

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY
CIRCULAR NO.SU/Engg./T.Y.B.Tech./63/2018



It is hereby informed to all concerned that, the syllabi prepared by the Board of Studies & recommended by the Dean, Faculty of Science & Technology, the **Academic Council at its meeting held on 30 June & 02 July 2018 has accepted the following syllabi in accordance with Choice Based Credits & Grading System for all Branches T.Y.B.Tech** under the Faculty of Science & Technology as enclosed herewith.

Sr.No.	Syllabi as per CBC & GS
[1]	Third Year B.Tech.[Civil Engineering],
[2]	Third Year B.Tech. [Mechanical Engineering],
[3]	Third Year B.Tech. [Agricultural Engineering],
[4]	Third Year B.Tech.[Electrical Engineering],
[5]	Third Year B.Tech. [Plastic & Polymer Engineering],
[6]	Third Year B.Tech [Electronics & Telecommunication Engg.],
[7]	Third Year B.Tech. [Computer Science Engineering].

This is effective from the Academic Year 2018-2019 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
 Aurangabad-431 004.
 REF.No. SU/T.Y.B.TECH./2018/

Date:- 03-07-2018. / 10486-96 * * * * *

6/7/18
Deputy Registrar,
Syllabus Section.

Copy forwarded with compliments to :-

- 1] **The Principals, affiliated concerned Colleges, Dr. Babasaheb Ambedkar Marathwada University.**
- 2] The Director, University Network & Information Centre, UNIC, with a **request to upload this Circular on University Website.**

Copy to :-

- 1] The Director, Board of Examinations & Evaluation,
- 2] **The Section Officer,[Engineering Unit] Examination Branch,**
- 3] The Section officer, [Eligibility Unit],
- 4] **The Programmer [Computer Unit-1] Examinations,**
- 5] **The Programmer [Computer Unit-2] Examinations,**
- 6] The In-charge, [E-Suvidha Kendra],
- 7] The Public Relation Officer,
- 8] The Record Keeper,

SCHEME AND DETAILED SYLLABUS

of

T. Y. B. Tech. (Civil Engineering)

Under Choice Based Credit & Grading System

(w.e.f. academic year 2018-19& onwards/-)

FOUR YEAR DEGREE COURSE IN SCIENCE & TECHNOLOGY



**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD**

FACULTY OF SCIENCE AND TECHNOLOGY

Syllabus Structure- 2018-2019(Rev. on April 2018)

Third Year B. Tech (T.Y. Civil Engineering)

Sub No.	SEMESTER-I	Contact Hrs / Week				Examination Scheme					Credits	Theory Exam
	Subject	L	T	P	Total	CT	TH	TW	P	Total		
CED301	Design of Steel Structures	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED302	Water Resources Engineering -I	4	-	-	4	20	80	-	-	100	4	3 Hrs
CED303	Environmental Engineering -I	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED304	Geotechnical Engineering	4	-	-	4	20	80	-	-	100	4	3 Hrs
CED305	Theory of Structure -II	4	-	-	4	20	80	-	-	100	4	3 Hrs
CED341-343	Elective - II	2	-	-	2	10	40	-	-	50	2	2 Hrs
CED321	Lab-I (Design of Steel Structures)	-	-	2	2	-	-	25	25	50	1	
CED322	Lab II (Environmental Engineering -I)	-	-	2	2	-	-	25	25	50	1	
CED323	Lab III (Geotechnical Engineering)	-	-	2	2	-	-	25	25	50	1	
CED324	Lab IV (STAAD Pro)	-	-	2	2	-	-	50	-	50	1	
CED325	Mini-Project	-	-	2	2	-	-	50	-	50	1	
	Total of Semester-I	20	2	10	32	110	440	175	75	800	27	
Sub No.	SEMESTER-II	Contact Hrs / Week				Examination Scheme					Credits	Theory Exam
	Subject	L	T	P	Total	CT	TH	TW	P	Total		
CED351	Design of RCC Structures	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED352	Environmental Engineering -II	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED353	Water Resource Engineering - II	4	-	-	4	20	80	-	-	100	4	3 Hrs
BSH354	Industrial Management	4	-	-	4	20	80	-	-	100	4	3 Hrs
*	Open Elective-I	4	-	-	4	20	80	-	-	100	4	3 Hrs
CED356	Transportation Engineering - I	2	-	-	2	10	40	-	-	50	2	2 Hrs
CED371	Lab V (Design of RCC Structures)	-	-	2	2	-	-	25	25	50	1	
CED372	Lab VI (Environmental Engineering -II)	-	-	2	2	-	-	25	25	50	1	
CED372	Lab VII (Water Resource Engineering -II)	-	-	2	2	-	-	25	25	50	1	
CED373	Lab VIII (Engineering Geology)	-	-	2	2	-	-	50	-	50	1	
CED374	Project-I Presentation	-	-	2	2	-	-	-	50	50	1	
**	#Audit Course-I	2	-	-	2	-	-	-	-	-	-	
	Total	22	2	10	34	110	440	125	125	800	27	
	Grand Total of I & II									1600	54	

L: Lecture hours per week

CT: Class Test

TH: University Theory Exam

T: Tutorial hours per week

P: Practical hours per week

TW: Term Work

Note: Interested student can opt for any one of audit course offered by various dept.

For Audit Course, Audit Pass (NP) and Audit Fail (NF) grades will be awarded

Elective- II (341-Engineering Geology) (342- Earthquake Engineering) (343- Green Building)

*** Open Elective-I Course**

Sr. No.	Name of course	Department	Course code
1.	Remote Sensing and GIS	AED	AED381
2.	Professional Ethics and Cyber Security	CSED	CSE381
3.	Design for Environment	CED	CED381
4.	Robotics and Automation	EED	EED381
5.	Internet of Things	ETC	ETC381
6.	Costing and Financial Management	MED	MED381
7.	Introduction to Nano Technology	PPED	PPE381

**** Audit Course-I**

Sr. No.	Name of course	Department	Course code
1.	Japanese Language module	BSH	BSH801
2.	Cyber Crime and Law	CSED	CSE801
3.	Road Safety Management	CED	CED801
4.	Value Education	BSH	BSH802
5.	Smart Cities	ETC	ETC801
6.	Rural community Engagement	MED	MED801
7.	German Language Module	BSH	BSH803

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of T. Y. B. Tech. (Civil) Semester V		
Code No: CED301		Title: Design of Steel Structures
Teaching Scheme: 04 Hrs/week		Class Test: 20 Marks
Theory: 03 Hrs/week		Theory Examination (Duration): 03 Hrs
Tutorial: 01 Hr/week	Credits:04	Theory Examination (Marks): 80 Marks
Objectives	:	This is a basic course to introduce basic concepts behind design of Steel Structures. This course acts as a prerequisite for the elective course Advanced Structural Design by Limit State Method as per IS: 800-2007
Unit-I	:	Introduction to structural design, Structural systems, Role of the designer, Advantages & Disadvantages of steel as a structural material, Types of structural steel, Mechanical properties of steel, various rolled steel sections & structural pipe (tube) sections and their properties, Codes and specifications. Fatigue of steel structures. Principles of Limit state design: Introduction on limit state design, Design philosophies & analysis procedures, Design requirements, Loads & load combinations, Types of limit states (limit state of strength, limit state of serviceability) (8 Hrs)
Unit-II	:	Connections: Introduction on Connections. Bolted connections: Classification, Behavior of bolted joints. Bolts & Bolting, Design strength of ordinary black bolts, Design of simple connections, Analysis of Bolt Group, beam to beam, beam to column, framed connections. Welded connections: Advantages and disadvantages, types and properties of welds, specification for weld, types of joints, Effective areas of welds, Design of simple connections, Beam to beam, beam to column, framed connections. (10Hrs)
Unit-III	:	Design of Tension members: Types of tension members, Slenderness ratio, Behavior of tension members, Modes of failure, Design of sections for tension, tension member splice, and lug angles. (6 Hrs)
Unit-IV	:	Design of Compression Members: Behavior of compression members, Modes of failure, Classification of cross section, Effective length of compression members, Design strength, Compression members in trusses, Design of columns subjected to axial loads, Laced and Battered columns. Column bases: Slab base and Gusseted base. (8Hrs)
Unit-V	:	Plastic theory: Plastic hinge concept, Plastic collapse load, Plastic moment, Shape factor, Plastic section modulus. Design of beams: Laterally restrained and unrestrained simply-supported beams. Design of compound beams. Design of plate girder: elements of plate girders, economical depth, size of flange, shear buckling resistance of web, end panel design, anchor forces, design connection between flange and web plates, design of bearing stiffeners, web for end stiffeners, connection of intermediate stiffeners to web, design of plate girder. (10Hrs)
Unit-VI	:	Design of Roofing for an industrial building: Roofing materials, Types of trusses, Loading on roof trusses, Analysis of trusses, Design of various members of roof trusses. (6 Hrs)
Reference Books:	:	1. Design of Steel Structures - N. Subramanian - Oxford University Press. 2. Comprehensive Design of Steel Structures - Dr. B C Punmia, A K Jain -- Laxmi Pub. 3. Design of Steel Structures - S K Duggal - Tata McGraw Hill Publishing Company Ltd. 4. Design of Steel Structures (By Limit State Method as per IS:800 2007) -- S.S. Bhavikatti- International Publishing House Pvt. Ltd. 5. IS:800 2007 and Steel Table.

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper: Minimum ten questions and Five questions in each section. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of T. Y. B. Tech. (Civil) Semester V

Code: CED302

Teaching scheme: 04 Hrs/ week

Theory: 04 Hrs /week

Credits: 04

Title: Water Resources Engineering-I

Class Test: 20 Marks

Theory Examinations (Marks): 80 Marks

Theory Examination (Duration): 03 Hrs

Objective	This is the basic course to introduce water resources, their occurrences, distribution, and application. This course acts as a pre- requisite for design of various dam structures.
Unit I	Irrigation and Water Resources Engineering: Introduction, World and India water resources, Necessity of irrigation, Advantages and ill-effects of irrigation, techniques of water distribution in farms, introduction to drip, sprinkler, lift irrigation, Quality of water for irrigation. Water requirements of crops: Function of irrigation water, types of soils and water available in various classes, base period, delta, duty and their relationship, evapo-transpiration, field capacity, wilting point, Irrigation seasons, principal crops and crop rotation. Numerical. (8Hrs.)
Unit II	Surface and Ground-water Hydrology: Introduction, Hydrological cycle, precipitation, measurement of rainfall, Characteristics of a rain storm (rain hyetograph, mass curve of rainfall, DAD relationship, recurrence interval), computation of average rainfall over a basin, Infiltration studies and IC-Curve, factors affecting runoff, Unit hydrograph, Derivation of unit hydrograph from complex storms, Numerical. Ground Water Hydrology: Terminology, Occurrence and distribution of ground water, aquifers and its parameters, movement of ground water, wells in confined and unconfined aquifers, specific yields of wells. Penetration of wells, interference of wells and its boundary, Tube wells. Numerical. (12 Hrs.)
Unit III	Watershed Management: Concept and Necessity of Watershed Management, steps involved in watershed management, treatment of ridge line in upper catchments and drainage line treatment, small structures, soil erosion control. (4 Hrs.)
Unit IV	Canal Irrigation System: Canal classification, factors affecting the alignment of canals, design of canals in alluvial soils, Kennedy and Lacey's silt theories and their application to channel design, longitudinal section and cross section of an irrigation channel, terminology used for various components of canal cross section including borrow pits, balancing depth, canal breaches and repairs. Canal Lining: Losses in canals, Advantages and disadvantages, types of lining, Requirement of good lining. (12 Hrs.)
Unit V	Canal Regulation Works and Cross Drainage Works: Cross Drainage works: Types of CD. Works, their purpose, selection of suitable type of C. D. Work, types and components of CD works, Design of transitions. Numerical. Canal Regulation works: Necessity, location and types of canal falls, head regulators, cross regulators, their design, canal escapes, outlets and their types. Numerical. (08 Hrs.)
Unit VI	Water Logging, Salinity and Drainage: Water Logging-causes and effects, controlling water logging. Reclamation of saline land. Types of drainage, Surface and sub-surface drainage. (04 Hrs.)
Reference Books	1. Hydrology- Jay Rami Reddy - Lakshmi Publications- Second Edition 2. Irrigation and water power Engineering- Punmia and Pande- Standard Publishers- Fifth Edition 3. Irrigation and Hydraulic structures- Santoshkumar Garg- Khanna Publishers 4. Hydrology for Engineers- Linsley, Kohler et al- TMH Publications

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper: Minimum ten questions and Five questions in each section. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of T. Y. B. Tech. (Civil) Semester V	
Code No: CED303 Teaching Scheme: 04Hrs/week Theory: 03Hrs/week Tutorial: 01 Hrs/week Credits: 04	
Title: Environmental Engineering-I Class Test: 20 Marks Theory Examination (Duration): 03 Hrs Theory Examination (Marks): 80	
Objectives	: "A knowledge of Environmental Engineering-I helps the engineers to analyze, think logically and pursue the engineering approach for the benefits of society and therefore desirable as an integral part of engineering education and training, irrespective of the branch specialization."
Unit-I	: Water demand & quantity: Introduction to Water Supply Scheme, Different Components of Water Supply Scheme, Water Demands, its Variation, Different factors affecting Water Demand, Design of Components, Population Forecasting Methods, Numerical (08Hrs)
Unit-II	: Quality of water & its analysis: Wholesome water, potable water, contaminated water, Impurities in water. Analysis of water-physical, chemical & biological tests. Microorganism in water and Water Borne Diseases. IS standards. (06Hrs)
Unit-III	: Water treatment and softening process: Layout of WTP, Screening, Aeration, Primary settling, Coagulation & flocculation, sand filters, disinfection, methods of disinfection - boiling, chlorination, forms of chlorination chlorine demand & its estimation, break point chlorination, Design of various components of Water Treatment Plant. Examples, Water softening Methods, removal of colors, odors & tastes, treatment with activated carbon, removal of Heavy metals, Fluoridation & Defluoridation (12Hrs)
Unit-IV	: Conveyance and Distribution system of water: Intakes & its types; Stresses in pipes, Corrosion of pipes & its prevention, Pipe appurtenances, Methods of distribution, Storage and distribution reservoirs —locations & types, Capacity estimation methods, numerical, Layouts of distribution system, Analysis & Design of distribution system – examples. Water piping systems- Plumbing Terminology, Fixtures Component Design. (10Hrs)
Unit-V	: Solid Waste Management: Terminology, Origin of domestic solid wastes, Quantity of refuse & transportation of refuse, economics of refuse collection. Solid waste in industries, agricultural waste – its effect on environment. Solid waste handling methods, treatment & disposal of solid wastes. Sanitary landfills leachates and latest methods. Integrated Solid Waste Management. (08Hrs)
Unit-VI	: Air pollution & Control: Various layers of atmosphere, types of pollutants, Sources of air pollution & its effect (humans, property, plants & animals) control technique for SPM & gaseous pollutant (three methods of each), problems on particulate matter, Controlling Equipments-Fabric Filters, Cyclones, Electrostatic Precipitator. (04Hrs)
Reference Books:	: 1. Environmental Engineering - Howard, S. Peavy - Tata McGraw-Hill International Editions. 2. Water supply, Waste Disposal & Environmental Engineering- A. K. Chatterjee - Khanna publishers. 3. Water supply Engineering - S. K. Garg - Khanna Publishers. 4. Water supply Engineering- B. C. Punmia, Ashok Jain, Arun Jain- Laxmi Publications. 5. Water Supply & Sanitary Engineering- G.S. Birde, J. S. Birde -Dhanpat Rai Publishing Company. 6. Air Pollution - M. N. Rao - Tata McGraw-Hill International Editions.

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper: Minimum ten questions and Five questions in each section. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of T. Y. B. Tech. (Civil) Semester V	
Code No: CED304 Teaching Scheme: 04 Hrs/week Theory: 04 Hrs/week Credits:04	Title: Geotechnical Engineering Class Test: 20 Marks Theory Examination (Duration): 03 Hrs Theory Examination (Marks): 80 Marks
Objectives	: “The objective of this course is to introduce the civil engineering students to the behavior of soils under different loading conditions. It explores the natural characteristics, methods of classification and testing of soils as an engineering material also students will understand the concept of bearing capacity and settlement related to design of the above structures and related permissible Criteria of B.I.S. Codes.”
Unit-I	: Introduction and Properties of soil: Origin of soil, scope of “Geotechnical Engineering’, Types of weathering, soil formation, and major soil deposits of India, Components of soils, soil Minerals, Mechanical composition of soil, volume and weight relationship. specific gravity, density, relative density, void ratio, porosity degree of saturation, functional relationships, moisture content, grain size analysis, mechanical and sedimentation analysis, consistency limits, soil texture and structure, elementary ideas about swelling sensitivity and thixotropy. (12Hrs)
Unit-II	: Classification of Soil, Soil Moisture and Permeability: Particle size classification, Highway Research Board Classification, IS Classification and Unified Classification, Soil moisture, effect of moisture content on soil, structural water, absorbed water, capillary water, Effective and neutral pressure. Critical hydraulic gradient, Seepage of water through soil, permeability, Darcy’s law, discharge velocity and seepage velocity. factors affecting the permeability, Laboratory methods of determination Permeability, concept of flow net and its characteristics, graphical method of Flow net construction and its classification to isotropic soil. (10Hrs)
Unit-III	: Stress Distribution in Soil Bossinesq’s equation for point load, vertical pressure under loaded circular area and uniformly distributed Load, preparation and use of Newmark’s Chart. (04Hrs)
Unit-IV	: Compaction and Consolidation: Proctor density and optimum moisture content. Comparison of standard and modified proctor test factor, affecting compaction. Field methods of compaction control and mechanical stabilization of soil, compressibility of soil, concept of consolidation spring analogy, Terzaghi’s one dimensional consolidation, secondary compression, square root of time fitting method and logarithm of time fitting method, Consolidation test. (08Hrs)
Unit-V	: Shear Strength Concept of shear strength, Principles stresses, Mohr’s envelopes for cohesive and non-cohesive soils and composite soils, general principle of drained, Consolidated un-drained and drained tests. Determination of shear strength by direct, unconfined, tri-axial and vane Shear tests. Comparison of these methods. (08Hrs)
Unit-VI	: Earth Pressure and Stability of slopes: Earth pressure at rest, active and passive condition, elementary idea about Rankine’s and Coulomb’s earth Pressure. Factors contributing to slope failures, Classification of Slope failures, Infinite and finite slope. The Swedish method and its application to dry cohesive soils and composite soils, Friction circle method, Taylor’s number and stability curve. (06Hrs)
Reference Books:	: 1. Soil Mechanics and Foundation Engg. - B.C .Punmia - Laxmi Publications - 17th edition 2. Soil Mechanics and Foundation Engg - Dr.K. R. Arora – A. K. Jain for standard publisher’s distributors – 7th edition 3. Basic and applied soil mechanics – Gopal Ranjan and A. S. R. Rao – New age international publishers – 3rd edition 4. Foundation Engg. - B.J. Kasmalkar - Pune Vidyarthi Griha - 3rd edition

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of T. Y. B. Tech. (Civil) Semester V		
Code No: CED305		Title: Theory of Structure-II
Teaching Scheme: 04 Hrs/week		Class Test: 20 Marks
Theory: 04 Hrs/week		Theory Examination (Duration): 03 Hrs
Credits:04		Theory Examination (Marks): 80 Marks
Objectives	:	This is an introductory advanced course based on Theory of Structure - II. It introduces various basic concepts in Theory of Structure through theory and series of numerical examples. The course serves as a prerequisite for the advanced courses in structural analysis.
Unit-I	:	Theory of Elasticity: Basic Concepts, Strain Compatibility, Stress and Strain Equilibrium, Hook's Law. (09-Hrs)
Unit-II	:	Flexibility Matrix Method: Flexibility coefficients, Applications to Continuous beams & Single Story Single Bay Portal Frames (08-Hrs)
Unit-III	:	Slope Deflection Method: Applicable to Continuous Beams & Single Story Single Bay Portal Frames (09-Hrs)
Unit-IV	:	Moment Distribution Method: : Applicable to Continuous Beams & Single Story Single Bay Portal Frames (09-Hrs)
Unit-V	:	Stiffness Matrix Method: Stiffness coefficients, Applications to Continuous Beams & Single Story Single Bay Portal Frames. (09-Hrs)
Unit-VI	:	Approximate Methods of Analysis of Multistoried, Multi Bay Rigid Jointed Frames. (i) (i) Portal method (ii) Cantilever method (04-Hrs)
Reference Books		1. Theory of Elasticity -Timoshenko S. P.- <i>Tata McGraw-Hill</i> 2. Basic Structural Analysis - C. S. Reddy - <i>Tata McGraw-Hill</i> 3. Theory of Structures - S. Ramamurtham. - Dhanpatrai 4. Mechanics of Structures Vol.II - Junnarkar S. B.- Charotor 5. Structural Analysis Pandit - G. S.- <i>Tata McGraw-Hill</i> 6. Structural Analysis -Hibbeler R. C. - Pearson 7. Structural Mechanics - Upadhyay A. K.- S. K. Kataria

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T. Y. B. Tech. (Civil) Semester V

Code No: CED341

Teaching Scheme: 02 Hrs/week

Theory: 02 Hrs/week

Credits : 02

Title: Elective-II (Engineering Geology)

Class Test: 10 Marks

Theory Examination (Duration): 02 Hrs

Theory Examination (Marks): 40 Marks

Objective	:	The objective of this Course is to focus on the core activities of engineering geologists – site characterization and geologic hazard identification and mitigation. Through lectures, labs, and case study examination student will learn to couple geologic expertise with the engineering properties of rock and unconsolidated materials in the characterization of geologic sites for civil work projects and the quantification of processes such as rock slides, soil-slope stability, settlement, and liquefaction
Unit-I	:	Introduction- Branches of geology useful to civil engineering, scope of geological studies in various civil engineering projects. Department dealing with this subject in India and their scope of work Mineralogy- Mineral, Origin and composition, Physical properties of minerals, susceptibility of minerals to alteration, basic of optical mineralogy, Rock forming minerals, megascopic identification of common primary & secondary minerals. (02Hrs)
Unit-II	:	Petrology- Rock forming processes. Specific gravity of rocks. Ternary diagram. Igneous petrology- Volcanic Phenomenon and different materials ejected by volcanoes. Types of volcanic eruption. Concept of Hot spring and Geysers. Characteristics of different types of magma. Division of rock on the basis of depth of formation, and their characteristics. Chemical and Mineralogical Composition. Texture and its types. Various forms of rocks. IUGS Classification of phaneritic and volcanic rock. Field Classification chart. Structures. Classification of Igneous rocks on the basis of Chemical composition. Detailed study of Acidic Igneous rocks like Granite, Rhyolite or Tuff, Felsite, Pegmatite, Hornfels. Metamorphic Aureole, Kaolinization. Landform as Tors. Engineering aspect to granite. Basic Igneous rocks Like Gabbro, Dolerite, and Basalt. Sedimentary petrology- mode of formation, Mineralogical Composition. Texture and its types, Structures, Gradation of Clastic rocks. Classification of sedimentary rocks and their characteristics. Detailed study of Conglomerate, Breccia, Sandstone, Mudstone and Shale, Limestone Metamorphic petrology- Agents and types of metamorphism, metamorphic grades, Mineralogical composition, structures & textures in metamorphic rocks. Important Distinguishing features of rocks as Rock cleavage, Schistosity, Foliation. Classification. Detailed study of Gneiss, Schist, Slate with engineering consideration. (06Hrs)
Unit- III	:	Strength Behavior of Rocks- Stress and Strain in rocks. Concept of Rock Deformation & Tectonics. Dip and Strike. Outcrop and width of outcrop. Inliers and Outliers. Main types of discontinuities according to size. Fold- Types (Anticline and syncline, symmetrical and asymmetrical fold, Isoclinal's fold, Recumbent fold.) and nomenclature, Criteria for their recognition in field. Faults: Classification (normal fault and reverse fault, strike fault, dip fault, oblique fault, Hurst and Graben), recognition in field, effects on outcrops. Joints & Unconformity- Types, Stresses responsible, geotechnical importance. Importance of structural elements in engineering operations. Consequences of failure as land sliding, Earthquake and Subsidence. Strength of Igneous rock structures. (04Hrs)
Unit-IV	:	Geological Hazards- Rock Instability and Slope movement: Concept of sliding blocks. Different controlling factors. Instability in vertical rock structures and measures to prevent collapse. Types of landslide. Prevention by surface drainage, slope reinforcement by Rock bolting and Rock anchoring, retaining wall, Slope treatment. Case study on black clay. Ground water- Factors controlling water bearing capacity of rock. Pervious & impervious rocks and ground water. Lowering of water table and Subsidence. Earthquake- Magnitude and intensity of earthquake. Seismic sea waves. Revelation from Seismic Records of structure of earth. Case Study on Elevation and Subsidence in Himalayan region in India. Seismic Zone in India. (04 Hrs)

Unit-V	: Building stones – Requirements of good building stones such as strength, durability, appearance, availability, field characters and its dependence on geological characters of rock. Factors affecting strength, building stones of India. Landslides – Definition of landslide, Rock fall, soil creeps. Angle of repose, causes of landslide, stability of hill slopes, dip of bed and direction of slope. Preventive measures for landslides. Core logging – Diamond and calyx drill machine, inclined and large diameter drill hole, core recovery, rock quality designation, drill water loss, preservation of cores. Tunneling – Tunnel, Adit and Shaft. Difficulties During Tunneling like seepage of groundwater, over break, Support during tunneling, lining after tunneling, rate of tunneling and influence of geological conditions on these. Tunneling through hard rock and soft rocks. Tunnels in folded strata, Tunnels across fracture zones, fault zones, Tunnels in closely jointed rocks, Tunnels in sedimentary rocks. (06 Hrs)
Unit-VI	: Geology of dam and reservoir site - Required geological consideration for selecting dam and reservoir site. Failure of Reservoir. Favorable & unfavorable conditions in different types of rocks in presence of various structural features, precautions to be taken to counteract unsuitable conditions, significance of discontinuities on the dam site and treatment giving to such structures. Dependence on type of dam on geological conditions of the project site and availability of construction material. Dams on sedimentary rocks, dams in area of folded strata, dams on dyke, fracture, faults and on carbonate rocks. (02Hrs)
Reference Books:	: 1. 'Engineering and General Geology', Parbin Singh, 8 th Edition (2010), S K Kataria & Sons. 2. 'Text Book of Engineering Geology', N.C. Kesavulu, 2 nd Edition (2009), Macmillan Publishers India. 3. 'Geology for Geotechnical Engineers', J. C. Harvey, Cambridge University Press (1982). 4. Engineering Geology - S. K. Garg - Khanna Publications – 5 th edition 5. Structural Geology – Billings - Prentice Hall of India, New Delhi – 3 rd edition

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper: Minimum eight questions and four questions in each section. Question no 1 from section A and Question no 5 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for eight marks each. The Question no.1 and 6 should be of objective nature. Two questions of six marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T. Y. B. Tech. (Civil) Semester V

Code No: CED342

Teaching Scheme: 02 Hrs/week

Theory: 02 Hrs/week

Credits: 02

Title: Elective-II (Earthquake Engineering)

Class Test: 10 Marks

Theory Examination (Duration): 02 Hrs

Theory Examination (Marks): 40 Marks

Objectives :	To make students familiar with the structural behavior of civil engineering structure (building) during earthquake. The Loading calculations and design of members to be adopted in Structural Consultancy practice shall strictly be in accordance with the relevant IS codes and the analysis of structure shall be as per elastic methods developed and adopted widely all over the country.
Unit-I :	Elements of seismology – terminology, structure of earth, causes of an earthquake, plate tectonic theory, continental drift theory, elastic rebound theory, seismic waves, magnitude and intensity, methods of measurement, seismic zoning of India, seismic coefficients for different zones, seismograph, strong motion earthquakes, accelerogram, Lessons from past earthquake: - Study of damages caused due to past, earthquakes in India and remedial measures.(4 Hrs)
Unit-II :	Vibrations: definition, causes, classification: Single Degree of Freedom systems (SDOF) - free, forced, damped, un-damped vibrations. Introduction to Multi-degrees of Freedom systems (MDOF), concept of response spectrum.(4 Hrs)
Unit-III :	Equivalent static lateral earthquake force, study of IS 1893,2002(4 Hrs)
Unit-IV :	Building forms for earthquake resistance. Seismic effects and liquefaction(4 Hrs)
Unit-V :	Earthquake Resistance Design Principles: Design philosophy, Behavior of RC building, ductility and ductile detailing, Design and detailing of beam and columns using IS 13920.(4 Hrs)
Unit-VI :	Seismic design of Masonry Buildings Study of IS 4326, IS 13827, IS 13828, IS 13920(4 Hrs)
1. Dynamics of Structures-Theory and Applications to Earthquake Engineering by A.K. Chopra – Prentice Hall Publications. 2. Earthquake Resistance Design of Structure – S. K. Duggal, Oxford publication. 3. Earthquake Engineering by Manish Shrikhande 4. Earthquake Engineering by D. S. Joshi, Indian Society of Structural Engineering 5. Elements of Earthquake Engineering – Jai Krishna, South Asian Pub. New Delhi 6. Earthquake Resistant, Design of Masonry and Timber Structures – A.S. Arya 7. BMTPC Earthquake Engineering Tips 8. Structural Dynamics - Mario Paz CBS Publication 9. Earthquake Resistant Design of R. C. C. Structures – S. K. Gosh 10. IS 1893:2002: Criteria for Earthquake Resistant Design of structures 11. IS 4326:1993: Earthquake Resistant Design and Construction of Buildings- code of practice 12. IS 13827: Improving Earthquake Resistance of Earthen Buildings- Guidelines 13. IS 13828: Improving Earthquake Resistance of low strength Masonry Buildings- Guidelines 14. IS 13920: Code of practice for Ductility Detailing of reinforced concrete structures subjected to seismic forms.	

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Syllabus of T. Y. B. Tech. (Civil) Semester V

Code No: CED343**Teaching Scheme: 02 Hrs/week****Theory: 02 Hrs/week****Credits: 02****Title: Elective-II (Green Building)****Class Test: 10 Marks****Theory Examination (Duration): 02 Hrs****Theory Examination (Marks): 40 Marks**

Objectives	Main object is to create interest among students in green buildings and motivate them to pursue knowledge in this field. At the end of this course student should gain basic knowledge of the green buildings planning and design.
Unit I	Introduction, Concept of Green Building and Green Architecture; Green building concepts (choice of building materials to where a building is located, how it is designed and operated), Benefits of Green Buildings Materials and Equipment in India, Requisites for Green Building, Important Sustainable features, IGBC-Indian Green Building Council, Green Building Moment in India, TERI - The Energy and Resources Institute (04 Hrs)
Unit II	Launch of Green Building Rating Systems, Residential Sector, Market Transformation; Water Efficiency, Optimum Energy Efficiency, Typical Energy Saving Approach in Buildings. LEED India Rating System and Energy Efficiency, various points calculation ratings e.g. Silver, Gold and platinum, government policies, environmental norms. Planning: Sun diagram, indoor air pollution, LEED credits calculation, resources (04 Hrs)
Unit III	Building elements e.g. door, window, HVAC, paints, landscaping, biodiversity, zero discharge concept, comparison between construction cost & operation cost Materials: Recycled, processed, locally available, sustainable material, new age green materials (04 Hrs)
Unit IV	Elements of Green Buildings (Detail study of): Light, Ventilation, Water recycle & optimization, HVAC SYSTEM, Electric efficiency, Finishing items, Furniture & fixtures, Landscaping, Maintenance (04 Hrs)
Unit V	Green Building Design, Reduction in Energy Demand, Onsite Sources and Sinks, Maximize System Efficiency, Steps to Reduce Energy Demand and Use Onsite Sources and Sinks, Use of Renewable Energy Sources. Eco friendly captive power generation for factory, Building requirement (04Hrs)
Unit VI	Case Study: Industrial Building, Hotel, Residential Building, Commercial complex, Educational Institute, Government building Visit to these places which are in Operation, under construction, study and report (04 Hrs)

Green Buildings: Professional guide to Concepts, Codes & Innovations,	Anthony Floyd	Cengage Learning
Green Buildings: Project planning & cost estimating	Kweku K. Bentil & Carl w. Linde	John Wiley & Sons
Green Building Materials: A guide to product selection & specification	Ross Spiegel & Dru meadows	John Wiley & Sons
Guide to Energy Conservation, energy planning for buildings	Seymour Jermul	Mc Grow-Hill
Energy efficient buildings in India	Mili Muzumdar	Ministry of Nonconventional Energy sources
LEED 2011 FOR INDIA Green Buildings rating system		IGBC, Hyderabad References

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.**Pattern of Question Paper:** The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.**For 80 marks Paper:** Minimum eight questions and four questions in each section. Question no 1 from section A and Question no 5 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for eight marks each. The Question no.1 and 6 should be of objective nature. Two questions of six marks each from remaining questions from each section A and B be asked to solve.

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester V

Code No.: CED321

Practical/Term work: 02 Hrs/week

Credits:01

Title: Lab-I (Design of Steel Structures)

Teachers Assessment: 25 Marks

Practical/Oral Examination: 25 Marks

Objectives	:	The objective of this subject is that the students should be able to analyze and design various types of Steel Structural elements related to Structural Engineering's.
Projects	:	Design of an industrial building with mezzanine floor which should include the following: 1. Design of roof truss 2. Design of Purlins 3. Design of connections 4. Design of Beams 5. Design of Columns 6. Design of Base 7. Design of Beam to beam and beam to column connections 8. Detail design report 9. Shop drawing and structural detailing of the above elements on half imperial drawing sheets (AUTOCAD may be used) Report of a site visit mentioning structural details with relevant sketches of structural connections

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment
- Performing the experiment given in Laboratory

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Syllabus of T. Y. B. Tech. (Civil Engineering) Semester V

Code No.: CED322

Practical/Term work: 02Hrs/week

Credits:01

Title: Lab-II (Environmental Engineering-I)

Teachers Assessment: 25 Marks

Practical/Oral Examination: 25 Marks

Objectives	:	The objective of this subject is student should be able to analyze the various parameters of water for different purposes particularly for drinking purposes.
Projects	:	1. Determination of pH using pH meter 2. Determination of turbidity by titration method 3. Determination of alkalinity by titration method 4. Determination of chloride by titration method 5. Determination of hardness by titration method 6. Determination of fluoride in Spectrophotometer 7. Determination of sulphate in Spectrophotometer 8. Determination of bacteriological colonies using Colony Counter. 9. Detailed design of Water supply system 10. Visit to water treatment plant

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment
- Performing the experiment given in Laboratory

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester V

Code No.: CED323

Practical/Term work: 02Hrs/week

Credits:01

Title: Lab-III (Geotechnical Engineering)

Teachers Assessment: 25 Marks

Practical/Oral Examination: 25 Marks

Objectives	:	“The objective of this course is to introduce the civil engineering students to the behavior of soils under different loading conditions. It explores the natural characteristics, methods of classification and testing of soils as an engineering material.”
List of Practical	:	The term work shall consist of a record of laboratory experiments as mentioned below: 1. Determination of specific gravity 2. Field density test 3. Determination of particle size distribution of soil 4. Determination of Atterberg's Limits 5. Permeability test-variable or constant head method 6. Standard proctor compaction test 7. Direct shear test 8. Unconfined compression test 9. Tri-axial shear test 10. Consolidation test 11. Static cone penetration test 12. Standard Penetration test Note: Minimum 10 experiments should be carried out, out of 8, 9, 10, 11 and 12 four demonstration experiments will be permitted.
Reference Books	:	• Soil Mechanics and Foundation Engg. - B.C.Punmia - Laxmi Publications - 17th edition • Soil Mechanics and Foundation Engg - Dr.K. R. Arora – A. K. Jain for standard publisher's distributors – 7th edition • Basic and applied soil mechanics – Gopal Ranjan and A. S. R. Rao – New age international publishers – 3rd edition • Foundation Engg. - B.J. Kasmalkar - Pune Vidyarthi Griha - 3rd edition • Geotechnical Engineering - C.Verikatramaiah - New Age International publishers

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester V

Code No.: CED324

Practical/Term work: 02 Hrs/week

Credits:01

Title: Lab IV (STAAD.Pro)

Teachers Assessment: 50 Marks

Objectives:

Student will be able to handle STAAD.Pro which is the most popular structural engineering software product for 3D model generation, analysis and design. It has an intuitive, user-friendly GUI, visualization tools, powerful analysis and design facilities.

List of Experiments:

- 1.Elements of the STAAD.Pro Screen
- 2.Starting a New Project/Importing CAD Models
- 3.Defining Structure Geometry/ Modeling
- 4.Setting the Project Units
- 5.Assigning Member Specifications
- 6.How to specify member releases, Additional Member
- 7.Specifications
- 8.Assigning Supports and Loads (Nodal Load and Member Load)
- 9.Creating the Load Cases (Seismic Load Case and Wind Load Case)
- 10.Creating the Combination Load Case
- 11.Performing the Analysis
- 12.Design of Steel Structure and R. C. C. Structure
- 13.Design Viewing the Output File
14. Case study of Residential Building (G+3)

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester V

Code No.: CED325

Practical/Term work: 02Hrs/week

Credits: 01

Title: Lab V (Mini-Project)

Teachers Assessment: 50 Marks

Course Objectives	:	• To plan for various activities of the project and distribute the work amongst team members. • To develop the ability to define and design the problem and lead to its accomplishment with proper planning. • To understand the importance of document design by compiling Technical Report on the Minor Project work carried out. • To develop student s abilities to transmit technical information clearly and test the same by delivery of Seminar based on the Minor Project.
Guidelines	:	• Students should select a problem which addresses some basic home, office or other real-life applications. • Projects which will address the social issues will be given due weightage. • It is desirable that the systems developed by the students have some novel features. • The batch size shall not exceed TWO students per batch. • The students have to select a suitable problem, design, prepare the drawings, produce the components, assemble and commission the project. • Institute may arrange demonstration with poster presentation of all mini projects developed by the students at the end of semester. • At the end of the semester, the students have to prepare and present 20-25 pages project report. • Final evaluation shall be based on continuous internal assessment followed by Viva-Voce.

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No: CED351

Teaching Scheme: 04Hrs/week

Theory: 03 Hrs/week Tutorial: 01 Hrs/week

Credits : 04

Title: Design of RCC Structures

Class Test: 20 Marks

Theory Examination (Duration): 03 Hrs

Theory Examination (Marks): 80

Objective:	“DOS-II (RCC) is the core subject in civil engineering. Without knowledge of this subject students could not design the structures like residential or public buildings.”
Unit 1	Introduction- Stress strain behavior of concrete and steel, Behavior of RCC, Permissible stresses in steel and concrete, Different design philosophies, various limit states, Characteristic strength and characteristic load, Load factor, Partial safety factors. (08 Hrs)
Unit 2	Limit state of collapse (flexure): Analysis and Design of Singly and Doubly Reinforced rectangular sections, singly reinforced T and L beams. (08 Hrs)
Unit 3	Limit state of collapse (shear and bond): Shear failure, Types of Shear reinforcement, Design of Shear reinforcement, Bond-types, Factors affecting bond Resistance, Check for development length. b) Limit state of serviceability: Significance of deflection, IS recommendations, Cracking-classification and Types of Cracks, Causes. (08 Hrs)
Unit 4	a) Design of slabs: Cantilever Slab, simply supported One-way slab, Two way slab with different support conditions as per IS:456-2000 b) Design of Simply Supported single flight and Dog legged staircase. (08 Hrs)
Unit 5	Analysis and Design of axially and eccentrically (uni-axial) loaded circular and rectangular columns, Interaction diagram, Circular column with helical reinforcement. (08 Hrs)
Unit 6	Design of isolated rectangular column footing with constant depth subjected to axial load and moment, Design of combined rectangular footing. (08 Hrs)
Reference	1. Design of R.C. structure, by: A. K. Jain, Published By: NEM chand, Roorkee 2. Design of R.C. structure, by: Dr. Shah & Karve Published By: Structures publishers, pune 3. Design of R.C. structure, by: Ramamurtham Published By: Dhanpat Rai & Sons 4. R. C. C. Designs- Dr. B. C. Punmia 6. Fundamentals of Reinforced Concrete- Sinha and Roy 5. Design of Concrete structures- J. N. Bandopadhyay Other references: 1. IS-456-2000 2. SP-16 3. Hand book of concrete reinforcement & detailing —SP-66 4. Illustrated design of R.C. design DR. Shah & Karve 5. Manuals of R.C.C. Design software like STADD etc.

Pattern of Question Paper: **Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper: Minimum ten questions. Five questions in each section. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No: CED352**Teaching Scheme: 04 Hrs/week****Theory: 03 Hrs/week Tutorial 01 Hrs/wk****Credits: 04****Title: Environmental Engineering II****Class Test: 20 Marks****Theory Examination (Duration): 03 Hrs****Theory Examination (Marks): 80**

Course Objective	:	A Knowledge of Environmental Engineering help the engineers to analyze, think logically and pursue the engineering approach for safe disposal of waste and therefore desires as an integral part of engineering education and training, irrespective of the branch specialization
Unit-I	:	Waste Water Terminology: Terminology in Waste Water-Sewage, Storm Water, Sullage, Sewer, Sewerage. Components of sewerage system, system of sanitation. Sewer System- Types, Layouts, Patterns of Collection System, Design of Sewers, Appurtenances. (08 Hrs)
Unit-II	:	Quality and Characteristics of Waste Water: Physical, Chemical and Biological Parameters, BOD and COD, first and second stage BOD, limitations of BOD, Numerical on first stage BOD, and Basic Microbiology Related to Waste Water. (06 Hrs)
Unit-III	:	Natural Methods of Waste Water Disposal: Methods of disposal, disposal by dilution, Water Quality Modeling (self-purification & Zones of Pollution in streams, Oxygen Sag Curve, Streeter-Phelps Equation) Disposal On Land, Comparison Of Disposal Methods, Inline-Offline Flow Equalization. (10 Hrs)
Unit-IV	:	Waste Water Treatment process and its Design: Layout of STP, Screen, grit chambers, Settling Tanks, Activated Sludge Process, sludge disposal methods, design of various components of Waste Water Treatment Plant. (12 Hrs)
Unit-V	:	Low Cost Waste Water Treatment System and its Design: Objectives of Low Cost Treatment Plant, Types - Aerated lagoon, stabilization pond, Oxidation Ditch, Numerical. Advance Waste Water System: Nitrification and Denitrification, Phosphorous Removal, Removal of Dissolved Inorganic Substances. (06 Hrs)
Unit-VI	:	Environmental Impact Assessment: Introduction, basic fundamental, procedure, main objectives, methods, role of regulatory agencies & controlling board in obtaining environmental clearance for project, public hearing, environmental management plan. (06 Hrs)
Text Books	:	1. Water Supply Waste Disposal and Environmental Engineering --- A. K. Chatterjee, Khanna publishers. 2. Sewage Disposal and Air Pollution --- S. K. Garg, Khanna publishers. 3. Waste Water Engineering --- B. C. Punmia, A. K. Jain, Laxmi publications. 4. Water Supply and Sanitary Engineering --- G. S. Birde, J. S. Birde, Dhanpat Rai publishing company. 5. Waste Water Treatment --- M. N. Rao, A. K. Datta, Oxford and IBH Publication. 6. Environmental Engineering --- Howard S. Peavey and Donald R. Rowe, McGraw-Hill. 7. Waste Water Engineering --- Metcalf and Eddy, Tata McGraw Hill.

Pattern of Question Paper: **Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper: Minimum ten questions. Five questions in each section. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

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(Faculty of Science & Technology)

Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No: CED353

Teaching Scheme: 04 Hrs/week

Theory: 04Hrs/week

Credits:04

Title: Water Resources Engineering-II

Class Test: 20 Marks

Theory Examination (Duration): 03 Hrs

Theory Examination (Marks): 80

Objectives	After the basic study of natural water resources in the earlier course of WRE-I, the objective of this course is to implement basic knowledge to create structures for engineering of water resources and make benefits to mankind by and large.
Unit-I	Planning of Reservoirs: Concept of reservoir and its types based on purpose, Ideal site of reservoir, determination of storage capacity of reservoir by mass curve analysis, life of reservoirs, economic height of dam, various types of dams with relative merits. Numerical on mass curve analysis and economic height of dam. (08 Hrs)
Unit-II	Gravity Dams: Definitions, various forces acting on gravity dams, modes of failure, principle stresses in gravity dams, Low and high gravity dams, stability analysis, design of low and high gravity dams, galleries, joints, keys and crack control in gravity dams, Numerical on stability analysis and principal stresses. (12 Hrs)
Unit-III	A. Earth Dams: Definition, types of earth dams, components and their functions, causes of failure, design criteria, stability analysis, seepage through the body of dam and the foundation of the dam and its control. B. Arch and Buttress Dams: Types and suitability, different forces acting, stability criteria. (04 Hrs)
Unit-IV	A. Diversion Head Works: Layout, Site selection, component, weirs and their types, causes of failure, design of weir by Bligh and Khosla's theory. B. Spillways: Definitions, types, suitability under different conditions, features of construction, design criteria, IS recommendations, spillways gates, and energy dissipation in spillways. (12 Hrs)
Unit-V	Minor Irrigation Works and Practices: Definition and general introduction, isolated tanks and tanks in series, design and selection of a tank bund, tank weirs or surplus escaping weirs, their design principles, tank outlets or sluices and their design principles, Bandhara irrigation, design of Bandharas, K.T. Weirs, Farm irrigation, methods of farm water supplies, on farm structures, introduction to Maharashtra Irrigation Act, Methods of water charge assessment, CADA and participatory irrigation. (08 Hrs)
Unit-VI	Hydro-electric Power: Thermal and hydropower, classification of hydel plants, runoff river plants, storage plants, pumped storage schemes, principal components of hydroelectric plants, forebay, intake structures, penstocks, surge tanks. (04 Hrs)
Reference Books	6. Irrigation and Water Power Engineering, Punmia and Pande, Standard Publishers 7. Irrigation Engineering and Hydraulic Structures, Santoshkumar Garg, Khanna publishers 8. Water supply Engineering, S. K. Garg, Standard Publishers 9. Irrigation, Water Power and Water Resources Engineering, K. R. Arora, Standard Publishers

Pattern of Question Paper: **Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper: Minimum ten questions. Five questions in each section. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No: BSH354

Teaching Scheme: 04 Hrs/week

Theory: 04 Hrs/week

Credits:04

Title: Industrial Management

Class Test: 20 Marks

Theory Examination (Duration): 03 Hrs

Theory Examination (Marks): 80

Objectives	1. Students should understand concept of management 2. Students should understand human resource management, production management, marketing management, financial management and quality management 3. Students should understand modern management techniques
Unit-I	Basics of Management: Introduction , Definition of Management, Characteristics of management, functions of Management – planning, Organizing, Staffing, Directing, Coordinating, Controlling, Motivation, Communication, Decision Making, Principles of management – F. W. Taylor, Henry Fayol, Elton Mayo, Administration and Management, Nature of Management, Levels of Management, Managerial skills, managerial roles, Forms of organization, Line, Line-staff etc. Forms of ownership – Partnership, Proprietorship, joint stock, cooperative society, Government sector etc., concept of globalization. [8 Hours]
Unit-II	Human Resource Management: Objectives of HRM, Strategic importance of HRM, Challenges to HR Professionals, Roles and responsibilities of HR professionals, Human resources planning, talent acquisition, recruitment and selection, Career Planning & Management, Training & Development, discipline and disciplinary action, executive development, need and benefits of good HR policy [8 Hours]
Unit-III	Purchase & Stores Management: Materials Function, Purchasing or Procurement, buying techniques, purchase procedure, vendor selection, vendor rating. Stores management: Introduction to Stores Management, Stores and material control, Receipt and issue of Materials, Concept of inventory control & its objectives, EOQ, ABC analysis, Material Requirement Planning. [8 Hours]
Unit-IV	Production and Quality Management: Types of production, Functions of Production Planning & Control, Plant location and layout, Method Study. Inspection, types of inspection, difference between inspection and quality control, sampling inspection statistical quality control, quality circles, reliability concept. [8 Hours]
Unit-V	Marketing Management & Financial Management: Marketing Management: Introduction, the sales concept, sales vs marketing, market research, sales forecasting, and channels of distribution, pricing. Financial Management: Introduction to financial management, types of capital, sources of finance, assets and Liabilities, factors affecting requirement of working capital, return on investment [8 Hours]
Unit-VI	Modern Management Techniques: Kaizen, Flexible Manufacturing System, Just in Time, Lean Manufacturing, Total Productive Maintenance, Supply Chain Management, Agile Manufacturing, Six Sigma, Management Information System. [8 Hours]
References:	1. O P Khanna, "Industrial Engineering and Management", 2nd Edition, Dhanpat Rai, 2004. 2. Korgaonkar M.G. 'Just In Time Manufacturing', Laxmi Publication. 3. Besterfield Dale H., Besterfield Carol, Total Quality Management 3rd Edn. 4. Chopra Sunil, Meindl Peter, Kalra D.V., Supply Chain Management : Strategy Planning & Operation 6th Edn., Pearson. 5. S. S. Patil & N K Hukeri, Industrial Engineering and Production and Operations Management, Electrotech Publication

	6. S. Sadagopan, Management Information System, PHI Learning. 7. Craig W Baird, The six Sigma Manual for small and Medium Business.
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Pattern of Question Paper: **Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI. Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper: Minimum ten questions. Five questions in each section. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI	
Code No: CED381 Class: T.Y. B.Tech. (All Domains) Teaching Scheme: 04 Hrs/week Credits : 04	Title: Open Elective: Design for Environment Class Test: 20 Marks Theory Examination (Duration): 03 Hrs Theory Exam Marks: 80 Marks
Objectives	This course has been designed to teach about environmental engineering, energy and economy through the use of case studies, computer software tools, and seminars from the point of view of sustainable development and changing societal, industrial demands. Case studies provide the basis for group projects as well as individual theses
Unit: 1	Review of physical, chemical, ecological, and economic principles used to examine interactions between humans and the natural environment. Modeling concepts, applications in all engineering domains [7 Hours]
Unit: 2	Mass balance concepts are applied to ecology, chemical kinetics, hydrology, and transportation; energy balance concepts are applied to design, ecology, and climate change; and economic and life cycle concepts are applied to resource evaluation and engineering design. [7 Hours]
Unit: 3	Design for Environment (DfE) concepts, applications, and Case studies [10 Hours]
Unit: 4	Assessment, Monitoring and control of Rural, Urban and Industrial Pollutions using CDTs [8 Hours]
Unit: 5	Numerical models are used to integrate concepts and to assess environmental impacts of human activities. Problem sets involve development of MATLAB and GIS models for engineering applications in all domains. [8 Hours]
Unit: 6	Emphasis on the principles of infrastructure planning with a focus on appropriate and sustainable technologies incorporating technical, socio-cultural, public health, and economic factors into the planning and design of urban, industrial systems. [8Hours]
Reference:	1. Ecological Water Quality (Water Treatment and Reuse) – Kostas Voudouris and Dimitra Voutsas. 2. Wastewater Engineering- Metcalf and Eddy, McGraw Hill Publication. 3. MATLAB for Engineering Application- Williams J. Palm, Tata McGraw Hill Publication. 4. Application of GIS and Remote Sensing in Environmental Management- S. A. Abbasi, DPH Publications. 5. Harte, John "Consider a Cylindrical Cow: More Adventures in Environmental Problem Solving," Mill Valley, CA: University Science Books, 2001. 6. Fay, James A., and Dan S. Golomb. Energy and the Environment. New York, NY: Oxford University Press, 2002 7. Etter, Dolores. Introduction to MATLAB for Engineers and Scientists. Upper Saddle River, NJ: Prentice Hall, 1996 8. Etter, Dolores, David Kuncicky, and Holly Moore, "Engineering Problem Solving with MATLAB" . Upper Saddle River, NJ: Prentice Hall, 2006. 9. Howard S. Peavy, Donald R. Rowe, George Tchobanoglous "Environmental Engineering" McGraw Higher Ed. ISBN: 9789351340263

Pattern of Question Paper: **Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI. Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No.: AED381

Teaching Scheme: 04Hrs/week

Theory: 04 Hrs/week

Credits : 4

Title: Institute Elective-I (Remote Sensing & GIS)

Class Test: 20 Marks

Theory Examination (Duration): 03 Hrs

Theory Examination (Marks): 80

Objectives	:	To develop applications of environmental remote sensing and GIS which can directly enhance service delivery on land use management, ground water management/prospects, agriculture, forestry, food and water security, disaster management. Present subject is designed for fulfillment of following objectives 1. To understand the fundamental principles and applications of Remote Sensing and Geographical Information Systems. 2. To increase awareness about RS and GIS among students for various researches pertaining to watershed management 3. To describe how geographical information is used and managed.
Unit-I	:	Remote Sensing: Definition, Historical Development, remote sensing system, Multi concept of remote sensing. Advantages and disadvantages in remote sensing, general applications of remote sensing (8Hrs)
Unit-II	:	Electromagnetic radiation: Electromagnetic energy, energy interaction with atmosphere and earth surface, resolutions in remote sensing (8 Hrs)
Unit-III	:	Sensors and Platforms: Classification, Land observation satellites, Weather satellites, Satellite data reception, transmission and processing, Data products, Standard products, Digital data products, (8Hrs)
Unit-IV	:	Image interpretation: Procedure, elements, techniques, equipment's for image interpretation, basic principles of image interpretation, factors governing the quality of an image, factors governing interpretability, visibility of objects, digital image processing, digital image, steps, remote sensing in agriculture progress and prospects, microwave radiometry for monitoring agriculture crops and hydrologic forecasting, aerial photo interpretation for water resources development and soil Conservation survey. (8 Hrs)
Unit-V	:	Geographical Information System: History of development of GIS definition, basic components, GIS input data and output product, general application. (8Hrs)
Unit-VI	:	GIS data: type, representation, source, data sets, acquisition, data structure, data base management systems (DBMS), GIS application. (8Hrs)
Reference Books:	:	1. Remote sensing and Geographical Information System by A. M. Chandra & S. K. Ghosh, Narosa Publishing House, New Delhi 2. Remote Sensing- Principles and Applications by B. C. Panda, Viva book Publication, New Delhi 3. Basics of Remote Sensing & GIS by S. Kumar, an online book published by Laxmi Publications, New Delhi 4. Remote Sensing & GIS by Basudeb Bhatta, an online book published by OUP India

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

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Dr.BabasahebAmbedkarMarathwada University, Aurangabad (Faculty of Science and Technology) Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester VI Code No.: CSE381 Teaching Scheme:04 Hours per week Theory: 04 Hours per week Credits:04 Title: Professional Ethics and Cyber Security Class Test: 20 Theory Examination (Duration): 03 Hrs Theory Examination (Marks): 80	
Objectives	- To make students familiar with the fundamental concepts of computer ethics. - To know the linkage between computer, professional ethics and ethical decision making 3.To know the ethical concepts and ethical theories - To Know the privacy and cyberspace - To know concept of cyber security. - To know the practice of administrating using Cyber Security.
Outcomes	- Illustrate the fundamental concepts of computer ethics with ethical decision making & give correlation - with professional ethics. - Classify features of intellectual property type with their issues in cyberspace. - Identify security perspective of hacking - Apply Ethical Concepts and Ethical Theories to Establishing and Justifying A Moral System - To develop problem solving abilities using Cyber Security 6. Analyze various issues of privacy in cyberspace
Unit-I	: Introduction: Why Computer Ethics?Standard Account: New Possibilities, a Vacuum of Policies, Conceptual Muddles• An Update to the Standard Account. Ethical Decision making: Ethical dilemma, Guidelines for dilemma (Formal and Informal), Solving ethical dilemma,Socio technical Computer Ethics, Micro- and Macro-Level Analysis, Intellectual Property: Copy right, Trade mark, Trade Secret, Patent (8 Hrs)
Unit-II	: Professional Ethics, Codes of Conduct, and Moral Responsibility Professional Ethics: Profession, Professional, Computer/ IT Professional, Computer/IT Professionals Special Moral Responsibilities: Safety-Critical Software, Professional Codes of Ethics and Codes of Conduct: Purpose of Professional Codes, Criticisms of Professional Codes, Defending Professional Codes, Conflicts of Professional Responsibility: Employee Loyalty and Whistle-Blowing, Whistle-Blowing Issues, Strategy for Understanding Professional Responsibility. (8 Hrs)
Unit-III	: Ethical Concepts and Ethical Theories: Establishing and Justifying A Moral System Ethics and Morality: Morality, Rules and Principles of a Moral System, Ethical Theories: Consequence-Based: Utilitarianism, Duty-Based:Deontology, Contract-Based,Rights-Based Contract , Character-Based : Moral Person vs. Following Moral Rules, Acquiring the “Correct” Habits, Integrating Aspects of Classical Ethical Theories into a Single Comprehensive Theory: Moor’s Just-Consequentiality Theory and Its Application to Cyber technology.(8 Hrs)
Unit-IV	: PRIVACY AND CYBERSPACECyber technology Unique or Special, Personal Privacy: Accessibility Privacy, DecisionalPrivacy, InformationalPrivacy, Comprehensive Account of Privacy, Privacy as “Contextual Integrity”, Privacy Important: Intrinsic Value, Social Value. Gathering Personal Data: Dataveillance Techniques, Internet Cookies, RFID Technology, Cyber technology and Government Surveillance, Exchanging Personal Data: Merging Computerized Records, Matching Computerized Records.Protecting Personal Privacy in Public Space: Search Engines and the Disclosure of Personal Information, Accessing Online Public Records.(8 Hrs)
Unit-V	: Security Basics: Introduction, Elements of Information security, Security Policy, Techniques, steps, Categories, Operational Model of Network Security, Basic Terminologies in Network Security. Intrusion and Firewall: Introduction, Intrusion detection, IDS: Need, Methods, Types of IDS, Password Management, Limitations and Challenges, Firewall Introduction, Characteristics and types, Benefits and limitations. Trusted Systems, Access Control.(8 Hrs)
Unit-VI	: Security perspective of Hacking and its counter major’sRemote connectivity and VoIP hacking, Wireless Hacking, Mobile Hacking, HackingHardware, Application and data Hacking, Mobile Hacking, Counter majors: GeneralStrategies, Example Scenario’s: Desktop, Servers, Networks, Web, Database, Mobile.(8 Hrs)

Reference Books:	:	• Computer Ethics by Deborah Johnson 4th edition • Ethics and Technology Controversies, Questions, and Strategies for Ethical Computing by HERMAN T. TAVANI, 4th Edition, Wiley publication • Dr. V.K. Pachghare, Cryptography and Information Security, PHI, ISBN 978-81-303-5082 • Nina Godbole, Sunit Belapure, Cyber Security, Wiley India, ISBN:978-81-345-2179
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Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of T. Y. B. Tech. (Electrical Engineering) Semester-VI

Code No.: EED381

Teaching Scheme: 4 hrs/week

Theory: 4 hrs/week

Credits:4

Title: Open Elective-I: Robotics and Automation

Class Test (Marks): 20

Theory Examination (Duration): 3 Hr

Theory Examination (Marks): 80

Objectives	:	- Describe the history and early beginnings of automated manufacturing & Robotics. Ability to recognize industrial control problems. - Aims to Develop Understanding Robotics Components. - Apply creative approaches to practical applications, identify technological opportunities in robotics. - An over view of technology of advanced topics such as CNC Machines, Human Robot Interaction. - The ability to provide Automation solution.				
Unit-I	:	Introduction to Automation: Types of Automation; Architecture of Industrial Automation Systems, Advantages and limitations of Automation, Effects of modern developments in automation on global competitiveness. Introduction of CNC Machines: Basics and need of CNC machines, NC, CNC and DNC (Direct NC) systems, Structure of NC systems, Applications of CNC machines in manufacturing, Advantages of CNC machines. (8 Hrs)				
Unit-II	:	Robotics: Robot Anatomy-Definition, law of robotics, History and Terminology of Robotics-Accuracy and repeatability of Robotics-Simple Problems Specifications of Robot-Speed of Robot-Robot joints and links-Robot Classifications-Architecture of robotic systems-Robot Drive Systems Hydraulic, Pneumatic and Electric system. (8Hrs)				
Unit-III	:	Robot Transformation, Sensors & End effectors: Transformation types: 2D, 3D. Translation-Homogeneous coordinates multiple transformation-Simple problems. Sensors in robot – Touch Sensors-Tactile sensor – Proximity and range sensors Robotic vision sensor-Force Sensor-Light sensors, Pressure sensors End effectors: Mechanical Grippers-Slider crank mechanism, Screw type, Rotary actuators, cam type-Magnetic grippers- Vacuum Grippers-Air operated grippers-Gripper force analysis-Gripper Design-Simple problems. (8Hrs)				
Unit-IV	:	Kinematics: Rigid body Kinematics, Inverse Kinematics, Rotation matrix, Homogenous transformation matrix, Denavit - Hartenberg convention, Euler angles, RPY representation, Direct and inverse Kinematics for industrial robots for position and orientation Redundancy, Manipulator, Jacobian Joint, End effector, velocity – direct and inverse velocity analysis. Control: Individual joint computed torque. (8Hrs)				
Unit-V	:	Dynamics: Lagrangian Dynamics, link inertia tensor and manipulator inertia tensor, Newton-Euler Dynamics of Robot, Newton-Euler formulation for RR & RP manipulators, Dynamics of systems of Interacting Rigid Bodies, D-H Convention, Trajectory planning for Flexible Robot, Cubic polynomial linear segments with parabolic blending, static force and moment transformation, solvability, stiffness, Singularities. (8Hrs)				
Unit-VI	:	Robot Control & Applications 6L Control approaches: oscillatory based time varying control law, control law based on vector field orientation approach. Advanced strategies of control: conventional aerial vehicle, Bidirectional X4-flyer. Applications of Fuzzy Logic and Neural network in Robot Control, Neural controllers, Implementation of Fuzzy controllers: Trajectory tracking controller. Applications of Robotic system: complex control system, vision system in complex control system. Human Robot Interaction: Architecture. (8 hrs)				
Text books	:		Title	Author	Publication	Edition
		1	Robotics and Automation Handbook	Thomas R. Kurfess,	CRC Press	2004, ISBN 0-8493-1804-1
Reference Books		2	Robot Motion and Control (Recent Developments)	M.Thoma& M. Morari	Infinity Science Press,	2018
		3	Welding Robots -Technology, System Issues and Applications	J. Norberto Pires, AltinoLoureiro and Gunnar Bölmsjö	Springer-Verlag	2006, ISBN-10:1852339535
		4	Robotics: Designing the Mechanisms for Automated Machinery	Ben-Zion Sandler,	Academic Press,	2nd ed.1999

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Dr.BabasahebAmbedkarMarathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI Code No.: ETC381 Teaching Scheme: 04Hrs/week Theory: 04Hrs/week Credits:04 Title: Internet of Things Class Test (Marks): 20 Theory Examination (Duration): 03 Hrs Theory Examination (Marks): 80	
Prerequisites	: Python Fundamentals, basics of electronics, Networking fundamentals, WWW terminology
Objectives	: - To understand IOT value chain structure (device, data cloud), application areas and technologies involved - To understand IOT sensors and technological challenges faces by IoT devices. - Explore and learn about Internet of things with the help of projects
Outcomes	After completion of this course, students should be able to: 1. Distinguish between the various elements of IoT 2. Decide which sensors to use based upon given application 3. Decide which protocols to use based upon given application 4. Distinguish between various means of communication 5. Perform data analytics on the data received from IoT based solutions 6. Develop architecture of IoT based application for given problem.
Unit-I	: Introduction to IoT: Definition of IOT- Evolution of IOT and related terms, hardware, software, network stack for IoT, Business Scope, SAAS Model, Industry 4.0. (8 Hrs)
Unit-II	: Elements of IoT: Introduction to elements of IOT, Basic Architecture of an IOT application sensors, and Actuators – Edge Networking (WSN) – Gateways – IOT Communication Model – WPAN and LPWA, 6LoPAN, Sigfox, Introduction to basis looping and conditional statements, basics of HTML.(8 Hrs)
Unit-III	: IoT Sensors: Node MCU ESP 8266- hardware specification, GPIO programming, WIFI connectivity programming, Access Point Programming. (8 Hrs)
Unit-IV	: Communication and Connectivity Technologies: Introduction to: TCP/IP, UDP, NTP, MQTT, Network and Sockets, WIFI. Cloud Computing in IOT - IOT Communication Model – Cloud Connectivity, Things speak, ‘100’, HCR. (8 Hrs)
Unit-V	: Data Analytics and IOT Platforms: Basics of statistics, Descriptive statistics and probability distributions. Big Data Analytics - Hadoop, Data Visualization – radar charts, – IOT Platforms- Microsoft Azure and Amazon Web Services, IBM Watson, Google Home and Amazon’s Alexa (8 Hrs)
Unit-VI	: Preparing IoT Projects (Creating the sensor project with Node MCU ESP 8266 - Sensor libraries - Interacting with the hardware, Internal representation of sensor values - Persisting data - External representation of sensor values - Exporting sensor data - Creating the actuator project Hardware - Interfacing the hardware - Creating a controller - Representing sensor values - Parsing sensor data - Calculating control states. (8 Hrs)
Reference Books:	: Text Books: - The Internet of Things: Applications and Protocols, Wiley publications. Author(s): Oliver Hersent, David Boswarthick, Omar Elloumi - Architecting the Internet of Things, Springer publications. Author(s): Dieter Uckelmann, Mark Harrison, Florian Michahelles - Internet of Things with Arduino Cookbook, Packt Publications. Author(s): Marco Schwatz Reference Books: - Internet of Things and Data Analytics, Wiley Publications

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI	
Course Code: MED381 Teaching Scheme: 04 Hrs/week Theory: 04 Hrs/week Credits: 04	Course: Costing and Financial Management Class Test: 20 marks Theory Examination (Duration): 03 Hrs Theory Examination (Marks): 80
Objectives	: 1. To understand the basic concepts and processes used to determine product costs, 2. To be able to analyze and evaluate information for cost ascertainment, planning, control and decision making, 3. To develop ability to analyse and interpret various tools of financial analysis and planning, 4. To gain knowledge of management and financing of working capital, 5. To understand concepts relating to financing and investment decisions
Unit-I	: Costing: Methods of costing and elements of cost. Material Cost: Different methods of pricing of issue of materials. Labour Cost: Different methods, wages and incentive plans. Principles of good remunerating system, labour turnover. Depreciation: Concept, importance and different methods of depreciation (8 Hrs)
Unit-II	: Overheads: Classification, collection of overheads, Primary and Secondary apportionment of overheads, absorption of overheads- Machine hour and labour hour rate. Under and over absorption of overheads. (8 Hrs)
Unit-III	: Standard costing: Concept, development and use of standard costing, variance analysis. Marginal Costing: Use of Marginal Costing in decision-making. Capital Budgeting: Control of Capital Expenditure, techniques of capital budgeting –Pay Back Method, Accounting rate of return, Internal Rate of Return, DCF, Net Present Value and profitability index. (8 Hrs)
Unit-IV	: Introduction to Financial Management: Concept of business finance, Goals & objectives of financial management, Sources of financing - LONG TERM: shares, debentures, term loans, lease & hire purchase, retained earnings, public deposits, bonds (Types, features & utility), SHORT TERM: bank finance, commercial paper, trade credit & bills discounting, INTERNAL: Retained earnings, Cost of Capital & Means of Finance. (8 Hrs)
Unit-V	: Financial Statement Preparation, analysis & Interpretation: Preparation of financial statement and Profit & Loss Account, Balance Sheet. Ratio Analysis: Classification, Ratio Analysis and its limitations, Index Statement & Common Size Statement. (8 Hrs)
Unit-VI	: Working Capital Management: Concept and design of Working Capital, types of working capital, sources of working capital, Time value of money, definition of cost and capital, Cash management, creditors management, debtor's management. (8 Hrs)
Text Books	: 1. Bhattacharya A. K., "Principles and Practice of Cost Accounting", Prentice Hall India. 2. B K Bhar, "Cost Accounting – Methods and Problems", Academic Publishers 3. Khan M. Y., Jain P. K., "Financial Management", Tata McGraw Hill 4. Pariasamy P., "Financial, Cost & Management Accounting", HH Publication
Reference Books	: 1. Colin Drury, "Management and Cost Accounting", English Language Book Society, Chapman and Hall London. 2. Tulsian P. C., "Financial Management", S. Chand.

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No.: PPE381**Teaching Scheme: 4 hrs/week****Theory: 4 hrs/week****Credits:4****Title: Open Elective-I: Introduction to Nanotechnology****Class Test (Marks): 20****Theory Examination (Duration): 3 Hrs****Theory Examination (Marks): 80**

Objectives	:	1. To study the introduction to nanomaterials and the factors affecting it. 2. To study the types and synthesis methods of nanomaterials. 3. To study the characterizations and properties of nanomaterials. 4. To study the different applications of nanomaterials.				
Unit-I	:	Introduction: Introduction to nanotechnology, conventional micro vs. Nano-material properties, role of size in properties of Nano-materials, length scale and surface to volume concept, and uniqueness of nanostructured materials; health hazards and handling of nanomaterials.(4 h)				
Unit-II	:	A) Types of Nano-Materials: Montmorillonite, Layer double hydroxide (LDH), Carbon nanofibers (CNFs) – vapour grown carbon fibres (VGCs), Polyhedral Oligomeric Sisoquioxane (POSS), Carbon nanotubes, Nano-silica, Nano-aluminium oxide, Nano-titanium oxide, Nano-hybrids. B) Synthesis: Bottom-up and Top-down approach for nano materials synthesis, Methods: Ball Milling, Chemical vapor deposition, Pressure vapor deposition, Ultrasound assisted, Minimuslusion, Microemulsion, Nanoemulsion, Hydrothermal, Sol-gel, Miscellaneous techniques. (12 h)				
Unit-III	:	Properties of Nanomaterials in terms of Structure Property Relationship: Thermal properties, Mechanical properties, Gas barrier properties, Flame retardant properties, Electrical and electrochemical properties, Electronic properties, Optical properties, Magnetic properties, Biodegradable properties, Antimicrobial properties, Catalytic properties.(8 h)				
Unit-IV	:	Preparation of Polymer Nanocomposites: Solution intercalation, Melt intercalation, Roll Milling, Emulsion Polymerization,In-Situ Polymerization.(6 h)				
Unit-V	:	Characterization of Nanomaterials and Nanocomposites: X ray diffraction (XRD), Dynamic light scattering (DLS), Scanning electron microscopy (SEM), Transmission electron microscopy (TEM), Energy dispersive x-ray spectroscopy (EDS), Atomic force microscopy (AFM), Small angle X ray scattering (SAXS), Differential scanning calorimetry (DSC), Thermo gravimetric analysis (TGA). (10 h)				
Unit-VI	:	Application of Nanomaterials and Nanocomposites: Biomedical-Drug delivery, Bone replacement; Sensors – gas sensor, Metal adsorption and recovery, Bio-molecule detectors; Energy storage and conversion - Super capacitors, Solar cells, Energy generators; Electronics; Self-cleaning&Self-healing paints, Nano-engineering of cement-based materials,Agricultural Nanotechnologies.(8 hrs)				
Reference books	:		Title	Author	Publication	Edition
		1	Polymer Nanocomposites Processing, Characterization, and Applications	Joseph H. Koo	McGraw-Hill Nanoscience and Technology Series	1 st 2006
		2	Encyclopedia of Nanoscience and Nanotechnology	Hari singhNalwa	American Scientific publishers	-
		3	Nanoparticle Technology Handbook	M Hosokawa, K Nogi, M Naito, T Yokoyama	Elsevier	-
		4	The Science of Nanotechnology: An introductory text	Luanne Tilstra et al	Nova Science Publishers, Inc.	-
		5	Polymer-Layered Silicate and Silica	Y.C. Ke, P.	Elsevier	2005

		Nanocomposites	Stroeve		
	6	Nanotechnology in concrete – A review	Florence Sanchez, Konstantin Sobolev	Construction and Building Materials, Elsevier	24 (2010) 2060–2071
	7	Agricultural Nanotechnologies: What are the current possibilities?	Claudia Parisi et al	Nano Today, Elsevier	2014

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science and Technology) Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI Code No.: CED356 Teaching Scheme: Theory: 02 Hrs./ week Credits:02 Course Title: Transportation Engineering-I Class Test (Marks): 10 Theory Examination (Duration): 02hrs Theory Examination (Marks): 40	
Course Objectives	: The primary objective of this course is to introduce to transportation engineering principles for Bridges and tunnels with emphasis on the safe and efficient operation of ways. The students will be able to evaluate, analyze, design optimize, simulate, and present a through description of analysis process. To give an overview of the transportation engineering in railway engineering, Introduction to Bullet Train Metro Train, Monorail. To expose the various aspects of planning and design of Rail Transportation.
Unit-I	: Bridge Engineering: Definition & components of bridges, classification of bridges, Preliminary data to be collected for selection of bridge site, Stages of Investigation, Alignment, Traffic requirement of highway bridges, Waterway of bridge, Maximum flood discharge, Afflux, Approaches, Clearance and free board, Economic Span. (04Hrs)
Unit-II	: Substructures and Superstructures: Abutments, Piers, Wing Walls, Setting out for piers and abutments, Materials for substructures Superstructures: Types of Bridges on the basis of Fixed Span and Movable Spans- Simple, continuous, cantilever, Arch, Suspension, Bow-String girder Bascule, Cut-boat, Flying, Lift, Swing, and Transporter & Traversing types Bridges. Suspension, Bow- String girder, Bridge flooring & its Types Temporary Bridges: types Bridges. Culverts: Definition, Waterway of a culvert, Types of culverts. (04Hrs)
Unit-III	: Loading on Bridges: Buoyancy Pressure, Centrifugal forces, Dead Load, Live Load, and Wind Load, Bearing: Definition, Purposes, and its importance. Types of Bearings, Maintenance of bearings Maintenance of Bridges. (04Hrs)
Unit-IV	: Railway Engineering: Railway Track, its construction and maintenance the permanent way, requirement of permanent way, gauges, sleeper ballast, function of rails Requirement of rails, buckling of rails Rail Failures Rail joints, Creep, different theories of creep, prevention of creep, Coning of wheel. Rail fixtures & fastenings, Different fixtures their purposes (04 Hrs)
Unit-V	: Railway Track: Rail Track on curve, Type of Gradient Grade compensation on curve, Ruling gradient, momentum gradient, pusher gradient, Cant deficiency, Negative cant. Points & Crossing, Different terms used necessity of points & crossing types of crossing, Track junctions. (04 Hrs)
Unit-VI	: Railway Station & Signals: Station Yards and its type, requirement & Classification of Station, their purposes, location. Signaling& interlocking: Necessity of interlocking, principles & object of signaling & interlocking, Types of signals, location and purpose. (04 Hrs.)
Text Books	: 1. Bridge Engineering- Rangwala- Charotar Publishing House Pvt. Ltd. 1986. 2. Bridge Engineering- S. P. Bindra- Dhanpat Rai Publications 1992. 3. Railway Engineering- S.C. Saxena-Dhanpat Rai Publications 2015. 4. Railway track Engineering: J. S. Munday, Tata Mc. Graw Publishing Co. Ltd. 5. Transportation Engineering: N. L. Arora, New India Publication.

Pattern of Question Paper: **Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI. Pattern of Question Paper: The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper: Minimum EIGHT questions. FOUR questions in each section. Question no 1 from section A and Question no 5 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for EIGHT marks each. The Question no.1 and 6 should be of objective nature. Two questions of SIX marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No: CED371

Teaching Scheme: 02 Hrs/week

Practical / Term Work: 2 Hrs/week

Credits : 01

Title: Lab-V [Design of RCC structures]

Teacher Assessment: 25 Marks

External Assessment: 25 Marks

Objectives: To understand actual working out quantities of various items of works including writing specification, rate analysis and actual procedure of contracts and tendering.

List of Practical:

Part A: - TW shall consist of detailed design and drawing based on structural planning and designing of R.C.C residential/ public building (G + 2) by limit state method. It shall include analysis and design of all structural members as per IS -456 -2000. The drawing shall be submitted on at least three full imperial size sheets.

Part B: - Any of the above two structural components must be designed by the latest R.C.C design software like STAAD etc. Programmes may also be developed using excel.

Practical Exam: Shall consist of sketching and Viva-voce based on the designing and drawing work done during the term.

Reference Books:

1. IS-456-2000
2. SP-16
3. Hand book of concrete reinforcement & detailing —SP-66
4. Illustrated design of R.C. design DR. Shah & Karve
5. Manuals of R.C.C. Design software like STADD etc.

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Oral examination conducted on the syllabus and term work mentioned above

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No: CED 372

Practical: 02 HRS/week

Course Title: Lab-VI (Environmental Engineering II)

Term Work (Marks): 50 Credits: 01

Course Objectives	:	A Knowledge of Environmental Engineering help the engineers to analyze ,think logically and pursue the engineering approach for safe disposal of waste and therefore desires as an integral part of engineering education and training, irrespective of the branch specialization
List of Practical	:	Experiments: Waste water quality analysis for the following parameters 1. Determination of pH. 2. Determination of Total solids. 3. Determination of SVI 4. Determination of BOD @ 3 days and 5 days 5. Determination of COD 6. Determination of Characterization of waste water from any two sources, interpretation of results 7. Design of waste water system 8. Visit to waste water treatment plant 9. Visit to dairy industry 10. Layout of the treatment plant

Term Work assessment shall be done on the basis of performing the experiments in the laboratory and Continuous assessment. Practical Examination, if applicable, shall be conducted on the syllabus and term work mentioned above.

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code: CED373

Practical / Term work: 02 Hrs/week

Credits: 01

Title: Lab-VII (Water Resources Engineering-II)

Teachers Assessment: 25 Marks

Practical / Oral Examination: 25 Marks

Objectives	The objective of this subject is student should be able to design the various types of dams with various capacities and design of minor irrigation works.
Assignments based on -	1. Reservoir storage capacity. 2. Economic height of dam. 3. Stability of gravity dams. 4. Principal stresses in gravity dams. 5. Phreatic line location in earth dams. 6. Design of ogee shaped spillway. 7. Bligh's theory and Khosla's theory. 8. Theoretical assignment on minor irrigation works. 9. Theoretical assignment on hydroelectric power plant. 10. A visit to Dam/Weir/ Hydroelectric power plant.

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment
- Performing the given assignment/design in laboratory.

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No : CED374

Title : Lab-VIII (Engineering Geology)

Teachers Assessment: 50 Marks.

Practical / Term Work: 2 Hrs/week

Credits: 1

Course Objective	:	The objective of this Course is to focus on the core activities of engineering geologists – site characterization and geologic hazard identification and mitigation. Through lectures, labs, and case study examination student will learn to couple geologic expertise with the engineering properties of rock and unconsolidated materials in the characterization of geologic sites for civil work projects and the quantification of processes such as rock slides, soil-slope stability, settlement, and liquefaction
List of Practical	:	The term work shall consist of a record of laboratory experiments as mentioned below: Experiment 1: Mineralogy -Study of physical properties of minerals, Identification of minerals: Silica group: (Quartz, Amethyst, Opal); Feldspar group: (Orthoclase, Plagioclase); Cryptocrystalline group: (Jasper); Carbonate group: (Calcite); Element group: (Graphite); Pyroxene group: (Talc); Mica group: (Muscovite); Amphibole group: (Asbestos, Olivine, Hornblende, Magnetite, Hematite, Corundum, Kyanite, Garnet, Galena, Gypsum) Experiment 2: Igneous Petrology - Study of mineral composition. texture, classification of igneous rocks. Identification of rocks (Igneous Petrology): Acidic Igneous rock: (Granite and its varieties, Syenite, Rhyolite, Pumice, Obsidian, Scoria, Pegmatite and Volcanic Tuff) Basic rock: (Gabbro, Dolerite, Basalt and its varieties, Trachyte.) Experiment 3: Sedimentary Petrology - Study and classification of secondary and sedimentary rocks. Study and characteristic of secondary rocks. Study and identification of following secondary rocks. Identification of rocks (Sedimentary Petrology): Laterite, Conglomerate, Breccia, Sandstone and its varieties, Laterite, Limestone and its varieties, Shales and its varieties. Experiment 4: Metamorphic Petrology - Study and types of structures of metamorphic rocks. Identification of rocks (Metamorphic Petrology): Marble, slate, Gneiss and its varieties, Schist and its varieties. Quartzite, Phyllite. Experiment 5: (4 Maps) Study of topographical features from Geological maps. Identification of symbols in maps. Study of geological maps and drawing vertical section of map no.1 (simply dipping beds). Study of map no.4 to map no.7-study of five geological maps with simply dipping, with strike fault, with dip fault and with engineering problems related to selection of dam site, location of tunnel, stability of hill slopes. Drawing and vertical geological sections of each step.
Reference Books	:	1. 'Engineering and General Geology', Parbin Singh, 8th Edition (2010), S K Kataria & Sons. 2. 'Engineering Geology', N.C. Kesavulu, 2nd Edition (2009), Macmillan Publishers India. 3. 'Geology for Geotechnical Engineers', J. C. Harvey, Cambridge University Press (1982). 4. Engineering Geology - S. K. Garg - Khanna Publications – 5th edition 5. Structural Geology – Billings - Prentice Hall of India, New Delhi – 3rd edition

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No.: CED375

Teaching Scheme: 02 Hrs/week

Practical: 02 Hrs/week

Title: Project I

Practical Examination(Marks): 50

Credits:01

Objectives	:	The Projects in the undergraduate study of engineering aims at developing in the student, knowledge and skills to match the current and projected needs of industry, society or user systems and to create social awareness and professional attitudes. Apart from monitoring the engineering processes and maintenance of engineering work, machines and equipment's, an engineer has to do investigate survey, collect data, refer handbooks/datasheets, prepare estimates and design the systems.
Outcomes	:	Upon studying this course student will be able to, 1. Conduct surveys and investigate the field situation, collect, analyse and synthesize the data. 2. Apply knowledge to solve real time/field problems 3. Develop inquisitive, innovative skills and confidence to work independently. 4. Work effectively in team. 5. Plan and organize the work properly.
Contents	:	• The completion of project is to be carried out in two semesters i.e. in T.Y. Sem. VI and final year B. Tech Sem. VII. • The students shall form project group of maximum 3 students for within department projects and maximum of 6 students in case of interdepartmental projects of their choice. • The student's groups shall collect the information on the topic/area of interest and submit brief synopsis to Project Coordinator. • The Project Coordinator shall allot the Project Guide depending upon the area or specialization of eligible faculty members from the department. • The individual student from the project group shall maintain the project diary and update weekly by taking remark of respective guide. • The industry sponsored projects and inter departmental projects shall be encouraged and in case of inter departmental projects, students of maximum 3 different departments/disciplines shall work together by forming the group. The guide allotment and internal/external assessment of such groups shall be done by the respective departments. • The projects addressing issues related to environmental, rural development and societal issues shall be preferred. • The selected project shall help to promote participation in government approved schemes like Unnat Maharashtra Abhiyaan (UMA) and Unnat Bharat Abhiyaan (UBA). • The students shall aim to promote their project work in project exhibitions/competitions, paper presentation/publication in reputed journals and conferences. • The relevance of project and implementation including details of attainment of POs and PSOs addressed through the projects with justification must be clearly stated. Phases of Project Part- I: Phase I: Problem Identification, Literature survey, data collection, deciding scope of topic and objectives of the project. Phase II: Confirmation of block diagram or layout of the proposed project. Phase III: Submission of small report of project work.

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Syllabus of T.Y.B. Tech. (Electronics and Telecommunication Engineering) Semester-VI

Code No.: BSH801

Title: Audit I: Japanese Language module

Teaching Scheme: 02 Hours per week

Examination Scheme

Theory: 02 Hours per week

Total Marks: 50 (Continuous Assessment)

Objectives	• Students will be able to apply communicative Japanese Grammar in communication. • Students will be able to enhance the level of Japanese vocabulary. • Students will be able to pronounce and articulate words as well as sentences accurately. • Students will be able to understand and apply Japanese language eventually. • Students will be able to develop Japanese language skills. • Students will be able to manage situational communication in Japanese.
Unit-I	: Introduction - Introduction - Numbers - Days, Months, Dates [5 Hours]
Unit-II	: Grammar - Verb and verb forms - Present and Past Tense [5 Hours]
Unit-III	: Communication - Introduction of Japanese script - Dialogues (Shopping, in the restaurant) - Themes: Family, my city, my country, my friend [10 Hours]

List of	Sr. No.	Title	Author	Publication
	1	Japanese Kanji for	Timothy G. Stout	Tuttle Publishing

Reference		Beginners	and Kaori Hakone	
Books	2	Essential Japanese Grammar: A Comprehensive Guide to Contemporary Usage	Masahiro Tanimori and Eriko Sato Ph.D.	Tuttle Publishing
	3	15-Minute Japanese: Learn in Just 12 Weeks	D.K. Goel and Rajesh Goel	Amazon.in
	4	Oxford Japanese Grammar and Verbs (Dictionary)	Bunt Jonathan	Oxford Publication
	5	Read and write Japanese scripts: Teach yourself	Helen Gilhooly	Teach Yourself
	6	Complete Japanese Beginner to Intermediate Book and Audio Course: Learn to read, write, speak and understand a new language with Teach Yourself	Helen Gilhooly	Teach Yourself

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science and Technology) Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester VI Code No.: CSE801 Title: Cybercrime and law Teaching Scheme: 02 Hours per week		
Objectives	1. To introduce the cyber world and cyber law in general 2. To enhance the understanding of problems arising out of online transactions and provide them to find solutions 3. To examine the effects of cybercrime through the experiences of victims and law enforcement 4. To know the technologies that stand behind certain cybercrimes, 5. Students identify and analyse statutory, regulatory, constitutional, and organizational laws that affect 6. The information technology professional. 7. Students distinguish enforceable contracts from non - enforceable contracts.	
Outcomes	1. Understand the structure and evolution of the Internet and its basic operations in the context of the emerging crime threats and trends in cyberspace and law related to that. 2. Identify and evaluate the data protection. 3. Evaluate approach of E contract and E commerce. 4. Analyse the impact of computer crime on government, businesses and individuals and discuss the impact of cybercrime on society. 5. To clarify the Intellectual Property issues in the cyber space and the growth and development of the law in this regard 6. Identify and evaluate trends in cybercrime and its legal framework.	
Unit-I	: Introduction Overview of Computer and Web Technology, Need for Cyber Law, Cyber Jurisprudence at International and Indian Level	(04Hrs)
Unit-II	: Jurisdictional Aspects in Cyber Law Issues of jurisdiction in cyberspace, Types of jurisdiction, The Test evolved, Minimum Contacts Theory, Sliding Scale Theory, Jurisdiction under IT Act, 2000.	(04Hrs)
Unit-III	: Cyber Crimes & Legal Framework Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Identity Theft & Fraud, Cyber Terrorism, Right to Privacy and Data Protection on Internet, Different offences under IT Act, 2000	(04Hrs)
Unit-IV	: Digital signature and Electronic Signature and Data Protection Concept of public key and private key, Certification authorities and their role, Creation and authentication of digital signature, Concept of electronic signature certificates, Electronic Governance	(04Hrs)
Unit-V	: E Contracting & E Commerce Salient features of E-contract, Formation of E-contract and types, E-mail Contracting, Indian Approach on E-contracts, E-commerce-Salient Features and advantages, Models of E-commerce like B2B, B2C, Indian Laws on E-commerce	(04 Hrs)
Unit-VI	: Intellectual Property Issues in Cyber Space Copyright Law, Patent Law, Trademarks & Domain Names Related issues, Dispute Resolution in Cyberspace	(04 Hrs)
Reference Books:	: 1. Karnika Seth, Computers, Internet and New Technology b Laws, Lexis Nexis Butterworths Wadhwa Nagpur. 2. Chris Reed & John Angel, Computer Law, OUP, New York, (2007). 3. Cyber Crime An Introduction by Prasad R.S. 4. Cyber Laws by Ed. Kumar Krishna	

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science and Technology) Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI Code No.: CED801 Teaching Scheme: 2Hrs/week Course Title: Road Safety Management	
Course Objectives	: To acquire knowledge and understanding of the road environment. To inculcate decision making and behavioral skills necessary to survive in the road environment. To impart knowledge and understanding of the causes and consequences of accidents. To understand roles and responsibilities in ensuring road safety.
Unit-I	: Introduction to Road Safety & Planning. Road traffic accidents scenario in India and in world. Road Safety and its importance. Traffic Rules and Driving Behavior. Characteristics of accidents, accidents vs. crash. Need of Road Safety. Awareness about rules and regulations of traffic. Assisting Traffic control authorities. Multidisciplinary approach to planning for traffic safety and injury control. Vulnerable road users: crashes related to pedestrian and bicyclists, their safety, provision for disabled. (04Hours)
Unit-II	: Traffic Signs, signals & traffic furniture & Role of traffic signals. Warning, cautioning & Informing sign. Location of Road sign, Traffic signals. Road Marking: Colour of road marking, kerb marking, night driving aid, traffic light signals. Types of Signals. Road safety tips for different categories of Road users. Causes of accidents, prevention & 1st aid to accident victim. Rules on road. Necessity of traffic lights. Major violations leading to accidents. (04Hours)
Unit-III	: Responsibility of Road accidents and Safety measures. People responsible for accident prevention: Police, Politicians, Community members, Policy makers, Teachers, Parents, Infrastructure authorities, Drivers and Official road safety body. Reasons of students/ children have accidents. 4 E's of Accidents Prevention: 1. Engineering - by altering the environment 2. Enforcement - by imposing laws 3. Encouragement - by the use of publicity campaigns 4. Education - by gaining and using knowledge. (04 Hours)
Unit-IV	: Road Safety Education & Events. Introduction to Road Safety Education. 5 P's of Road safety education: 1. Pre-school road safety education 2. Practical rather than theory education 3. Principles of own development about road safety education 4. Presentations on road safety education 5. Place for road safety education in syllabus. Discussions on efforts done by Government on Road Safety. Workshop on Road Safety week/ Organization of seminar on Road Safety. (04 Hours)
Unit-V	: Traffic Flow Analysis. Macroscopic, Microscopic & Mesoscopic approach Types of Flow, Traffic stream characteristics, Space, Time diagram, Relationship between speed, flow & density, Level of service & capacity analysis, Shockwave theory. (04 Hours)
Unit-VI	: Road Safety Audit. Global & Local perspective, Road safety issues, Road safety programmes, types of RSA, planning, design, construction & operation stage audits, Methodology, Road safety audit measures (04 Hours)
Text Books	: 1. Traffic Flow Theory & Control- D. R. Drew- McGraw Hill, New York, 1968. 2. Traffic Engineering and Transport Planning- L.R. Kadiyali- Khanna Publishers, New Delhi, 2002. 3. Transportation Engineering-An Introduction- C. J. Khisty- Prentice-Hall, NJ, 2005 4. Traffic Flow Fundamentals- A. D. May- Prentice – Hall, Inc., New Jersey, 1990. 5 Highways- Traffic Planning & Engineering- C. A. O'Flaherty- Edward Arnold, UK 6. Traffic Engineering – Theory & Practice- L. J. Pignataro- John Wiley, 1985. 7. Highway Traffic Analysis and Design, R. J. Salter, N. D. Hounsel- Macmillan, London, 1996. 8. Traffic Engineering & Transport Planning- L. R. Kadiyali- Khanna Publishers, 2003.

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(Faculty of Science and Technology)

Syllabus of T.Y. B. Tech. (Civil Engineering) Semester VI

Code No.: BSH801

Course Title: Value Education

Teaching Scheme: 2Hrs/week

Course Objectives	The students will be able to: • Understand the need of values and its classification in contemporary society. • Appreciate the values needed for peaceful society like democratic, secular, and socialist etc. Become aware of role of education in building value as dynamic social reality. • Know the importance of value education towards personal, national and global development.
Unit: 1	Introduction to Value Education: Value Education, Purpose of Value Education as specifying the present deterioration in the value system in the fast-changing world trends. [4Hours]
Unit: 2	Importance of Values in Life: What is a Value system? What kinds of values need to be inculcated? Eg.. Ethical, moral and spiritual instead of materialistic values, value inculcation, trend of values such as a permissive culture. [4 Hours]
Unit: 3	Character Building: Advantages of good character, importance of trust, honesty, integrity, morality, and reliability as qualities of a good character. Building Relationship-Group Behaviour, limitations of a relationship. How to be a better person, better manager and better Engineer? [4 Hours]
Unit: 4	The Purpose of Life & Education: Meaning, purpose of one's life, Destination success - why are you here? How to make every day worth living? [4 Hours]
Unit: 5	Values For Personal Life & Professional Life: Self-sovereignty-Discernment-Decision making-Self-actualization, Caring-Patience-Honesty-Forgiveness, Competence-Co-operation-Perseverance, Flexibility-Reliability-Tolerance-Unity-Knowledge Thirst, Sincerity in Profession, Regularity, Punctuality, Faith [4 Hours]
Unit: 6	Value Education towards National and Global Development: Constitutional Values: Sovereign, Democracy, Socialism, Secularism, Equality, Justice, Liberty, Freedom, Fraternity. Social Values: Pity and Probity, Self-Control, Universal Brotherhood. Religious and Moral Values: Tolerance, Wisdom, character. Aesthetic Values: Love and Appreciation of literature, fine arts and respect for the same. Environmental Ethical Values. National Integration and international understanding. Need of Humanistic value for espouse peace in the society? Conflict of cross-cultural influences, cross-border education [4 Hours]
Reference:	1. Sharma, S.P. Moral and Value Education; Principles and Practices, Kanishka publishers, 2013. 2. Kiruba Charles & V. Arul Selvi. Value Education: Neelkamal Publications, New Delhi, 2012. 3. Passi, B.K. and Singh, P. Value Education. National Psychological Corporation, Agra. 2004. 4. Chitakra, M.G.: Education and Human Values, A.P.H. Publishing Corporation, New Delhi. 2003. 5. Monica J. Taylor. Values in Education and Education in Value. Routledge. 1996. 6. Neil Postman. The End of Education: Redefining the Value of School. Vintage publisher. 1996. 7. http://cbseportal.com/exam/e-books/download-free-ncert-e-book-education-for-values-in-school-a-framework\ 8. http://cbseacademic.in/web_material/ValueEdu/Value%20Education%20Kits.pdf

Dr.BabasahebAmbedkarMarathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of T. Y. B. Tech. (Electronics and Telecommunication Engineering) Semester VI Code No.: ETC801 Title: Audit Course-I (Smart Cities) Teaching Scheme: 2 Hrs/week Theory: 02Hrs/week	
Objectives	• To identify urban problems. • To study Effective and feasible ways to coordinate urban technologies. • To study models and methods for effective implementation of Smart Cities. • To study new technologies for Communication and Dissemination. • To study new forms of Urban Governance and Organization.
Outcomes	• Better understanding of the dynamic behavior of the urban system by going beyond the physical appearance and by focusing on representations, properties and impact factors. • Exploration of the city as the most complex human-made organism with a metabolism that can be modeled in terms of stocks and flows. • Knowledge about data-informed approaches for the development of the future city, based on crowd sourcing and sensing. • Knowledge about the latest research results in for the development and management of future cities. • Understanding how citizens can benefit from data-informed design to develop smart and responsive cities
Unit-I	Understanding Inclusive Planning Definition and components; urban consultations; basic principles of urban consultation, process of urban consultations; urban strategic planning, good urban governance, subsidiarity, equity, efficiency, transparency and accountability, civic engagement and citizenship, security; valuing difference and working with diversity; livable cities; (4Hrs)
Unit-II	Participatory Planning Process and Policies, Programmes and Legislation Methods, role of stakeholders (including civil society organizations), etc.; Related Acts, Five year plans, policies and programmes at various levels (4Hrs)
Unit-III	Smart Cities Innovation economy (Innovation in industries, clusters, districts of a city; Knowledge workforce: Education and employment; Creation of knowledge-intensive companies) (4Hrs)
Unit-IV	Smart Cities Urban Infrastructure (Transport, Energy/ Utilities, protection of the environment and safety); Governance (Administration services to citizens, participatory and direct democracy, services to the citizen, quality of life) (4 hrs)
Unit-V	Planning interventions - I Inclusive zoning, development and building regulations, Slum Improvement; drafting strategic urban development plans – objectives and key actors; planning framework for actions, process of drafting the plan, key considerations. (4Hrs)
Unit-VI	Planning interventions - II - Urban design and decision-making; city transport for all; water supply and sanitation, urban disaster management, management through decentralization (4Hrs)
Reference Books:	1. Jo Beall (1997); "A city for all: valuing differences and working with diversity"; Zed books limited, London (ISBN: 1-85649-477-2) 2. UN-Habitat; "Inclusive and sustainable urban planning: a guide for Municipalities"; Volume 3: Urban Development Planning (2007); United Nations Human Settlements Programme (ISBN: 978-92-1-132024-4) 3. Arup Mitra; "Insights into inclusive growth, employment and wellbeing in India"; Springer (2013), New Delhi (ISBN: 978-81-322-0655-2) 4. William J. V. Neill (2004); "Urban Planning and cultural identity"; Routledge, London (ISBN: 0-415-19747-3)

	5. John S. Pipkin, Mark E. La Gory, Judith R. Balu (Editors); “Remaking the city: Social scienceperspective on urban design”; State University of New York Press, Albany (ISBN: 0-87395-678-8) 6. Giffinger, Rudolf; Christian Fertner; Hans Kramar; Robert Kalasek; NatašaPichler-Milanovic;EvertMeijers (2007). "Smart cities – Ranking of European medium-sized cities". Smart Cities.Vienna: Centre of Regional Science 7. "Draft Concept Note on Smart City Scheme". Government of India - Ministry of UrbanDevelopment (http://indiansmartcities.in/downloads/CONCEPT_NOTE_-3.12.2014__REVISED_AND_LATEST_.pdf)
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(Faculty of Engineering & Technology)

Syllabus of T. Y. B. Tech. (Mechanical) Part-II Semester VI

Code No.: MED- 801

Teaching Scheme:

Theory: 2

Title: Rural Community Engagement

Theory Examination (Duration): 02hrs.

Objectives	:	1. To provide practical opportunities for students for participation in rural community mobilization, service engagement and empowerment activities. 2. To promote preparation of strategies for building resilience and community responding system in nutrition, water, food safety and healthcare.
Unit-I	:	Dynamics Of Rural Society, Panchayat Raj System: Social, Economic, Political and Cultural Community Goal Setting : SAGY, MPLADS, UMA and UBA(4Hrs)
Unit-II		Approaches and Methods, Community Project Proposal and Project Management, Concept and Steps, Thematic Maps, Social Map Transect Walk, Seasonal Map, Natural and Human Resource Mapping and Management, Ethnographic Research (5Hrs)
Unit-III		Vulnerability, Rural Resilience - Risk Reduction, Role and Responsibilities Rehabilitation: Social, Physical and Psychological Aspect Increasing Efficiency in Water, Energy, Sanitation and Waste (Solid and Liquid) Management(5Hrs)
Unit-IV		Engagement With School for Competency Enhancement/Health Centre/Panchayat/Gram Sabha/SHGs Awareness: Rural Health Management, Indigenous or Folk Medicine and Hygiene/ Sports/ Rights/ Policies and Programs/ Transparency/Corruption/Social Benefits, addressing Issue In inclusive and Inclusive Identification of Beneficiaries, Improving Implementation Efficiencies While Plugging Leakages In Benefits Scheme, Direct Benefit Transfer(4 Hrs)
Unit-V		Making of Gram Panchayat Development Plan Including Aspects and Process of Preparation of Village Disaster Management Plan(3Hrs)
Unit-VI		Village Livelihoods, Rural Tourism, Entrepreneurship, Appropriate Technology Access Including Digitized Transaction.(3Hrs)
Reference Books:	:	1. Katar Singh "Rural development-Principles, Policies and Management" SAGE Publication 1999. 2. Agoramoorthy Govindaswamy "Sadguru Model of Rural Development: Elevates Food Security and Ease Poverty" Daya Publishing House, a division of Astral International Pvt. Limited, 2016 3. V.Gopalkrishnan Asari "Technological Change for Rural Development in India". B.R. Publisher 4. B.S. Gautam "Cooperatives And Rural Development In India" Radha Publications
Outcomes		After completion of the course, the students will be able to: 1. Understand the social, economic, political and cultural framework of the rural society 2. Address the challenges with suitable responses for the identified rural issues 3. Engage in the management of the rural community

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(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (Electronics and Telecommunication Engineering) Semester-VI

Code No.: BSH803

Title: Audit I: German Language Module

Teaching Scheme: 02 Hours per week

Examination Scheme

Theory: 02 Hours per week

Total Marks: 50 (Continuous Assessment)

Objectives	• Students will be able to apply communicative German Grammar in communication. • Students will be able to enhance the level of German vocabulary. • Students will be able to pronounce and articulate words as well as sentences accurately. • Students will be able to understand and apply German language eventually. • Students will be able to develop German language skills. • Students will be able to manage situational communication in German. .			
Unit-I	:	Introduction - Self –Introduction - Nos. up to 10,000 - Weekdays, Months - Date and Time - Greetings [5 Hours]		
Unit-II	:	Vocabulary - My house - My family - Daily routine - Hobbies - Food [5 Hours]		
Unit-III	:	Grammar - Verb forms (Present Tense) - Articles - Possessive pronouns - Auxiliary verbs - Wh-Questions / Yes-No Questions - Past-Tense of haben and sein [10 Hours]		
List of	Sr.	Title	Author	Publication

Reference	No.			
Books	1	German Made Simple: Learn to speak and understand German quickly and easily	Arnold Leitner PhD	Namrata's Amazon.in
	2	The Everything Learning German Book: Speak, write, and understand basic German in no time	Edward Swick	Adams Media
	3	Langenscheidt German in 30 Days	Von Angelika G. Beck	Langenscheidt
	4	Complete German Beginner to Intermediate Book and Audio Course: Learn to read, write, speak and understand a new language with Teach Yourself	<u>Heiner Schenke</u>	The McGraw Hill
	5	German: How to Speak and Write It (Beginners' Guides)	Joseph Rosenberg	Repro Books
	6	Collins Easy Learning – Collins Easy Learning German Grammar and Practice	Collins	Collins