

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonapat)

SCHEME OF STUDIES & EXAMINATIONS

B.Tech. 2nd YEAR (SEMESTER – IV: CIVIL ENGINEERING)

Choice Based Credit Scheme w.e.f. 2019-20 (applicable to the students admitted in 2018)

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	MC 201C OR MC 203C	ENVIRONMENTAL STUDIES (GROUP-A) OR CONSTITUTION OF INDIA (GROUP-B)	2	-	-	25	75	-	100	0	3
2	ME 222C	BASICS OF THERMAL ENGINEERING	2	1	-	25	75	-	100	3	3
3	MGT 201C	ENGINEERING ECONOMICS (common with CHE)	3	-	-	25	75	-	100	0	3
4	CE 202C	STRUCTURAL ANALYSIS - I	3	1	-	25	75	-	100	4	3
5	CE 204C	OPEN CHANNEL FLOW	3	1	-	25	75	-	100	4	3
6	CE206C	GEOMATIC ENGG	3	-	-	25	75	-	100	3	3
7	CE208C	TRANSPORTATION ENGINEERING - I	3	1	-	25	75	-	100	4	3
8	CE 210C	STRUCTURAL ANALYSIS – I LAB	-	-	2	25	-	75	100	1	3
9	CE 212C	OPEN CHANNEL FLOW LAB	-	-	2	25	-	75	100	1	3
10	CE 214C	GEOMATIC ENGINEERING LAB	-	-	2	25	-	75	100	1	3
11	CE216C	TRANSPORTATION ENGINEERING – I LAB	-	-	2	25	-	75	100	1	3
12	GFCE 202C	GENERAL FITNESS IN CIVIL ENGINEERING	-	-	-	-	-	75	75	-	3
Total			19	4	8	275	525	375	1175	22	

MOOC : Human Resources and Development

Note:

The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.

Electronics gadgets including Cellular phones are not allowed in the examination.

Each student has to undergo Survey Camp of 2 weeks to be conducted by the Department during summer vacation and its evaluation shall be carried out in the V Semester.

For student admitted in B. Tech. 1st Semester (C-Scheme) in 2019 and all trailing students, Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.

B.Tech (Semester III/IV)
Subject: Constitution of India
Subject Code: MC203C
(Common for all branches of B. Tech.)

L	T	P	Credits	Class-work Marks	: 25
3	0	0	0	Exam Marks	: 75
				Total Marks	: 100
				Duration of Examination	3 Hrs

Course Objectives:

To make students conscious citizens of India and well equip them to explain and understand the importance of constitution of the country

Course Contents:

Unit I

- Topic no 1 Philosophy of Indian Constitution, Ideological Basis and Salient Features of Indian Constitution
- Topic no 2 Fundamental Rights & Duties of the Citizens
- Topic no 3 Directive Principles of State Policy

Unit 2

- Topic no 4 Nature and Dynamics of Indian Federalism
- Topic no 5 Federalism: Theory and Practice in India
- Topic no 6 Features of the Indian Constitution
- Topic no 7 Legislative, Administrative
- Topic no 8 Financial Relations between the Union and the States

Unit III

- Topic no 9 Union and State Legislature
- Topic no 10 Parliament: Composition, Functions
- Topic no 11 Working of the Parliamentary system
- Topic no 12 State Legislature: Composition
- Topic no 13 Functions of Vidhan Sabha/ Vidhan Parishad

Unit IV

- Topic no 14 Centre and State: Executive and Judiciary
- Topic no 15 President, Prime Minister and Council of Ministers
- Topic no 16 Governor, Chief Minister and Council of Ministers
- Topic no 17 Judiciary: Supreme Court; High Court

At the end of the course students will be able to

To understand basic features of the constitution and rights and duties of Indian citizens

To understand the basic structure of Centre and State Government

To get acquainted with the nature of parliamentary form of Government have knowledge of the executive and judiciary powers in Indian democratic set-up

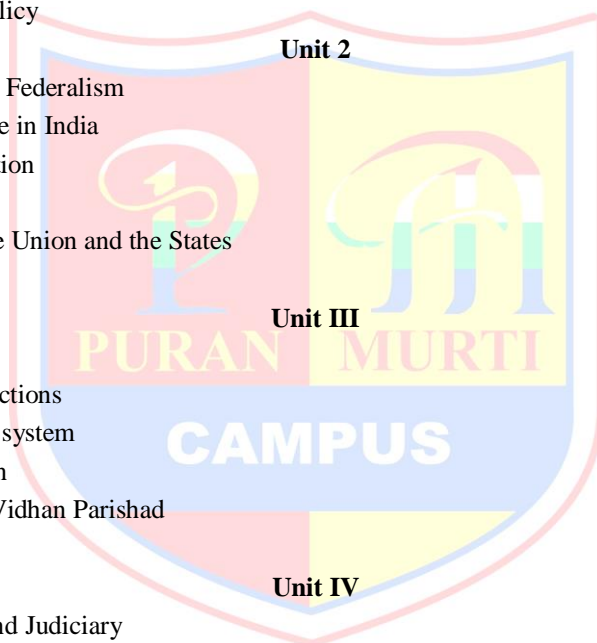
Scheme of End Semester Examinations (Major Test):

The duration of examinations will be three hours.

Nine questions of 15 marks each will be set out of which the students will have to attempt five questions in all.

First question of 15 marks will be compulsory. It will cover all the four units of the syllabus. The nature of the questions in each unit will depend upon the nature of content therein. The questions may have sub-parts with marks assigned against each.

Question No 02 to 09 of 15 marks each will be set from the four units of the syllabus --- two from each unit.



In addition to first compulsory question the students will have to attempt four more questions, selecting one from each unit.

Recommended Readings:

Austin G., The Indian Constitution: Corner Stone of a Nation, New Delhi: Oxford University Press, 1966

Basu D.D., An Introduction to the Constitution of India, New Delhi: Prentice Hall, 1994

Kothari R., Politics in India, New Delhi: Orient Language, 1970

Siwach J.R., Dynamics of Indian Government and Politics, New Delhi: Sterling Publishers, 1985

Bhambhri C.P., The Indian State--Fifty Years, New Delhi: Shipra, 1997

Ghai U.R., Indian Political System, Jalandhar: New Academic Publishing Company, 2010

Note:

In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.

The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Semester (C-Scheme) in 2019 and all trailing students, Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.



Subject: BASICS OF THERMAL ENGINEERING
Subject Code: ME222C

L	T	P	Credits	Class Work	: 25 Marks
3	-	-	3	Examination	: 75 Marks
				Total	: 100 Marks
				Duration of Examination	: 3 Hours

Unit I

- Topic no 1 Basic Concepts: concept of continuum, macroscopic approach; Thermodynamic systems-closed
Topic no 2 open and isolated; state, path and process. Quasistatic process, work, modes of work, Zeroth law and temperature scales
Topic no 3 concept of temperature and heat, ideal and real gases
Topic no 4 First Law of Thermodynamics: Concept of Internal energy, Specific heat capacities. Enthalpy
Topic no 5 Energy balance for closed and open systems, Energy balance for steady- Flow Systems
Topic no 6 Steady Flow Engineering Devices, Energy balance for Unsteady Flow

Unit 2

- Topic no 7 Second Law of Thermodynamics- Thermal energy reservoir, heat engines energy conversion, Kelvin's and Clausius Statements of second law, The Carnot cycle, the Carnot the thermodynamic temperature scale
Topic no 8 The Carnot heat engine and its efficiency, the Carnot refrigerator and heat pump, and its Clausius Inequality, concept of entropy, principle of increase of entropy- availability
Topic no 9 The increase of entropy principle, perpetual - motion machines, reversible and irreversible processes. Entropy- Entropy change of pure substances, isentropic processes, property diagrams involving entropy, entropy change of liquids and solids
Topic no 10 The entropy change of ideal gases, reversible steady-flow work, minimizing the compressor work, isentropic efficiencies of steady flow devices, entropy balance. Energy-a measure of work potential, including work potential of energy, reversible
Topic no 11 work and irreversibility, second law efficiency, concept of energy change of a system, energy transfer by heat, work, and mass, concept of decrease of energy principle and energy destruction, energy balance: closed systems and control volume energy balance.

Unit III

- Topic no 12 Properties of Pure Substance- Thermodynamic properties of pure substance in solid, liquid and vapor phases; Phase rule; P-V, P-T, T-V, T-S, H-S diagrams
Topic no 13 PVT surfaces; Thermodynamic properties of steam, use of standard thermodynamic tables and Mollier diagram; Elementary Calculations of work done and heat transfer in non-flow and flow processes
Topic no 14 Ideal and real gases -Ideal and real gases, and thermodynamic relations -Gas mixtures-properties of ideal and real gases, Equation of state,
Topic no 15 Avagadro's law, van der Waal's Equation of state, compressibility factor, compressibility chart; Dalton's law of partial pressure
Topic no 16 Exact differential, T-D relations, Maxwell relations; Clausius- Clapeyron equation; Joule-Thompson coefficient

Unit IV

- Topic no 17 Power Cycles – vapor and combined power cycles, Carnot vapor cycle, Rankine cycle; ideal cycle for vapor power
Topic no 18 ideal reheat and regenerative and the simple second law analysis of vapor power cycles
Topic no 19 Gas power cycles including basic considerations in the analysis of power cycles, the Carnot cycle and its value in engineering
Topic no 20 overview of reciprocating engines, air standard assumptions, gasoline engine, Otto cycle
Topic no 21 Basics of air conditioning and refrigeration: Psychometric, property calculations of air vapor mixtures, and psychometric chart
Topic no 22 Psychometric process- sensible and latent heat exchange processes, adiabatic mixing, evaporative cooling
Topic no 23 Basics of refrigeration: Refrigeration cycles, refrigerants and refrigerant property tables; Refrigerators and heat pumps
Topic no 24 ideal reversed Carnot cycle and vapor compression refrigeration cycle, actual vapor compression refrigeration cycles
Topic no 25 Heat pump systems, Gas refrigeration cycles, and basic absorption refrigeration system

TEXT BOOKS:

1. P K Nag , Engineering Thermodynamics , Tata McGraw Hill, New Delhi
2. Çengel, Thermodynamics-An Engineering Approach, Tata McGraw Hill, New Delhi.

REFERNCE BOOKS:

1. Sonntag, Borgnakke and Van Wylen, Fundamentals of Thermodynamics, Wiley Sons, Singapore.
2. Moran M.J. and Shapiro H.N., Boettner, D.D. and Baily, M. Fundamentals of Engineering Thermodynamics, John Wiley & Sons, Singapore.
3. Jones and Dugan, Engineering Thermodynamics –, Prentice Hall, New Delhi.

Note:

1. In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students. Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.



Subject: STRUCTURAL ANALYSIS –I
Subject Code: CE 202C

L	T	P	Credits
3	1	--	4

Class Work	:	25 Marks
Examination	:	75 Marks
Total	:	100 Marks
Duration of Examination	:	3 Hours

Course Outcomes :

At the end of the course, the student will be able to:

CO1	Identify the method of analysis for determinate and indeterminate structures.
CO2	Understand the importance of various methods for analyzing the different structural members.
CO3	Use of influence line diagram to solve various structural problems.
CO4	Understand the concept of Cables and suspension Bridges with different support conditions.

Prepare CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO3	PO4	PO6	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	3	1	3	1	1	2	1	2	2	3	2
CO2	3	3	2	2	1	1	2	1	2	2	3	2
CO3	2	2	3	3	1	1	2	1	2	2	3	2
CO4	2	2	2	3	1	2	2	2	2	2	3	2

Unit 1

Topic no 1 Analysis of Dams, chimneys and Retaining Walls: Introduction, limit of eccentricity for no tension in the section

Topic no 2 core of the section, middle third rule, wind pressure on chimneys

Topic no 3 Analysis of Indeterminate Structures: Degree of static and kinematic indeterminacies, analysis of indeterminate beams

Topic no 4 Pin jointed frames, rigid frames and trusses by method of consistent deformation

Topic no 5 effect of lack of fitness, temperature, method of least work, induced reactions on statically indeterminate beams

Topic no 6 Pin jointed frames, rigid frames and trusses due to yielding of supports, Analysis of two hinged and fixed arches.

Unit 2

Topic no 7 Fixed and Continuous Beams: Analysis of fixed beams, continuous beams and Propped cantilevers by moment-area theorem

Topic no 8 Strain energy method, fixed end moments due to different types of loadings

Topic no 9 Effects of sinking and rotation of supports, bending moment and shear force diagrams for fixed beams

Topic no 10 Propped cantilevers, slope and deflection of fixed beams

Topic no 11 Analysis of continuous beams by the three moment theorem (Clapeyron's theorem) due to different types of loadings.

Unit III

Topic no 12 Rolling Loads: Introduction to rolling loads and influence lines, Determination of shear force, bending moment at a section end

Topic no 13 Absolute shear force and bending moment due to single point load, uniformly distributed load, several

Topic no 14 Point loads Influence Lines: Construction of Influence lines for reaction, shear forces and bending moment for simply Supported, overhanging

Topic no 15 Compound beams, influence lines for girders with floor beams, Influence lines for forces in members of frames

Unit IV

Topic no 16 Arches: Introduction, Analysis of two hinged, two hinged and fixed arches, spandrel braced arches, Influence lines for Horizontal thrust

Topic no 17 Shear force and bending moment for three hinged and two hinged arches.

Topic no 18 Cables and suspension Bridges: Introduction, shape of a loaded cable, cable carrying point loads and UDL

Topic no 19 Cables with ends at different level, cable subjected to temperature stresses, suspension bridge with Two hinged and three hinged stiffening girders, influence lines

Text Books

Elementary Structural Analysis, Norris & Wilbur, McGraw Hill Publisher,
Basic Structural Analysis, C.S. Reddy, Tata McGraw Hill Publication.
C K WANG, “ Intermediate Structural Analysis” McGraw Hill Publisher

Reference Books

Structural Analysis (A unified approach), D.S. Parkash Rao, University Press.
Theory of structures, Punmia and Jain, Luxmi Publications.
Structural Analysis Thandvamoorthy TS Oxford University Press
Structural Analysis Devdas Menon Narosa Publishing House

Note:

In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.

The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students.

Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.



Subject : OPEN CHANNEL FLOW
Subject Code: CE 204C

L	T	P	Credits
3	1	--	4

Class Work	:	25 Marks
Examination	:	75Marks
Total	:	100 Marks
Duration of Examination	:	3 Hours

COURSE OUTCOMES:

Students after studying this course will be able to -

1. Understand flow patterns through channels.
2. Measure the flow through channels, gates and spillways.
3. Understand the hydraulic jump pattern and its applications.
4. Select and utilize hydraulic machine correctly according to the circumstances.
5. Know the details and importance of various hydraulic machines.

	PO1	PO2	PO4	PO6	PO7	PO9	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	1	-	1	-	2	2	1	2	1
CO2	3	1	-	1	2	2	1	-	3	3	1
CO3	1	2	2	2	1	2	1	2	1	2	2
CO4	2	1	1	2	2	1	2	-	-	1	2
CO5	1	1	2	1	-	2	3	1	3	1	2

Unit 1

Topic no 1 Flow in Open Channels: Difference between pipe flow and channel flow

Topic no 2 Types of channels, Classification of flows, Sub Critical and Supercritical Flows

Topic no 3 Velocity distribution in channel.

Topic no 4 Flow Measurement: Flow over notches and weirs, Pitot tube floats

Topic no 5 current meters for velocity measurement

Topic no 6 Flow over Spillways, Sluice gates, Freeoverfall flow

Unit 2

Topic no 7 Unsteady flow and Hydraulic jump: Froude number and types of hydraulic jump

Topic no 8 Applications Jumps in channels. Unsteady flow equation, Pre jump and post jump depths, length of Hydraulic Jump and energy dissipation, Surges.

Topic no 9 Concepts of Specific energy and specific Force: Specific energy and specific curve

Topic no 10 Momentum Equation in open channels, Specific force

Topic no 11 specific force curve Critical depth and its computation

Unit III

Topic no 12 Gradually Varied Flow: Channel transitions, Non-uniform flow in open channels

Topic no 13 Dynamic equation for GVF

Topic no 14 Water surface profiles in channels of different slopes GVF flow computations

Topic no 15 Design of Channels, Most efficient channel sections

Unit IV

Topic no 16 Pumps and Turbines: Reciprocating pumps, their types, work done by single and double acting pumps

Topic no 17 Centrifugal pumps, components and parts and working, types

Topic no 18 heads of a pump-statics and manometric heads,. Force executed by fluid jet on stationary and moving

Topic no 19 flat vanes, Turbines-classifications of turbines based on head and specific speed

Topic no 20 component and working of Pelton wheel and Francis turbines, Cavitation

Text Books:

K.G. Ranga Raju, "Flow Through Open Channels", Tata McGraw Hill, New Delhi.

F. M. Hendersen, "Open Channel Flow", McMillan, New York.

Reference Books:

K. Subramanya, "Flow in Open Channels", Tata McGraw Hill, New Delhi.

R. H. French, "Open-Channel Hydraulics", McGraw Hill Publishing Company, New York.

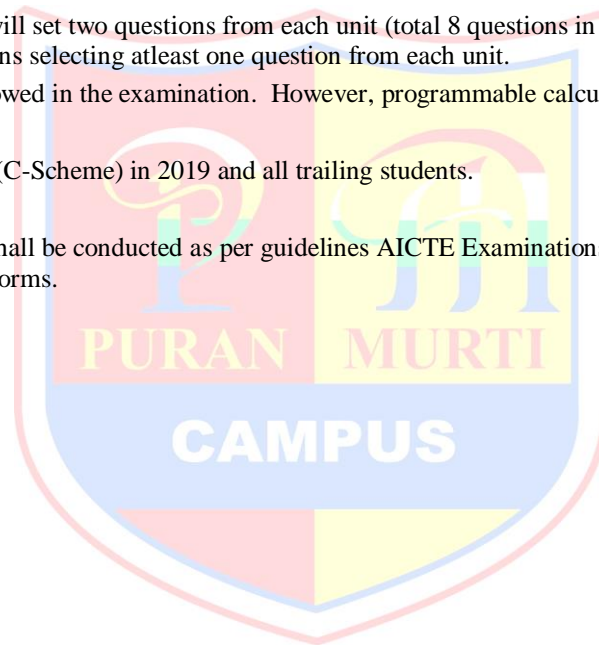
Note:

In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.

The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students.

Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.



Subject: GEOMATICS ENGINEERING
Subject Code: CE 206C

L	T	P	Credits
3	-	--	3

Class Work	:	25 Marks
Examination	:	75Marks
Total	:	100 Marks
Duration of Examination	:	3 Hours

COURSE OUTCOMES:

On completion of the course, the students will be able to:

1. Understand basics of advanced surveying techniques in different fields of civil engineering
2. Know the basics interaction of EMR
3. Be familiar with the data processes and analysis of RS Data
4. Figure out the use of Photogrammetry in surveying

	PO1	PO2	PO4	PO6	PO7	PO11	PSO1	PSO2	PSO3
CO1	3	-	-	1	1	1	-	2	1
CO2	1	3	1	2	1	1	1	3	1
CO3	2	3	2	1	-	1	1	2	1
CO4	2	2	3	2	2	-	1	3	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) “-”: no correlation

Unit 1

Topic no 1 Introduction to Geomatic Engineering, GIS, GPS, DEM, DTED, Large scale mapping, small scale mapping

Topic no 2 Components of GIS, Application of GIS in civil engineering

Topic no 3 Remote Sensing, Fundamentals, EMS, RS System, Active and Passive radiation – Electromagnetic Radiation – Nomenclature, Reflectance, Transmission and Absorption

Topic no 4 Thermal Emission – Plank’s formula, Stefan – Boltzman Law, Wein’s Displacement Law; Emissivity

Topic no 5 Kirchoff’s Law, Characteristics of Solar Radiant Energy, Application of remote sensing to various engineering fields

Unit 2

Topic no 6 Interaction of EMR with Atmosphere – Scattering, Refraction, Absorption, Transmission. Atmospheric Windows

Topic no 7 Interaction of EMR with Earth Surface – Spectral Reflectance Curves. Interaction of earth surface

Topic no 8 EM radiation in visible, NIR, TIR

Topic no 9 Microwave regions. Idealised & Real sequence of remote sensing

Unit III

Topic no 10 Sensors and Platforms: Platforms, Orbital characteristics, Storage

Topic no 11 Retrieval of data. IRS satellite systems – Introduction, Stages of development

Topic no 11 Sensors, Types of scanning system

Topic no 13 Data Processing: Initial data statistics. Pre-processing – Atmospheric, Radiometric and Geometric corrections

Unit IV

Topic no 14 Data analysis: Image Interpretation Elements, Keys and Aids

Topic no 15 Basic Instrumentation. Visual analysis of data

Topic no 15 Photogrammetry: Aerial and terrestrial, applications, types and geometry of aerial photograph

Topic no 15 Flight planning, relief displacement

Topic no 15 Stereoscopy, photogrammetric mapping, Mosaics

Books

Geomatic Engineering, Manoj K Arora, RC Badjatiya, Nem Chand & Bros.
Remote Sensing and Image Interpretation, by Lillisand, T.M. & Kiefer R.W., John Wiley and Sons.
Introduction to Remote Sensing, by Campbell, J.B. Taylor and Francis.
Principles of Geographic information systems, Burrough, P.A and MacDonnel, R.a , Oxford University press
Concepts and Techniques of GIS, C.P.Lo, Albert K.W. Yeung, PHI

Reference Books

Digital Remote Sensing, by Nag. P. & Kudrat, M. Concept Publication Company.
Remote Sensing and Photogrammetry – Principles and Applications, by Jhanwar, M.L. and Chouhan, T.S. VigyanPrakashan, Jodhpur.

Note:

In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.

The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students.

Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.



Subject: TRANSPORTATION ENGINEERING – I
Subject Code: CE 208C

L T P Credits
 3 1 -- 4

Class Work : 25 Marks
 Examination : 75 Marks
 Total : 100 Marks
 Duration of Examination: 3 Hours

COURSE OUTCOMES:

After completion of this course students will be able to

1. Develop skills of highway material testing and carryout construction and maintenance procedures.
2. Design road geometrics for various types of highways.
3. Design rigid and flexible pavements.
4. Conduct various traffic engineering studies and design traffic facilities.

CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO4	PO6	PO7	PO8	PO9	PO11	PSO1	PSO2	PSO3
CO1	-	-	3	1	1	1	-	1	1	3	2
CO2	3	3	-	1	-	-	-	1	1	3	-
CO3	3	3	-	-	1	2	-	1	1	3	-
CO4	2	2	3	2	1	-	1	1	1	3	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) “-”: no correlation

Unit 1

- Topic no 1 Highways developments Planning: Introduction, Different modes of transport, Development of Transport System
 Topic no 2 Highways developments Planning: Introduction, Different modes of transport, Development of Transport System
 Topic no 3 Phased development of Roads in India. Highway Surveys & Alignment, Design, Drawings, Estimates & Project Report
 Topic no 4 Highway materials and testing: sub grade, sub base and base course materials, bituminous materials, testing of soil, aggregate and bitumen

Unit 2

- Topic no 5 Geometric Design of Highways: Introduction, Highways Classification, Right of way, Land width, width of formation, width of pavement
 Topic no 6 Geometric Design of Highways: Introduction, Highways Classification, Right of way, Land width, width of formation, width of pavement, Sight Distances, camber, horizontal and vertical Road, Curves, Transition Curves
 Topic no 7 Design of Pavements: Types of pavements, Factors affecting design of pavements, wheel load factor, Climatic Factors
 Topic no 8 Structure of Flexible pavement, Function of various components of Flexible pavement, design of Flexible pavements by G.I. & CBR methods
 Topic no 9 stresses in rigid pavements, design of rigid pavements by IRC method

Unit III

- Topic no 10 Traffic Studies: Road user characteristics, Importance of traffic studies, spot speed, speed and delay and origin and destination studies
 Topic no 11 Vehicular flow models. Stream variables: Spacing and concentration, headway and flow, mean speed. Time distance diagram of flow
 Topic no 12 Traffic operations and control devices, intelligent transport systems, Road Safety Audits: Road Safety Audits
 Topic no 13 Safety concerns in highway projects, Systems approach, various stages of Safety Audit, Preparation of Audit Reports.

Unit IV

- Topic no 14 Highway construction: road types--earth roads, gravel roads,
 Topic no 15 WBM/WMM/BBM base courses,
 Topic no 16 GSB, surface treatments, premix carpet, mastic asphalt,
 Topic no 17 DBM, bituminous concrete and cement concrete roads
 Topic no 18 Construction methods of bituminous and cement concrete roads,

Topic no 19 Modern Construction Equipments: earthwork, roadwork and lifting equipments:

Topic no 20 Excavators, Loaders, Dozers, Graders and scrapers

Topic no 21 Milling Machine, Modern Paver, Compactor; Tower Crane, Tractor Crane.

Topic no 22 Maintenance: Introduction, Maintenance of Earth, gravel

Topic no 21 WBM, GSB, WMM Roads, Bituminous Roads, Maintenance of berms,

Topic no 22 Side Slopes, Pavement edge and draining work.

Topic no 23 Failures of flexible and rigid pavements: Maintenance, evaluation and its strengthening

Text Books

1. Highway Engineering by Khanna and Justo, Nem Chand & Brothers, Roorkee
2. Highway Engineering by L.R. Kadyali, Nem Chand & Brothers, Roorkee

Reference Books

Highway Engineering by Oglesby and Hews

Transportation Engineering by G.V. Rao, Tata McGraw Hill Publisher, New Delhi

Principles of Pavement Design by E.J. Yodder

4. Traffic Engineering by Matson, Smith & Hurd

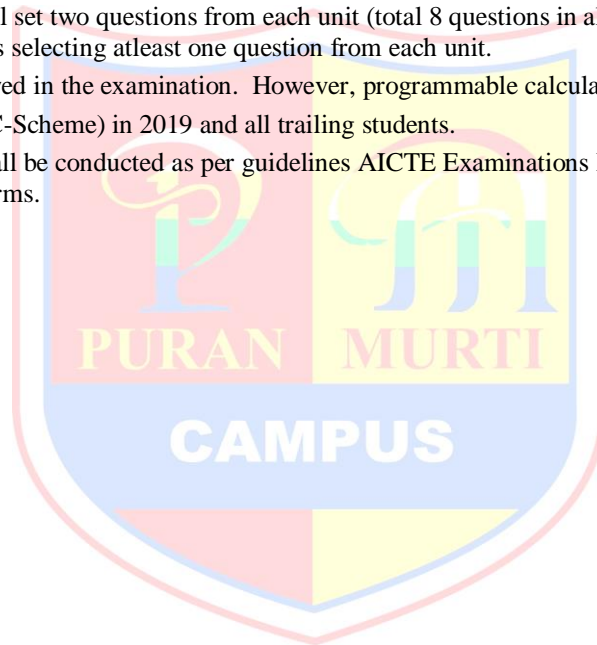
Note:

In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.

The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students.

Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.



Subject: STRUCTURAL ANALYSIS-I LAB
Subject Code: CE 210C

 L T P Credits
 -- -- 2 1

 Class Work : 25 Marks
 Examination : 75 Marks
 Total : 100 Marks
 Duration of Examination : 3 Hours

Course Outcomes :

At the end of the course, the student will be able to: A student will be able to achieve the followings if he undergoes through this laboratory course

CO1	Knowledge of theorems and experiments.
CO2	understand analytical and practical behavior of the members.
CO3	understand computer applications for programming.

Prepare CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO3	PO4	PO5	PO6	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	1	2	1	2	2	3	2
CO2	3	3	1	2	1	1	1	1	1	2	3	2
CO3	2	2	1	1	3	1	1	2	1	2	3	2

List of Experiments:

To verify Betti's Law

To determine the flexural rigidity (EI) of a given beam.

To verify Moment-Area Theorems for slope and deflection of a beam.

To study the behavior of different types of struts.

To determine the elastic displacement of curved members.

To determine the horizontal displacement of the roller end in a curved beam.

To make computer programs for theoretical verification of the above experiments.

Text Books:

Experimental Methods in Structural Mechanics Kukreja C B and Sastry V V

Note:

Seven experiments are to be performed in the Semester.

Subject: OPEN CHANNEL FLOW LAB
Subject Code: CE 212C

L	T	P	Credits
--	--	2	1

Class Work	:	25 Marks
Examination	:	75 Marks
Total	:	100 Marks
Duration of Examination	:	3 Hours

Outcomes—

Students will be able to-

1. Perform various applications of Froude no.
2. Determine the open channel flow pattern.
3. Know about calibration of venturimeter, current meter etc.
4. Effects of various types of roughness coefficients in a channel.

	PO1	PO2	PO7	PO11	PSO1	PSO2
CO1	-	2	1	1	-	2
CO2	3	3	1	1	1	3
CO3	3	3	-	1	1	2
CO4	2	2	-	-	1	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) “-”: no correlation

List of Experiments:

To determine Manning’s co-efficient of roughness for the rough bed of a given flume.

To measure the velocity distribution in a rectangular channel by Prandtl Pitot tube and to determine the energy correction factors

To study the flow through a horizontal contraction in a rectangular open channel.

To calibrate a current meter

To study the formation of hydraulic jump in a horizontal rectangular open channel (Measurement of Froude no. and energy loss)

To study the flow over a hump in a channel bed.

To study the pressure distribution along the spillway surface for different heads.

To calibrate a broad-crested weir and to study the pressure distribution along its surface.

To calibrate a venturi flume.

To study the flow under a sluice gate and formation of hydraulic jump at different Froude no.

Note: Ten experiments are to be performed in the Semester taking atleast seven experiments from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

Subject: GEOMATICS ENGINEERING LAB
Subject Code: CE 214C

L	T	P	Credits
--	--	2	1

Class Work	:	25 Marks
Examination	:	75 Marks
Total	:	100 Marks
Duration of Examination	:	3 Hours

COURSE OUTCOMES:

On completion of the course, the students will be able to:

1. Understand basics of advanced surveying techniques in different fields of civil engineering
2. Know the basics interaction of EMR
3. be familiar with the data processes and analysis of RS Data
4. Figure out the use of Photogrammetry in surveying

	PO1	PO2	PO4	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	1	2	1	3	2
CO2	3	3	2	1	-	1	3	-
CO3	1	1	1	2	1	-	1	2
CO4	2	2	3	1	1	1	3	1

List of Experiments

Study of Aerial photographs.

Study and image interpretation of remote sensing data.

Introduction to CAD/GIS/Image Processing software

Study of digital image characteristics such as:

DN value,

Histogram,

Color image generation,

Simple Image enhancement,

On-screen digitization from images,

Area computation,

Geo-registration of images etc.

Note: The students will perform all above mentioned experiments. However, some more experiments may be performed as designed & set by the concerned Institution as per the scope of the syllabus.

Subject: TRANSPORTATION ENGINEERING-I LAB**Subject Code: CE 216C**

L	T	P	Credits
--	--	2	1

Class Work	:	25 Marks
Examination	:	75 Marks
Total	:	100 Marks
Duration of Examination	:	3 Hours

COURSE OUTCOME

After completion of this course students will be able to

Learn testing procedure for determination of mechanical properties of highway materials.

Perform various traffic studies.

Acquire basic ability of Accident Analysis.

CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO4	PO9
CO1	-	-	3	-
CO2	1	2	3	2
CO3	1	2	3	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) “-”: no correlation

List of Experiments:

To test toughness of road Aggregates by Impact Test (CO-1)

To test hardness of aggregates by Los Angles Abrasion Test (CO-1)

To perform Crushing Strength Test on Aggregates (CO-1)

To identify grade of bitumen using Penetration Test. (CO-2)

To test the ductility of bitumen using Ductility test. (CO-2)

To test water absorption and specific gravity of road aggregates using density basket. (CO-1)

To find out Softening Point of Bitumen. (CO-2)

To find out Flash & fire point of bitumen. (CO-2)

To determine spot speed of traffic by radar speedometer and endoscope. (CO-3)

To conduct CBR test on samples of subgrade. (CO-3)

To perform classified traffic Volume count on a road section. (CO-3)

Study of Fir Perma and analysis of data extracted from FIR. (CO-4)

Subject: GENERAL FITNESS FOR CIVIL ENGINEERING

Subject Code: GFCE 202C

B. Tech. Semester – IV (Civil Engineering)

L	T	P	Credits	Examination	:	75Marks
-	--	--	-	Total	:	75 Marks

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

A Faculty Counselor will be attached to a group of students which will remain associated with him /her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

The student will present a written report before the committee with following in view:

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

- I. Academic Performance (10 Marks)
- II. Extra Curricular Activities / Community Service, Hostel Activities(10 Marks)
- III. Technical Activities / Industrial, Educational tour (10 Marks)
- IV. Sports/games (10 Marks)

A student will support his/her achievement and verbal & communicative skill through presentation before the examiners.
(15 Marks)

- C. Faculty Counselor Assignment (20 Marks)

It will be the duty of the student to get evaluated by respective faculty counselor and to submit the counselor assessment marks in a sealed envelope to the committee.

A counselor will assess the student which reflects his/her learning graph including followings:

Discipline throughout the year

Sincerity towards study

How quickly the student assimilates professional value system etc.

University Departments:

- 1 Chairperson of the Department
- 2 Senior Most Faculty Counselor
- 3 Vice- Chancellor's Nominee

- Chairman
- Member
- Member

Affiliated Colleges:

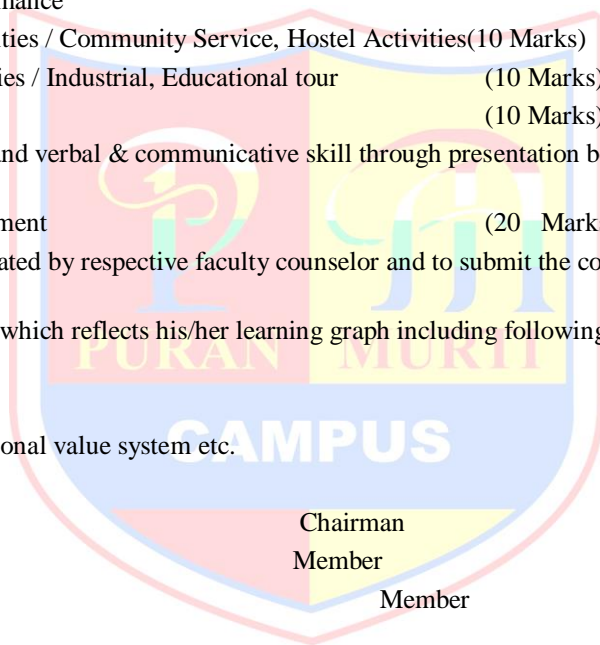
Director/Principal

Chairman

Head of the Department/Sr. Faculty

Member

External Examiner to be appointed by the University Member



Subject: Environmental Studies
Subject Code: MC201C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	100
3	-	-	3	25	75	3 hours	

UNIT – I Environmental Studies and Environmental Pollution

- Topic No1 The Multidisciplinary Nature of Environmental Studies,
- Topic No2 Introduction to Environment:
- Topic No3 Definition, Scope, and importance of environmental studies;
- Topic No4 need for public awareness.
- Topic No5 Environmental Pollution: Definition, Cause and effects
- Topic No6 Air pollution,
- Topic No7 Water pollution,
- Topic No8 Soil pollution,
- Topic No9 Marine pollution,
- Topic No10 Noise pollution,
- Topic No11 Role of an individual in prevention of pollution,
- Topic No12 Pollution case studies

UNIT – II Natural Resources:

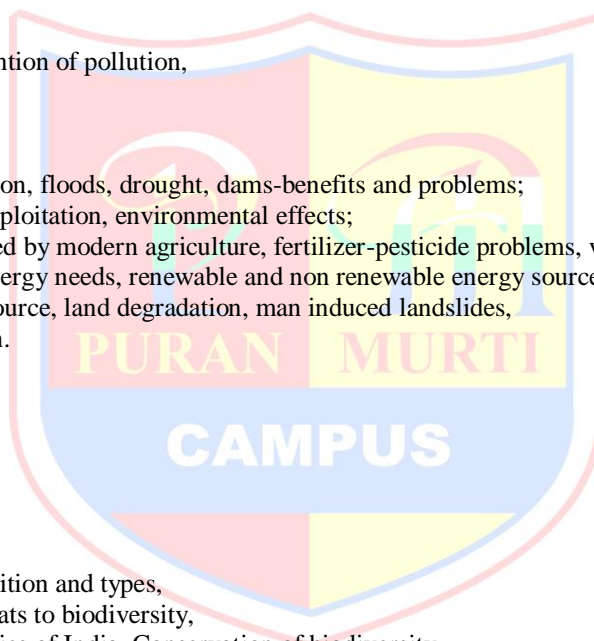
- Topic No13 Water resources: over-utilization, floods, drought, dams-benefits and problems;
- Topic No14 Mineral resources: Use and exploitation, environmental effects;
- Topic No15 Food resources: changes caused by modern agriculture, fertilizer-pesticide problems, water logging,
- Topic No16 Energy resources: Growing energy needs, renewable and non renewable energy sources;
- Topic No17 Land resources: Land as a resource, land degradation, man induced landslides,
- Topic No18 soil erosion and desertification.

UNIT – III Ecosystems and Biodiversity

- Topic No19 Concept of an ecosystem,
- Topic No20 Structure and function,
- Topic No21 Energy flow,
- Topic No22 Ecological succession,
- Topic No23 ecological pyramids.
- Topic No24 Concept of Biodiversity, definition and types,
- Topic No25 Hot-spots of biodiversity; threats to biodiversity,
- Topic No26 Endangered and endemic species of India, Conservation of biodiversity.

UNIT - IV Social Issues and Environment

- Topic No27 Water conservation,
- Topic No28 rain water harvesting,
- Topic No29 Environmental ethics: Issues and possible solutions.
- Topic No30 Climate change, global warming,
- Topic No31 acid rain,
- Topic No32 ozone layer depletion,
- Topic No33 Public awareness.
- Topic No34 Population growth, variation among nations,
- Topic No35 Family Welfare Programme.
- Topic No36 Human Population and the Environment
- Topic No37 Population growth,
- Topic No38 Population explosion,
- Topic No39 Women and Child Welfare.



Field Work –

1. Visit to a local area to document environmental assets—river/forest/grassland/hill/ mountain.
2. Visit to a local polluted site—Urban/Rural/Industrial/Agricultural.
3. Study of common plants, insects, birds.
4. Study of simple ecosystems—pond, river, hill slopes, etc

REFERNCE BOOKS:

1. A Textbook of Environmental Studies by Asthana D.K. and Asthana Meera
2. Fundamental Concepts in Environmental Studies by Mishra D.D.
3. Environmental Studies by S.C Sharma M.P Poonia
4. Textbook of Environmental Studies for Undergraduate by Erach Bharucha
5. Environmental Studies: Third Edition by R. Rajagopalan

