINGH.

NOTE: There shall be total Six questions, Module-I is compulsory having weight-age of 40 Marks. Three questions out of five have to be attempted from Module-II having weightage of 20 marks each. Use of calculator is allowed.

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022

CLASS : B.E. 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   CREDITS: 3
COURSE TITLE: ENGINEERING GEOLOGY
COURSE NO. : PCE- 304   L   T   P   Marks
DURATION OF EXAM : 3 HOURS   3   0   0   Theory   Sessional
                                                                   100   25

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Know the various types of rocks and their formation.
CO2	Know the structural features of rocks.
CO3	Know the engineering properties of rocks.
CO4	Know the earthquake effects and its seismic design consideration

Detailed syllabus

Module-I

Introduction, Geological work of atmosphere, wind, water (running lakes, oceans and subsurface water), ice, geomorphological features resulting from their action. Minerals and Rocks.Introduction to Crystalline State of Minerals, important crystal systems, rock forming minerals, their main properties and identification.Rock classification, textures and structures and important types of igneous, Sedimentary and Metamorphic rocks, Processes involved in their formation.   **(10hrs)**

Module-II

Structural Geology, main structural features of stratified and unstratified rocks, Folding, Faulting and Jointing, Classification and major types of folds, faults, joints and unconformities. Their significance in Engineering Geology.Mountains - Types and Origin.
                (10hrs)

Module-III

Engineering properties of rocks, common methods for investigation of geological characteristics of sites and alignments for engineering projects, Geology aquifers and their characteristics, Stability of Slopes, landslide and other mass movements, their causes, types and methods to control them.   **(10hrs)**

Module-IV

Earthquakes : causes and effects, consideration for seismic designs, geological consideration for selection of sites-alignments for Dams, Tunnels, Highways, Water Storage Tanks, Multi-Storeyed buildings and Port Structures.   **(10 hrs)**

BOOKS RECOMMENDED :

1.   ENGINEERING & GENERAL GEOLOGY   BY PARBIN SINGH

2.   ELEMENTS OF STRUCTURAL GEOLOGY   BY HILLS, E.S.

3.   INTRODUCTION TO PETROLOGY   BY BRIAN BOLY.

4.   ENGINEERING GEOLOGY & GEOTECHNICS   BY KRYNINE & JUDD RUTLEYS.

5.   ELEMENTS OF MINERALOGY.

NOTE: There shall be total Eight questions, two from each Module. Five questions have to be attempted, selecting at least one question from each Module. Use of calculator is allowed.

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022

CLASS : B.E. 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   **CREDITS: 3**
COURSE TITLE: BASIC ELECTRICAL ENGINEERING
COURSE NO. : EEE- 301   **L   T   P   Marks**
DURATION OF EXAM : 3 HOURS   **2   1   0   Theory   Sessional**
                                                                                        100   25

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	At the end of this course, students will demonstrate the ability.
CO2	To understand and analyze basic electric and magnetic circuits.
CO3	To study the working principles of electrical machines.
CO4	To introduce the components of low-voltage electrical installations.

Detailed syllabus
Module-I

DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff current and voltage laws, analysis of simple circuits with dc excitation. Mesh and Nodal analysis, Superposition, Maximum Power Transfer theorem, Thevenin and Norton Theorems.   **(08hrs)**

Representation of sinusoidal waveforms, peak and rmsvalues, phasor representation, real power, reactive power, apparent power, power factor.Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel) and resonance   **(08hrs)**

Three-phase Circuits Concept of three phase voltage, voltage and current relations in star and delta connections. Measurement of power in three-phase balanced circuits.   **(06hrs)**

Module-II

Transformers: Principle of operation, ideal and practical transformer (no-load & on-load phasor diagrams), equivalent circuit, losses in transformers, Transformer test (open circuit & short circuit), regulation and efficiency.   **(06hrs)**

Electrical Machines: DC Machines- Principle 'of operation, emf equation, torque production. AC Machines- Three-phase induction motor, principle of operation, slip and rotor frequency.Synchronous machines- Principle of operation and emf equation.   **(08hrs)**

Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.   **(06hrs)**

Text / References:
1.   D.P. Kothari and J. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill.
2.   D.C Kulshreshtha, "Basic Electrical Engineering', McGraw Hill.

3.   L. S. Bobrow, "Fundamentals of Electrical Engineering', Oxford University Press. Zo

4.   E. Hughes, "Electrical and Electronics Technology", Pearson. a
5.   V.D. Toro, "Electrical Engineering Fundamentals', Prentice Hall India.

NOTE: The question paper shall comprise of total eight questions, four from each Module. Students are required to attempt five questions selecting at least two questions from each module. Use of scientific calculator is allowed.

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022

CLASS : B.E. 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   CREDITS: 3
COURSE TITLE: Engineering Economics
COURSE NO. : HMC- 301   L   T   P   Marks
DURATION OF EXAM : 3 HOURS   2   1   0   Theory   Sessional
                                                                               100   25

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Understand the micro economic concepts in details (Such as demand, utility, consumer behaviour, etc.).
CO2	Understand the laws of production and cost analysis and their applicability in day to day life.
CO3	Understand and apply macroeconomics concepts such as national income, index numbers, inflation and business cycle in real life situations.
CO4	Understand and learn about functioning of central and commercial banks.

Detailed Syllabus
Module-I
DEMAND THEORY
Meaning of demand and law of demand; Factors affecting demand; Elasticity of demand (price; income & cross elasticity)
(06hrs)

CONSUMER BEHAVIOUR
Cardinal utility analysis: the concept: law of diminishing marginal utility; law of Equi-marginal utility; Ordinal utility analysis: meaning and properties of indifference curves and utility maximization (Consumer Equilibrium)   **(06hrs)**

THEORY OF PRODUCTION AND COST ANALYSIS
Factors of Production and Production Function; Law of Variable Proportions; law of Returns to Scale; The concept of Fixed, Variable, Total, Marginal, and Average Costs; their shapes and relationships (Short Run)
(06hrs)

Module-II
BASIC MACRO ECONOMICS CONCEPTS
Meaning & Concept of National Income (Different methods of calculating national income and difficulties in measuring national income); Concept of stock market.   **(06hrs)**

INDEX NUMBERS: Meaning, Construction and difficulties in measurement of Index Number and its uses; Meaning and phases of Trade/ Business Cycle.   **(06hrs)**

BANKING AND INFLATION
Functions of CentralBank and methods of credit control; Functions of Commercial Bank and methods of credit creation.Inflation (Types ,effects and methods to control inflation .   **(06hrs)**

BOOKS RECOMMENDED :

1.	K.K.Dewett	: Modern Economic Theory
2.	H.L Ahuja	: Advanced Economic Theory
3.	M.L. Jhingan	: Macro Economics
4.	P.N Chopra	: Business Economics/Advanced Eco. Theory
5.	A. Koutsoyiannis	: Modern Micro Economics

NOTE FOR PAPER SETTER: There shall be total eight questions, four from each Module. Each question carries 20 marks. Students have to attempt Five questions selecting at least two from each module. Use of calculator is allowed.

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022

CLASS : B.E. 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   **CREDITS: 1**
COURSE TITLE: MATERIAL TESTING LAB
COURSE NO. : PCE-311   **L   T   P**   **Marks**
DURATION OF EXAM : 3 HOURS   **0   0   2**   **Practical**
                                                                                50

	COURSE OUTCOMES :
On completion of the course the students will be able to:	
CO1	Perform various tests on bricks.
CO2	Determine the physical properties of cement .
CO3	Perform various tests on aggregates.

LIST OF EXPERIMENTS:

1. To determine the compressive strength of brick.

2. To determine the water absorption for the given sample of brick.

3. To determine the Effloresce and dimension tolerance for the given sample of brick.

4. To determine the physical properties of cement using Vicat's apparatus (consistency, initial setting time, final setting time and compressive strength).

5. To perform soundness test on cement using Le Chatlier's apparatus.

6. To find out absolute density of cement using specific gravity bottle.

7. To find the specific surface area of given combined aggregates.

8. To determine the fineness modulus of fine and course aggregates.

9. To find bulk density of aggregates and bulking factor of fine aggregates.

10. To determine the compressive strength and water absorption of tiles.

Note: Students have to complete at least 06 experiments in the lab.

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022

CLASS : B.E 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   **CREDIT: 1**
COURSE TITLE: SURVEYING LAB   **Marks**
COURSE NO.: PCE- 312   **L   T   P   Practical**
                                                0   0   2   75

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Use conventional surveying tools in the field for various civil engineering projects.
CO2	Perform survey and enter the observations in the field book.
CO3	Prepare map of area using plane table surveying
CO4	Prepare L-section and X-sections with the help of level.

LIST OF EXPERIMENTS:

1.   To Locate various objects by Chain and cross staff survey.
2.   To measure distance by ranging and chaining.
3.   Temporary and Permanent adjustment of a Dumpy level.
4.   Measurement of horizontal angles with the help of theodolite.
5.   Determination of horizontal distance between two inaccessible points with theodolite.
6.   To measure the area with the help of chain Surveying.
7.   To measure angles with the help of a Prismatic Compass.
8.   To locate given building by plane table traversing.
9.   Determination of elevation of various points with Dumpy level by H.I and Rise and fall Method.
10. Plotting of longitudinal section and cross-section with the help of a level.

Note: Students have to complete at least 06 experiments in the lab.

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022

CLASS : B.E 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   CREDIT: 1
COURSE TITLE: BUILDING DRAWING LAB   **Marks**
COURSE NO.: PCE- 313   **L   T   P**   **Practical**
                                              0   0   2   **75**

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Understand the basic principles of building design and planning.
CO2	Develop ideas for residential and commercial buildings.
CO3	Draw the elevation and section of buildings.
CO4	Draw the plan and sections for various structural components .

LIST OF PRACTICALS:

1. Drawing of Plan, Elevations, Sections of small buildings
2. Drawings of a Hostel Building.
3. Drawings of a School l Building
4. Drawing of Plans and Sections of wooden doors
5. Drawing of Plans and Sections of windows.
6. Drawing of Timber Truss with joint details.
7. Drawing of R.C.C. Slabs with reinforcement details.
8. Drawing of R.C.C. Beams with reinforcement details.
9. Drawing of R.C.C. Columns with reinforcement details.
10. Drawing of elementary structured steel work like:
    i) Riveted lap and butt joint
    ii) Typical joint of a roof truss
    iii) Connection Beam to Column
    iv) Cross Section and elevation of plate girder

Note: Students have to draw/complete at least 08 drawings/experiments in the lab.

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022

CLASS : B.E 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   CREDIT: 1
COURSE TITLE: ENGINEERING GEOLOGY LAB   Marks
COURSE NO.: PCE- 314   L   T   P   Practical
                                           0   0   2   25

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Categorize engineering properties of minerals
CO2	Categorize engineering properties of rocks
CO3	Apply geological principles to rock masses and discontinuities for use in engineering design.
CO4	Interpret geological maps.

List of Laboratory Experiments/Demonstrations:

1. Megascopic and microscopic identification of minerals
2. Megascopic and microscopic identification of rocks
3. Study of salient characters of crystals with the help of models
4. Study of Topographic features and geological structures (on models).
5. Study of geological structures on sections in different directions.

Field Visit: -

Minimum 3 days' field visit to acquaint with essentials of Geology.

Note: Students have to complete at least **04** experiments in the lab.

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022

CLASS : B.E 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   **CREDIT: 1**
COURSE TITLE: MooCs   **Marks**
COURSE NO.: MOC- 315   **L   T   P   Practical**
                                                    0   0   2   25

MooCs: A massive open online course (MooC) is a model for delivering learning content to any person who wants to take a course by means of the web. It has been incorporated in the 3rd semester. Here the students will have a choice to choose between Engineering Geology Lab and a MooC course.

Open choice to students with approval of faculty depending upon the courses available.

To evaluate a MooCs course following break up of Marks is proposed:

Attendance- 5 marks
Students will have to visit the lab twice a week as per the time table and pursue their respective online course.
Report file-7.5 marks
A detailed report of about 20-25 pages has to be submitted to the department at the end of the semester, which should contain Details of the course undertaken, Copy of the assignments with solutions uploaded on the MooC platform and Copy of the Certificate, if awarded.
Presentation-7.5 marks.
The presentation should be given to the peers/students focusing on the key points of the course with an aim to share the knowledge.
Certification- 5 marks
The students awarded with the certificate will be given 5 marks.

3rdSemester Examination to be held in the Year December 2019,2020,2021,2022

CLASS : B.E 3rd SEMESTER
BRANCH : CIVIL ENGINEERING   **CREDIT: 1**
COURSE TITLE: BASIC ELECTRICAL ENGINEERING LAB   **Marks**
COURSE NO.: EEE-311   **L T P**   **Practical**
                                            0 0 2   **25**

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Get an exposure to common electrical components and their ratings.
CO2	Understand the usage of common electrical measuring instruments.
CO3	Demonstration of various laws and theorems
CO4	Determination of efficiency of single phase transformer

List of Laboratory Experiments/Demonstrations:

1. Basic safety precautions. Introduction and use of measuring instruments

2. Demonstration of cut-out sections of machines dc machine and ac machines.

3. Study of wires, cables, fuses and MCBs

4. Verification of Kirchoff's Laws.

5. Verification of Superposition Theorem.

6. Verification of Thevenin's Theorem.

7. Study of single phase transformers. Determination of Polarity Test of given single phase transformer.

8. To perform open and short circuit test on single phase transformer.

Note: Students have to complete at least **04** experiments in the lab.

4th Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS :B.E 4th SEMESTER

BRANCH : CIVIL ENGINEERING   CREDITS: 3

COURSE TITLE : STRUCTURAL ANALYSIS – I

COURSE NO. : PCE- 401	L	T	P	Marks	
DURATION OF EXAM : 3 HOURS	2	1	0	Theory	Sessional
				100	50

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Evaluate the stresses due to different types of loading.
CO2	Draw S.F.D and B.M.D of different end conditions for beams.
CO3	Analyze the deflection of beam.
CO4	Understand the behavior of different kind of columns under different conditions.

Detailed syllabus
Module-I

Simple Stresses and Strains, Hooks law, Composite sections.
Strain Energy, Stresses due to different type of loadings, Gradually& suddenly applied loads.   **(10 hrs)**

Module-II

Shear force and Bending Moment for simply supported, cantilevers, fixed beam, continuous beams & members subjected to couples & oblique loadings.

Stresses in beams, Theory of simple bending, Neutral axis, Bending stress distribution, Shear stresses, Unsymmetrical bending & shear center.   **(10 hrs)**

Module-III

Direct and Bending stresses, eccentrically loaded rectangular columns, Circular section, hollow sections, Structural sections, walls and pillars.
Deflection of beams, Slope, Deflection and radius of curvature, Derivation of slope deflection formula, Macaulay's method.
          (10 hrs)

Module-IV

Principal stresses and strains, Mohr's circle, Graphical and Analytical method, Strain energy in terms of principal stresses, Ellipse of strain, Thin cylinders, Circumferential & longitudinal stresses.
Columns & Struts: Short & Long Columns Euler's Theory. Effective Length, Empirical Formulae.Eccentrically Loaded Columns.Laterally Loaded Columns.   **(10 hrs)**

BOOKS RECOMMENDED :
1.   STRENGTH OF MATERIALS   BY TEMOSHONKO & YOUNG
2.   THEORY OF STRUTURES   BY TEMOSHONKO & YOUNG
3.   STRENGTH OF MATERIALS   BY RAMAMURTHAM
4.   ANALYSIS OF STRUCTURES   BY O.P. JAIN

NOTE: There shall be total Eight questions, two from each Module. Five questions have to be attempted, selecting at least one question from each Module. Use of calculator is allowed.

4th Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS : B.E 4th SEMESTER

BRANCH : CIVIL ENGINEERING   CREDITS: 3

COURSE TITLE: FLUID MECHANICS

COURSE NO.: PCE- 402	L	T	P		Marks	
DURATION OF EXAM: 3 HOURS	2	1	0		Theory	Sessional
					100	50

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Understand the properties of fluid & Solve problems of manometers and submerged surfaces.
CO2	Understand the concept of continuity , Bernoulli's equation and its applications.
CO3	Understand the Momentum equation & dimensional analysis.
CO4	Solve basic problems of losses through pipes and the concept of drag and lift on immersed surfaces.

Detailed syllabus
Module-I

Properties of Fluids : Mass density, Specific weight, Specific volume, Viscosity, bulk modulus of elasticity, Surface tension and capillarity.
Fluid Statics : Fluid pressure, manometers, forces on immersed plane surfaces, floating bodies.
Kinematics of Fluid flow - Types of fluid flow, stream lines, path lines, streak lines, continuity equation, rotation, vorticity, circulation, velocity potential and stream function, flow nets.   **(10 hrs)**

Module-II
Equation of motion and energy theorem - Integration of Euler's theorem of motion along a stream line.
Applications of Bernoulli's Equation: Pressure rotation in irrotational flow, Hydraulic grade line and total energy line, Flow through small and large orifices, Flow through mouth pieces. Measuring devices in pipes, weirs, flow under a sluice gate.   **(10 hrs)**

Module-III
Momentum equation and its application. Dimensional analysis and similitude, important dimensional parameters, procedure for dimensional analysis.   **(10 hrs)**
Module-IV
Problems in pipe flow: Sudden expansion and diffusers, Flow in pipe bends, pipe flow problems, pipe networks.
Forces on Immersed Bodies : Deformation drag, form drag, drag lift.   **(10 hrs)**

BOOKS RECOMMENDED :
1.	ENGINEERING FLUID MECHANICS	BY GARDE & MIRAJGAONKAR
2.	ENGINEERING FLUID MECHANICS	BY KUMAR, K.L.
3.	FLUID MECHANICS & FLUID POWER ENGG.	BY KUMAR, D.S.

4.	FLUID MECHANICS & MACHINERY	BY MODI SETH
5.	FLUID MECHANICS & ITS APPLICATIONS	BY GUPTA & GUPTA
6.	FLUID MECHANICS (THEORY & PROBLEMS)	BY JAIN, S.C.
7.	THEORY & APPLICATIONS OF FLUID MECHANICS	BY SUBRAMANYA, K.

NOTE: There shall be total Eight questions, two from each Module. Five questions have to be attempted, selecting at least one question from each Module. Use of calculator is allowed.

4ᵗʰ Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS : B.E 4ᵗʰ SEMESTER

BRANCH : CIVIL ENGINEERING   CREDITS: 3

COURSE TITLE: ESTIMATION AND COSTING

COURSE NO.: PCE- 403	L	T	P	Marks	
DURATION OF EXAM: 3 HOURS	2	1	0	Theory	Sessional
				100	50

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Prepare quantities for different items of work and probable cost in the construction project
CO2	Find out quantity of cutting and filling from L-section of a road.
CO3	Analyze rates for different items of works.
CO4	Evaluate the cost and fixation of rent of a building.

Detailed syllabus
Module-I

Building Estimates - Methods of building estimates, Estimate of Masonry Platform, Single room building, two/three room building estimate. Estimate of office building. Estimate of R.C.C. works, R.C.C. water tank estimate and underground water tank estimate.   **(20 hrs)**

Module-II

Road Estimates - Methods, estimate of earthwork of road from L Section.
Steel roof truss; Estimate of road Section , G.I and A.C sheets.
Types of Estimates - Types of estimates, contingencies, work charged estimate. Layout plan, index plan. Sub-heads, Schedule of rates. Administrative approval, expenditure sanction.Technicalsanction.Bill of quantities.Plinth area, floor area.
Analysis of Rates - Analysis of Rates, overhead costs, labor required. Materials for different items of work and their rates.Preparing analysis of rates for various items of building works, Specifications for various items of work.
Valuations - Valuation, Gross income, Net income, outgoings, Scrap and salvage values, capitalized value, Depreciation, valuation of buildings, fixation of rent. Plinth area required.   **(20 hrs)**

BOOKS RECOMMENDED:

1. ESTIMATING & COSTING   BY DUTTA & DUTTA

2. ESTIMATING, COSTING, SPECIFICATION & VALUATION IN CIVIL ENGINEERING   BY M CHAKRABORTI

3. CONTRACTS & ESTIMATES   BY PATEL, B.S.

NOTE: Question No.1 from Module I is compulsory having a weight age of 40 Marks. From Module II students have to attempt three questions out of five each having weight-age of 20 Marks. Use of calculator is allowed.

4th Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS : **B.E. 4th SEMESTER**

BRANCH : CIVIL ENGINEERING   CREDITS: 3

COURSE TITLE: MATHEMATICS-III

COURSE NO.: BSC- 402   L   T   P   Marks

DURATION OF EXAM: 3 HOURS   2   1   0   Theory   Sessional

                                                                                    100   50

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Find limit, continuity, differentiability of a function in a plane.
CO2	Calculate the integrals using residue evaluation instead of actual complicated calculation.
CO3	Understand the basics of Operators and their types.
CO4	To obtain the values of function at a given point within the given data by using certain method of Interpolation
CO5	Find out the exact real root of algebraic and transcendental equations.

Detailed syllabus
SECTION A

THEORY OF COMPLEX VARIABLES   **(20 hrs)**
Limits, Continuity, Derivatives, Cauchy-Riemann equations, analytic functions, harmonic functions, finding harmonic conjugate; elementary analytic functions (exponential, trigonometric, logarithm) and their properties; Conformal mappings, Mobius transformations and their properties. Line Integral, Cauchy's theorem, Cauchy Integral formula, Liouville's theorem and Taylor's series, zeros of analytic functions, singularities, Laurent's series; Residues, Cauchy Residue theorem and Contour integration.

SECTION B

NUMERICAL METHODS   **(20 hrs)**
Solution of polynomial and transcendental equations – Newton-Raphson method, direct iterative method and Regula-Falsimethod.Finite and divided difference, Interpolation using Newton's and Lagrange's formulae. Numerical integration: Trapezoidal rule and Simpson's 1/3rd rule. Ordinary differential equations: Taylor's method, Picard's method, Euler and modified Euler's methods. RungeKutta method of fourth order for solving first and second order equations.

BOOKS RECOMMENDED:
1. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. Dr.Bhopinder Singh, A textbook on complex variables and Numerical methods, Kirti Publishers.

3. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., McGraw Hill, 2004.
4. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.
5. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.

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

4th Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS : B.E.4th SEMESTER

BRANCH : CIVIL ENGINEERING   **CREDITS: 03**

COURSE TITLE: BASIC ELECTRONICS

COURSE NO.: EEC- 401		**L**	**T**	**P**		**Marks**	
DURATION OF EXAM: 3 HOURS		**2**	**1**	**0**		**Theory**	**Sessional**
						100	**50**

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Understand the operation of rectifiers and the noise removal using filters and their applications.
CO2	Understand the fundamental concepts of different types of transistors, its biasing conditions along with concept of load lines and operating points.
CO3	Identify the need for cascading, frequency response and different coupling methods of multistage amplifiers
CO4	Understand number system and design of combinational circuits used in digital world

Detailed syllabus
Module I
Introduction to Rectifires:-Half wave, full wave and bridge rectifier with necessary derivations, Voltage regulation, Capacitor filter, Inductor filter, LC filter, Bleeder resistor, numerical problems. **(09 hrs)**

Transistors: Transistor and itscharacteristics in CE,CB,CC mode, generalized transistor equation, Base width modulation, types of biasing circuits, operating point and load line. **(11hrs)**

Module II
Amplifiers: Principle of operation and classification of amplifiers (Single stage and multistage amplifiers), Frequency response of single and multistage amplifiers- LC, RC, DC and transformer coupled. **(09hrs)**

Digital Electronics: Number system, radix conversion, logic gates, Boolean algebra, , Simplification of Boolean expressions, Minimization techniques, Karnaugh map, Half and Full adders, Subtractors, MUX, Demultiplexer, Decoder, Encoder.
(11 hrs)

BOOKS Recommended:-
1. Integrated Electronics   MillmanHalkias
2. Electronics Devices   Bolystead
3. Digital Electronics   By R.P Jain
4. Digital Electronics & Microcomputer   By R.K. Gaur

NOTE: There will be 8 questions in all, four from Module. Students are required to attempt five questions in all, at least two question from each module. Use of scientific calculator will be allowed in the examination hall.

4th Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS : B.E.4th SEMESTER

BRANCH : CIVIL ENGINEERING   CREDITS: 3

COURSE TITLE: MECHANICAL ENGINEERING

COURSE NO.: EME- 405	L	T	P	Marks	
DURATION OF EXAM: 3 HOURS	2	1	0	Theory	Sessional
				100	50

	COURSE OUTCOMES :
	On completion of the course the students will be able to:
CO1	Use and practice two property rule and hence thermodynamic tables thermodynamicdiagrams and conceptof equation of state, also their simple application
CO2	Develop intuitive problem solving technique
CO3	Discuss second law of thermodynamics and its corollaries viz. absolute (thermodynamics) temperature scale, reversibility, entropy, feasibility of a process based on first law and second law, isentropic efficiency of adiabatic machines
CO4	Reviews introductory concept of power and refrigeration cycles, their efficiencies and coefficients of performance. Illustrate ideas of heat transfer in conduction, convection and radiation modes and Application of these concepts to heat transfer in single and combined mode.

Detailed syllabus
Module-I

INTRODUCTION TO AIR STANDARD CYCLES: Air standard efficiency. Otto cycle: Air standardefficiency, mean effective pressure, Power developed. Diesel cycle: Air standard efficiency,mean effective pressure and power developed .   **(10 hrs)**
CLASSIFICATION OF IC ENGINES: Basic operations Actual P-V diagram of four stroke otto cycleengine and four stroke diesel cycle engine. Engine performance parameters.Measurements offuel and air consumption, brake power and in-cylinder pressure.
                                                                                                                                        (10 hrs)

Module-II

VAPOUR COMPRESSION refrigeration system and its working principle .Classifications ofrefrigerants, properties, eco- friendly refrigerants.Analysis of vapor compression refrigerationcycle, P-h chart.Factors affecting the performance of VCR system. Sub-cooling and superheatingphenomena in VCR cycle.   **(10 hrs)**
PSYCHROMETRY AND AIR CONDITIONING: Properties of atmospheric air and Psychrometricchart..Psychrometricprocesses., sensible heating and cooling. cooling and dehumidification,heating and humidification. Adiabatic mixing of two air streams and property calculations.Summer, Winter and Year round air conditioning systems**.   (10 hrs)**

BOOKS RECOMMENDED:
1.   Thermal Engineering   PL Ballaney
2.   Heat Engineering   VP Vasandani
3.   Thermodynamics- Work and Heat Transfer   Rogers & Mayhew
4.   Engineering Thermodynamics   PK Nag

NOTE: There will be 8 questions in all, four from Module. Students are required to attempt five questions in all, at least two question from each module. Use of scientific calculator will be allowed in the examination hall.

4th Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS : B.E. 4th SEMESTER

BRANCH : CIVIL ENGINEERING   **CREDITS: 0**

COURSE TITLE: ORGANIZATIONAL BEHAVIOUR

COURSE NO.: NCC- 402	**L T P**	**Marks**
DURATION OF EXAM : 3 HOURS	**2 0 0**	**Theory Sessional**
		Satisfactory/unsatisfactory

Objective of the course

The objective of the course is to familiarize the students with the working of an organization and make them experts in the domain of organizational behaviour.

Detailed Syllabus

Unit 1

Organization Dynamics: Organisation: Meaning, Definition, Need & Principles, Formal & Informal Organisation; Emotional Intelligence: Concept and Application within organization; Attitudes and Values.

(08hrs)

Unit 2

Organizational Behavior: Fundamental Concepts, Nature of people, Nature of organization, Features, Need to study Organization Behaviour, Models of organizational behavior; Learning concepts and Theories of Learning.

(08hrs)

Unit 3

Work Teams: Concept of Team, Types of Teams, Effective Teams, Teams Creations: Planning for Team Creation and Implementation of Team Creation Programs   **(08hrs)**

Note for Teachers

The course should aim at making students expert in efficient organizational working.

Evaluation of the course

There will be internal evaluation based on Two internal sessional tests of 30 marks each.

4th Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS : B.E.4th SEMESTER

BRANCH : CIVIL ENGINEERING   **CREDITS: 1**

COURSE TITLE: FLUID MECHANICS LAB   **Marks**

COURSE NO.: PCE- 412   **L   T   P**   **Practical**

                                                           0   0   2   **50**

COURSE OUTCOMES :
On completion of the course the students will be able to:

CO1	Determine the discharge using various instruments like venture meter and orifice meter.
CO2	Study the stability of floating bodies.
CO3	Understand various types of flow.
CO4	Calculate the various losses in the flow of fluid through pipes.

LIST OF EXPERIMENTS:

1.   To verify Bernoulli's Theorem.

2.   To find Metacentric height of a floating body.

3.   To verify Impulse - Momentum Equation.

4.   To determine C_c, C_v and C_d for an Orifice/Mouthpiece.

5.   To determine friction factor ' f ' for a given pipe.

6.   To determine C_d for Venturimeter and Orifice meter.

7.   To study Reynold's Experiment.

8.   To determine C_d for Notch/Weir.

9.   To determine Coefficient of Drag on a immersed body.

10.   To visualize the flow patterns for irrotational flow around aero foil using Hele Shaw apparatus.

Note: Students have to complete at least 06 experiments in the lab.

4th Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS : B.E. 4th SEMESTER

BRANCH : CIVIL ENGINEERING   **CREDITS:1**

COURSE TITLE: BASIC ELECTRONICS LAB   **Marks**

COURSE NO.: EEC- 411   **L T P**   **Practical**

                                                   0 0 2   **25**

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Fabricate half and full wave rectifiers and evaluate their performance parameters.
CO2	Plot V-I characteristics of transistor for various configurations using trainer kit
CO3	Implementation and verification of Boolean expressions using logic gates.
CO4	Design and implementation of various combinational circuits using digital IC's.

LIST OF PRACTICALS

1. To study the operation of Half wave Rectifier.
2. To study the operation of Full wave / Bridge Rectifier.
3. To study the operation characteristics (Input/Output) of PNP/NPN Transistor (Common Emitter/Common Base).
4. Verification of truth tables of logical gates AND / OR / NOT, NAND, NOR, EXOR, EXNOR, gates.
5. Implementation of Boolean expression using AND, OR, NOT, NAND, & NOR logic.
6. Implementation of Decoder, Encoder using IC's & gates.
7. To implement half adder, half subtractor, full adder, full subtractor using different IC's & gates.
8. Implementation of multiplexer, Demultiplexer using IC's & gates.

Note: Students have to complete at least 06 experiments in the lab.

4th Semester Examination to be held in the Year May 2020,2021,2022,2023.

CLASS : B.E. 4th SEMESTER

BRANCH : CIVIL ENGINEERING   **CREDITS: 1**

COURSE TITLE: MECHANICAL ENGG LAB   **Marks**

COURSE NO.: EME- 415   **L T P   Practical**

                                                      0 0 2   25

COURSE OUTCOMES :	
On completion of the course the students will be able to:	
CO1	Compute the property of real gases.
CO2	Demonstrate the performance of Refrigerator and Heat pump.
CO3	Interpret the characteristics of Boiler.

LIST OF EXPERIMENTS
1.   To study the p-v-T behavior of real gases in comparison with Ideal gases.
2.   To study steam boiler and its accessories and determination of:
         i)   Equivalent Evaporation
         ii)   The dryness fraction of steam using Throttling Calorimeter
3.   To verify Second law of thermodynamics with the help of heat engine.
4.   To find out the COP of the Refrigerator.
5.   To find out the COP of the Heat Pump.
6.   To analyze isentropic flow of a perfect gas through a nozzle.
7.   To find volumetric and isothermal efficiency of reciprocating air compressor.
8.   To find COP of air conditioning unit.

Note: Students have to complete at least 06 experiments in the lab.