



**Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal**  
**Program Name: Three Year Diploma in Cement Technology [C01]**  
**(III Semester)**

Name of Scheme: Jul.08

Exam Code: \*

Implemented From: 2008-09

Sub Code	Paper Code	Name of Subject	SCHEME OF STUDIES			SCHEME OF EXAMINATION												
			Hours per Week			Sess. Marks		Prog. Assm		Sess + Prog	UNIV. EXAMINATION							TH+P R.
			TH.	PR.	TOTAL	Term Work	Lab work	I	II	Total Internal Assessment	Th. Paper	Duration	Marks	PR	Duration in Hrs	Mks.	Total External assessment	Total Marks
301	5022	Business Communication	06	-	06	30	-	10	10	50	01	3 Hrs	100	-	-	-	100	150
302	6301	General Mech. Engg. in cement technology	06	02	08	15	15	10	10	50	01	3 Hrs	100	01	03	50	150	200
303	6302	Cement Chemistry	06	02	08	15	15	10	10	50	01	3 Hrs	100	01	03	50	150	200
304	6253	Strength of Materials	04	02	06	15	15	10	10	50	01	3 Hrs	100	01	03	50	150	200
305	6303	Mechanical Drafting	06	-	06	30	-	10	10	50	01	3 Hrs	100	-	-	-	100	150
306		Professional activities	-	02	02	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total	28	08	36	105	45	50	50	250	05	-	500	03		150	650	900

1. Number of Theory Papers : 05
2. Total theory Marks : 500
3. Number of Practicals : 03
4. Total Practical Marks : 150
5. Total marks of Sessional + Prog. Asst. + Pract. : 250
6. Grand Total : 900

Passing marks for (a) Theory : 33%  
 (b) Practical : 40%  
 (c) Sessional : 60%

**CURRICULUM**  
**FOR**  
**DIPLOMA IN CEMENT TECHNOLOGY**  
**(THIRD SEMESTER)**

**Scheme: JULY2008**  
**Implemented from session 2008-09**

**Under semester system**

**JULY 2008**

**CURRICULUM DEVELOPMENT CENTRE**  
**CEMENT TECHNOLOGY DEPARTMENT**



# **RAJIV GANDHI PROUDYOGIKI VISWAVIDYALAYA, BHOPAL**

## **DIPLOMA IN CEMENT TECHNOLOGY**

SEMESTER: **THIRD**

COURSE CODE: **301**

PAPER CODE; 5052

NAME OF COURSE: **BUSINESS COMMUNICATION**

SCHEME: **Dip.CT\_JULY 2008**

COMMON WITH PROGRAMME (S):

### **RATIONALE**

The subject professional communication is developed with the aim of equipping students to express themselves in English in real life situations in today's world. The foundation has already been laid by teaching them communication skills in first semester .At the later stage, it has been observed that diploma holders in the world of work have to carry out variety of activities requiring command over communication skills.

**The course professional communication will enable students to**

-

- develop communication skills (Speaking, listening, reading and writing )
- learn techniques of communication
- acquire proficiency in their business communication skill
- build confidence.



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## DIPLOMA IN CEMENT TECHNOLOGY

SEMESTER: **THIRD**

SCHEME: **Dip.CT\_JULY 2008**

COURSE CODE: **301**

COMMON WITH PROGRAMME (S):

NAME OF COURSE **BUSINESS COMMUNICATION**

### SCHEME OF STUDIES AND SPECIFICATION TABLE

Lectures: **6 Hrs.** Per week

<u>S.NO.</u>	<u>TOPIC</u>	<u>SCHEME OF STUDIES</u>		
		<u>Hrs. OF STUDY</u>		
		<u>THEORY</u>	<u>PRACTICAL</u>	<u>TOTAL</u>
<u>1.</u>	<u>COMMUNICATION</u>	<u>02</u>	<u>=</u>	<u>02</u>
<u>2.</u>	<u>METHODS OF COMMUNICATION</u>	<u>40</u>	<u>=</u>	<u>40</u>
<u>3.</u>	<u>INTER OFFICE COMMUNICATION</u>	<u>08</u>	<u>=</u>	<u>08</u>
<u>4.</u>	<u>TECHNICAL WRITING</u>	<u>10</u>	<u>=</u>	<u>10</u>
<u>5.</u>	<u>REPORT WRITING</u>	<u>20</u>	<u>=</u>	<u>20</u>
<u>6.</u>	<u>TELE COMMUNICATION</u>	<u>10</u>	<u>=</u>	<u>10</u>
	<u>TOTAL</u>	<u>90</u>	<u>=</u>	<u>90</u>



# RAJIV GANDHI PROUDYOGIKI VISWAVIDYALAYA, BHOPAL

## DIPLOMA IN CEMENT TECHNOLOGY

SEMESTER: **THIRD**  
COURSE CODE: **301**  
NAME OF COURSE: **BUSINESS COMMUNICATION**  
PAPER CODE: 5022

SCHEME: **Dip.CT\_JULY 2008**  
COMMON WITH PROGRAMME (S):

### COURSE CONTENT

Lectures: **6 Hrs.** per week

S. NO.	DETAILED COURSE CONTENT	HRS	MKS
	<u>1. COMMUNICATION- A brief introduction</u> <u>Definition:</u> <u>Communication Process</u>	02	05
	<u>2. METHODS OF COMMUNICATION- Introduction.</u>		
	<u>2.1 ORAL COMMUNICATION</u> <u>Development of oral communication skill through following tools/devices:</u> <u>Face to face communication</u> <u>Using Telephones</u> <u>Interviews</u> <u>Group discussion</u> <u>Conference</u>	15	20
	<u>2-2 WRITTEN COMMUNICATION</u> <u>Business Letters</u> <u>Need and Principles of effective Business Letters</u> <u>Its parts, mechanics and style</u> <u>Types and practice of writing following business letters-</u> <u>Letter of enquiry</u> <u>Placing order</u> <u>Complaint</u> <u>Correspondence with Bank and Insurance Company</u> <u>Application for Job., Bio data and C.V.</u> <u>Drafting Advertisement and Tender Notice</u> <u>Drafting of notice for meeting</u> <u>Agenda formation and minutes of meeting</u>	25	30

	<u>Press release</u>		
	<b><u>3. INTER OFFICE COMMUNICATION</u></b>		
	<u>Meaning</u>		
	<u>Drafting following types of Inter Office Communication</u>		
	<u>Office Memorandum, Office Orders, Office Circular.</u>		
	<b><u>4. TECHNICAL WRITING</u></b>		
	<u>Features of technical writing</u>		
	<u>Mechanics of technical writing – Abbreviations, Numerals, Spelling rules, and punctuation.</u>	08	10
	<b><u>5. REPORT Writing</u></b>		
	<u>Meaning</u>		
	<u>Characteristics of a good Report</u>		
	<u>Formal reports, Informal reports</u>		
	<u>Types of Reports- Progress Report</u>	10	05
	<u>                                    Trouble Report</u>		
	<u>                                    Feasibility Report</u>		
	<u>                                    Recommendation Report</u>		
	<u>                                    Statistical Report</u>		
	<b><u>6. TELECOMMUNICATION</u></b>	20	20
	<u>Drafting Telegrams</u>		
	<u>Facsimile and E-mail messages</u>		
	<b>TOTAL HRS.</b>		
		10	10
		90	100



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SEMESTER: **THIRD**

COURSE CODE: **301**

NAME OF COURSE: **BUSINESS COMMUNICATION**

PAPER CODE: 5022

SCHEME: **Dip.CT\_JULY 2008**

COMMON WITH PROGRAMME (S):

### REFERENCES

#### **Text Books:-**

1. Effective Business Communication, - M.V. Rodriguez,  
Concept pub Co.  
New Delhi
2. Communication for Business - Shirley Taylor,  
Longman, U.K.
3. Technical English Book-II - T.T.T.I, Bhopal, Somaiya  
Pub., Bombay
4. Essentials Business Communication - Dr. Rajendra Pal &  
J.S.Korbahalli  
S.C. & Sons, New Delhi

#### **Reference Books:**

1. Spoken English - - Shashi Kumar & Dhamija
2. Business Correspondence & Report Writing- R.C.Sharma &  
Krishna Mohan
3. T.T.T.I. Learning Packages for Interpersonal Skills.  
- Self Concept by Prof. (Mrs.  
N. Saxena)  
- Human Needs and  
Motivation.
4. Business Communication & Customer Relations.  
- R.K. Madhukar, Vikas  
Publishing House, Delhi
5. Business Communication - T.N. Chabra Sun India Pub.  
Delhi.



# **RAJIV GANDHI PROUDYOGIKI VISWAVIDYALAYA, BHOPAL**

## **DIPLOMA IN CEMENT TECHNOLOGY**

SEMESTER: **THIRD**                      SCHEME: **Dip.CT\_July 2008**  
COURSE CODE: **302**              COMMON WITH PROGRAMME (S):  
NAME OF COURSE: **GENERAL MECHANICAL ENGINEERING IN**  
**CEMENT TECHNOLOGY**  
PAPER CODE:      6301

### **RATIONALE**

It is strongly felt that student of Cement Technology should have basic knowledge of Thermodynamic properties, steam boilers, steam power plant, I C Engines, Compressors, Blowers and fans, fabricating characteristics etc. As such the subject General Mechanical Engineering is kept for the Cement Technology students.

After going through the subject, the Cement Technology student is expected to develop skill to use the above fields in the Cement Technology.





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## DIPLOMA IN CEMENT TECHNOLOGY

SEMESTER: **THIRD**                      SCHEME: **Dip.CT\_July 2008**  
COURSE CODE: **302**              COMMON WITH PROGRAMME (S):  
NAME OF COURSE: **GENERAL MECHANICAL ENGINEERING IN CEMENT TECHNOLOGY**  
PAPER CODE:        6301

### SCHEME OF STUDIES AND SPECIFICATION TABLE

Lectures: **6** Hrs. per week  
Practical: **-2** Hrs. per week

	TOPIC	SCHEME OF STUDIES			SUGGESTED DISTRIBUTION OF MARKS FOR THEORY PAPER
		Theor y	Practic al	Total	
1.	Thermodynami c Properties	12	02	14	
2	Energy, Its conservation.	12	02	14	
3	Properties of steam	10	04	14	
4	Steam Boilers.	08	04	12	
5	Steam Power Plant.	10	04	14	
6	Internal Combustion Engine.	12	08	20	
7	Compressors, blowers and fans.	12	04	16	
8	Classification and fabricating characteristics of metals.	06	02	08	
9.	Vapour Power Cycle	08	-	08	
		90	30	120	



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COURSE CODE: **302**              COMMON WITH PROGRAMME (S):  
NAME OF COURSE: **GENERAL MECHANICAL ENGINEERING IN CEMENT TECHNOLOGY**  
PAPER CODE:        6301

### COURSE CONTENT

Lectures: **6** Hrs. per week

S. NO	Course Content	Hours of Study
1	<b>THERMODYNAMIC PROPERTIES :</b> Introduction, working, substance, the system the pure substance, Phases, properties and state, system of units, weight, mass, specific volume and density, specific weight, pressure, temperature, scales of temperature, Zeroth law, measuring temperature, processes and cycle, conservation of mass.	
2	<b>ENERGY, ITS CONSERVATION:</b> Introduction, relation of mass and energy, Types of energy, Potential, kinetic, internal work, work on moving boundary of a system work depends upon the path, work of non-flow process, generalized work equation, flow work Heat-other forms of energy, conservation of energy, closes system, First law of thermodynamics, stored energy is a property, energy equation for closed system, open systems and steady flow, Enthalpy, Energy balance for steady flow. Application of steady flow equation, Boundaries of the system. Application of closed and open systems.	

	<p><b>PROPERTIES OF STEAMS</b></p> <p>3 Introduction, Generation of Steam at a given pressure from Water initially at 0°C – saturated steam – dry saturated steam and wet steam, superheated steam – Properties of steam, dryness fraction of steam, use of steam tables – sensible heat, latent heat of evaporation, total heat of dry saturated, wet and superheated steam methods of determination of dryness fraction of steam.</p> <p>4 <b>STEAM BOILERS :</b> Function of boiler, classification of boilers, terms employed in connection with boilers Lancashire and Cornish boilers, multitubular fire tube boilers, Cochran boiler, water tube boilers, Babcock and Wilcox boiler, steam boiler mountings and accessories, boiler performance, boiler trial, boiler house instruments, boiler house record.</p> <p>5 <b>STEAM POWER PLANT :</b> Introduction, steam turbines – classification, turbine details, simple impulse turbines, compound impulse turbines, reaction turbines, radial flow turbines, flow of steam through nozzle, velocity diagrams, work done on blades, steam turbine governing, condenser – classification, functions, ranking cycle, Thermal Power Plant, Layout and block diagrams, cooling towers.</p> <p>6. <b>INTERNAL COMBUSTION ENGINES :</b> Introduction classification, construction of I.C. Engines – Four stroke cycle stroke and four stroke cycle engine – I.H.P. B.H.P. an deficiency calculation, I.C. Engine cycles – Otto cycle, diesel cycle – dual combustion cycle, petrol engines, diesel engines (oil engines), governing of I.C. ?Engines, Scavenging supercharging of I.C. Engineers, Methods of starting I.C. Engines. Advantages,</p>	
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	<p>Disadvantages and limitations of diesel power plant. Auxiliaries of diesel engine plant – fuel system, intake system, starting system. Engine starting equipment – compressed air, auxiliary mini-engine, electric motor starting.</p>	
7.	<p><b>COMPRESSORS, BLOWERS AND FANS :</b></p> <p>Uses of compressed air, classification of compressors – Air compressor terminology – Reciprocating compressors – compression processes single stage, effects of clearance volume, volumetric efficiency, efficiency of a compressor multi stage compression, minimum work in two stage compression with intercooling – methods of controlling output of reciprocating compressors, centrifugal compressors – axial flow compressors Blowers Types, function and operation of each type, Induced draft fans, forced draft fans- functions and applications. Fan Laws.</p>	
8.	<p><b>CLASSIFICATION AND FABRICATING CHARACTERISTICS OF METALS:</b></p> <p>Fabricating characteristics – machinability, formability, weldability, castability – classification and fabricating characteristics of carbon alloy steels, high strength low alloy steels, tool steels, steels castings, cast iron, stainless steel, light metals and alloys – aluminum, copper and copper based alloys.</p>	
9.	<p><b>VAPOUR POWER CYCLE:</b></p> <p>Simple steam power cycle, Carnot's cycle, Rankine cycle, Actual vapour power cycle, Piping losses, Turbine losses, Pump losses, Condenser losses, Comparison of Carnot's cycle, Rankine cycle, reheat cycle, regenerative cycle, characteristics of ideal working fluid in vapour power cycle, binary vapour cycle.</p>	



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SEMESTER: **THIRD**

SCHEME: **Dip.CT\_July 2008**

COURSE CODE: 302

COMMON WITH PROGRAMME (S):

NAME OF COURSE: **GENERAL MECHANICAL ENGINEERING IN CEMENT TECHNOLOGY**

PAPER CODE: 6301

### LIST OF EXPERIMENTS

Practical: **2 Hrs.** per Week

S. NO.	Name of experiments	Hours of Study
	<p>1. Demonstration of any thermodynamic devices (boiler, steam Turbine, I.C. Engines, Air Compressors etc.) for the purpose of First law Analysis of the system by :-</p> <p>(i) Identifying system boundary.</p> <p>(ii) Identifying input and output energy quantities.</p> <p>(iii) Measuring properties at input and output points.</p> <p>2. Experiments to measure the following in different situations :-</p> <p>(i) Pressure (above and below atmosphere)</p> <p>(ii) Temperature (temperature of flowing fluid, surface temperature, high temperature etc.)</p> <p>(iii) Flow measurement of fluids (fuel, water, steam, air etc.)</p> <p>(iv) Speed.</p> <p>(v) Power (Brakes and Dynamometers)</p> <p>3. A First law open system air flow analysis, experiment with appropriate instrumentation.</p> <p>4. Study of models, charts and working units of the</p>	

	<p>following :-</p> <ul style="list-style-type: none"> <li>(i) Boiler (fire tube and water tube boilers)</li> <li>(ii) Steam turbine,</li> <li>(iii) I.C. turbine,</li> <li>(iv) Compressor (Reciprocating/Centrifugal)</li> </ul> <ul style="list-style-type: none"> <li>5. Determination of dryness fraction of steam by combined separating and throttling calorimeter.</li> <li>6. Study of single stage air compressor.</li> <li>7. Performance testing of a centrifugal/Rotary air compressor.</li> <li>8. Comparison of thermal conductivities at various temperatures.</li> <li>9. Study of Four Stroke/Two stroke Diesel/Petrol Engines.</li> <li>10. Study of Steam Power Plant.</li> <li>11. Study of Diesel Engine Power Plant.</li> <li>12. Study of I.D. Fans, F.D. Fans.</li> </ul>	
	<b>Total</b>	<b>30</b>



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## **DIPLOMA IN CEMENT TECHNOLOGY**

SEMESTER: **THIRD**                      SCHEME: **Dip.CT\_July 2008**  
COURSE CODE: **302**              COMMON WITH PROGRAMME (S):  
NAME OF COURSE: **GENERAL MECHANICAL ENGINEERING IN**  
**CEMENT TECHNOLOGY**  
PAPER CODE:      6301

### **REFERENCES**

#### **LIST OF SUGGESTED REFERENCE BOOKS :**

1. Thermal Engineering –  
By P.L. Ballaney.  
Khanna Publishers.
2. Thermodynamics by C.P. Gupta and Prasad
3. A Course in Thermodynamics and Heat Engines by  
Kothandraman, Domkundwar, Khajooria, Dhanpat Rai and  
Sons.
4. Fundamental of classical Thermodynamics  
By Gordan J.Van Wylen, Richard E.Sonutag  
John wiley and Sons.
5. I.C. Engines :-  
By Dr. A.C.Rao
6. Processes and Materials of manufacture  
By Lindberg (Prentice Hall)



# RAJIV GANDHI PROUDYOGIKI VISWAVIDYALAYA, BHOPAL

## DIPLOMA IN CEMENT TECHNOLOGY

SEMESTER: **THIRD**

**Dip.CT\_JULY 2008**

COURSE CODE: **303**

PROGRAMME (S):

NAME OF COURSE: **CEMENT CHEMISTRY**

SCHEME:

COMMON WITH

PAPER CODE:

### RATIONALE

Cement Chemistry is designed with a view to have a thorough Knowledge of chemical processes, reactions and its effect on properties of the by product. As this will help students to understand various chemical processes involved in manufacture of cement and effect of these on properties of cement.





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## DIPLOMA IN CEMENT TECHNOLOGY

SEMESTER: **THIRD**

**Dip.CT\_JULY 2008**

COURSE CODE: **303**

PROGRAMME (S):

NAME OF COURSE: **CEMENT CHEMISTRY**

SCHEME:

COMMON WITH

PAPER CODE: 6302

### SCHEME OF STUDIES AND SPECIFICATION TABLE

Lecturers: **6 Hrs.** per Week

Practical: **2 Hrs.** per Week

S.N.	Topic	Contact Hours			
		Theory	Practical Tutorials	Total	
1.	Chemistry of argillaceous and calcareous materials	08	04	12	
2.	Chemistry of other raw materials used in cement manufacture	10	06	16	
3.	Design of raw mix.	08	02	10	
4.	Two, Three, Four components design.	08	02	10	
5.	Pyro processing	10	02	12	
6.	Effect of adding gypsum.	06	-	06	

7.	Different types of cements	08	-	08	
8.	Manufacture of cement: (Total process description (board)	06	04	10	
9.	Effect of minerals in cement manufacturer	06	02	08	
10.	Residue determination (i) Raw mill. (ii) Kiln feed. (iii) Cement.	06	03	09	
11.	Calcium and Magnesium determination	06	02	08	
12.	Principles of x ray analyser and method of testing of raw mix and cement.	04	02	06	
13.	Principles of spectro photometer.	04	-	04	
14.	General principles of chromatography.	08	03	11	
		90	30	120	

1.	Chemistry of Argillaceous and Calcareous Materials:	08
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**RAJIV GANDHI PROUDYOGIKI VISWAVIDYALAYA, BHOPAL**

**DIPLOMA IN CEMENT TECHNOLOGY**

**SEMESTER: THIRD**

**COURSE CODE: 303**

**NAME OF COURSE: CEMENT CHEMISTRY**

**SCHEME: Dip.CT\_JULY 2008**

**COMMON WITH PROGRAMME (S):**

**PAPER CODE: 6302**

### ***COURSE CONTENT***

Lectures: 6 Hrs. per week

	History of Calcareous Cement and Argillaceous, Selection & proportionally Chemical Analysis.	
2.	<b>Chemistry of Other raw materials used in Cement Mftg.</b> Limestone, High grade, Low grade, feed take grade, Iron ore, Laterite, Bauxite, clay, Gypsum, /Fly History of Calcareous Cement and Argillaceous, Selection & proportionally Chemical Analysis of each materials related to cement.	08
3.	<b>Design of Raw Mix</b> Low grade, high grade, different methods of raw mix design, L.S.F., S.M., A.M., and their effects.	08
4.	<b>Two, Three, Four Components Designs :</b> Low grade, high grade, additive, clay, their roll in the manufactured of cement, control of LSF, SM, AM, HM, etc. Deletenous components and their effects.	08
5.	<b>Pyro Processing:</b> Types of fuels, solid, Liquid, gases, orsat gas analysis, calculations of air requirements, analysis of coal , proximate, ultimate analysis of coal, different methods , ultimate analysis of coal, different methods for the calculation of calorific values, effect of moisture on coal grinding . Reaction of clinkerisation process at different temperature in the preheater & kiln i.e. Drying, calcinations, burning zone (i.e. chemical transformation).	10
6	<b>Effect of adding gypsum :</b> Setting and hardening of Portland cements, Coater in set cement, shrinkage, thermal, creep, expansion of cement.	06
7.	<b>Different Types of Cements:</b> Ordinary Portland cement, Portland pozzolana cement, slag cement, their properties, composition, physical and chemical evaluation of properties, estimation of pozzolana and slag percentage in cement . Concept of various standards for cement as per ISI, BIS, ISD 9000, STI etc.	08
8.	<b>Manufacture of Cement :</b> Methods of different type of cement manufactures, Their advantages – disadvantages, compound composition of clinkers, C3S, C2S, C3A, C4AF	06
9	<b>Effect of Minerals in Cement Manufacture:</b> Effect of chlorides, alkalies, P2O5, etc. on cement.	06
10.	<b>Residue Determination:</b> Residue determination on 170and 72 mesh and their effect on each process,	06

	methods of control.	
11.	<b>Calcium and Magnesium Determination:</b> Chemical methods of determination, methods of control.	06
12.	<b>Principle of X ray analyser and method of testing of Raw mix and cement.</b>	04
13.	<b>Principle of spectro photometer</b>	04
14.	<b>General principle of chromatography.</b>	02
		90



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## DIPLOMA IN CEMENT TECHNOLOGY

SEMESTER: **THIRD**

SCHEME: **Dip.CT\_JULY 2008**

COURSE CODE: **303**

COMMON WITH PROGRAMME(S)

NAME OF COURSE: **CEMENT CHEMISTRY**

PAPER CODE: 6302

### LIST OF EXPERIMENTS

Practical: **2 Hrs.** per week

S. NO	Name of experiments	Hours of Study
1.	Determination of Compressive strength.	
2.	Determination of Insoluble residue.	
3.	Determination of acidic oxides ( $\text{SO}_3$ , $\text{SiO}_2$ )	
4.	Determination of Basic oxides ( $\text{Al}_2\text{O}_3$ , $\text{Fe}_2\text{O}_3$ , $\text{CaO}$ ,	
5.	$\text{MgO}$ )	
6.	Determination of setting time.	
7.	Determination of loss on ignition.	
8.	Study of pollution effects (Health Hazards – safety measured)	
9.	Analysis of Limestone, Iron ore, refractoriness slags, and silicates.	
10.	Preparation of schematic representation of flow sheets in the manufacture of cements.	
	Determination of expansion in cement.	
11.	(a) Le Chatelier's expansion.	
12.	(b) Autoclave expansion.	
13.	Determination of drying shrinkage.	

14.	Determination of concrete Strength.	
15.	Determination of Alkalis in Cements.	
16	Determination of Porosity of concrete and Refractory material.	
17	Analysis of Raw mix proportion, cement components by x-ray Analyser.	
<b>Total</b>		<b>30</b>



# RAJIV GANDHI PROUDYOGIKI VISWAVIDYALAYA, BHOPAL

## DIPLOMA IN CEMENT TECHNOLOGY

### REFERENCES

1. Chemistry of Cement, Vol.I & II by H.W.F. Taylor, Akademia Books International, New Delhi 110 019
2. Chemistry of Cement & Concrete, by F.M.Lea, Edware Arnold Publishers, 3<sup>rd</sup> Edition.
3. Cement Data book (Raw Material For cCement production) Vol. I, II and III by Walter H.Duda, Bauverlag GMBH.
4. Technology of Portland Cement and Blended Cement, by Barnes, Vaikunth, Nehru Place, New Delhi 19  
Cement Manufacturers Handbook, by Nevile.
5. Cement Engineers Handbooks, by Labahn/Koblhess, Bauverlag GMBH, 4<sup>th</sup> Edition.
6. Process Technology of Cement Manufacturing, by Zementwe, RKE.
7. Progress in Cement & Concrete.
  - i. Cement and concrete science & Technology, Vol. I Part I & II by S.N.Ghosh.
  - ii. Energy Conservation & Environmental Control in Cement industry. II
  - iii. Testing and Quality Control in Cement Industry.
  - iv. Mineral Admixtures in Cement and Concrete.
8. Chemical Engineer's Hand books by Peri.
9. Cement Rotary Kiln by Peri.





# **RAJIV GANDHI PROUDYOGIKI VISWAVIDYALAYA, BHOPAL**

## **DIPLOMA IN CEMENT TECHNOLOGY**

**SEMESTER: THIRD**  
**COURSE CODE: 305**

**SCHEME: Dip.CT\_JULY 2008**  
**COMMON WITH PROGRAMME (S):**  
**NAME OF COURSE: MECHANICAL DRAFTING**      **PAPER CODE:6303**

### **RATIONALE**

This course in mechanical drafting has been prepared with a view to developing elementary drafting skill in the students. Looking to the professional needs of the technicians, more emphasis is laid on the use of I.S. code of practice and reading and interpretation of drawings. The topics on multi view Representation, Dimensioning and Tolerating, free hand sketching and sections of M/C parts are included to build foundation for production drafting. The topic of pipe drafting will help the students to understand the importance and functions of piping system, in industry. Tracing and Blue printing will develop in them the skill of preserving important drawings.

Computer Graphics is a modern concept in mechanical drafting and knowledge of elementary level in display technology, D.D.A. and dimensional transfer scaling is considered essential for the technicians level



# RAJIV GANDHI PROUDYOGIKI VISWAVIDYALAYA, BHOPAL

## DIPLOMA IN CEMENT TECHNOLOGY

SEMESTER: **THIRD**

SCHEME: **Dip.CT\_JULY 2008**

COURSE CODE: **305**

COMMON WITH PROGRAMME (S):

NAME OF COURSE: **MECHANICAL DRAFTING**

PAPER CODE:6303

### SCHEME OF STUDIES AND SPECIFICATION TABLE

Lectures: **6** Hrs. per week

S.N.	Topic	Contract Hour			Total
		Theory	Practical/ Tutorials	Total	
1.	Sectional Views	04		04	
2.	Free Hand sketching	04		04	
3.	Fits and Tolerances	04		04	
4.	Working Drawing.	04		04	
5.	Welded joints	04		04	
6.	Screw Threads and Screwed Fastenings.	06		06	
7.	Keys, cotter joints and pin joints	08		08	
8.	Shaft couplings	08		08	
9.	Bearings	08		08	
10.	Pipes and pipe joints	10		10	
11.	Toothed Gearings	08		08	
12.	Jigs and fixtures	04		04	
13.	Electrical drawing	04		04	
14.	Assembly drawings	10		10	
15.	Reading and Interpretation of Drawings.	04		04	
		90		90	



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### COURSE CONTENT

Lectures: **3 Hrs.** per week

S. NO	Course Content	
1.	<b>Sectional Views :-</b> Introduction, Full section, Half section, Rules for sectioning, common mistakes in sectioning, partial or broken out or local section, Revolved section, Removed section, off-set section, conventional violations or exceptional cases, special cases – Intersection in section, Adjacent parts, parts located in front of a cutting plane, Conventional representation of materials and common features. Conventional breaks.	
2.	<b>Free Hand Sketching:-</b> Introduction, types, techniques and procedure of sketching.	
3.	<b>Fits and Tolerances:-</b>  Introduction, Definition of tolerance and fits, Types of fits, Terminology, standard tolerances, Hole basis and shaft Basis for fits, selection of fits, dimensioning of tolerances.	

4.	<p><b>Working Drawing:-</b></p> <p>Introduction, detail drawing, Assembly drawing, Marking assembly drawing from details, Making detail drawing from assembly, Checking machine drawings, Methods of indicating surface roughness for general engineering drawing, Roughness grade symbols, orientation of symbols .</p>	
5.	<p><b>Welded Joints:-</b></p> <p>Introduction, welding processes, Types and representation of welds , Size of weld, weld contours.</p>	
6.	<p><b>Screw Threads and Screwed Fastenings:-</b></p> <p>Screw threads, Definitions, Forms of screw threads, True projection of screw thread, conventional representation of screw threads. Multi start threads, nuts, and other forms of bolt heads end nuts. Prevent of bolt head rotation, locking devices, Tap bolts and studs, Ends of drilled bores and screw pieces. Machine screws, Foundation bolts.</p>	
7.	<p><b>Keys , Cotter Joints and Pin Joints:-</b></p> <p>Keys, Taper Keys, Parallel keys, pin keys, woodruff key, Spline shaft and hub knuckle joint, cotter joint.</p>	
8.	<p><b>Shaft Couplings:-</b></p> <p>Introduction, Rigid or fast couplings, Non rigid or flexible couplings, loose or disengaging couplings, Couplings for shafts out of alignment.</p>	
9.	<p><b>Bearings :-</b></p> <p>Introduction, journal bearings, prevention of rotation of brasses,</p>	

	<p>Pivot bearing, Thrust bearings, Ball and roller bearings, Types of rolling bearings, wall brackets, Hangers.</p>	
10.	<p><b>Pipes and Pipe Joints :-</b></p> <p>Introduction, Pipe joints – cast iron flanged joints, spigot and socket joint, Hydraulic pipe joint. Wrought iron and steel pipe joints – socket joint, Nipple joint , Loose flanges, Union joints, Pipe fittings, pipe layouts, expansion joints, Hangers and Rollers.</p>	
11.	<p><b>Toothed Gearing –</b></p> <p>Introduction, classification, Terms used in involutes gearing, construction of involutes tooth profile. Rack and pinion – construction, Cycloidal tooth profile, Bevel gears, helical gears, Worm and worm wheel conventional representation of toothed gearing.</p>	
12.	<p><b>Jigs and Fixtures :-</b></p> <p>Introduction, difference between jugs and fixtures.</p>	
13.	<p><b>Electrical Drawing :-</b></p> <p>Graphical symbols, circuit diagram and wiring diagram.</p>	
14	<p><b>Assembly Drawings :-</b></p>	

15	<p>Assembly drawings of ball bearing , gear box cover, worm and wheel gear, Machine tools, Lathe tail stock, Roller support, cam assembly, fan assembly , Force pump, Machine vice, Tool post, Kilns mills etc. , Belt conveyors, Screw conveyors, Elevators , Slides.</p> <p><b>Reading and Interpretation of Drawings :-</b></p> <p>Reading and interpretation of drawings related to cement plants.</p>	



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## **DIPLOMA IN CEMENT TECHNOLOGY**

**SEMESTER: THIRD**

**SCHEME: Dip.CT\_JULY 2008**

**COURSE CODE: 305**

**COMMON WITH PROGRAMME (S):**

**NAME OF COURSE: MECHANICAL DRAFTING**

**PAPER CODE:6303**

### **REFERENCES**

1. A Text Book of Machine Drawing,  
By V.L.Laxminarayanan and M.L.Mathur,  
Publication: Jain Brothers, New Delhi.
2. Geometrical and Machine drawing,  
By N.D.Bhatt,  
Charator Publishing House, Anand.
3. Fundamentals of Engineering Drawing.  
By Warren J. Luzadder  
Prentice Hall of India Private Limited.

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## DIPLOMA IN CEMENT TECHNOLOGY

SEMESTER: **THIRD**

SCHEME: **Jul.08**

COURSE CODE: **306**

NAME OF COURSE: **PROFESSIONAL ACTIVITIES**

Practical: **2 Hrs.** per week

### RATIONALE

**Professional Activities** is not a descriptive course, as per conventional norms; therefore specific content for this course cannot be prescribed. It is a group of open-ended activities; where in variety of tasks are to be performed, to achieve objectives. However general guidelines for achieving the target and procedure for its assessment are given under the course content.

As the student has to practice this course in all the six semesters, the guidelines given therein are common and applicable to each semester.

### OBJECTIVES:

- To allow for professional development of students as per the demand of engineering profession.
- To provide time for organization of student chapter activities of professional bodies) i.e. Institute of engineers, ISTE or Computer Society of India etc.)
- TO allow for development of abilities in students for leadership and public speaking through organization of student's seminar etc.
- To provide time for organization of guest lectures by expert engineers/eminant professionals of industry.
- To provide time for organization of technical quiz or group discussion or any other group activity.
- To provide time for visiting library or using Internet.
- To provide time for group discussion or solving case studies.
- To provide time for personality development of students.
- To provide time for working for social cause like awareness for environmental and ecology etc.



DETAILED INSTRUCTIONS TO CONDUCT PROFESSIONAL ACTIVITIES:

- S. Study hours, if possible should be given greater time slot with a minimum of two hrs/week to a maximum of four hrs/week.
- T. This course should be evaluated on the basis of grades and mark sheet of students, should have a separate mention of the grade awarded. There will be no pass/fail in professional activities (PA).
- U. Following grade scale of evaluation of performance in PA has been established.

<u>Grades</u>	<u>Level of performance</u>
A	Excellent
B	Good
C	Fair
D	Average
E	Below Expectations

- V. Grades once obtained in a particular examination shall become final and no chance of improvement in grades will be given to the students.
- W. Assessment of performance in PA is to be done internally by the Institution, twice in a Semester/Term through a simultaneous evaluation of the candidate by a group of three teachers, of the deptt. Concerned. Group of teachers will jointly award the grade to candidate in the assessment. Best of the grades obtained by the student in these two assessments shall be finally taken on the mark sheet of the respective Semester/Term.

Candidate abstaining from the prescribed course work and/or assessment planned at the Institute shall be marked ABSENT in the mark sheet, instead of any grade.

- X. While awarding the grades for performance in PA, examining teacher should reach the final consensus based on the attendance, punctuality, interest, presentation skills in seminar on the topic assigned (collection of relevant data, observations, analysis, findings/conclusion) and its written report, awareness of latest developments in the chosen programme of study.
- Y. Institution shall maintain the record of grades awarded to all the students in PA for a period of 1 year.
- Z. It shall be mandatory for students to submit a compendium for his PA in the form of a Journal.
- AA. Compendium shall contain following:

- XV. Record of written quiz.
  - XVI. Report/write up of seminar presented
  - XVII. Abstract of the guest lectures arranged in the Institution.
  - XVIII. Topic and outcome of the group discussion held.
  - XIX. Report on the problems solved through case studies.
  - XX. Report on social awareness camps( organized for social and environmental prevention).
  - XXI. Report on student chapter activities of professional bodies like ISTE, IE (India), CSI etc.
- L. PA is not a descriptive course to be taught in the classroom by a particular teacher. Various activities involved in the achievement of objectives of this course should be distributed to a number of teachers so that the talent and creativity of group of teacher's benefit the treatment of the course content. These activities should preferably be conducted in English language to maintain continuity and provide reinforcement to skill development.
- Small groups shall be formed like in tutorials, group discussion, case studies, seminar, project methods, roll play and simulation to make the development of personality affective.

Treatment of PA demands special efforts, attention, close co-operation and creative instinct on the part of teachers of department concerned. Since this course is totally learner centered, many of the activities planned under this course shall come out from the useful interaction of student, among themselves and with the teachers. The guide teacher/s shall best act as a facilitator of these creative hunts/ exercises, which unfold many of the hidden talents of the students or bring out greater amount of confidence in them, to execute certain activity.