RAJIV GANDHI PRODYOGIKI VISHWAVIDYALAYA

BHOPAL

CURRICULAM

FOR
DIPLOMA IN CIVIL ENGINEERING

(FIFTH SEMESTER)

SCHEME ,DIPLOMA CIVIL ENGINEERING :-- JULY 2008

IMPLEMENTED FROM SESSION 2008-2009

UNDER SEMESTER SYSTEM

CURRICULUM DEVELOPMENT CETER

DEPTT. OF CIVIL ENGINEERING

MJP GOVT. POLYTECHNIC COLLEGE,
KHANDWA (M.P.)

RAJIV GANDHI PRODYOGIKI VISHWAVIDYALAYA
BHOPAL

DIPLOMA IN CIIVL ENGINEERING

SEMESTER	FIFTH SEMESTER
SCHEME	JULY-08
COURSE CODE	501
NAME OF THE COURSE (SUBJECT)	**IRRIGATION ENGINEERING**
OLD PAPER CODE	C501
NEW PAPER CODE	**6180**
COMMON WITH PROGRAMME	
BRANCH	C03 (CIVIL)
LECTURE HRS. PER WEEK	TH. 05 PR. NIL
LECTURE HRS. PER SEMESTER	TH. 75 PR. NIL

RATIONALE

India is an agricultural country where majority of persons live in villages. Agricultural Industry is the backbone of Indian economy. India being the tropical country, rainfall is available only for three to four months and is not uniform. To increase the yield of the farmers, assured uniform supply of water throughout the year is essential. This is possible only with enhancing the Irrigation facilities in the country. Irrigation is an age-old art. The aim of the subject is to present the science and practice of Irrigation engineering in a concise form comprising practically all the modern development. The input to the subject is the knowledge of survey for investigation, hydrology for calculation of yield from rainfall records and hydraulics for designing the storage, conveyance and outlet structures.

In current time the interlinking of river project is in the stage of implementation. The knowledge of irrigation is necessary.

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DIPLOMA IN CIVIL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 501 **PAPER COADE : 6180**
NAME OF COURSE : Irrigation Engineering

SCHEME OF STUDIES

S. No	Topics	Theory Hrs	Practical Hrs	Total Hrs	Suggested distribution of marks for Th. paper
1.	Introduction	07	-	07	10
2.	Hydrology	10	-	10	12
3.	Water Requirement Of Crops	08	-	08	12
4.	Investigation And Reservoir Planning	10	-	10	08
5.	Dams And Spillways	12	-	12	14
6.	Small irrigation Structure, Bandhara Percolation Tanks And Lift Irrigation	12	- -	12	12
7.	Diversion Head Works	08	-	08	16
8.	Canals	08		08	16
	Total	75	-	75	100

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DIPLOMA IN CIVIL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 501 **PAPER COADE : 6180**
NAME OF COURSE : Irrigation Engineering

CONTENTS

S.No.	Topics	Course content	Total Hrs.
01	INTRODUCTION	Definition – Irrigation and irrigation engineering, advantages of irrigation, ill effects of over irrigation, and types of irrigation project purpose wise and administrative wise, Methods of irrigation. Analyze data for irrigation project, supervision of reservoir and canal structure, weir and barrages, lift irrigation scheme, its suitability, advantages and limitations Capacity of reservoir ,Principle of Hydrology Relation between water and crop Rainfall, Crops, Dams Weir, Barrages, Area Capacity curve Capacity Canal Concept of runoff duty delta and base period	**07**
02	HYDROLOGY	Hydrological cycle**,** Definition of rainfall , rain gauge and rain gauge station , types of rain gauges (names only) average annual rain fall and its calculation , definition of run off, factor affecting run off, calculation of run off by run off coefficient, English formula , Stranges and Binnie's tables and curves. Maximum flood discharge and methods of calculation. Unit hydrograph Yield and Dependable yield and methods calculation.	**10**
03	WATER REQUIREMENT OF CROPS	Cropping seasons and crop in Madhya Pradesh. Definition – Crop period base period Duty Delta , factors affecting Duty , relation between Duty Delta and base period Definition – CCA , GCA, IA, intensity of irrigation time factor capacity factor. Crop rotation. Problems on water requirement and capacity of canal. Assessment of irrigation water	**08**
04	INVESTIGATION AND RESERVOIR PLANNING	Survey for irrigation project data collected for irrigation project. Area capacity curve, silting of reservoir, rate of silting, factors affecting silting, methods to control levels and respective storage in reservoir. Fixing control levels	**10**
05	DAMS AND SPILLWAYS	Types of dams – Earthen dams and Gravity dams (masonry and concrete) Comparison of earthen and gravity dams with respect to	**12**

		foundation, seepage, construction and maintenance Earthen Dams – Components and their function , typical cross section seepage through embankment and foundation seepage control though embankment and foundation . Methods of constructions, types of failure of earthen dams and remedial measures. Gravity Dams Theoretical and practical profile, typical cross section, drainage gallery, joint in gravity dam, high dam and low dam Spillways-Definition, function, location and components. Emergency and services, ogee spillway and bar type spillway, discharge over spillway. Spillway with and with out gates	
06	SMALL IRRIGATION STRUCTURE , BANDHARA, PERCOLATION TANKS AND LIFT IRRIGATION	Advantages and disadvantages of Bandhara irrigation layout and component parts, solid and open Bandhara. Percolation Tanks – necessity and importance, selection of site. Layout of lift irrigation scheme. Irrigation department standard design and specification. Small irrigation structures, like Stop dam, stop dam cum cause way, ring bund , small ponds	**12**
07	DIVERTION HEAD WORKS	Weirs – components parts, unction and types, layout of diversion head works wits its components and their function, canal head regular, silt excluders and silt ejectors. Barrages – components and their function. Difference between weir and barrage irrigation department standard design and specifications.	**08**
08	CANALS	Classification of canals according to alignment and position in the canal network. Design of most economical canal section. Canal lining – Definition, purpose, types of canal lining advantages of canal lining properties of good canal lining material. CD. works- different C.D. works, canal falls, escapes, cross regulators and canal outlets	**08**
		TOTAL	**75**

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DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 501

NAME OF COURSE : Irrigation Engineering Paper code : 6180

LIST OF REFEENCE BOOKS

S.No.	Title	Author	Publisher
1	Irrigation and water power Engineering	B.C. Punmia	
2.	Introductory Irrigation Engineering	B.C. Punmia	Laxmi Publication, Delhi.
3	Fundamental principle of Irrigation Engineering	V.B. Priyani	
4	Fundamental principles of Irrigation Engineering	Bharat Singh	
5	Irrigation Engineering. & Hydraulic structures	S.K. Garg	Khanna publisher, New Delhi.
6	Principles of Irrigation. Engineering	S.K. Verma	
7.	Irrigation Engineering	Birdie.	

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SEMESTER	FIFTH SEMESTER
SCHEME	JULY-08
COURSE CODE	**502**
NAMEOF THE COURSE(SUBJECT)	**QUANTITATIVE SURVEYING ESTIMATING & COSTING - I**
OLD PAPER CODE	
NEW PAPER CODE	**6181**
COMMON WITH PROGRAMME	
BRANCH	C03
LECTURE HRS. PER WEEK	TH. 06 PR. 00
LECTURE HRS. PER SEMESTER	TH. 90 PR. 00

RATIONALE

Preparation of quantity and cost estimates of the various items/ works is a major job function of a Diploma pass out in the field of Construction Technology and Management. This is a core technology subject, which will enable the students to learn core facts, concepts, principles & procedures in Estimating & Costing. With this knowledge and skill, he will be able to prepare estimate before start of construction and during execution. The course therefore, aims in developing in the student competency in preparing estimates of all types of Civil Engineering Structures i.e. Building Construction, Irrigation, Transportation and Environmental Engineering. The student is made familiar with the procedures and principles of measuring various works, estimating its cost and computing quantities of material needs. After learning the principles and procedures student applies them to prepare Estimate cost of various types of buildings, Earthwork and Road work estimates.

RAJIV GANDHI PRODYOGIKI VISHWAVIDYALAYA
BHOPAL

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 502 **Paper code : 6181**

NAME OF COURSE : QUANTITATIVE SURVEYING ESTIMATING & COSTING - I

SCHEME OF STUDIES

S. No	Topics	Th.Hrs	Pract.Hr	Total Hr.	Suggested distribution of marks for theory paper
01	Overview Of Estimating & Costing	12	-	12	12
02	Detailed Estimate	08	-	08	08
03	Mode of Measurements.	06	-	06	08
04	Procedure for Preparing Detailed Estimate	24	-	24	36
05	Rate analysis	16	-	16	18
06	Taking out quantities of work for different Civil Engineering Works	24	-	24	18
	Total Hours	**90**		**90**	**100**

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DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 502 **PAPER CODE : 6181**
NAME OF COURSE : QUANTITATIVE SURVEYING ESTIMATING & COSTING - I

S.No.	Chapter	Name of the Topic	Hours
01	Overview Of Estimating & Costing	Meaning of the terms estimating, costing. Purpose of estimating and costing . Types of estimate - Approximate and Detailed. Approximate estimate Types- Plinth area rate method, Cubic Content method, Service Unit method, Typical bay method, Approximate Quantity method , Problems on Plinth area rate method & application of Service unit method for selection of service unit for different types of civil Engineering Structures. Types of detailed estimate Detailed estimate for new work. Revised estimate. Supplementary estimate. Revised & Supplementary estimate. Maintenance & Repair estimate. Uses of detailed estimate	**12**
02	Detailed Estimate	Unit quantity method, Total quantity method, Data required for detailed estimate. Factors to be considered during preparation of detailed estimate, Specification, Quantity availability of material, Location of site, Labour Component. Steps in preparing detailed estimate. Taking out quantities, squaring, abstracting. Preparing check list – by adoption of Sequence of execution. drafting Brief Specification of items, contents of measurement Sheet , Abstract sheet , face sheet	**08**
03	Mode of Measurements.	General Rules for fixing units of Measurements for different– items of work as per IS 1200 & As per PWD Hand Book Desired accuracy in taking measurements of various items of work & rules for deductions as per IS 1200 & P.W.D. handbook.	**06**
04	Procedure for Preparing Detailed Estimate	Procedure for taking out quantities for various items of works by P.W.D & IS 1200 for. a) for Load bearing Structure –Long Wall and short wall method , Center line method . b) Framed Structure building. -- - By using thumb rules for reinforcement quantity calculation - By preparing bar bending Schedule Provisions in detailed estimate for contingencies, work charged establishment, Provisional items, Provisional Sum, Provision for water Supply & Sanitary works, Electrical wiring & installations, centage charges, Tools & Plants,Prime cost, Day work.	**24**

05	Rate analysis	Meaning of term Rate analysis –Factors affecting rate analysis, lead, lift, task work, materials and labour component, Market Rate and labour rate. Transportation of Materials, load factor for different materials. Standard lead , extra lead, Transportation Charges , Labour - Categories of labours, labour rates, overheads contractor's profit, water charges, taking out quantities of materials for different items of works. Preparing rate analysis of different items of work Standard Schedule of rates, full rates & labour rates.	**16**
06	Taking out quantities of work for different Civil Engineering Works	Roads, Dam , Canals ,Railway embankments, methods of mean area , mid sectional area, trapezoidal, Prismoidal formula. Calculation of quantity of earth work. Estimate of Road of 1km. length for pavement surface – WBM Bitumen Cement concrete road Use of software for estimation & for analysis of rates.	**24**
		Total	**90**

List of Assignments:

1) Prepare Check list of items of following type of Civil Engineering works.
    a) Load Bearing type Building
    b) Framed structure type building
    c) W.B.M.Road
    d) Septic Tank
    e) Community well

2) Writing the rules of deduction's for below mentioned items of work as per IS 1200.
    a) Brick / Stone masonry.
    b) Plastering / Pointing

3) Taking out quantities of various items of work for load bearing building.
    i) Earth work in excavation for foundation
    ii) Base Concrete of foundation
    iii) U.C.R. /BB Masonry work in foundation and plinth.
    iv) D.P.C.
    v) Plinth Filling.
    vi) Brick work in masonry.
    vii) Flooring
    viii) Plastering.
    ix) Wood work in doors & windows

4) Taking out quantities of following items for small R.C.C. Hall
    i) Concreting for footing, Column, Beam, slab.
    ii) Reinforcement for above items by preparing Schedule of bars.
    iii) Form work for all above items.

5) Preparing detailed estimate of a RCC single & two storied residential building for all items of work. (The quantity of reinforcement shall be calculated by percentage.)

6) Preparing Rate analysis of following items:
Building work – Brick work, P.C.C., R.C.C., Plastering, Flooring, Doors, Windows.

7) Taking out quantities of earth work for a Road profile prepared in surveying subject. Prepare
the lead statement.

8) Taking out quantities of work for a Community well or Jack well or Septic Tank.

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DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 502 **PAPER CODE : 6181**
NAME OF COURSE : QUANTITATIVE SURVEYING ESTIMATING & COSTING - I

LIST OF REFEENCE BOOKS

S.No.	**Title**	**Author**	**Publisher**
01	Estimating & costing in Civil Engineering	B.N. Datta	UBS Publishers Distributors Pvt Ltd New Delhi
02	Estimating & costing, Specification and Valuation in Civil Engineering	M. Chakraborti M. Chakraborti , Calcutta	
03	Estimating & costing	S.C. Rangwala Charotar	Publication Anand
04	Civil Engineering Estimating, Contracts and accounts Vol . I	B.S. Patil Orient Longman, Mumbai	
05	Estimating & costing	G. S. Birdie	Dhanpat Rai and Sons Delhi

2. Video Cassettes /CDS:

S.No.	**Title**
01	Q. E. PRO software
02	IS/INTERNATIONAL CODES
S.No.	**Title**
01	IS 1200- Method of Measurement of building and Civil engineering works

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SEMESTER	FIFTH SEMESTER
SCHEME	JULY-08
COURSE CODE	**503**
NAMEOF THE COURSE(SUBJECT)	**WORK ORGANIZATION & MANAGEMENT**
OLD PAPER CODE	
NEW PAPER CODE	**6182**
COMMON WITH PROGRAMME	
BRANCH	C03,
LECTURE HRS. PER WEEK	TH. 06 PR. 00
LECTURE HRS. PER SEMESTER	TH. 90 PR. 00

RATIONALE

A technician of Civil Engineering is required to execute civil work in various departments. The subject of included as a basic technology courage so as to develop abilities of solving day to day problems arising during construction maintenance work. Handling live problems in the department such as issue of tender documents preparing T.A. Bills & CPM & charts, Handling to cash book, muster Rolls and settlement of imprest account problems etc. Understand labour laws and successfully dealing with labour and sub-ordinate staff.

In brief the subject works organization and management has been introduced to develop managerial skills in the students, so that he can successfully hurdle live situations at work.

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH SCHEME : JULY 08
COURSE CODE : 503 PAPER CODE : 6182
NAME OF COURSE : WORK ORGANIZATION & MANAGEMENT

SCHEME OF STUDIES

S.No	Topics	Theory Hrs	Practical Hrs	Total Hrs.	Suggested distribution of marks
01	Procedure of Execution of work by P.W.D	08	-	08	08
02	Contract	14	-	14	12
03	Tender & Tender documents	14	-	14	12
04	Accounts of P.W.D.	10	-	10	10
05	Payment to Contractors	10	-	10	12
06	Specifications	08	-	08	10
07	CASH, BILLS, AUCTION & T.A. RULES	10	-	10	12
08	TIME SCHEDULE FOR WORKS	08	-	08	12
09	MISCELLANEOUS	08	-	08	12
	Total	**90**		**90**	**100**

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH SCHEME : JULY 08

COURSE CODE : 503 PAPER CODE : 6182

NAME OF COURSE : WORK ORGANIZATION & MANAGEMENT

CONTENT

S.No.	Chapter	Name of the Topic	Hours
01	Procedure of Execution of work by P.W.D.	Organization of P.W.D. functions of their personnel. P.W.D. procedure of initiating the work administrative approval, technical sanction, budget provision. Method used in P.W.D. for carrying out works contract method and departmental method, Rate list method, piece work method, day's work method, department method. (NMR and casual muster roll).	**08**
02.	Contract	Definition of contract, objects of contract, requirements of valid contract. Types of engineering contract- Lump sum contract, item rate contract, percentage rate contract, cost plus percentage, cost plus fixed fee, cost plus variable percentage and cost plus variable fee contract, labor contract, demolition contract , fee contract, target contract, negotiated contract. Class of contractor, Registration of contractor. BOT Project.	**14**
03.	Tender & Tender documents	Definition of Tender, necessity of Tender, Types of Local & Global.Tender Notice, points to be included while drafting Tender Notice, Drafting of Tender Notice. Meaning of terms: Earnest money, security deposit, validity period, right to reject one or all tenders, corrigendum to tender notice and its necessary. Tender documents – List, scheduled A, Schedule B, Schedule C. Terms related to Tender documents – Contract conditions, time limit, time extension, penalty, defective material and workmanship, Termination of contract, Suspension of work, subletting of contract, extra item, escalation, arbitration, price variation clause, defect liability period, liquidated and un liquidated damages. Filling the tender by contractor and points to be observed by him.Procedure of submitting filled in Tender document. Procedure of opening tender, comparative statement, scrutiny of tenders, award of contract, acceptance letter and work order. Unbalanced Tender, Ring Formation.	**14**
04.	Accounts of P.W.D.	Various Accounts Forms and their uses – measurement, Books, Nominal Muster Roll, Imprest Cash, indent, Invoice, Bills, Vouchers, Cash Book, Temporary advance	**10**
05.	Payment to Contractors	Mode of payment to the contractor : Interim payment and its necessity, Advance payment, secured advance, on account payment, Final payment, first and final payment, retention money, reduced rate payment, petty advance, mobilization advance.	**10**

06.	Specifications	Necessity and importance of specifications of an items, points to be observed in framing specifications of an item, types of specification. Brief and detailed, standard and manufacturers specifications. Preparing detailed specifications of items in Civil engineering works, standards specification book. Legal aspects of specification.	**08**
07.	CASH, BILLS, AUCTION & T.A. RULES	Procedure to settle account of money received, modes of payment, permanent and temporary advance, comparison, checking of bills and vouchers, auction procedure, T.A. rules etc.	**10**
08.	TIME SCHEDULE FOR WORKS	Importance of management of works Gantt bar chart, limitation of chart, CPM network, project chart	**08**
09.	MISCELLANEOUS :	Necessity of maintaining daily dairy, need for presence of sub engineer, A/R & S/R , charge to be handled to be cash transferred, inspection of rest houses. Measures to improve the efficiency of labour, causes of accident, trade unions, aims of labour legislation, labour courts, attitudes of sectional officers towards labour	**08**
		Total	**90**

Assignments :

1. Collecting old set of tender document and writing a report on it.
2. Collection of tender notices published in newspapers for various items of civil engineering works (At least 5) write salient features of them.
3. Drafting Tender Notice for construction of a Civil Engineering work (W.B.M. Road, Residential Building)
4. Preparation of Tender Document for the building. (Detailed Estimate prepared for R.C.C. building in estimating and costing shall be used)
5. Collection of various account forms from PWD & wiring report on in it.
6. Writing a report on store procedure and account producer of PWD. For it A – a) Guest Lecture of PWD Official may be arranged.
7. Writing detailed specifications for one item from each of following :
   A) Building construction system.
   B) Irrigation engineering system.
   C) Transportation engineering system.
   D) Environment engineering system.
8. Preparing muster rolls.
9. Preparing imprest account and temporary advance forms and developing skill for filling in forms.
10. Solving CPM and Net work problems
11. CPM PERT RELATED SOFTWARE
12. Preparation a ‘ E” Tendering of a particular project .

VISITS :

1. Visit to public sector/Govt. Industry/ Organization.like PWD ,RES,
2. Visit to private sector Industry.

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH SCHEME : JULY 08
COURSE CODE : 503 PAPER CODE : 6182
NAME OF COURSE : WORK ORGANIZATION & MANAGEMENT

REFERENCE BOOKS :

S.No.	Title	Author	Publisher
01	A.B.C. of PWD Accounts	C.M. Kaul	
02	Overseer accounts & Duties	Kumar	
03	PWD Managements, Accounts & Labour Relation	H.S. Pandit	
04	Construction Management & PWD Accounts	Agrawal & Arora	
05	MPPWD Manual Vol-I & Vol-II		
06	Manual of Labour Relations	R.C. Shrivastava	
07	Civil Engineering management	O.N. Wakhle,	D.K. Publisher
08	Estimating & costing in civil Eng	B.N. Datta	USB Publisher
09	Estimating & costing	G.S. Birdie	Dhanpat rai & son

RAJIV GANDHI PRODYOGIKI VISHWAVIDYALAYA
BHOPAL

SEMESTER	FIFTH SEMESTER
SCHEME	JULY-08
COURSE CODE	**504**
NAMEOF THE COURSE(SUBJECT)	**TRANSPORTATION ENGINEERING - II**
OLD PAPER CODE	
NEW PAPER CODE	6183
COMMON WITH PROGRAMME	CTM (Exam code 841)
BRANCH	C03
LECTURE HRS. PER WEEK	TH. 04 PR. 02
LECTURE HRS. PER SEMESTER	TH. 60 PR. 30

RATIONALE

Road is important, largest and basic mode of transportation in India. The transportation by road is the only one mode which could give maximum service to all. The road is also easy and effective mode of transportation. There is very much scope of road development work and its maintenance in our country. Students of Diploma in Civil Engineering have very much job opportunities in this field. He could work as a technician in P.W.D. and road construction organization. Also He could take the road construction works on contract basis. This subject gives the knowledge and skills required to carry investigation, planning, design, construction, maintenance works related to the roads.

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 504 **PAPER CODE : 6183**
COMMON WITH PROGRAMME : CTM (Exam code 841)
NAME OF COURSE : TRANSPORTATION ENGINEERING - II

SCHEME OF STUDIES

S. No.	Topics	Theory Hrs	Practical Hrs.	Total Hrs.	Suggested distribution of marks
1	Road Engineering	04	--	04	04
2	Investigation For Road Project	07	06	13	10
3	Geometric Design Of Highways	12	08	20	24
4	Construction Of Roads Pavements And Materials	15	08	23	25
5	Traffic Engineering	08	04	12	15
6	Hill Roads	04	--	04	05
7	Drainage Of Roads	04	--	04	05
8	Maintenance And Repairs Of Roads	04	04	08	08
9.	Arboriculture	02	--	02	04
	Total	60	30	90	100

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**

COURSE CODE : 504 **PAPER CODE : 6183**

COMMON WITH PROGRAME : CTM (Exam code 841)

NAME OF COURSE : TRANSPORTATION ENGINEERING - II

CONTENT

S. No	Chapter	Topics	Total Hr.
01.	ROAD ENGINEERING	Importance of road in India. Classification of roads according to Nagpur plan (Location and function), and third road development plan. Traffic and tonnage, Classification of urban roads.different road yojana ,like pradhan mantra gram sadak yojana ,Mukhya mantra sadak yojna .	**04**
02	INVESTIGATION FOR ROAD PROJECT	Reconnaissance survey, Preliminary survey and Location survey for a road project. Detailed survey for cross drainage- L-section and C/S sections. Fixing the alignment of road, factors affecting alignment of road. Drawings required for road project- Key map, Index map, Preliminary survey plan and detailed location survey plan, L section and C/S sections cross drainage work, land acquisition plan. Survey for availability of construction material, location plan of quarries	**13**
03	GEOMETRIC DESIGN OF HIGHWAYS	Camber- definition, purpose, types, IRC – specifications. Kerbs, road margin, road formation, right of way. Design speed- IRC – specifications. Gradient – definition, types, IRC specification. Sight distances– definition, types, IRC specification. Curves–Necessity, types– horizontal, vertical and transition curves. Widening of roads on curves. Super Elevation – definition, formula for calculating super elevation, minimum and maximum values of super elevation, and methods of providing super elevation. Sketching of standard C/S of national highway in embankment and cutting. Simple problems on geometric design of road	**20**

04	CONSTRUCTION OF ROADS PAVEMENTS AND MATERIALS	Types of road materials and Tests – soil, aggregates, bitumen, Cement Concrete. Test on soil sub grade- C.B.R. test, Test on Aggregate – Los Angeles abrasion, impact, and shape test. Tests on bitumen- Penetration, Ductility and Softening point test. Pavement – objective of pavement, structure of pavement, function of pavement components, types of pavement. Construction of earthen road – general terms used- borrows pits, spoil bank, lead and lift, balancing of earthwork. Construction procedure. Soil stabilized roads – necessity, methods of soil stabilization, brief details of mechanical soil stabilization. Water bound macadam roads – materials used, size and grading of aggregates and screening, construction procedure including precautions in rolling. Construction of bituminous roads. Terms used– bitumen, asphalt, emulsion, cutback, tar, common grades adopted for construction. Types of bituminous surface – prime coat, tack coat, seal coat, Surface dressing – procedure of construction bituminous penetration macadam, and Bitumen/Tar carpets – procedure of construction. Cement concrete pavements- Construction procedure and equipments, Construction joints, joint filler, joint sealer.	**23**
05	TRAFFIC ENGINEERING	Traffic volume study, Traffic control devices- road signs, marking, Signals, Traffic Island. Road intersections- intersections at grade and grade separator intersections. Road accident. Building code IS:1904. Definition of active earth pressure and passive earth pressure, structures subjected to earth pressure in the field	**12**
06	HILL ROADS:	Parts and functions of hill road components, types of curves, Hill road formation. Land slides- causes and prevention. Structures- drainage structures	**04**
07	DRAINAGE OF ROADS	Surface drainage – side gutter, catch water drains, surface drainage. Sub-surface drainage –Longitudinal drains and cross drains	**04**

08	MAINTENANCE AND REPAIRS OF ROADS	Necessity of maintenance of roads, Classification of maintenance operation – ordinary, routine and periodic maintenance. Maintenance of W.B.M., bituminous and cement concrete roads.	**08**
09	ARBORICULTURE	Road side arboriculture, necessity, planning of plantation of trees selection of types of threes and development of nursery considering the environment aspects	**02**

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 504 **PAPER CODE : 6183**
COMMON WITH PROGRAMME : CTM (Exam code 841)
NAME OF COURSE : TRANSPORTATION ENGINEERING - II

SUGGESTED TERMS –WORK

List of Assignments:

1. Road project for a road of minimum 0.5 km. length having at least one small cross drainage work.
    - Site selection.
    - Reconnaissance survey.
    - Fixing the alignment.
    - Detailed profile survey along the alignment and cross section of road and CD Work.
    - Prepare computer generated drawing of longitudinal section and typical cross sections of the road in cutting and filling.
    - Prepare computer generated drawing of proposed typical CD work/culvert. (Using CAD)
2. Visit to a road under construction/constructed to study the construction of (a) WBM road (b) flexible pavement (c) Rigid pavement roads for observing the type of construction and construction equipments.
3. Preparing drawings of detailed cross sections of (a) major district road (b) state Highway (c) National highway (d) Express Highway in cutting and banking showing details and dimensions with proper scale. (Any two)
4. Traffic volume study and its representation of an important road intersection in your city.
5. Visit to a W.B.M. and Bituminous road for observing the different types of defects in roads.
6. Prepare a visit report. Which should consist of (a) List of various defects observed b) Suggestions regarding the possible remedial measure.
7. Types of road materials and Tests – soil, aggregates, bitumen, Cement Concrete. Test on soil sub grade- C.B.R. test, Test on Aggregate – Los Angeles abrasion, impact, and shape test. Tests on bitumen- Penetration, Ductility and Softening point test.
8. Study of Different Highway software. Road SOR , MOST
    1- Geometrics 2- Pythagoras 3- C-Lx

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 504 **PAPER CODE : 6183**
COMMON WITH PROGRAMME : CTM (Exam code 841)
NAME OF COURSE : TRANSPORTATION ENGINEERING - II

REFERENCE BOOKS:

S.No.	Title	Author	Publisher
01	Highway Engineering	Khanna & Justo	Khanna Pub.
02	Traffic Engineering	L.R. Kadiyali	
03	Transportation Engineering	N.L.Arora,S.P.Luthara	I.P.H. New Delhi
04	Transportation Engineering	Vazarani & Chandola	Khanna Pub.
05	Road, Railway, Bridges	Biridi & Ahuja.	S.B.H.New Delhi
06	Transportation Engineering	Kamala	T.M.H. New Delhi
07	DATA book of P.W. D.		
08	MOST		
09			

IS / International Codes. : IRC 36 – 1970, IRC 16 –1965, IRC 20 -1966

RAJIV GANDHI PRODYOGIKI VISHWAVIDYALAYA
BHOPAL

SEMESTER	FIFTH SEMESTER
SCHEME	JULY-08
COURSE CODE	**505**
NAMEOF THE COURSE(SUBJECT)	**STRUCTURAL DESIGN & DRAFTING – I (RCC)**
OLD PAPER CODE	**6184**
NEW PAPER CODE	CTM (Exam code 841)
COMMON WITH PROGRAMME	C03,
BRANCH	TH. 06 PR. 02
LECTURE HRS. PER WEEK	TH. 90 PR. 30
LECTURE HRS. PER SEMESTER	

RATIONALE

The technician in construction Technology must have the concept of R.C.C. and should also be able to design simple R.C.C. structures, though be is not required to design complicated R.C.C. structures. Keeping this view in mind the course of R.C.C. is so designed that a technician in construction technology develop a concept of theory of R.C.C. gradually and finally will be able to design simple R.C.C. structures such as beam, slab, column footing ,ductile detailing etc.

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 505 **PAPER CODE : 6184**
COMMON WITH PROGRAMME :CTM (Exam code 841)
NAME OF COURSE : STRUCTURAL DESIGN & DRAFTING – I (RCC)

SCHEME OF STUDIES

S No	Topics	Theory Hrs	Practical Hrs.	Total Hrs.	Suggested distribution of marks
01	Introduction	02	--	02	02
02	Fixed & continuous beams	08	--	08	08
03	Working Stress Method & Prestressed Concrete.	10	--	10	10
04	Limit State Method	08	--	08	05
05	Analysis and Design of Singly Reinforced Sections (LSM)	10	03	13	10
06	Analysis and Design of Doubly Reinforced Sections (LSM)	10	03	13	10
07	Shear, Bond and Development Length (LSM	06	03	09	08
08	Analysis and Design of T-Beam (LSM)	08	06	14	14
09	Design of Slab (LSM)	10	06	16	10
10	Design of Axially Loaded Column and Footing (LSM)	10	06	16	15
11	Earthquake resistance structures	08	03	11	08
	Total	90	30	120	100

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH **SCHEME : JULY 08**
COURSE CODE : 505 **PAPER CODE : 6184**
COMMON WITH PROGRAMME :CTM (Exam code 841)
NAME OF COURSE : STRUCTURAL DESIGN & DRAFTING – I (RCC)

CONTENTS

04	**Limit State Method** Definition, types of limit states, partial safety factors for materials strength, characteristics strength, characteristics load, design load. Loading on structure as per I.S. 875. I.S. Specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing, minimum reinforcement in slab, beam & column, lapping, anchoring effective span for beam & slab.	08
05	**Analysis and Design of Singly Reinforced Sections (LSM)** Limit State of collapse (Flexure), Assumptions stress. Strain relationship for concrete and steel neutral axis, Stress block diagram and Strain diagram for singly reinforced section. Concept of under-reinforced, over-reinforced and balanced section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for balanced singly R.C. Section. Simple numerical problems on determining design constants, moment of resistance and area of steel.	13
06	**Analysis and Design of Doubly Reinforced Sections (LSM)** General features, necessity of providing doubly reinforced section reinforcement limitations. Analysis of doubly reinforced section, strain diagram stress diagram, depth of neutral axis, moment of resistance of the section. Simple numerical problems on finding moment of resistance and design of beam sections.	13
07	**Shear, Bond and Development Length (LSM)** Nominal Shear stress in R.C. Section, design shear strength of concrete, Maximum shear stress, Design of shear reinforcement, Minimum shear reinforcement, forms of shear reinforcement. Bond and types of bond, Bond Stress, check for bond stress, Development length in tension and compression, anchorage value of hooks 90° bend and 45° bend Standard Lapping of bars, check for development length. Simple numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear. Design of shear reinforcement; Minimum shear reinforcement in beams; Determination of Development length required for tension reinforcement of cantilevers beams and slab, check for development length.	09

08	**Analysis and Design of T-Beam (LSM)** General features, advantages, effective width of flange as per IS:456-2000 code provisions. Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam Section with neutral axis lying within the flange. Design of T-beam for moment and shear for Neutral axis within or up to flange bottom. Simple numerical problems on deciding effective flange width. (Problems only on finding moment of resistance of T-beam section with N.A. lies within or upto the bottom of flange shall be asked in written examination.	14
09	**Design of Slab (LSM)** Design of simply supported one-way slabs for flexure check for deflection control, and shear. Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear. Design of two-way simply supported slab for flexure with corner free to lift. Design of dog-legged staircase. Simple numerical problems on design of one-way simply supported slabs cantilever slab & two –way simply supported slab. (No problem on design of dog-legged staircase shall asked in written examination.)	16
10.	**Design of Axially Loaded Column and Footing (LSM)**	
	Assumptions in limit state of collapse- compression. Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties. Analysis and design of axially loaded short, square; rectangular and circular columns with lateral ties only, check for short column and check for minimum eccentricity may be applied. Types of footing, Design of isolated square footing for flexure and shear. Simple numerical problems on the design of axially loaded short columns and isolated square footing. (Problems on design of footing shall be asked in written examination for moment and two way shear only.)	16
11	**Principal of earth quake engineering** Introduction ,RICHTER SCALE, Soft story effect, detailing of structural elements ,ductile detailing ,earthquake zone in India Different earthquake I S codes (IS 1893-1984) IS 4326-1976 .causes of failure of structure during earth quake ,principal of constructing earthquake resistant buildings .	11
	Total	**120**

Sketch book :

Sketch book consists of approximately ten plates from R.C.C. Design shall include important information of clauses of IS 456-2000 code. Typical sketches of components members/stress distribution & strain distribution diagrams R.C.C. section / detailing of reinforcement in joints / members. Design of R.C.C. structural components by LSM.

Introduction to RCC design software STRUUDS

The students should make detailed simple design and drawing of reinforcement detailing on two full imperial size sheets finished in pencil on any five of the following R.C.C. components members of a two-storied building with detailing of reinforcement (G+1) at the joints as per requirements & IS 13920.

1. One-way simply supported slab.
2. Two-way simply supported slab.
3. Cantilever slab/chajja.
4. T-Beam
5. Column and column footing.
6. Dog-legged staircase.

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH SCHEME : JULY 08
COURSE CODE : 505 PAPER CODE : 6184
COMMON WITH PROGRAMME :CTM (Exam code 841)
NAME OF COURSE : STRUCTURAL DESIGN & DRAFTING – I (RCC)

Reference Books

S.No.	Authors	Title	Publisher
01	Dr. V.L. Shah & Late Dr. S.R. Karve.	Limit State Theory & Design of Reinforced Concrete.	Structure Publications
02	N.C. Sihna & S.K. Roy	Fundamentals of Reinforced concrete.	S.Chand& Company
03	N.Krishna Raju R.N. Pranesh	Reinforced concrete Design (IS 456-2000) Principles & Practice	New Age International
04	N. Krishna Raju	Prestressed Concrete	
05	S.U. Pillai & Devdas Menon	Reinforced concrete Design	Tata Mcgraw Hill.
06.	P.C. Varghase	Limit State Design of Reinforced Concrete.	Prentice Hall of India.
07	Shah & Kale	R.C.C. Design	

RAJIV GANDHI PRODYOGIKI VISHWAVIDYALAYA
BHOPAL

SEMESTER	FIFTH SEMESTER
SCHEME	JULY-08
COURSE CODE	**506**
NAMEOF THE COURSE(SUBJECT)	**FIELD VISIT / SEMINAR**
OLD PAPER CODE	
NEW PAPER CODE	
COMMON WITH PROGRAMME	CTM (841)
BRANCH	C03,
LECTURE HRS. PER WEEK	TH. 00 PR. 03
LECTURE HRS. PER SEMESTER	TH. 00 PR. 45

RATIONALE

It is necessary to have a field visit where the civil work in progress to implement books knowledge to the field. This will improve the knowledge of student .it also help to make interaction with offices & technical institutions .conducting seminar in the institution will improve student's confidence to present there work in proper manner. Seminar gives the present scenario of technology .

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH SCHEME : JULY 08
COURSE CODE : 506 PAPER CODE :
COMMON WITH PROGRAMME :CTM (Exam code 841)
NAME OF COURSE : FIELD VISIT / SEMINAR

SCHEME OF STUDIES

S No.	Topics	Theory Hrs	Practical Hrs.	Total Hrs.
1	FIELD VISITS	--	27	27
2.	SEMINAR	--	18	18
	Total	--	45	45

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH SCHEME : JULY 08

COURSE CODE : 506 PAPER CODE :

COMMON WITH PROGRAMME :CTM (Exam code 841)

NAME OF COURSE : FIELD VISIT / SEMINAR

CONTENTS

1. **FIELD VISITS** –

Visit to a construction site where the RCC work is in progress.

Visit to a construction site where the irrigation work is in progress.

Visit to a bridge site. Batching plant for cement concrete and bituminous road

Visit to water treatment plant.

Visit to a dam site Canal site .

Visit for a power plant site .

Visit for a construction site where multistoried mal /shoping complex i

2. SEMINAR –

Seminar on low cost housing ,

interlinking of rivers & irrigation structure rain water harvesting

Cement concrete roads & joints in cement concrete roads .

Traffic engineering .

Ductile detailing ,

use of different ISI codes for civil engineers ,releted to RCC & Earth quake resistant structure

Earthquake resistant structure ,design concepts for buildings

RAJIV GANDHI PRODYOGIKI VISHWAVIDYALAYA
BHOPAL

SEMESTER	FIFTH SEMESTER
SCHEME	JULY-08
COURSE CODE	**507**
NAMEOF THE COURSE(SUBJECT)	**PROFESSIONAL ACTIVITIES –** V
OLD PAPER CODE	NIL
NEW PAPER CODE	
COMMON WITH PROGRAMME	CTM (841)
BRANCH	
LECTURE HRS. PER WEEK	02
LECTURE HRS. PER SEMESTER	30

RATIONALE:

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive
tests. While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and their attitude, in addition to basic technological concepts. The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

OBJECTIVES:

Student will be able to:
1. Acquire information from different sources
2. Prepare notes for given topic
3. Present given topic in a seminar
4. Interact with peers to share thoughts
5. Prepare a report on industrial visit, expert lecture.

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH SCHEME : JULY 08
COURSE CODE : 507 PAPER CODE :
COMMON WITH PROGRAMME :CTM (Exam code 841)
NAME OF COURSE : PROFESSIONAL ACTIVITIES – V

PROFESSIONAL ACTIVITIES – V

Teaching Scheme Examination Scheme

Topic No	Contents	Hours
1	**Industrial /field /site Visits**	
	Structured industrial visits shall be arranged and report of the same should be submitted by the individual student, to form a part of the term work. Following are the suggested type of Industries/ Fields – (Any three visits) i) Irrigation project for observing components of dam and canal. ii) Concrete mixing & batching plant iii) Residential apartment /public building to study plumbing system. iv) Hot mix plant v) Market rate analysis of different materials and labour rate for different type of civil works. vi)Visit to a site where RCC work is in progress, slab casting Road work , Thermal Power Plant ..	**12**
2	The Guest Lecture/s from field/industry experts, professionals to be arranged (2 Hrs duration), minimum 2 nos. from the following or alike topics. The brief report to be submitted on the guest lecture by each student as a part of Term work. a) Construction of highway, material of construction ,machinery used and manpower requirement .RMC ,Highway project (DPR) b) To set up a small scale industry. c) Planning and design of irrigation project. Lift irrigation project d) design of earth quake resistant structures.	**04**
3	**Information Search :--**	
	data collection and writing a report on the topic a) Collecting an estimate from P.W.D. b) International Plumbing code and material specifications from market. c) Collecting market rates for material and labor for building items . d) Collecting D.S.R. /C.S.R. from PWD and its use for preparing revise estimate.	**06**

4	The students should discuss in group of six to eight students and write a brief report on the same as a part of term work. The topic of group discussions may be Selected by the faculty members. Some of the suggested topics are - i) Recent trends in civil engineering as a service industry. j) Waterproofing and leakage prevention. sound proofing ,air ducting k) Troubleshooting in plumbing system. l) Causes of failure of road. m)interlinking of rivers n) traffic volume study	**4**
5	Seminar : Seminar topic shall be related to the subjects of fourth/fifth semester. Each student shall submit a report of at least 05 pages and deliver a seminar A power point presentation preferred to caliber student skill. (Presentation time – 5 minutes)	**06**
	Total	**30**

DIPLOMA IN CIIVL ENGINEERING

SEMESTER : FIFTH SCHEME : JULY 08
COURSE CODE : 507 PAPER CODE :
COMMON WITH PROGRAMME :CTM (Exam code 841)
NAME OF COURSE : PROFESSIONAL ACTIVITIES – V

Reference Books:

Sr. No	Author	Title of the book	Publisher
1	Marshall Cooks Adams	Time management	Viva Books
2	E.H. Mc Grath , S.J.	Basic Managerial Skills for All	Pretice Hall of India, Pvt Ltd
3	Allen Pease	Body Language	Sudha Publications Pvt. Ltd.
4	Lowe and Phil	Creativity and problem solving	Kogan Page (I) P Ltd
5	by Adair, J	Decision making & Problem Solving	Orient Longman
6	Bishop , Sue	Develop Your Assertiveness	Kogan Page India
7	Marion E Haynes	Make Every Minute Count	Kogan page India
8	Steven L McShane and Mary Ann Glinow	Organizational Behavior	Tata McGraw Hill
9	Stephen P. Robbins	Organizational Behavior	Pretice Hall of India, Pvt Ltd
10	Michael Hatton	Presentation Skills	(Canada – India Project) ISTE New Delhi
11		Stress Management Through Yoga and Meditation	Sterling Publisher Pvt Ltd
12	Richard Hale ,Peter Whilom	Target setting and Goal Achievement	Kogan page India
13	Chakravarty, Ajanta	Time management	Rupa and Company
14	Harding ham	Working in Teams	A Orient Longman

Program Name : Three Year Diploma in Civil Engg.

Name of Scheme : JULY 2008 Exam Code : **(V Semester)** Implemented From : 2008-09

COURSE CODE	COURSE TITLE	PAPER CODE	THEORY COMPONENT								PRACTICAL COMPONENT						TOTAL
			LECTURES Hrs. PER WEEK	CONTINUOUS			END OF THE SEMESTER EVALUATION			TOTAL MARKS	PRACTICAL Hrs Per week	CONTINUOUS EVALUATION	END OF THE SEMESTER EVALUATION			TOTAL	
				TERM WORK	PROGRESSIVE TESTS (TWO)												
					I	II	THEORY PAPER					LAB WORK	PRACTICAL/ORAL EXAMINATION (VIVA)				
							NO	MARKS	DURATION (Hrs)				NO	MARKS	DURATION (Hrs)		
501	Irrigation Engg.	6180	05	30	10	10	01	100	3Hrs	150	-	-	-	-	-	-	150
502	Q.S.C.-I	6181	06	30	10	10	01	100	3Hrs	150	-	-	-	-	-	-	150
503	Work organ. & mang	6182	06	30	10	10	01	100	3Hrs	150	-	-	-	-	-	-	150
504	Transportation Engg.-II	6183	04	15	10	10	01	100	3Hrs	135	02	15	01	50	3Hrs	65	200
505	S.D.D.-I (RCC)	6184	06	15	10	10	01	100	3Hrs	135	02	15	01	50	3Hrs	65	200
506	Field visit/Seminar		-	-	-	-	-	-	-	-	03	50	-	-	-	50	50
507	Professional Activi										02	GRADE TO BE AWARDED					
			27	120	50	50	05	500		720	9	80	02	100		180	900

1.	Number of Theory papers	05	Passing marks for	
2.	Total Theory marks	500	Theory	33%
3.	Number of Practicals	02	Practical	40%
4.	Total practical marks	100	Sessional	60%
5.	Total marks of term work+lab work+prog.asst.	300		