Faculty of Engineering & Technology

P.K.University

Shivpuri (MP)

Department of Civil Engg.

Evaluation Scheme & Syllabus for

Diploma-(Civil Engg.)

(VI Semester)

(Effective from session 2025-26)

Evaluation Scheme

DIPLOMA –CIVIL ENGINEERING

Study And Evaluation Scheme For Diploma in Civil Engineering

SEMESTER-6

SUBJECT CODE	SUBJECTS NAME	STUDY SCHEME Periods/Week			Credits	Marks In Evaluation Scheme						Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT			
		L	T	P		Th	Pr	Tot	Th	Pr	Tot	
DENVICE601	Environmental Pollution & Control	4	-	-	4	30	-	30	70	-	70	100
DDESICE602	Design of Steel & Masonary Structure	4	-	-	4	30	-	30	70	-	70	100
DCONSCE603	Construction Management, Accounts & Entrepreneurship Development	4	-	-	4	30	-	30	70	-	70	100
DCIVICE604	Civil Engineering Drawing-II	4	1	-	5	30	-	30	70	-	70	100
DEARTCE605	Earthquake Engineering	4	-	-	4	30	-	30	70	-	70	100
DPROJCE606	PROJECT	-	-	12	6	-	100	100	-	100	100	200
Total		20	1	12	27	150	100	250	350	100	450	700

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III Year VI Semester

DENVICE601
Environmental Pollution & Control

L	T	P
4	0	0

1. ECOLOGY OF ENVIRONMENT:- Elements of environment: Earth, water, air, space and energy. Ecology: Living and non living concept leading to ecology. Ecosystem: Terrestrial, aquatic and marine effect of environmental pollution on ecological balances.

2. POLLUTION AND ITS CLASSIFICATIONS:- Definition, classification ,air,water,solid waste, thermal , noise and radioactive pollutions. Different parameter of pollution.

3. WATER POLLUTION:-Sources , transport of pollutants,effect of water pollutants on man, animal ,plant and material,various types of pollutants.Mainly discuss various types of wastes from community, general characteristics of domestic & industrial wastes and their affects on environment, disposal methods on land and water, criteria of disposal by dilution. Stream sanitation. Sampling and monitering instrumentation for water pollution and control.

4. AIR POLLUTION:-Sources, types of air pollutants, Transport of air pollutants, dispersion by single and multile sources. Control equipment, filter, electrostatic precipitators, wet scrubbers, fume combustion by incineration. Air pollution control in new and old plants.

5. SOLID WASTE POLLUTION:- Review of various types of solid waste.sources,components of solid waste,city garbage and industrial solid waste handling and disposal equipment . Method of disposal, salvage andrecovery. Volume reduction in solid waste.

6. NOISE POLLUTION:-Sources,measurement of pollution. Degree of noise. Echos and their

control. Industrial noise, units characteristics occupational injuries due to noise, criteria and standard for occupational injuries due to noise. Means to control noise in industry.

7. THERMAL POLLUTION:-Various pollutants. Affects on environment, preventive measures.

8. RADIO ACTIVE POLLUTION: Sources and affect on human, animals, plants and materials, measurement, means to control, preventive measures.

9. LEGISLATION : Preliminary knowledge of the following Acts and rules made thereunder-

- The Water (Prevention and Control of Pollution) Act - 1974.
- The Air (Prevention and Control of Pollution) Act - 1981.
- The Environmental Protection (Prevention and Control of Pollution) Act -1986. Rules notified under EP Act - 1986 Viz.

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DDESICE602
Design of Steel and Masonry Structures

L	T	P
4	0	0

1. Structural Steel and Sections

(i) Properties of structural steel as per IS:226 and IS:1977.

(ii) Designation of structural steel sections as per IS Handbook and IS:800.

2. Structural Steel Connections

(i**) Riveted connections** - types of rivets, permissible stresses in rivets. Types of riveted joints, Failure of riveted joints, Assumptions madein the design of riveted joints. Specification for riveted joints. Design of riveted joints for axially loaded members.

(ii) Welded Connections:- Comparison between riveted and welded joints, types of welds, permissible stresses in welds, types of welded connections, strength of welded joint, Design of welded joints for axially loaded members.

3. Tension Members:-Forms of common sections. Permissible Stresses in tension for steel. Strength of a tension member. Design of tension members (flats, angle& Tee Sections only). Tension splice and their design.

4. Compression Members_ Design of struts and columns as per IS:800. Effective length, slenderness ratio and permissible stresses, simple and built up sections, concept of lacings in built up columns.

5. Beam-Design criteria, allowable stresses, Design of laterally restrained beams including simple built-up sections. Checks for web bulking , web crippling and deflection.

6. Column Bases:- Column bases, design of simple column base

7. Steel Roof Trusses:- Different types of trusses, Loads on roof trusses. Various combination of loads to cause worst condition. Design of angle and tubular trusses(Tension and compression members), Design of purlins.

8. Masonry and Foundation Structures- Gravity masonry dams , retaining walls and chimneys

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DCONSCE603
Construction Management, Accounts & Entrepreneurship Development

L	T	P
4	0	0

PART A : CONSTRUCTION MANAGEMENT

1. Introduction:

(i) Classification of construction into light, heavy and industrial construction.

(ii) Stages in construction from conception to realization.

(iii) The construction team: Owner, engineer and contractors , their functions and inter-relationship.

(iv) Resources for construction industry; men, machines, materials, money and management.

(v) Main objectives of Civil engineering & management.

(vi) Functions of construction management, planning, organizing, staffing , directing, controlling and co-coordinating, meaning of each of these with respect to a construction job.

2. Construction Planning

(i) Stages at which planning is done. Pre tender and contract planning by the contractor.

(ii) Scheduling: Definition, Methods of scheduling: bar charts and CPM, advantages of scheduling. No problem on CPM to be set in the examination.

(iii) Planning and scheduling of construction jobs by bar charts.

(iv) Preparation of construction schedule, labour schedule, material schedule, and equipment schedule.

(v) Limitations of bar charts.

(vi) Cost-time balancing.

3. Organization:

(i) Types of organization: Line, staff, functional and their characteristics.

(ii) Principles of organization; (only meanings of the following and their significance);Span of control ; Delegation of authority and responsibility ; Ultimate authority and responsibility;

Unity of command; contact; unity of assignment; job definition; increasing organization relationship.

(iii) Motivation and human relationship concept, need and fundamentals.

4. Site Organization:

(i) Factors influencing, job layout from site plan.

(ii) Principle of storing and stacking materials at site.

(iii) Location of equipment.

(iv) Preparation of actual job layout for a building.

(v) Organizing labor at site.

5. Construction Labor

(i) Conditions of construction workers in India, wages paid to workers.
(ii) Trade unions connected with construction industry and trade Union Act.
(iii) Labour welfare.
(iv) Payment of wages Act. Minimum wages Act.
(v) Workmen compensation Act.
(vi) Contract Labor Act.

6. Control of Progress:

(i) Methods of recording progress.
(ii) Analysis of progress.
(iii) Taking corrective actions keeping head of office informed.

7. Inspection and Quality Control

(i) Principles of inspection.
(ii) Major items in construction job requiring quality control.

8. Accidents and Safety in Construction:

(i) Accidents - causes.
(ii) Safety measures for:
  (a) Excavation work
  (b) Drilling and blasting.
  (c) Hot bituminous works.
  (d) Scaffolding, ladders, form work.
  (e) Demolitions.
(iii) Safety campaign.

PART B : ACCOUNTS

10. Introduction:

(i) Necessity of account.
(ii) List of reference book on accounts:
  (a) Civil Services Rules, Vol,I,Ii and III
  (b) PWD Accounts codes.
  (c) Manual of orders.
  (d) Departmental financial rules.
  (e) State Treasury rules.

11. Organisation

(i) Establishments in the PWD.
(ii) Regular establishment:
  (a) Permanent establishment.
  (b) Temporary establishment.
(iii) Work charged establishment.
(iv) Contingency establishment.

12. Outline of P.W.D. System of Accounts:

(i) Necessity of a system of accounts.

(ii) P.W.D. system of accounts.

(iii) Classification of transactions:

(a) Necessity of maintaining the accounts by Head of Accounts:

(b) Heads of Account:

- Major Heads.
- Minor Heads.
- Detailed Heads.

13. Cash

(i) Definition of cash.

(ii) Precautions in custody of cash.

(iii) Treasury challan -procedure to fill the prescribed form.

(iv) Impress account and temporary advance.

(v) Definition of imprest and rules for maintain in impress account. Actual filling of the prescribed form.

(vi) Definition of temporary advance; Its difference from the imprest account ; maintenance of temporary advance account.

14. Stores:

(i) What are stores, their necessity and safe custody.

(ii) Classification of Stores:

(a) Stores debatable to suspense heads-stock.

(b) Stores debatable to final heads: Tools and plant, Road metal, Material charged direct to works.

(iii) Stock

(a) Kind of articles in sto

(b) Sources of stock receipt; Supplier, Other departments, divisions and sub- divisions Manufacturers.

(c) Sub heads of stock.

(d) Quantity accounts of stock.

(e) Return of monthly transaction of stock and half yearly return of stock.

(f) Stock taking of stores-general rules.

(g) Surpluses and shortages of stock-action for rectification of mistakes in stock accounts.

(h) Losses of stock-reporting the loss, estimates for loss of stock and writing off.

(iv) Tools and Plants (T&P)

(a) Meaning.

(b) Classification of T&P

- Register of T&P receipts and issues-Rules for actual filling of the prescribed form.
- Statement of receipts and issues of T&P in prescribed form.

(c) Sources of recipt of T&P

(d) Authority of issue of T&P.

(e) Surpluses and shortage of T&P-reconciliation of accounts.

(f) Points of difference in accounts of stock and T&P.

(g) Disposal of unserviceable articles of T&P.

Preparation of survey report in prescribed form.

(v) Road Metal:

(a) Meaning.

(b) Rules for maintaining road metal returns- filling up the prescribed form.

(c) Method of checking.

(d) Shortages and surpluses.

(vi) Materials charged direct to works:-Necessity, circumstance under which materials are directly charged to work.

(a) Material at site Accounts (M.A.S), Rules for actual filling of prescribed form i.e.

- Detailed statement of materials compared with Estimated requirements
- Report of the value and verification of unused materials.

(b) Disposal of surplus materials at the work site.

(c) Definition of:

- Issue rate.
- Storage rate.
- Storage charges.
- Supervision charges -

Assets and liabilities.

(viii) Issue of materials to contractors.

15. Works:

(i) Categories:

(a) Original works. (b) Repair works.

(ii) Classification of works according to cost

(a) Major works. (b) Minor works. (c) Petty works.

(iii) Conditions to be fulfilled before a work can be taken in hand:

(a) Administrative approval. (b) Technical sanction.

(c) Appropriation of funds. (d) Expenditure sanction (for plan works)

(iv) Methods of carrying out works:

(a) Departmentally through daily labor

(b) Through contractors

- Piece work system - work order
- Contract system - Agreement.

(v) Different types of contract:

(a) Item rate contract.

- Labor rate (%age above or below)for various items or for covered areas construction (Private construction only)
- Through rate basis (%age above or below)

(b) Lump-sum contract.

(vi) Allotment of works:

(a) Concept of quotations and tenders (b) Work order - Rules and Form.

(vii) Definition of deposit works and Taccavi works.

16. Payment for Works:

(i) Daily labor:

(a) Meaning. (b) Muster roll.

Rules.

Instruction for maintenance.

Three parts of M.R. - Nominal roll, unpaid wages, detail of work done and filling of prescribed form.

(c) Daily labor report, filling of prescribed form.

(d) Casual labor-Rolls Its difference from M.R.

(e) Mistakes of common occurrence.

(ii) Payment of work charged establishment- preparation of pay bill on prescribed form.

(iii) Payment to contractors and suppliers:

(a) Record of measurement.

Measurement book (M.B.)

General Instructions.

Method of payment after measurements are recorded in M.B.

Common mistakes in the use and maintenance of M.B.

Student may be directed to record the measurement of different item such as W/w, Distemper, Painting, Glass fitting, Plastering, etc. for maintenance of a building.

(b) Check measurement Book (C.M.B.)

Purpose, administration with regard to its maintenance.

(c) Standard measurement book (SMB)

Purpose and instruction with regard to its maintenance.

(iv) Different types of payment

(a) First and final payment.

(b) Running payment. Secured advance. On account payment. Advance payment. Running and final payment.

(v) Hand receipt.

(vi) Clause in which the detailed measurements are dispensed with.

7. Miscellaneous

(i) Duties of Junior Engineer/S.O. and S.D.O.

(ii) Instructions on transfer of charge.

(iii) Maintenance of log books of vehicles and machinery.

(iv) Manufacturers accounts and out turn of machinery.

(v) Dealing with railways-booking of consignment, taking delivery, credit note, demurrage and wharf age charges and damaged consignment.

NOTE: Students will not be required to draw out and memorize the forms. They are expected to know only how to fill up the forms supplied for the purpose from the given data.

PART C : ENTREPRENEURSHIP DEVELOPMENT

18. Introduction:

Entrepreneur, entrepreneurship, its meaning & importance.
Qualities of an entrepreneur. Entrepreneur Motivation Training.

19. Financing Agencies :

Financial agencies for land, infra structure, machinery, raw material, import of raw material and machinery. Role and function of Govt. department connected with the development of industries/business ventures in the State.

20. Industrial Legislation and taxes:

Industrial and labor laws, production tax, local tax, trade tax, excise duty and income tax.

21. Project Report:

Component of project report - Land, building, electricity, water, equipment and other utilities. Materials, its availability, cost, labor availability and wage rates.
Project report preparation, provisional registration and plan of acquiring finance from proper source (financing agencies).

PART D. INTELLECTUAL PROPERTY RIGHTS :

Introduction to IPR (Patents, Copy Right, Trade Mark), Protection of undisclosed information, Concept and history of patents, Indian and International Patents Acts and Rules, Patentable and No patentable invention including product versus Process.

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III Year VI Semester

DCIVICE604
Civil Engineering Drawing-II

L	T	P
4	1	0

PART A : STEEL STRUCTURAL DRAWING

1. Preparation of a working drawing (elevation ,plan ,details of joints at ridge, eaves and other connections) for a riveted steel roof truss resting on a masonry wall for the given span, shape of the truss and the design data regarding the size of the members and the connections. Also calculate the quantity of steel for the truss.

2. Tubular Steel Roof Trusses : Types of trusses for different spans. Details of column-truss connection. Simple truss using tubular sections. North light provision.

3. Steel connections (a,b,c,d) rivetted and (e) welded All unstiffened.
   (a) Beam to beam connections (seated and framed)
   (b) Beam to column (seated and framed)
   (c) Column base connections (slab base & gusseted base)

PART B : R.C.C. STRUCTURES(On Computer by AutoCAD)

a. PUBLIC BUILDING :Plan elevation & sections of a public building like school .hospital, canteen, community hall, guest house .at least double strayed showing details of following RCC elements:

(i) R.C.C. beam singly reinforced and doubly reinforced giving the size and number of bars, stirrups their size and spacing.

(ii) Details of reinforcement for a RCC square and circular column with isolated square footing.

(iii) Details of reinforcement for a cantilever beam with given data regarding the size of the beam and the reinforcement. Anchorage of reinforcement.

NOTE:-1.Bar bending schedules for each of the three above items will be prepared:

2. Details of reinforcement in plan and section for simply supported RCC. One way slab with intermediate support and two way slab. Bar bending schedule should be prepared.

3. Details of reinforcement of a two storeyed intenrnaland corner column. In this, the details of reinforcementat the junction with beams must be shown. Details of reinforcement of the junction of a secondary beam with the main beam with the given data.

4.i. Sectional details of T-beam showing details of bars

ii. Details of reinforcement for cantilever retaining wall with the given design data regarding the reinforcement, size and shape of the wall.

iii. Details of reinforcement in a simple circular overhead water tank.

PART C : IRRIGATION ENGINEERING :

(i) Typical sections of a channel. Typical cross-section of an unlined and lined channel in cutting, partly cutting and fully in filling.

(ii) Plan and cross-section of tube well with pump house.

(iii) Plan, cross-section and L-section of a distributors fall with details of wing wall, pitching, flooring and tube-well.

PART D : Reading and interpreting Civil Engg. Drawing.

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DEARTCE605
EARTHQUAKE ENGINEERING

L	T	P
4	0	0

1. Causes of earthquakes and seismic waves, magnitude, intensity and energy release, Basic terminology, Characteristics of earthquakes, Seismic hazard, vulnerability and risk, Seismic Zoning.

2. Earthquakes performance of structures in past earthquakes.

3. Philosophy of earthquake resistant design and concept of ductility, Short and long period structures, Concept of spectrum, Static force calculations.

4. Architectural considerations : Building simplicity, symmetry. Irregularities, Continuity and Uniformity

5. Effect of soils and liquefaction, Remedial measures, Construction of earth structures.

6. Seismic construction of masonry buildings, precisions of IS:4326.

7. Seismic construction of RC buildings detailing, provisions of IS: 13920.

8. Retrofitting of masonry and reinforced concrete buildings.

9. DISASTER MANAGEMENT :

Definition of disaster - Natural and Manmade, Type of disaster management,How disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy-Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and benefit of vulnerability reduction, Factor promoting vulnerability reduction and mitigation, Emergency support function plan.

Main feature and function of National Disaster Management Frame Work, Disaster mitigation and prevention, Legal Policy Frame Work, Early warning system, Human Resource Development and Function, Information dissemination and communication.

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DPROJCE606
PROJECT

L	T	P
0	0	12

6.6.1 Preparation of any such project:

(i) Survey and soil investigation, planning, designing preparing working drawings, estimation and scheduling of a work for a small building including writing of Technical Report.

(ii) Planning a water supply and drainage system for a house. Prepared of working drawings for all the sanitary fittings. Estimating quantity of materials and cost including writing of technical report.

(iii)Preparation of water supply and drainage scheme for a small colony with all working drawings, estimates and schedule of works including writing of technical report.

(iv) Given topographical sheet of the area, select alignment of a small length of road connecting tow stations. Preparation of detailed drawings (L-section, cross- section and plan). Detailed estimate, schedule of work and writing of technical report.

(v) Selection of type design for a culvert to be proposed over a river let crossing a road. Preparation of working drawings, detailed estimate, schedule of wor and writing of technical report.

(vi) Conducting survey, preparation of drawings, Estimate and writing technical report for the improvement and widening of an existing road.

(vii)Conducting survey work, preparation of plans, making proposals for improvement, preparation of estimate for existing road including writing of technical report.

(viii)Conducting survey work, preparation of plan, L-section and cross-section of a small distributor making proposals and preparing detailed estimates for earth work including writing of technical report.

(ix) Conducting survey work of a depression, making proposals for bund working out capacity of reservoir and design of irrigation system including writing of technical report.

(x) Planning of small civil engineering work including designs, drawings, estimates and technical report writing

(xi) Other problem with in syllabus including survey work, design, drawing estimate and technical report writing.