POLYTECHNIC ENGINEERING

Sri Satya Sai University of Technology And Medical Sciences, Sehore (M.P.)

Syllabus of Examination - AICTE Pattern

Undergraduate Diploma Courses in Engineering & Technology

Department of CIVIL Engineering

Semester-V

Course Code	**DCEA- 501**
Course Title	**Design of Steel and RCC Structures**
Number of Credits	3 (L:3; T:0; P:0)

Course Objectives:

- To learn the concept of limit state design for tension and compression steel members.
- To learn the concept of limit state design of steel beams.
- To understand design of RCC elements.
- To know the design of short and long RCC columns.

Course outcomes:

After competing this course, student will be able to perform:

- Design of steel tension and compression member.
- Design of steel I and Channel sections.
- Design of singly and doubly reinforced RCC beam.
- Design of RCC beam for shear and development length.
- Design of short and long RCC columns.

Unit – I Design of Steel Tension and Compression Members (Limit State Method)

Types of sections used for Tension members. Strength of tension member by- yielding of section, rupture of net cross-section and block shear. Design of axially loaded single angle and double angle tension members with bolted and welded connections. Types of sections used as compression member, Calculation of effective length, Radius of gyration and slenderness ratio, Permissible values of slenderness ratio as per IS 800, Design compressive stress. Introduction to built up sections, lacing and battening (Meaning and purpose), Diagrams of single and double lacing and battening system. (No numerical problems). Design of axially loaded single and double angle struts connected by bolted and welded connections with gusset plate.

Unit– II Design of Steel beams (Limit State Method)

Standard beam sections, Bending stress calculations. Design of simple I and channel section. Check for shear as per IS 800.

Unit– III Design of Reinforced Concrete Beams by Limit State Method

Concept of Limit state, Stress block diagram, Introduction to singly and doubly reinforced sections, IS 456. Design of singly reinforced beam, concept of under reinforced, over reinforced and balanced
section, Simple numerical problem on ultimate moment of resistance and design of beam section. Design of doubly reinforced sections, stress and strain diagrams, depth of neutral axis, simple numerical problems on ultimate moment of resistance of reinforced beam, Calculation of Ast and Asc.

Unit– IV Shear, Bond and Development length in Design of RCC member

Nominal shear stress in RCC section, Design shear strength of concrete, Design of shear reinforcement, Minimum Shear Reinforcement, Provisions of IS 456, forms of shear reinforcement. Types of bond, Bond stress, check for bond stress, Determination of Development length in tension and compression members and check as per codal provisions, Anchorage value of 900 hook, Lapping of bars. Simple numericals on: Shear reinforcement, Adequacy of section for shear. Introduction to serviceability limit state check.

Unit– V Design of axially loaded RCC Column

Definition and classification of column, Limit state of compression members, Effective length of column. Provisions of IS 456 for minimum steel, cover, maximum steel, spacing of ties etc. Design of axially loaded short column - Square, Rectangular, and Circular only.

Suggested learning resources:

• Shah, V. L., and Gore, V., Limit State Design of Steel Structures, Structures Publications, Pune.
• Dayarathnam P., Design of Steel Structures, S. Chand and Company, Delhi.
• Subramanian N., Design of Steel Structures, Oxford University Press.
• Sairam, K.S., Design of Steel Structures, Pearson Publication, Chennai, Delhi.
• Shah, V. L., and Karve, S.R., Limit State Theory and Design of Reinforced Concrete Structures, Structures Publications, Pune,2014.
• Sinha N.C., and Roy S.K., Fundamentals of Reinforced Concrete, S. Chand & Co., New Delhi.
• Krishna Raju, and N. Pranesh, R.N., Reinforced Concrete Design Principles and Practice, New Age International, Mumbai.
• Pillai, S.U., and Menon, Devdas, Reinforced concrete Design, McGraw Hill Publications, New Delhi.
• Varghese, P. C., Limit State Design of Reinforced Concrete, Prentice Hall India Learning Private Limited, Delhi.

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Department of CIVIL Engineering

Semester-V

Course Code	**DCEA- 501**
Course Title	**Design of Steel and RCC Structures**
Number of Credits	1 (L:0; T:0; P:2)

Course Objectives:

- To learn the concept of limit state design of tension and compression steel members.
- To understand design of steel beams.
- To learn the concept of limit state design of RCC beams.
- To know the limit state design of RCC columns.

Course outcomes:

After competing this course, student will be able to perform:

- Design of steel tension and compression member.
- Design of steel beams including check for shear.
- Design of singly and doubly reinforced RCC beam.
- Design of shear reinforcement in RC beams.
- Design of RCC column as per IS 456.

List of Practical to be performed:

1. Draw any five commonly used rolled steel sections and five built up sections.
2. Summarize the provisions of IS 800 required for the design of tension member in report form.
3. Compile relevant clauses from IS 800 required for the design of a compression member and submit it in report form.
4. Draw sketches for single & double lacing of given built up columns.
5. Draw sketches for battening of given built up columns.
6. Prepare a report on the IS 800 provisions pertaining to design of lacing & battening along with its significance.
7. Draw cross section, strain diagram & stress diagram for singly reinforced section.
8. Draw cross section, strain diagram & stress diagram for doubly reinforced section.
9. Design simply supported I section steel beam for udl.
10. Design beams section for shear as per IS 800 provisions.
11. Draw sketches of different types of column footings.
12. Interpret the actual RCC Structural Drawings used on site with reference to reinforcement details of various structural elements.
13. Prepare a checklist for reinforcement provided from actual drawings used on site for various structural elements.
14. Prepare a detailed report of site visit for reinforcement detailing of structural elements like beams, columns, staircase & footing.
15. Prepare a detailed report of site visit for study of rolled steel tension & compression members used in various structures.

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Semester-V

Course Code	**DCEA -502**
Course Title	**Estimating and Costing**
Number of Credits	3 (L:3; T:0; P:0)

Course Objectives:

- To learn the procedure for estimating and costing of Civil Engineering works.
- To perform rate analysis for different items associated with construction projects.
- To use software for detailed estimate related to civil infrastructural projects.

Course outcomes:

After competing this course, student will be able to:

- Select modes of measurements for different items of works.
- Prepare approximate estimate of a civil engineering works.
- Prepare detailed estimate of a civil engineering works.
- Use relevant software for estimating the quantities and cost of items of works.
- Justify rate for given items of work using rate analysis techniques.

Unit – I Fundamentals of Estimating and Costing

Estimating and Costing – Meaning, purpose, Administrative approval, Technical Sanction and Budget provision. Types of estimates – Approximate and Detailed estimate. Types and Uses of Estimates: Revised estimate, Supplementary estimate, Repair and maintenance estimate, renovation estimate. Roles and responsibility of Estimator. Checklist of items in load bearing and framed structure. Standard formats of Measurement sheet, Abstract sheet, Face sheet. Modes of measurement and desired accuracy in measurements for different items of work as per IS:1200. Rules for deduction in different category of work as per IS:1200. Description / specification of items of building work as per PWD /DSR.

Unit– II Approximate Estimates

Approximate estimate- Definition, Purpose. Methods of approximate estimate - Service unit method, Plinth area rate method, Cubical content method, Typical bay method, Approximate quantity method (with simple numericals). Approximate estimate for roads, Railways, bridges/culvert, irrigation projects and water supply projects.

Unit– III Detailed Estimate

Detailed Estimate- Definition and Purpose, Data required for detailed estimate - Civil cost, GST, Contingencies, Supervision charges, Agency charges, Procedure for preparation of detailed estimate Taking out quantities and Abstracting. Methods of Detailed Estimate- Unit quantity method and total quantity method (with simple numericals). Long wall and Short wall method, Centre line method. Bar bending schedule for footing, column, beam, Lintel, chajja and slab elements. Provisions in detailed estimate: contingencies, work charged establishment, percentage, charges, water supply and sanitary Charges and electrification charges etc. Prime cost, Provisional sum, Provisional quantities, Bill of quantities, Spot items or Site items.

Unit– IV Estimate for Civil Engineering Works

Earthwork - Quantities for roads, Embankment and canal by – Mid sectional area method, mean sectional area method, Prismoidal and trapezoidal formula method. Detailed estimate for septic tank, Community well. Use of computer /softwares / programmes for detailed estimate Preparation of Civil Engineering Works.

Unit– V Rate Analysis

Rate Analysis: Definition, purpose and importance. Lead (Standard and Extra), lift, overhead charges, water charges and contractors' profit, Procedure for rate analysis. Task work- Definition, types. Task work of different skilled labour for different items. Categories of labours, their daily wages, types and number of labours for different items of work. Transportation charges of materials - Lead and Lift, Hire charges of machineries and equipments. Preparing rate analysis of different items of work pertaining to buildings and roads.

Suggested learning resources

1. Datta, B.N., Estimating and Costing in Civil engineering, UBS Publishers Distributors Pvt. Ltd. New Delhi.
2. Peurifoy,Robert L. Oberlender,Garold, Estimating construction cost (fifth edition), McGraw Hill Education, , New Delhi.
3. Rangwala,S.C., Estimating and Costing, Charotar Publishing House PVT. LTD., Anand.
4. Birdie,G.S., Estimating and Costing, Dhanpat Rai Publishing Company(P) Ltd. New Delhi.
5. Patil,B.S., Civil Engineering Contracts and Estimates, Orient Longman, Mumbai.
6. Chakraborti,M., Estimating and costing, specification and valuation in civil engineering, Monojit Chakraborti, Kolkata.
7. PWD Schedule of Rates.
8. Ministry of Road Transport and Highways (MORT&H) Specifications and Analysis of Schedule of Rates.
9. Manual of Specifications and Standards for DBFOT projects, EPC works.

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Semester-V

Course Code	**DCEA -502**
Course Title	**Estimating and Costing**
Number of Credits	1 (L:0; T:0; P:2)

Course Objectives:

• To learn the procedure for estimating and costing of Civil Engineering works.
• To perform rate analysis for different items associated with construction projects.
• To use software for detailed estimate related to civil infrastructural projects.

Course outcomes:

After competing this course, student will be able to:
• Select modes of measurements for different items of works.
• Prepare approximate estimate of a civil engineering works.
• Prepare detailed estimate of a civil engineering works.
• Use relevant software for estimating the quantities and cost of items of works.
• Justify rate for given items of work using rate analysis techniques.

List of Practical to be performed:

1. Prepare the list of items to be executed with units for detailed estimate of a given structure from the given drawing.
2. Prepare a report on market rates for given material, labour wages, hire charges of tools & equipments required to construct the given structure as mentioned in at Serial number 1 above.
3. Study of items with specification given in the DSR (for any ten item).
4. Recording in Measurement Book (MB) for any four items.
5. Prepare bill of quantities of given item from actual measurements. (any four items).
6. Prepare approximate estimate for the given civil engineering works.
7. Calculate the quantity of items of work from the given set of drawings using standard measurement sheet for load bearing residential structure using description of item from DSR (1BHK Building with staircase).
8. Prepare detailed estimate from the given set of drawings using “standard measurement and abstract format” for RCC framed structure using description of item from DSR along with face sheet and prepare quarry chart, lead statement (G+1 Building) .
9. Calculate the reinforcement quantities from the given set of drawings for a room size of 3 m X 4 m with bar bending schedule (footing, column, beam, lintel with chajja, slab).
10. Prepare rate analysis for the given five item of works.
11. Prepare detailed estimate of road of one kilometre length from the given drawing.
12. Prepare detailed estimate of small Septic tank from the given set of drawings.
13. Prepare detailed estimate of well from the given set of drawing.
14. Use the relevant software to prepare detailed estimate of a Road.
15. Use the relevant software to prepare detailed estimate of a residential building.

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Semester-V

Course Code	**DCEA- 503**
Course Title	Elective – II (A) Traffic Engineering
Number of Credits	3 (L:3; T:0; P:0)

Course Objectives:

Following are the objectives of this course:

- To understand the issues involved in traffic flow.
- To know and understand the tools for traffic studies.
- To delineate various traffic control measures.
- To understand measures for preventing accidents.

Course outcomes:

After competing this course, student will be able to:

- Analyze road traffic characteristics.
- Undertake various types of road traffic studies.
- Use relevant road traffic signs, signal and markings.
- Identify the intersection depending on the traffic flow.
- Suggest preventive measures to avoid accidents by analyzing the traffic conditions at site.

Unit – I Fundamentals of Traffic Engineering.

Traffic engineering- Definition, objects, scope. Relationship between speed, volume and density of traffic Road user's characteristics-physical, mental, emotional factors. Vehicular characteristics-width, length, height, weight, speed, efficiency of breaks. Road characteristics - gradient, curve of a road, design speed, friction between road and tyre surface. Reaction time - factors affecting reaction time. PIEV Theory.

Unit– II Traffic Studies

Traffic volume count data- representation and analysis of data. Necessity of Origin and Destination study and its methods. Speed studies - Spot speed studies, and its presentation. Need and method of parking study.

Unit– III Road Signs and Traffic Markings

Traffic control devices –definition, necessity, types. Road signs - definition, objects of road signs. Classification as per IRC: 67-Mandatory or Regulatory, Cautionary or warning, informatory signs, Location of cautionary or warning sign in urban and non-urban areas, Points to be considered while designing and erecting road signs. Traffic markings- definition, classification, carriage way, kerb, object marking and reflector markers.

Unit– IV Traffic Signals and Traffic Islands

Traffic signals- Definition, Types, Traffic control signals, pedestrian signals. Types of traffic control signals - Fixed time, manually operated, traffic actuated signals and location of signals. Compute signal time by fix time cycle, Webster's and IRC method and sketch timing diagram for each phase. Traffic islands Definition, advantages and disadvantages of providing islands. Types of traffic islands - rotary or central, channelizing or Refuge Island. Road intersections or junctions - Definition, Types of road intersection. Intersection at grade- Types, basic requirements of good intersection at grade. Grade

separated intersection- advantages and disadvantages, types - flyovers-partial and full Cloverleaf pattern, Diamond intersection, Trumpet type, underpass.

Unit– V Road Accident Studies and Arboriculture

Road Accidents-Definition, types and causes for collision and non-collision accidents. Measures to prevent road accidents. Collision and condition diagram. Street lighting –definition, necessity, types-luminaire, foot candle, lumen, factors affecting their utilization and maintenance. Arboriculture- definition, objectives, factors affecting selection of type of trees. Maintenance of trees-protection and care of road side trees.

Suggested learning resources:

1. Khanna S.K., Justo, C E G and Veeraragavan, A., Highway Engineering, Nem Chand and Brothers, Roorkee.
2. Kadiyali L.R., Transportation Engineering, Khanna Book Publishing Co., Delhi
3. Vazirani, V N , Chaondola, S P, Transportation Engineering Vol. I & II, Khanna Publishers. Delhi.
4. Saxena, S C, Traffic planning and design, Dhanpat Rai & Sons Delhi.
5. Kumar R S, Introduction to Traffic Engineering, University Press (India), Pvt. Ltd.

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Department of CIVIL Engineering

Semester-V

Course Code	**DCEA- 503**
Course Title	Elective – II (B) **Solid Waste Management**
Number of Credits	3 (L:3: T:0: P:0)

Course Objectives:

Following are the objectives of this course:

• To know various sources of solid.
• To learn techniques of collection and transportation of solid waste.
• To know various methods of disposal of solid waste.
• To understand and identify different biomedical and E-waste and their subsequent disposal techniques.

Course outcomes:

After competing this course, student will be able to:

• Identify the sources of solid waste.
• Select the relevant method of collection and transportation of solid waste.
• Suggest an action plan for composting of solid waste.
• Devise suitable disposal technique for solid waste
• Use the relevant method for disposal of Bio-medical and E-waste.

Unit – I Introduction

Definition of solid waste, different solid waste – domestic Waste, commercial waste, industrial waste, market waste, agricultural waste, biomedical waste, E-waste, hazardous waste, institutional waste, etc. Sources of solid waste, Classification of solid waste – hazardous and non- hazardous waste. Physical and chemical characteristics of municipal solid waste.

Unit– II Storage, Collection and Transportation of Municipal Solid Waste

Collection, segregation, storage and transportation of solid waste. Tools and Equipment-Litter Bin, Broom, Shovels, Handcarts, Mechanical road sweepers, Community bin - like movable and stationary bin. Transportation vehicles with their working capacity -Animal carts, Auto vehicles, Tractors or Trailers, Trucks, Dumpers, Compactor vehicles. Transfer station- meaning, necessity, location. Role of rag pickers and their utility for society.

Unit– III Composting of Solid Waste

Concept of composting of waste, Principles of composting process. Factors affecting the composting process. Methods of composting – Manual Composting – Bangalore method, Indore Method, Mechanical Composting – Dano Process, Vermi composting.

Unit IV Techniques for Disposal of Solid Waste

Solid waste management techniques – solid waste management hierarchy, waste prevention and waste reduction techniques Land filling technique, Factors to be considered for site selection, Land filling methods-Area method, Trench method and Ramp method, Leachate and its control, Biogas from landfill, Advantages and disadvantages of landfill method, Recycling

of municipal solid waste Incineration of waste: Introduction of incineration process, Types of incinerators - Flash, Multiple chamber Incinerators, Products of incineration process with their use, Pyrolysis of waste – Definition, Methods.

Unit– V Biomedical and E-waste management

Definition of Bio medical Waste. Sources and generation of Biomedical Waste and its classification. Bio medical waste Management technologies. Definition, varieties and ill effects of E- waste, Recycling and disposal of E- waste.

Suggested learning resources:

1. Gupta O.P, Elements of Solid Hazardous Waste Management, Khanna Book Publishing Co., Delhi Ed. 2018
2. Bhide, A. D., Solid Waste Management, Indian National Scientific Documentation Centre, New Delhi.
3. George Techobanoglous, Kreith, Frank., Solid Waste, McGraw Hill Publication, New Delhi.
4. Sasikumar, K., Solid Waste Management, PHI learning, Delhi.
5. Hosetti, B.B., Prospect and Perspectives of Solid Waste Management, New Age International Publisher.

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Undergraduate Diploma Courses in Engineering & Technology

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Semester-V

Course Code	**DCEA- 504**
Course Title	Elective – III (A) **Pavement Design and Maintenance**
Number of Credits	3 (L:3: T:0: P:0)

Course Objectives:

Following are the objectives of this course:

- To know types of pavements and their uses.
- To learn issues in design of flexible and rigid pavements.
- To understand methods of pavement evaluation.
- To learn pavement maintenance methods.

Course outcomes:

After competing this course, student will be able to:

- Identify the components of the given type of pavement.
- Suggest the type of pavement for the given situation.
- Design the flexible pavement using the provisions of IRC
- Design the concrete pavement using the provisions of IRC
- Decide type of maintenance required under different damaged conditions

Unit – I Basics of pavement Design

Types of pavement - Flexible, Rigid and Semi Rigid Comparison of Rigid and flexible pavement according to Design precision, life maintenance, initial cost, stages of construction, availability of materials, surface characteristic, penetration of water in the pavement, utility location, glare and night visibility. Functions and characteristics of pavement. Factors affecting selection of type of pavement.

Unit– II Fundamentals of pavement design

Factors affecting pavement design-design wheel load ,Traffic factors, Environmental factors, Road geometry and material, Characteristics of soil and Drainage situation.

Unit– III Design overview of Flexible and Concrete pavement

Methods of flexible pavement design-Theoretical method, Empirical method with and without soil strength test. IRC37 guidelines for design of flexible pavement (overview only), Factors affecting design of concrete pavement. IRC58 guidelines for design of concrete pavement (overview only). Joints-Need, Types, requirements, spacing of joints.

Unit– IV Pavement evaluation

Definition and purpose of pavement evaluation Methods of Pavement evaluation –Visual rating, Pavement serviceability index, Roughness, measurements, Benkelman Beam deflection method

Unit V - Pavement Maintenance

Types of pavement maintenance - routine, periodic, and special. Need for inspection and maintenance schedule. Causes of pavement failure and remedial measures. Typical flexible and rigid pavement failures. Types and causes of damages in flexible pavement, surface defects, cracks. Deformations. Rutting, fatigue, settlement and upheaval. Disintegration- loss of

aggregate, stripping, pothole. Remedial measures - slurry seal, liquid seal, fog seal, patching, ready mix patch. Types of damages to rigid pavement - cracking, spalling, slab rocking, settlement, joint sealant failure. Methods repair of spalled joints, full depth reconstruction, replacement of dowel bars.

Suggested learning resources

1. Kadiyali, L.R., Highway Engineering, Khanna Book Publishing House, New Delhi (ISBN: 978-93-86173-133).
2. Chakroborty, Partha Das, Animesh., Principles of Transportation engineering, Prentice-Hall of India Pvt.Ltd
3. Vazirani, V N, Chaondola, S P., Transportation Engineering Vol. I & II, Khanna Publishers. Delhi
4. Yoder, E J, Principles of Pavement Design, Wiley India Pvt Ltd.
5. Bindra, S P., Highway Engineering, Dhanpat Rai Publications (P) Ltd.
6. Kumar R S, Pavement Evaluation and Maintenance Management system, University Press (In-dia), Pvt. Ltd.
7. Sharma S K, Principles, Practice and Design of Highway Engineering, S Chand, New Delhi.

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Semester-V

Course Code	**DCEA- 504**
Course Title	Elective – III (B) **Green Building and Energy Conservation**
Number of Credits	3 (L:3: T:0: P:0)

Course Objectives:

- To know various aspects of green buildings
- To use different steps involved in measuring environmental impact assessment.
- To relate the construction of green building with prevailing energy conservation policy and regulations.
- To know and identify different green building construction materials.
- To learn different rating systems and their criteria.

Course outcomes:

After completing this course, student will be able to:

- Identify various requirements for green building.
- Use different steps in environmental impact assessment.
- Relate the construction of green building with prevailing energy conservation policy and regulations.
- Supervise the construction of green building construction using green materials.
- Focus on criteria related to particular rating system for assessment of particular Green building.

Course Content:

Unit I : Introduction to Green Building and Design Features

Definition of Green Building, Benefits of Green building, Components/features of Green Building, Site selection, Energy Efficiency, Water efficiency, Material Efficiency, Indoor Air Quality. Site selection strategies, Landscaping, building form, orientation, building envelope and fenestration, material and construction techniques, roofs, walls, fenestration and shaded finishes, advanced passive heating and cooling techniques, waste reduction during construction.

Unit–II Energy Audit and Environmental Impact Assessment (EIA)

Energy AudiT: Meaning, Necessity, Procedures, Types, Energy Management Programs. Environmental Impact Assessment(EIA): Introduction, EIA regulations, Steps in environmental impact assessment process, Benefits of EIA, Limitations of EIA, Environmental clearance for the civil engineering projects.

Unit– III Energy and Energy conservation

Renewable Energy Resources: Solar Energy, Wind Energy, Ocean Energy, Hydro Energy, Bio-mass Energy. Non-renewable Energy Resources: Coal, Petroleum, Natural Gas, Nuclear Energy, Chemical Sources of Energy, Fuel Cells, Hydrogen, Biofuels. Energy conservation: Introduction, Specific objectives, present scenario, Need of energy. conservation, LEED India Rating System and Energy Efficiency.

Unit– IV Green Building

Introduction: Definition of Green building, Benefits of Green building, Principles: Principles and planning of Green building. Features: Salient features of Green Building, Environmental design (ED) strategies for building construction.

Process: Improvement in environmental quality in civil structure.

Materials: Green building materials and products- Bamboo, Rice husk ash concrete, plastic bricks, Bagasse particle board, Insulated concrete forms. reuse of waste material-Plastic, rubber, Newspaper wood, Nontoxic paint, Green roofing.

Unit V Rating System

Introduction to (LEED) criteria, Indian Green Building council (IGBC) Green rating, Green Rating for Integrated Habitat Assessment. (GRIHA) criteria. Heating Ventilation Air Conditioning (HVAC) unit in green Building. Functions of Government organization working for Energy conservation and Audit(ECA)- National Productivity council(NPC). Ministry of New and Renewable Energy (MNRE). Bureau of Energy efficiency (BEE).

Suggested learning resources:

1. Kibert, C.J., Sustainable construction: Green Building design and Delivery, John Wiley Hoboken, New Jersey.
2. Chauhan, D S Sreevasthava, S K., Non-conventional Energy Resources, New Age International Publishers, New Delhi.
3. O.P. Gupta, Energy Technology, Khanna Publishing House, New Delhi
4. Jagadeesh, K S, Reddy Venkatta Rama & Nanjunda Rao, K S., Alternative Building Materials and Technologies, New Age International Publishers, Delhi.
5. Sam Kubba., Handbook of Green Building Design and Construction, Butterworth-Heinemann.
6. Means R S, Green Building - Project Planning and Cost Estimating, John Wiley & Sons
7. Sharma K V, Venkataseshaiah P., Energy Management and Conservation, IK International.

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Semester-V

Course Code	DOE-505
Course Title	Open Elective –I (A) Economic Policies In India
Number of Credits	3 (L:3: T:0: P:0)

Course Outcomes:

The objective of this course is to familiarize the students of different streams with the basic concepts, structure, problems and issues concerning Indian economy.

Course outcomes:

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

1 Understand Indian economics policy, planning strategies

2 It will enable to students to comprehend theoretical and empirical development across countries and region for policy purposes

3 Development Economics as a discipline encompasses different approaches to the problems of unemployment, poverty, income generation, industrialization from different perspectives

4 Able to identify the problems and capable to decide the application for future development

5 Analyze economic issues and find solutions to complex economic problems and take correct economic judgment

UNIT-I: Basic features and problems of Indian Economy: Economic History of India; Nature of Indian Economy, demographic features and Human Development Index, Problems of Poverty, Unemployment, Inflation, income inequality, Black money in India.

UNIT-II: Sectoral composition of Indian Economy: Issues in Agriculture sector in India, land reforms Green Revolution and agriculture policies of India,

UNIT-III: Industrial development, small scale and cottage industries, industrial Policy, Public sector in India, service sector in India.

UNIT-IV: Economic Policies: Economic Planning in India, Planning commission v/s NITI Aayog, Five Year Plans, monetary policy in India, Fiscal Policy in India, Centre state Finance Relations, Finance commission in India. LPG policy in India

UNIT-V: External sector in India: - India's foreign trade value composition and direction, India Balance of payment since 1991, FDI in India, Impact of Globalization on Indian Economy, WTO and India.

Reference Books:

1. Dutt Rudder and K.P.M Sunderam (2017). Indian Economy. S Chand & Co. Ltd. New Delhi.
2. Mishra S.K & V.K Puri (2017). Indian Economy and –Its Development Experience. Himalaya Publishing House.
3. Singh, Ramesh, (2016): Indian Economy, Tata-McGraw Hill Publications, New Delhi.
4. Dhingra, I.C., (2017): March of the Indian Economy, Heed Publications Pvt. Ltd.
5. Karam Singh Gill, (1978): Evolution of the Indian Economy, NCERT, New Delhi
6. Kaushik Basu (2007): The Oxford Companion to Economics of India, Oxford University Press.

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Semester-V

Course Code	DOE-505
Course Title	Open Elective –I (B) Disaster Management
Number of Credits	3 (L:3: T:0: P:0)

Course Objectives:

Following are the objectives of this course:

1 To learn about various types of natural and man-made disasters.
2 To know pre- and post-disaster management for some of the disasters.
3 To know about various information and organisations in disaster management in India.
4 To get exposed to technological tools and their role in disaster management..

Course outcomes:

After competing this course, student will be:

1 Acquainted with basic information on various types of disasters
2 Knowing the precautions and awareness regarding various disasters
3 Decide first action to be taken under various disasters
4 Familiarised with organisation in India which are dealing with disasters
5 Able to select IT tools to help in disaster management

Unit – I: Understanding Disaster

Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability, Risk, Capacity– Disaster and Development, and disaster management.

Unit – II: Types, Trends, Causes, Consequences and Control of Disasters

Geological Disasters (earthquakes, landslides, tsunami, mining); Hydro-Meteorological Disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves) Biological Disasters (epidemics, pest attacks, forest fire)

Technological Disasters (chemical, industrial, radiological, nuclear) and Manmade Disasters
(building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters) Global Disaster Trends – Emerging Risks of Disasters – Climate Change and Urban Disasters.

Unit- III: Disaster Management Cycle and Framework

Disaster Management Cycle – Paradigm Shift in Disaster Management.
Pre-Disaster – Risk Assessment and Analysis, Risk Mapping, zonation and Microzonation, Prevention and Mitigation of Disasters, Early Warning System; Preparedness, Capacity Development; Awareness.
During Disaster – Evacuation-Disaster Communication-Search and Rescue -Emergency Operation Centre Incident Command System – Relief and Rehabilitation
Post-disaster – Damage and Needs Assessment, Restoration of Critical Infrastructure
Early Recovery – Reconstruction and Redevelopment; IDNDR, Yokohama Stretegy, Hyogo Framework of Action.

Unit– IV: Disaster Management in India

Disaster Profile of India – Mega Disasters of India and Lessons Learnt.
Disaster Management Act 2005 – Institutional and Financial Mechanism,
National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national),Non-Government and Inter Governmental Agencies

Unit– V: Applications of Science and Technology for Disaster Management

Geo-informatics in Disaster Management (RS, GIS, GPS and RS).
Disaster Communication System (Early Warning and Its Dissemination).
Land Use Planning and Development Regulations, Disaster Safe Designs and Constructions,
Structural and Non Structural Mitigation of Disasters
S&T Institutions for Disaster Management in India

Reference Books:

1. Publications of National Disaster Management Authority (NDMA) on Various Templates and Guidelines for Disaster Management
2. Bhandani, R. K., An overview on natural & man-made disasters and their reduction, CSIR, New Delhi
3. Srivastava, H. N., and Gupta G. D., Management of Natural Disasters in developing countries, Daya Publishers, Delhi
4. Alexander, David, Natural Disasters, Kluwer Academic London
5. Ghosh, G. K., Disaster Management, A P H Publishing Corporation
6. Murthy, D. B. N., Disaster Management: Text & Case Studies, Deep & Deep Pvt. Ltd.

POLYTECHNIC ENGINEERING

Sri Satya Sai University of Technology And Medical Sciences, Sehore (M.P.)

Syllabus of Examination - AICTE Pattern

Undergraduate Diploma Courses in Engineering & Technology

Department of CIVIL Engineering

Semester-V

Course Code	DCEA-506
Course Title	Summer Internship-II
Number of Credits	2 (L:0: T:0: P:0)

Course Outcomes:

At the end of this course students will gain the ability to

CO1: Apply theoretical knowledge in real-life engineering scenarios.

CO2: Demonstrate understanding of construction processes and project workflows.

CO3: Use basic tools, equipment, and techniques used in civil engineering.

CO4: Interpret technical drawings, site plans, and specifications.**

CO5: Communicate effectively with engineers, contractors, and site supervisors.**

POLYTECHNIC ENGINEERING

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Undergraduate Diploma Courses in Engineering & Technology

Department of CIVIL Engineering

Semester-V

Course Code	DCEA-507
Course Title	Major Project-I
Number of Credits	1 (L:0: T:0: P:2)

Course Outcomes:

Build projects as per industry and society demands.

Guidelines:

Major Project should cater to a small system required in laboratory or real life.

1 After interactions with course coordinator and based on comprehensive literature survey/need analysis, the student shall identify the title and define the aim and Preambles of Minor project.

2 Student is expected to detail out specifications, methodology, resources required, critical issues involved in design and implementation and submit the proposal within first week of the semester.

3 The student is expected to exert on design, development and testing of the proposed work as per the schedule.

THE END