Estimation, Costing and Valuation
Sem -VII

General Course Information

Course Code: PCC-CVE401-T Course Credits: 3 Mode: Lecture (L) Type: PCC Contact Hours: 3 hours (L) Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments and quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answer type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Course outcomes

S. No.	**Course outcomes** At the end of the course students will be able to:	RBT* Level
CO1	Explain the basics of preparing estimates, costs and valuation for civil engineering works	L2 (Understanding)
CO2	Prepare specifications for different items of civil works	L3 (Applying)
CO3	Analyze rates for various items of works	L4 (Analyzing)
CO4	Estimate quantities of different items of civil engineering works	L5 (Evaluating)
CO5	Prepare tender documents for civil work and perform valuation of different civil engineering structures.	L6 (Creating)

*Revised Bloom's Taxonomy

Course Contents

UNIT-I

Estimate: Principles of estimation, units, items of work, different kinds of estimates, different methods of estimation, estimation of materials in single room building, two roomed building with different sections of walls, foundation, floors and roofs, R.B. and R.VC.C. works, Plastering, White-washing, Distempering and painting, doors and windows, lump sum items, Estimates of canals, roads etc.

UNIT-II

Specification of Works: Necessity of specifications, types of specifications, general specifications, specification for bricks, cement, sand, water, lime, reinforcement; Detailed specifications for Earthwork, Cement, concrete, brick work, floorings, D.P.C., R.C.C., cement plastering, white and color washing, distempering, painting.

UNIT-III

Rate Analysis: Purpose, importance and requirements of rate analysis, units of measurement, preparation of rate analysis, procedure of rate analysis for items:- Earthwork, concrete works, R.C.C. works, reinforced brick work, plastering, painting, finishing(white-washing, distempering).

UNIT-IV

Public Works Account: Introduction, function of P.W. department, contract, guidelines, types of contracts, their advantages and disadvantages, Tender and acceptance of tender, Earnest money, security money, retention money, measurement book, cash book, preparation, examination and payment of bills, first and final bills, administrative sanction, technical sanction.

Valuation: Different terms used, the role of a valuer, purpose and necessity of the same. Capitalised Value, Years purchase ,sinking fund, depreciation, types of values, Purpose of valuation Different methods of valuation for

i. open plots , ii. open plots with existing residential & commercial structures iii. lease hold properties Use of valuation tables and formulae

REFERENCE BOOKS

1. Estimating & Costing in Civil Engg..: Theory & Practice by B.N.Dutta, S.Dutta & Co., Lucknow.
2. Estimating, Costing & Specification in Civil Engg. by M.Chakarborty, Calcutta
3. Estimating and Costing for Building & Civil Engg.Works by P.L.Bhasin, S.Chand & Co., N.Delhi.
4. .Building Construction Estimating by George H.Cooper, McGraw Hill Book Co., New York.

Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	-	1	-	1	-	-	3	2	-	-	2
CO2	2	2	1	1	-	1	-	2	-	1	3	2	1	1	2
CO3	2	2	1	1	-	1	-	2	-	1	3	2	1	1	2
CO4	2	2	1	1	-	1	1	2	-	1	3	2	1	1	2
CO5	3	3	3	2	-	2	2	2	-	3	3	3	3	3	3

Transportation Engg.-II

Sem -VII

General Course Information

Course Code:PCC-CVE403-T Course Credits:3 Mode: Lecture (L) Type: PCC Contact Hours: 3 hours (L) Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments and quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answer type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Course outcomes

S. No.	**Course outcomes** At the end of the course students will be able to:	RBT* Level
CO1	Understand the runway orientation and the runway length as per FAA & ICAO guidelines	L2 (Understanding)
CO2	Employ Railway Track specifications and perform geometric design of the railway track.	L3(Applying)
CO3	Analyze pavement and learn the concept of pavement maintenance management system	L4(Analysing)
CO4	Design turnout and crossings as per the Indian Railways	L5 (Evaluating)
CO5	Design the airport pavements including air-side marking & lighting as per ICAO & FAA guidelines	L6(Creating)

Course Contents

UNIT I

Railway Engineering: Permanent way, gauges in railway tracks, typical railway track cross-section, coning of wheels, Function of rails, requirement of rails, types of rail sections – comparison of rail types, length of rail, rail wear, rail failures, creep of rails, rail fixtures and fastenings – Fish plates, spikes, bolts, chairs, keys, bearing plates.

Sleepers: Functions and requirements of sleepers, classification of sleepers, timber, metal and concrete sleeper, comparison of different types of sleepers, spacing of sleepers and sleeper density.

UNIT II

Ballast: Function and requirements of ballast, types, comparison of ballast materials.

Geometric design: alignment, horizontal curves, super elevation, equilibrium, cant and cant deficiency, length of transition curve, gradients and grade compensation. Stations and yards, and their classification

Points and crossings: introduction, necessity of points and crossings, turnouts, points and crossings, design of a simple turnout.

Track Recording: Equipment, Mechanized Maintenance, High Speed Trans, Present & Future.

Signaling and interlocking: objects of signaling, engineering principle of signaling, classification of signaling, control of train movements, interlocking definition, necessity and function of interlocking, methods of interlocking, mechanical devices for inter locking. Traction and tractive resistance, stresses in track, modernization of railway track.

UNIT III

Airport Engineering: Airport site selection, various surveys for site selection. Classifications of obstructions, Imaginary surfaces, Approach zone and turning zone.Runway orientation, basic runway length, corrections for elevation, temperature & gradient, airport classification.

UNIT IV

Runway & Taxiway Design: Geometric design of runway, airport capacity, factors controlling taxiway layout, geometric design standards for taxiway holding aprons, Wind-rose diagram, Structural design of runway pavements LCN/PCN method of rigid pavement design, Pavement Evaluation for runway & taxiway, design of overlay, Terminal area, building area, parking area, apron, hanger typical airport layouts. Design of flexible and rigid runways as per FAA procedure, Specifications for the different layers of runway and taxiway pavements, Pavement management systems for runway pavements.

REFERENCE BOOKS

1. Rangawala, Railway Engineering, Charotar Publishing House, Anan (1989).
2. Aggarwal M.M., and Satish Chandra Railway Engineering, Oxford University Press (2002).
3. Horenjeff Robert, Airport Engineering, McGraw Hill International Publisher (2010)
4. Arora and Saxena, Railway Engineering, Dhanpat Rai & Sons, New Delhi (2006).
5. Khanna, Arora & Jain, Airport Planning and Design, Nem Chand & Brothers, Roorkee (1999).

Course Articulation Matrix:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	-	-	-	1	-	-	-	-	-	1	1	-	-
CO2	1	1	3	-	-	-	-	-	-	-	1	1	1	2	3
CO3	1	3	2	1	-	-	-	-	-	-	1	1	3	1	2
CO4	1	-	3	3	2	1	-	-	-	-	2	1	1	3	2
CO5	1	-	3	3	2	1	-	-	-	-	2	1	1	3	2

Foundation Engineering

Sem -VII

General Course Information:

Course Code: PCC-CVE405-T Course Credits: **3** Mode: Lecture (L) Type: PCC Contact Hours: 3 hours (L) Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks- class performance measured through percentage of lecture attended (4 marks)- assignments and quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination- nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answer type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Course outcomes

S. No.	**Course outcomes** At the end of the course students will be able to:	RBT* Level
CO1	Describe and discuss the concepts of foundation engineering	L2 (Understanding)
CO2	Employ various methods of soil exploration for foundation engineering	L3 (Applying)
CO3	Analyze and determine earth pressure behind a retaining structure- for various soil and loading conditions.	L4 (Analyzing)
CO4	Evaluate the use of soil stabilization and geo-textiles in foundation engineering	L5 (Evaluating)
CO5	Develop and designvarious types of foundations for civil engineering works	L6 (Creating)

*Revised Bloom's Taxonomy

Course Contents

UNIT I

Introduction to soil exploration: Scope- Methods of soil exploration- spacing- significant depth-boring and sampling techniques- types of samples- sample disturbances- penetration tests (Standard Cone Penetration Test and Standard Penetration Test)- andGeophysical methods (Seismic Refraction Method & Electrical Resistivity Method).

Earth Pressure: Earth Pressures at rest condition- states of plastic equilibrium- Rankine's theory for active and passive conditions- Influence of surcharge- water table- wall friction- Numerical Problems for the determination of Active and Passive Earth Pressure diagrams- Critical height of an Unsupported Vertical Cut.

UNIT II

Stability of Slopes: Infinite slopes- Critical Depth of a cohesive Infinite Slope- types of failure- Swedish Slip Circle Method- Taylor's stability Number and Stability Curves- Concept of factors of safety- Bishop's Method of slices- Effect ofsudden draw down and submergence.

Design of Shallow Foundation: Bearing Capacity- Definitions- depth of foundation- Terzaghi's generalbearing capacity equation- IS code equation- factors affecting bearing capacity- Influence of eccentric and inclined loads. Bearing capacity by penetration tests- Plate load test.

Design Criteria for Shallow Foundations- Stability- Shear- and Settlement Failures

UNIT III

Pile Foundations: Types- function- selection of piles- pile driving formulae- point- bearing andfriction piles. Load carrying capacity of single pile- group action- spacing of piles- Negative skin friction- Concept of under reamed piles.

Caissons and Wells: Introduction-components- shapes- stability of well foundation- sinking of well- tilts andshifts.

UNIT IV

Drainage and Dewatering of Soil: Methods of Ditches and Sump- Well Point System- Shallow Well System- Deep Well Drainage- Vacuum Method- Electro Osmosis Method- Seepage Analysis for various conditions of Fully penetrating slot and partially penetrating slot- Protective Filters.

Soil stabilization and Geo-textiles: Need and advantages ofGround Improvement techniques- Stabilization (Mechanical- Lime- Cement- bitumen- Chemical) of Soils and its advantages- Geo-textiles (Concept- Types- Functions- Use of Geo-textiles in Earth Dam Construction- Road Works- Railway works- Erosion Control and in Bearing capacity Improvement

REFERENCES BOOKS:

1. Foundation Analysis and Design- by J.E. Bowles McGraw Hill Book Company- NewYork.
2. Foundation Engineering by Peck- Wiley Eastern India Limited- New Delhi.
3. . Soil Dynamics and Machine Foundations by Swami Saran- Galgotia Publishers- New Delhi
4.. Basic and Applied Soil Mechanics- by Gopal Ranjan Rao- ASR Rao- New Age Int. (P) Ltd. Pub.- New Delhi.
5.Soil Mechanics and Foundations by B. C. Punmia- Ashok Kumar Jain & Arun Kumar Jain- Laxmi Publications- New Delhi.
6.Soils and Foundations- by Cheng Liu & Jack B Evett- Prentice-Hall Inc.- USA.
7.A Text Book of Soil Mechanics Foundation Engg. by VNS Murthy – U.B.S- New Delhi.

Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	2	2	-	-	-	-	-	2	2	1	1	2
CO2	2	2	1	2	1	-	-	-	-	-	1	2	2	2	2
CO3	2	2	2	2	1	-	-	-	-	-	1	2	3	3	3
CO4	2	2	3	3	1	-	-	-	-	-	1	2	2	2	3
CO5	2	2	3	3	1	-	-	-	-	-	1	2	2	3	3