



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Technology and Science
Choice Based Credit System (CBCS) in Light of NEP-2020
Diploma in Civil Engineering
(2021-2024)

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME									
			THEORY			PRACTICAL			L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*					
DTCE601	DCC	Design of Steel Structures	60	20	20	30	20	3	0	2	4	

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

Students will be able to analyze structures and will be able to design steel structural systems, as per provisions of the latest IS Code.

Course Outcomes (COs):

Students will be able to

1. Understand the concept of limit state design of steel structures.
2. Design bolted and welded connections.
3. Design compression and tension member.
4. Understand the concept of steel beams.

Syllabus

UNIT I

8 Hrs.

Introduction: Grades of steel and strength characteristics; advantages and disadvantages of steel as a construction material; Structural steel sections; Limit State Design Concepts; Types of loads on steel structure and its I. S. code specification.

UNIT II

9 Hrs.

Connections: Advantages and Disadvantages of Bolted connections; Strength of Bolted joint; efficiency of a Bolted joint; Welded connection; Permissible stress in weld; strength of weld; advantages and disadvantages of the welded joint. Types of welds and their symbols.

UNIT III

8 Hrs.

Tension member: Types of Sections used; Permissible Stresses in Axial Tension; gross and net cross-sectional area of tension member; Analysis and design of tension member.

UNIT IV

8 Hrs.

Compression Members: Design of single section and compound section of compression members; Design of Column; Concept of laced and battened type columns.

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UNIT V

9 Hrs.

Beams: Design of simple beams; Concept of web buckling and web crippling; Concept of laterally supported and laterally unsupported; Concept of Built-up beams.

Text Books:

1. Limit State Design of Steel Structures by S K Duggal, McGraw Hill; 2nd edition, 2016
2. Design of Steel Structures –B.C Punmia, Firewall Media, 1998
3. Design of Steel Structures – L.S. Negi, Tata McGraw-Hill Publishing Company

References:

1. Design and Analysis of Steel Structures- V.N. Vazirani & M.M. Ratwani, Khanna Publishers
2. Design of Steel Structures – S.S Bhavikatti, I.K. International Publishing House Pvt. Limited, 2014

List of Experiments.

1. Detailed drawing of bolted connection.
2. Detailed drawing of the welded connection.
3. Design and drawing of tension members.
4. Design and drawing of compression members.
5. Design and drawing of simple and compound beams.


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DTCE 602(1)	DSE	Traffic Engineering	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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Course Educational Objectives (CEOs):

Following are the objectives of this course:

1. To understand the issues involved in traffic flow.
2. To know and understand the tools for traffic studies.
3. To delineate various traffic control measures.
4. To understand causes and measures for preventing accidents.

Course Outcomes (COs):

Student will be able to

1. Understand the traffic characteristics.
2. Perceive the knowledge about different studies involved in traffic engineering.
3. Use the relevant road traffic signs and markings.
4. Suggest preventive measures to avoid accidents by analyzing the traffic conditions at site.

Syllabus

UNIT I

8 Hrs.

Fundamentals of Traffic Engineering: Traffic engineering- Definition, objective and 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

9 Hrs.

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

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UNIT III

8 Hrs.

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

8 Hrs.

Traffic Signals and Traffic Islands: Traffic signals- Definition, Types, Advantages and disadvantages of traffic 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, types, advantages, and disadvantages of providing islands, Traffic islands - Rotary intersection components, advantages, and disadvantages of rotary intersection, Rotary intersection components, advantages, and disadvantages of rotary intersection

UNIT V

9 Hrs.

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.


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Text Books:


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

References:

1. Vazirani, V N , Chaondola, S P, Transportation Engineering Vol. I & II, Khanna Publishers. Delhi.
2. Saxena, S C, Traffic planning and design, Dhanpat Rai & Sons Delhi.
3. Kumar R S, Introduction to Traffic Engineering, University Press (India), Pvt. Ltd.


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DTCE 602 (2)	DSE	Advanced Surveying	60	20	20	0	0	3	0	0	3	

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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Course Educational Objectives (CEOs):

1. To gain experience regarding the advance techniques of surveying.
2. To provide an opportunity to learn how to use and apply the techniques in measurement to collect the data.
3. To impart knowledge about the changing scenario in field of surveying.

Course Outcomes (COs):

After completing this course, student will be able to:

1. Prepare plans using Theodolite surveys.
2. Find distances and elevations using Tachometer.
3. Prepare plans using Total Station instrument.
4. Locate coordinates of stations using GPS.

Syllabus

UNIT I

9 Hrs.

Introduction of Theodolite: Types and uses of Theodolite, Components of transit Theodolite and their functions, Reading the Vernier of transit Theodolite; Technical terms- Swinging, Transiting, Face left, Face right. Fundamental axes of transit Theodolite and their relationship, Temporary adjustment of transit Theodolite.

UNIT II

10 Hrs.

Theodolite Surveying: Measurement of horizontal angle- Direct and Repetition method, Errors eliminated by method of repetition; Prolonging and ranging a line, deflection angle; Measurement of vertical Angle; Theodolite traversing by Included angle method and Deflection angle method; Checks for open and closed traverse, Calculations of bearing from angles; Traverse computation- Latitude, Departure, Consecutive coordinates, Independent coordinates, balancing the traverse by Bowditch's rule and Transit rule, Gale's Traverse table computation.

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UNIT III

10 Hrs.

Tacheometric surveying and Curve setting: Principles of Tacheometry, Tacheometer and its component parts, Analytic lens; Tacheometric formula for horizontal distance with telescope horizontal and staff vertical; Field method for determining constants of tacheometer, Determining horizontal and vertical distances with tacheometer by fixed hair method and staff held vertical, Limitations of tacheometry; Types of curves used in roads and railway alignments; Designation of curves; Setting simple circular curve.

UNIT IV

8 Hrs.

Advanced surveying equipments: Principle of Electronic Distance Meter (EDM), its component parts and their Functions, use of EDM; Use of micro-optic Theodolite and Electronic Digital Theodolite; Use of Total Station, Use of function keys, Measurements of Horizontal angles, vertical angles, distances and coordinates using Total Station, Traversing, Profile Survey and Contouring with Total Station.

UNIT V


8 Hrs.

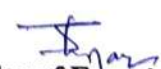
Remote sensing, GPS and GIS: Remote Sensing – Overview, Remote sensing system, Applications of remote sensing in Civil engineering, land use / Land cover, mapping, disaster management; Use of Global Positioning System (G.P.S.) instruments; Geographic Information System (GIS): Overview, Components, Applications, Software for GIS.


Text Books:

1. Basak, N. N., Surveying and Levelling, McGraw Hill Education (India) Pvt. Ltd., Noida.
2. Punmia, B.C.; Jain, Ashok Kumar; Jain, Arun Kumar, Surveying Vol. I and Surveying Vol. II, Laxmi Publications Pvt. Ltd., New Delhi.
3. Duggal, S. K., Survey I and Survey II, Tata McGraw Hill Education Pvt. Ltd., Noida.
4. Subramanian, R., Surveying and Levelling, Oxford University Press. New Delhi.


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References:

1. Rao, P. Venugopala Akella, Vijayalakshmi, Textbook of Surveying, PHI Learning Pvt. Ltd., New Delhi.
2. Anderson, James M and Mikhail, Edward M, Surveying theory and practice, Mc Graw Hill Education, Noida.
3. Venkatramaiah, C, Textbook of Surveying, Universities Press, Hyderabad.
4. De, Alak, Plane Surveying, S.Chand Publications, New Delhi.
5. Kanetkar, T. P.; Kulkarni, S. V., Surveying and Levelling Part I and II, Pune Vidyarthi Gruh
6. Prakashan, Pune.
7. Saikia, M D.; Das. B.M.; Das. M.M., Surveying PHI Learning Pvt. Ltd., New Delhi.

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DTCE 603(1)	DSE	Construction Management	60	20	20	0	0	3	0	0	3

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Course Educational Objectives (CEOs):

1. Planning and allocation of various construction resources during construction of Building, Roads, etc.
2. Understand the importance & uses of Contracts and Specifications in Civil Engineering Project.
3. Understand and Evaluate Engineering economy.
4. Understand the Quality and Safety measures at Site in Civil Engineering Construction.

Course Outcomes (COs):

After competing this course, student will be able to:

1. Understand the contract management and associated labour laws.
2. Prepare and understand the nuances of executing the site layout.
3. Prepare networks and bar charts for the given construction project.
4. Understand the intricacies of disputes, related arbitration and settlement laws.
5. Apply safety measures at construction projects.

Syllabus

UNIT I

9 Hrs.

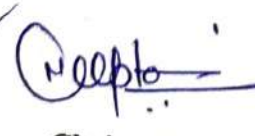
Construction Industry and Management: Organization-objectives, principles of organization, types of organization: government/public and private construction industry; Role of various personnel in construction organization, Agencies associated with construction work- owner, promoter, builder, designer, architects; Role of consultant for various activities: Preparation of Detailed Project Report (DPR), monitoring of progress and quality, settlement of disputes.

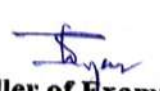
UNIT II

8 Hrs.

Site Layout: Principles governing site layout; Factors affecting site layout; Preparation of site layout; Land acquisition procedures and providing compensation.


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UNIT III

12 Hrs.

Planning and scheduling: Identifying broad activities in construction work & allotting time to it, Methods of Scheduling, Development of bar charts, Merits & limitations of bar chart; Elements of Network: Event, activity, dummy activities. Precautions in drawing Network, Numbering the events; CPM networks, activity time estimate, Event Times by forward & backward pass calculation, start and finish time of activity, project duration; Floats: Types of Floats-Free, independent, and total floats, critical activities and critical path; Purpose of crashing a network, Normal Time and Cost, Crash Time and Cost, Cost slope, Optimization of cost and duration.

UNIT IV

6 Hrs.

Construction Contracts and Specification: Types of Construction contracts; Contract documents, Contract Management; Specifications, General special conditions; procedures involved in arbitration and settlement (Introduction only).

UNIT V

10 Hrs.

Material Management & Safety in Construction Material Management- Ordering cost, inventory carrying cost, Economic Order Quantity; Store management, various records related to store management, inventory control by ABC technique, Introduction to material procurement through portals (e.g. www.inampro.nic.in). Safety in Construction Industry—Causes of Accidents, Remedial and Preventive Measures; Labour Laws and Acts pertaining to Civil construction activities (Introduction only).

Text Books:

1. Sharma S C and Deodhar S V, Construction Engineering and Management, Khanna Book Publishing, New Delhi
2. Punmia, B.C. and Khandelwal, K.K., Project Planning and Controlling with PERT And CPM, Laxmi Publications (P)Ltd.
3. Gahlot, P.S. and Dhir, B.M Construction planning and management, New Age International (P) Ltd. Publishers, New Delhi.
4. Sharma, S.C., Industrial Engineering and Management, Khanna Publications, New Delhi

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1. Shrivastava, U.K., Construction planning and management, Galgotia Publication Pvt Ltd. New Delhi
2. Mantri, S., The A To Z of Practical Building Construction and its Management, Satya Prakashan New Delhi
3. Khanna, O.P. , Industrial Engineering and management, Dhanpat Rai New Delhi
4. Sengupta, B., Guha H., Construction Management and Planning, Tata-McGraw Hill.
5. Singh, Harpal, Construction Management and accounts, Mc-Graw Hill

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DTCE 603(2)	DSE	Solid Waste Management	60	20	20	0	0	3	0	0	3	

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Course Educational Objectives (CEOs):

The following are the objectives of this course:

1. To know various sources of solid.
2. To learn techniques of the collection and transportation of solid waste.
3. To know various methods of disposal of solid waste.
4. To understand and identify different biomedical and E-waste and their subsequent disposal techniques.

Course Outcomes (COs):

After completing this course, students will be able to:

1. Identify the sources of solid waste.
2. Select the relevant method of collection and transportation of solid waste.
3. Suggest an action plan for composting of solid waste.
4. Devise suitable disposal techniques for solid waste
5. Use the relevant method for disposal of Bio-medical and E-waste.

Syllabus

UNIT-I

8 Hrs.

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

10 Hrs.

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: 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.

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Shri Vaishnav Institute of Technology and Science
Choice Based Credit System (CBCS) in Light of NEP-2020
Diploma in Civil Engineering
(2021-2024)

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCE 603(2)	DSE	Solid Waste Management	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT-III

9 Hrs.

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

10 Hrs.

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.

UNIT-V

8 Hrs.

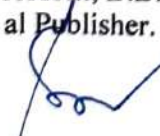
Biomedical and E-waste management: Definition of Bio medical Waste, Sources and generation of Biomedical Waste and its classification, Bio medical waste Management technologies. Definition, varieties, and ill effects of E- waste, Recycling and disposal of E- waste.


Text Books:


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.


References:

1. George Techobanoglous, Kreith, Frank., Solid Waste, McGraw Hill Publication, New Delhi.
2. Sasikumar, K., Solid Waste Management, PHI learning, Delhi.
3. Hosetti, B.B., Prospect and Perspectives of Solid Waste Management, New Age International Publisher.


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