

**Scheme of Teaching and Examination for
IV Semester DIPLOMA in CIVIL(RURAL) ENGINEERING**

THEORY

SL. No	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME					
			Periods per Week	Periods in one Session	Hours of Exam.	Terminal Exam. (A) Marks	Final Exam. (B) Marks	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
1	Surveying-II	15401	6	60	3	20	80	100	26	36
2	Quantity Surveying & Costing - I	15402	6	60	4	20	80	100	26	36
3	Cost Effective Rural Housing Construction Technology	16403	5	60	3	20	80	100	26	36
4	Civil Engineering drawing & drafting	15404	12	120	4	20	80	100	26	36
5	Anthropology & Rural Sociology	16405	4	50	3	20	80	100	26	36
Total :-			33					500		

PRACTICAL

SL. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME					
			Periods per Week	Periods in one Session	Hours of Exam.	Marks Internal Exam. (A)	Marks External Exam. (B)	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
6	Field Survey	15406	18 days Continuous		4	10	40	50	16	21
7	Rural Construction Practice Lab	16407	9	60	4	10	40	50	16	21
Total :-			9					100		

SESSIONAL

SL. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME			
			Periods per Week	Periods in One Session	Marks of Internal Examiner (X)	Marks of External Examiner (Y)	Total Marks (X+Y)	Pass Marks in the Subject
8	Field Survey	15408	-	-	20	30	50	25
9	Civil Engineering Drawing	15409	-	-	20	30	100	25
Total :-							150	

Total Periods per Week	42	Total Marks	750
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SURVEYING – II

Subject Code 15401	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale:

The primary job of civil engineering technician is survey work. It is to be carried out for any civil engineering project before any planning & construction can be taken. Hence a thorough knowledge of the methods of surveying & leveling as well as that of plotting is must for any technician. Technicians must also possess skill in the handling of survey instrument for proficiency in carrying out survey work. Therefore the subject is of paramount importance & must necessarily form the base of Civil Engineering curriculum.

Objective:

The student will be made conversant with the various instruments & appliance used in surveying. He will be taught chain survey, plane table survey, compass survey and triangulation survey and would be introduced to the modern survey methods.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01	Theodolite Surveying	(15)
02	Curves	(15)
03	Tacheometry	(10)
04	Contouring	(14)
05	Modern Surveying	(06)
		(60)

CONTENTS:

TOPIC: 01 – THEODOLITE SURVEYING:

Fundamental axes of a theodolite & their relation. Temporary Adjustments. Face left. Face Right & concept of transiting. Measurement of horizontal & vertical Angles, prolonging a line. Travers survey with a Theodolite, Computation by rectangular coordinates. Balancing a traverse by Gale's traverse table, solution of simple problems on omitted measurements. Errors in theodolite survey & precautions for minimization. [15]

TOPIC: 02 – CURVES:

Need & benefits of its provision, Elements of Circular curves, Degree & Radius of curve & their relation. Problems on simple curves, compound curves, reverse curves & vertical curves. Definition & requirements of transition curves. Length of transition curve: Layout of circular curve with chain & tape and with theodolite. [15]

TOPIC: 03 – TACHEMETRY:

Principle of tacheometry; Instruments used in tacheometry; Methods of tacheometry; determination of Stadia constants; Tacheometric surveying with line of collimation (i) horizontal (ii) inclined with level staff held vertical. [10]

TOPIC: 04 – Contouring:

Concept & definition of contour line; contour interval & horizontal equivalent; factors governing contour interval, characteristics of contours; Methods of contouring; Interpolation of contours; Use of contours maps; drawing L section & cross-section from contour maps; Tracing contour gradient for alignment of roads etc; finding volume of earth-work & capacity of reservoir from contour map. [14]

TOPIC: 05 – MODERN SURVEYING:

(a) Aerial Surveying & Ground Photogrammetry; Elementary knowledge of both with the basic principles involved especially of stereoscopic vision. Advantages of aerial surveying over conventional methods. [06]

Book Recommended:

Text Books

- | | | |
|---------------------------------------|---|---------------------|
| 1. Surveying & leveling, Vol. II | - | Kanethar & Kulkarni |
| 2. Surveying, Vol. II | - | Dr. B. C. Punami |
| 3. Surveying, Vol. II | - | D. Clark |
| 4. Photogrammetry | - | F. H. Moffitt |
| 5. Air Photography Applied to Surveys | - | C. A. Mart |

QUANTITY SURVEYING & COSTING-I

Subject Code 15402	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale:

In order to find out the quantities of materials and its cost from the detailed drawing of any structure and find out different material required & cost involved as per drawing.

Objective:

Calculation of detailed quantities of materials and working out their costs is the major objective of a junior engineer technician. The students must be able to arrange the materials as per the detailed drawings need.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01	Procedure of Estimating	(05)
02	Calculation of quantities	(06)
03	Building Estimates	(16)
04	Estimate of Roofs	(14)
05	Earth Work	(14)
06	Application of Computer Programming	(05)
	Total :	(60)

CONTENTS:

TOPIC: 01 – PROCEDURE OF ESTIMATING: **[05]**

- 01.01 Definition
- 01.02 Requirements of an estimate.
- 01.03 Methods of estimating
- 01.04 Units of measurements.
- 01.05 Units of Payment of different items of work.
- 01.06 Systems for Preparation of an estimate.

TOPIC: 02 – CALCULATION OF QUANTITIES: **[06]**

- 02.01 General Principles.
- 02.02 Methods of working of quantities for different items of work.
- 02.03 Centre Line and Long Short Wall method.

TOPIC: 03 – BUILDING ESTIMATES: **[16]**

- 03.01 Estimate of a single room building with Verandah.
- 03.02 Estimate of a two/three roomed building.
- 03.03 Estimate of an building and a Primary health center.
- 03.04 Estimate of double buildings.

TOPIC: 04 – BUILDING ESTIMATES: **[14]**

- 04.01 Estimate of simple buildings with sloping roofs.
- 04.02 Hipped/gabled/Lean-to-roof with different roofing materials.
- 04.03 Estimate of King Post and Queen Post Roof Trueses.
- 04.04 Estimate of Workshop building of an industry or an institution.

TOPIC: 05 – EARTHWORK: **[14]**

- 05.01 Earthwork Computations.
- 05.02 Lead and Lift.
- 05.03 Methods of Calculating earthwork.
- 05.04 Earthwork of a Road. Canal and embankment party in cuttings and filling, using trapezoidal and prismatic formula.

TOPIC: 06 – APPLICATION OF COMPUTER PROGRAMMING: **[05]**

- 06.01 Application of computer programming on a simple estimate.

Book Recommended:

Text Books

- | | | |
|-------------------------|---|----------------|
| 1. Estimating & Costing | - | B.N. Dutta |
| 2. Estimating & Costing | - | G.S. Birdi |
| 3. Estimating & Costing | - | M. Chakraborti |

COST EFFECTIVE RURAL HOUSING CONSTRUCTION TECHNOLOGY

Subject Code 16403	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	05	-	-	Internal Exam.	:	20

Rationale

One of the primary function of any rural engineer is not only to provide shelter to the inmates, but they should also facilitate them sufficient accommodations, physical comforts, good appearance etc. Due to the economic crisis, this has necessitated to develop low cost safe houses in the rural area which should be fire and sound proof. An emphasis, in this direction has been created in the curriculum so that rural building construction work, performed by the technicians, can be completed systematically, safely and economically.

Objectives

The following topics with the contents are able to develop the knowledge, skill and proper attitude towards the construction work of rural houses in strict accordance with the prescribed specification and detailed drawings:

CURRICULUM

SL	Topics	Periods
1.	Planning of Rural Habitats	05
2.	Foundation	08
3.	Masonry	07
4.	Damp Proofing and Anti-Termite Measures	03
5.	Mortars and Concretes	04
6.	Scaffolding, Shoring and Under-Pinning	05
7.	Arches and Lintels	03
8.	Doors and Windows	03
9.	Roofs and Stairs	05
10.	Floors	05
11.	Surface Finishing	03
12.	Acoustics of Building and Fire Resistant for Rural Houses	03
13.	Construction of Low Cost Building and Sanitary Works	06
	Total	60

CONTENTS

Topics	Content	Periods
01	<u>Planning of Rural Habitats</u>	05
01.01	Purpose and types of buildings.	
01.02	Precaution in selection of site for different types of buildings.	
01.03	Brief ideas of orientation of building.	
01.04	Planning of Farm Stead, Requirements, Size and arrangements of farm house.	
01.05	Design of Farm House, Rural House and Dairy Farm.	
01.06	Types of Learn, loose Housing Learn.	
01.07	Poultry House - Requirements and Types.	
01.08	Planning of Grain Storage - Silos, Bins and Godowns, Modern Storage Structures, Equipments Workshop.	
02	<u>Foundation</u>	08
02.01	Necessity of foundation.	
02.02	Types of Soil: Gravel, Sand, Silt, Clay, Alluvial soil, Black cotton soil, Reclaimed soil. (Only character and suitability of above type of soil).	
02.03	Brief idea of sub surface investigation.	
02.04	Bearing Capacity of Soil: ultimate and safe bearing capacity and methods of improvement in safe bearing capacity.	
02.05	Types of foundation including piles and well foundations, their constructional methods and suitability for different types of soil.	
02.06	Foundation on Black Cotton soil.	

03	<u>Masonry</u>	07
03.01	Brick Masonry: Construction, defects and maintenance of brick masonry, simple idea of tools used in masonry work.	
03.02	Bond: Different types of bond including English and Flemish bond and their suitability wall junction and corner junction of wall for different sizes in English and Flemish bond including drawing.	
03.03	Stone Masonry: Types, suitability of rubble and ashlar masonry, dressing of stones and tools for dressing of stones.	
04	<u>Damp Proofing and Anti-Termite Measures</u>	03
04.01	Dampness: Its causes, ill effects of dampness and methods of preventing dampness.	
04.02	Damp Proof Materials: Requirements and classification of damp proofing materials.	
04.03	Anti-Termite Measures: Pre-constructional measures to avoid termite action.	
05	<u>Mortars and Concretes</u>	04
05.01	Mortar: Function, types and use of mortar. Function of sand and surkhi in mortars. Preparation of lime mortar, cement mortar and mud mortar.	
05.02	Concrete: Types of concrete and their uses. Ingredients of plain cement concrete, their requirements and functions.	
06	<u>Scaffolding, Shoring and Under Pinning</u>	05
06.01	Utility, types and suitability of shoring, underpinning and scaffolding.	
06.02	Form work, requirement of form work, centering.	
07	<u>Arches and Lintels</u>	03
07.01	Arches: Parts of an arch, classification of arches and their methods of construction.	
07.02	Lintels: Advantages of lintels, classification of lintels and their methods of construction.	
08	<u>Doors and Windows</u>	03
08.01	Doors: Technical terms and fixing of a door frame in a wall. Types of door and their suitability. Fixtures and fastening for doors.	
08.02	Windows: Location of windows, types of windows and their suitability.	
09	<u>Roofs and Stairs</u>	05
09.01	Roofs: Related technical terms, types of roof, wooden sloping and steel sloping roof, types of flat roof including mud roof, R.B., R.C.C., methods of erection of different types of roof.	
09.02	Stairs: Related technical terms, classification of stair and layout of stair cases.	
10	<u>Floors</u>	05
10.01	Components of floors and related technical terms, types of floors and their suitability for different purposes.	
10.02	Upper floor, their types, merits and demerits of different types of upper floor.	
11	<u>Surface Finishing</u>	03
11.01	Plastering: Methods of different types of plaster work.	
11.02	Pointing: Purpose, types and methods of flush, stuck, recessed, V-weather, keyed and tuck pointing.	
11.03	Painting: Painting oil preparation, painting of wood and steel work (both new and old), painting of plastered surfaces.	
11.04	White washing, Color washing and Distempering - operation for them.	
12	<u>Acoustics of Building and Fire Resistant for Rural Houses</u>	03
12.01	Acoustics of Building: Technical term, factors to be considered, optimum time of reservation, sound absorbing materials, sound insulation and its methods.	
12.02	Fire Resistant for Rural Houses: Methods for different types of houses including thatched roof.	
13	<u>Construction of Low Cost Building and Sanitary Works</u>	06
13.01	Study of easily available building construction material in the rural areas of plain and hilly side and their suitability in rural housing construction work, latest low cost techniques for the construction of rural houses and sanitary works by the material available in the area.	

Recommended Books

SL	Title/Publisher	Author
1.	A Text Book of Building Construction, S.P.D.	Sushil Kumar
2.	भवन निर्माण टेक्नोलॉजी	वी. एल. गुप्ता
3.	भवन निर्माण तकनीकी	गुरु चरण सिंह

Reference Books

SL	Title/Publisher	Author
1.	Handbook of Building Engineering	N.B.D. Delhi
2.	A Text Book of Building Construction, Dhanpat Rai and Sons, New Delhi.	Arora
3.	Building Construction (Hindi), NAV	Das
4.	Indian Standard Codes (Relevant)	B.I.S.

CIVIL ENGINEERING DRAWING & DRAFTING

Subject Code 15404	Theory			No of Period in one session : 120		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	12	-	-	Internal Exam.	:	20

Rationale:

The language of an Engineer is drawing. He should prepare sketches and drawing to suit all communications. He should be able to understand the drawings and carry out work accordingly. He should be able to communicate with the workmen engaged in the Civil constructions works on the basis of the working drawings. Hence this paper has been intended.

Objective:

The student should be taught to express & communicate through the language of drawings. He would be taught to draw the drawings for buildings. Culvers, bridges etc. and made able to write the specifications of the items involved wherever necessary. The topics to be covered include details of buildings, doors & windows, lintels, arches, stairs & cases, roof & trusses, foundation, culverts and bridges.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01	Buildings	(30)
02	Doors and windows	(15)
03	Lintel and Arches	(15)
04	Stair & Stair cases	(15)
05	Roof and Roof trusses	(15)
06	Foundation	(09)
07	Culvert	(21)
		(120)

CONTENTS:

TOPIC: 01 – BUILDINGS:

[30]

- 01.01 Plan, Elevation & Section of a single storey building with flat roof.
- 01.02 Plan, Elevation & Section of a single storey building with inclined roof.
- 01.03 Plan, Elevation & Section of a double storeyed building with flat roof (ground floor) and inclined roof (1st floor).
- 01.04 Plan, Elevation & Section of a Godown showing main walls in brick masonry and inclined roof supported over tubular roof truss (Span 15 metres).

Note: The inclined roof should show the slope of the roof covering details of hip end. Gable and valley rafters, Jack rafters etc,

TOPIC: 02 – DOOR AND WINDOWS:

[15]

Sectional Plan, front Elevation & longitudinal section of the following

- 02.01 Ledged and braced door and windows.
- 02.02 Fully Paneled door and window.
- 02.03 Glazed door and windows.
- 02.04 Flush door.

TOPIC: 03 – LINTEL AND ARCHES :

[15]

- 03.01 Longitudinal and Cross Section of R. B. Lintel.
- 03.02 Longitudinal and Cross Section of R. C. C. Lintel.
- 03.03 Sectional Elevation of Semi Circular, segmental, Elliptical and Equilateral Arches.

TOPIC: 04 – STAIR AND STAIR CASES :

[15]

- 04.01 Plan and Cross Section of Dog legged stair.
- 04.02 Plan and Cross Section of open well stair.
- 04.03 Plan and Cross Section of Cantilever stair.

Note: The landings should be half and quarter space.

TOPIC: 05 – ROOF AND ROOF TRUSSES:

[15]

- 05.01 Sectional Elevation of flat top roof.
- 05.02 Sectional Elevation of Couple roof.
- 05.03 Sectional Elevation of Couple close roof.
- 05.04 Sectional Elevation of King Post truss.
- 05.05 Sectional Elevation of Queen Post truss.
- 05.06 Elevation of tubular North Light truss.

Note: Fixing of Roof materials i.e. A.C. Sheets, G.C.I. Sheets. Tiles etc. should also be shown in the above drawings.

TOPIC: 06 – FOUNDATION:

[09]

- 06.01 Foundation Plan and Section of Stepped foundation under load bearing structures.

TOPIC: 07 – CULVERTS :

[21]

- 07.01 Sectional Plan, half Elevation and Cross Section of Arch Culvert.
- 07.02 Sectional Plan, half Elevation and Cross Section of Pipe Culvert.
- 07.03 Sectional Plan, half Elevation and Cross Section of R.C.C. Slab Culvert.

Note: The wings walls to be at right angles to the abutments.

Book Recommended:

Text Books

- | | | |
|------------------------------------|---|--------------------------------|
| 1. Civil Engg. Drawing | - | D.N.Bose I.S. Code 696 & 962. |
| 2. A text book of Building Drawing | - | Sah & Kale |
| 3. Civil Engg. Drawing | - | B.N.Verma |
| 4. Civil Engg. Drawing Published | - | T.T.T.I.Bhopal |
| 5. Civil Engg. Drawing | - | Gurucharan Singh & S.C. Sharma |
| 6. Civil Engg. Drawing | - | Mallik & Meo. |
| 7. I.S. Code 696 & 962 | | |

ANTHROPOLOGY AND RURAL SOCIOLOGY

Subject Code 16405	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	04	-	-	Internal Exam.	:	20

Rationale and Objectives

The students passing out the Diploma in Rural Engineering are supposed to work among the people; Anthropology being the science of Man in holistic perspective. Rural Society will give insight of the rural perspective of the society to the student. Psychology will help in understanding the taught group with clarity. Thus the courses in Anthropology and Rural Sociology will orient the students of Rural Engineering in right perspective to understand the need of the target group and to act according with the Engineering inputs. The course has been designed in such a way that after going through this course students will attain perfection in knowledge in communicating with Rural Mass, understanding Rural Psychology, understanding Rural Sociological Condition, identifying Rural Needs etc.

CURRICULUM

SL	Topics	Periods
1.	Introduction of Anthropology, Sociology and Psychology	01
2.	Useful utilization of Engineering Services for Rural Mass	01
3.	Rapport Establishment and Community Participation	02
4.	Community, Tribe, Caste, Village	03
5.	Survey and Research	02
6.	Question, Schedule, Interview Guide, Caste Studies, etc.	03
7.	Environment, Ecology and Social Forestry Conventional and Non-Conventional Energy, Rural Electrification, Rural Water Supply	05
8.	Profile of Individual, Community, Village Block, Social Phenomenon	04
9.	Anthropology, Rural Anthropology, Psychology, Rural Psychology, Sociology, Rural Sociology of Man Holistic Approach	04
10.	Holistic Approach	03
11.	Development in Social Context	04
12.	Social Change and Social Engineering, Rural Road, Water Resource, Rural Drainage	04
13.	Aptitude, Attitude, Personality Formation, Motivation	03
14.	Social Institutions, Marriage, Family, Kinship, Totem, Taboo, Religion, Crowd, Target Group.	06
15.	Society and Scientific Approach	03
16.	Economics of Development	01
17.	Micro Level Planning	01
	Total	50

CONTENTS

Topics	Content	Periods
01	<u>Introduction of Anthropology, Sociology and Psychology</u>	01
01.01	Introduction of Anthropology, Sociology and Psychology.	
02	<u>Useful utilization of Engineering Services for Rural Mass</u>	01
02.01	Useful utilization of Engineering Services for Rural Mass .	
03	<u>Rapport Establishment and Community Participation</u>	02
03.01	Definition, Use as a Research Technique.	
03.02	Rapport building with the community, Community Participation in Rural Development Work. Examples of earlier studies.	
04	<u>Community, Tribe, Caste, Village</u>	03
04.01	Definition, Type and Relevance of Community in Rural Engineering.	
04.02	Definition of Tribe, Distribution, Demography, Constitutional Provisions and Rural Engineering.	
04.03	Definition and Relevance of Caste in Rural India and Engineering.	
04.04	Definition Typology and Relevance of Village in Rural Engineering.	

05	<u>Survey and Research</u>	02
05.01	Definition, Type and Research.	
05.02	Use and Relevance of Survey and Research in Rural Engineering.	
06	<u>Question, Schedule, Interview Guide, Case Studies, etc.</u>	03
06.01	Definition, Type and Use in Engineering of Questionnaire .	
06.02	Definition, Type and Use in Engineering of Schedule.	
06.03	Definition, Type and Use in Engineering of Interview Guide.	
06.04	Definition, Type and Use in Engineering of Case Studies.	
07	<u>Environment, Ecology and Social Forestry Conventional and Non-Conventional Energy, Rural Electrification, Rural Water Supply</u>	05
07.01	Definition, and Relevance of Environment in Engineering.	
07.02	Definition, and Relevance of Ecology in Engineering.	
07.03	Definition, and Relevance of Social Forestry in Engineering.	
07.04	Definition, and Relevance of Conventional and Non Conventional Energy in Engineering.	
07.05	Definition, and Relevance of Rural Electrification in Engineering, Necessity of Rural Electrification for Rural Development.	
07.06	Definition, Availability, Distributing necessity of Rural Water Supply. Definition, Concept of Rural Sanitation and its Linkages with health.	
08	<u>Profile of Individual, Community, Village Block, Social Phenomenon</u>	04
08.01	Profile as a Research Technique, How to prepare profile.	
08.02	Profile of individual need, Relevance, Construction and Application.	
08.03	Profile of Community and Village, Need, Relevance, Construction and Application.	
08.04	Profile of Block and Social Phenomenon, Need, Relevance, Construction and Application.	
09	<u>Anthropology, Rural Anthropology, Psychology, Rural Psychology, Sociology, Rural Sociology of Man Holistic Approach</u>	04
09.01	Definition, Branches and Application of Anthropology.	
09.02	Definition, Branches and Application of Rural Anthropology.	
09.03	Definition, Branches of Rural Sociology and its Relevance.	
09.04	Definition, Branches of Rural Sociology and its Relevance.	
09.05	Application of Integrated Knowledge of Anthropology, Rural Sociology and Psychology in Rural Engineering.	
10	<u>Holistic Approach</u>	03
10.01	Definition, Origin and Growth of Holistic Approach.	
10.02	Holistic Approach as a Research Technique.	
10.03	Holistic Approach and its Relevance in Development.	
10.04	Holistic Approach and Rural Engineering.	
11	<u>Development in Social Context</u>	04
11.01	Development and Types.	
11.02	Relevance of Development with the example of different Studies.	
11.03	Development and Rural Engineering in Social Context.	
12	<u>Social Change and Social Engineering, Rural Road, Water Resource, Rural Drainage</u>	04
12.01	Social Change in Social and Rural Engineering Context.	
12.02	Social Engineering in Rural Engineering Context.	
12.03	Rural Road-Concept, Relevance and Update Development and Application.	
12.04	Water Resource, Rural Drainage - Concept, Relevance and Update Development Application.	
13	<u>Aptitude, Attitude, Personality Formation, Awareness Generation and Motivation</u>	03
13.01	Definition Types and Usages Aptitude and Attitude in Rural Engineering.	
13.02	Personality Formation and Personality Development vis-à-vis Rural Development, Rural Engineering.	
13.03	Motivation - Awareness Generation through Social Mobilization and Motivation and Creation of Felt Need vis-à-vis Rural Development.	

14	<u>Social Institutions, Marriage, Family, Kinship, Totam, Taboo, Religion, Crowd, Target Group</u>	06
14.01	Social Institutions and Network of Relationship.	
14.02	Marriage, Family, Kinship, Totam, Taboo and Rural Development.	
14.03	Crowd and Target Group.	
14.04	Social Institutions and Rural Engineering.	
15	<u>Society and Scientific Approach</u>	03
15.01	Definition, Types and Characteristics of Society.	
15.02	Scientific Approach vis-à-vis Social Science.	
15.03	Scientific Approach vis-à-vis Rural Development.	
15.04	Scientific Approach vis-à-vis Rural Engineering.	
16	<u>Economics of Development</u>	01
16.01	Economics of Development - Rural, Rural Engineering, Facets, Dimensions of Economics of Development.	
17	<u>Micro Level Planning</u>	01
17.01	Planning - Macro-Micro, Rural Development Rural Engineering.	

Recommended Books

SL	Title/Publisher	Author
1.	Social Anthropology, Gyan Publications, 5 Ansari Road, New Delhi-110 002.	S. Narayan
2.	Rural Sociology, L-1958.	Bertand, Alvin
3.	Energy and Environment in the Developing Countries, (1981).	Manad Chatterjee
4.	Rural Road, Drinking Water (Rural Roads in Poruly), 1984	Howe, John

FIELD SURVEY

Subject Code 15406	Practical			No of Period in one session :		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	40
	18 days continuous			Internal Exam.	:	10

Rationale:

Survey is the prime work of a technician. No work/no project work can start without survey marks and etc. Main persons responsible in the chain of technician are the Junior Engineers. In other words, we can say that technicians are the back bone of any project work because of the fact that the whole of project depends upon the survey results.

Objective:

Seeing the duties of Junior Engineer, the field survey practical will help students to carry out the actual survey work to be done in field as regular practice work. This will build self confidence towards survey works in student.

CONTENTS

- 01 Traversing by transit theodolite consisting of at least five sides, preparation of Gale's Traverse table, plotting of traverse by independent co-ordinates. Details to be filed in the plane tabling.
- 02 Contouring of an area by square methods – sides of square may be approximately 150 m.
- 03 Contouring of an area 200 m x 200 m by spot levelling method.
- 04 Longitudinal section by tacheometry for approximately kilometer distance.
- 05 Setting out of a simple curve with given data by.
 - (a) Offset form Long chord method.
 - (b) Rankine's method of deflection angle.

Books Recommended:

Text Books

Sl	Title	Author
1.	Surveying & Leveling, Vol. II	- T.P. Kumhka
2.	Surveying, Vol. II	-
3.	Surveying, Vol. II	- D. Clave

RURAL CONSTRUCTION PRACTICE Lab.

Subject Code 16407	Practical			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	40
	09	-	-	Internal Exam.	:	10

Rationale and Objectives

One of the primary function of any Rural Engineer is not only to provide shelter to the inmates, but they should also facilitate them sufficient accommodations, physical comforts, good appearance etc. Due to the economics crisis, this has necessitated to develop low cost safe houses in the rural area which should be fire and sound proof. An emphasis, in this direction has been created in the curriculum so that rural building construction work, performed by the technicians, can be completed systematically, safely and economically.

Following experiments are to be performed:

LIST OF PRACTICALS

SL Content

1. Making sketches and learning use of various common tools and appliances used by mason.
2. Preparing foundation plans for load bearing and framed structure constructions.
3. Lay out of two roomed building having a plinth area of 50 to 60 square meters by mason's square and checking with the help of instruments.
4. Lay out of Low cost Latrines and Nallah (Drains).
5. Construction of a Corner and T junction of 1½ x 1 brick wall in mud mortar in English bond and in Flemish bond.
6. To lay damp proof course on the corner junction or T junction of walls prepared under experiment no. 4.
7. Placing of door frame in plumb on the already prepared wall.
8. Cement concrete Mortar mixing and laying manually for plaster and pointing work. Use of Mixer and Vibrator.
9. Lay out and constructing brick masonry steps at the entrance of building and in Stair cases.
10. Brick Flat and Brick on edge soiling in different bonds.
11. Construction of semi circular Arch.

Recommended Books

SL	Title/Publisher	Author
1.	A Text Book of Building Construction, S.P.D.	Sushil Kumar
2.	भवन निर्माण टेक्नोलॉजी	वी. एल. गुप्ता
3.	भवन निर्माण तकनीकी	गुरु चरण सिंघ

Reference Books

SL	Title/Publisher	Author
1.	Handbook of Building Engineering	N.B.D. Delhi
2.	A Text Book of Building Construction, Dhanpat Rai and Sons, New Delhi.	Arora
3.	Building Construction (Hindi), NAV	Das
4.	Indian Standard Codes (Relevant)	B.I.S.

FIELD SURVEY

Subject Code 15408	Sessional			No of Period in one session :		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	30
	-	-	-	Internal Exam.	:	20

Rationale:

This field survey work is the primary work of a civil technician without which no project work can be taken up during field survey works, a technician will be able to handle the different survey instruments which he is expected to do in service period. A junior engineer is fully responsible for all types of survey works in field. Hence he must be able to conduct all types of survey works successfully in the field.

Objective:

A student will be able to perform the survey works in the field with the given set of instruments will also be able to identify the errors of the instruments with which he is working. He will also learn to rectify some of the instrument errors personally and then conduct the survey works correctly.

CONTENTS

- 01 Traversing by transit theodolite consisting of at least five sides, preparation of Gale’s Traverse table, plotting of traverse by independent co-ordinates. Detail to be filed in the plane tabling.
- 02 Contouring of an area by square methods – sides of square may be approximately 150 m.
- 03 Contouring of an area 200 m X 200 m by spot leveling method.
- 04 Longitudinal section by tacheometry for approximately kilometer distance.
- 05 Setting out of a simple curve with given data by,
 - (a) Offset form Long chord method.
 - (b) Ranking’s method of deflection angle.

Books Recommended:

Text Books

Sl.	Title	Author
1.	Survey and leveling, Vol. II	- T. P. Kanetdar
2.	Surveying, Vol. II	- A. Punmics

CIVIL ENGINEERING DRAWING

Subject Code 15409	Sessional			No of Period in one session :		
	No. of Periods Per Week			Full Marks		
	L	T	P/S	Annual Exam.	:	100
	-	-	-	Internal Exam.	:	60

Rationale:

As we all know that Drawing is the language of a technician. Hence in order to make a technician master of Civil Engineering Drawing, He should be able to prepare detailed drawing of civil engineering structures which he will come across during in service.

Objective:

The detailed Drawing prepared in class should be neatly drawn on drawing sheets and should be preserved on drawing sheets as life time record. He may refer their drawings; whenever some compulsion arises in understanding similar drawing,

S.No. Topics

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|----|--|
| 01 | Plan, Elevation and Section of a single storey Residential Building having three main rooms, kitchen, bath, store and verandah with flat roof, showing details of stepped foundation. |
| 02 | Plan, Elevation and Section of a double storeyed public building with flat roof. |
| 03 | Plan, Elevation and Section of a single storey residential building with inclined roof. (Varandah lean to roof and other rooms couple roof). |
| 04 | Plan, Elevation and Section of a double storeyed building with Ground floor having flat roof and first floor having inclined roof. |
| 05 | Plan, Elevation and Section of a Godown Building 50 metre long, 15 metre wide with inclined roof supported over Tubular Tures. |
| 06 | Sectional Elevation of the following showing details of Rafters and purlins. (a) King Post Truss (b) Queen Post Truss (c) North light Tubular Roof Truss, Enlarged details of important joints should also be shown. |
| 07 | Sectional Plan, longitudinal section and Front Elevation of ledged and Braced. Fully paneled and Glazed doors & windows & Flush door. |
| 08 | Plan, half Elevation and half cross section of a single span R.C.C. slab culvert. Masonary Arched Culvert and Pipe Culvert. |

Books Recommended:

Text Books

Sl.	Title	-	Author
1.	Civil Engg. Drawing	-	D. N. Bose
2.	A text book of Building Drawing	-	Sah & Kale
3.	Civil Engg. Drawing	-	B. N. Verma
4.	Civil Engg. Drawing Published	-	T.T.T.I. Bhopal
5.	Civil Engg. Drawing	-	Gurucharan Singh & S. C. Sharma
6.	Civil Engg. Drawing	-	Mallik & Meo.
7.	I. S. Code 696 & 962.	-	