Government Polytechnic, Mumbai

(Academically Autonomous Institute of Maharashtra Government)
49,Ali Yawar jung Marg, Kherwadi, Bandra (E)
gpmumbai@gpmumbai.ac.in

Programme : Civil Engineering **First Semester** **With effect from 2017-18**

Course code	Course Title	Teachin Hours				Credits	Examination Scheme					
							Theory		PR	OR	TW	Total
		L	P	TU	Total		TH	TS				
HU16101	Basics of Communication	2	---	1	3	3	70	30				100
SC16107	Mathematics 1	3	---	1	4	4	70	30				100
SC16105	Engineering Chemistry	3	2	---	5	5	70	30			50	150
WS16201	Workshop Practise	---	4	---	4	4					50	50
ME16201	Engineering Drawing I	2	4	---	6	6			50		50	100
HU16103	Genric Skills	---	---	2	2	2				50		50
HU16104	Environmental Studies	---	---	2	2	2				25*	25	50
CO16201	Computer Fundamentals	---	4	---	4	4			50#			50
NC16101	Yoga	---	2	---	2	---						
NC16102	Social Service	1	2	---	3	---						
	TOTAL	**11**	**18**	**6**	**35**	**30**	**210**	**90**	**100**	**75**	**175**	**650**

Abbreviation : L-Theory lecture; P-Practical ; TU-Tutorial; TH-Theory Paper; TS-Term Test(02);PR-Practical Exam; OR-Oral Exam; TW-Term Work;* Indicates assessment by External Examiner; #-Online practcal examination

15-11-17
Academic co-ordinator
Government Polytechnic Mumbai

15/11/17
Head of Department
(Civil Engineering)

Principal
Government Polytechnic Mumbai

Approved Copy
Academic Co-ordinator
G. P. Mumbai

Received
15/11/17

Programme : CE/ME/EE/IS/EC/CO/IF/LG/LT/RT									
Course Code: **HU16101**				Course Title: **Basics of Communication**					
Compulsory / Optional: **Compulsory**									
Teaching Scheme and Credits				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
2	**1**	**-**	**3**	**70 (3 Hrs.)**	**30**	**---**	**---**	**---**	**100**

Rationale:

English is the global language today. The basic knowledge of this language is essential for everyone. It is necessary for the Engineering and Technology related students to cope up with the challenges of the modern world with the help of English. The major part of their work experience needs certain knowledge of this language. At worksite, on the shop floor or fields, they might be required to take the instructions from superiors and to pass them on to subordinates. To write letters, circulars, memos, notice and reports will be an important task for them. While designing the curriculum of communication skills and communication practice the probable needs of the future technicians are kept in view.

Course Outcomes:

Student should be able to

CO1	Make use of the basic concepts of grammar and communication techniques.
CO2	Interpret positive feedback at various situations by using appropriate body language.
CO3	Write letters circulars, memos, notices and reports to communicate.
CO4	Apply proper communication technique to cope up with the challenges of the modern world.
CO5	Adopt appropriate approach to take instructions from seniors and pass it on to the subordinates.

Course Content Details:

Unit No	Topics / Sub-topics
1	**Basics of Grammar:** Articles, Tense, Transformation of Sentences, Affirmative and negative, Interrogative and assertive , Exclamatory and assertive , Degrees of comparison, Direct indirect speech, Voice, Types of sentences
2	**Theory and methods of communication:** Meaning and definitions of communication, Elements of communication, Communication cycle, Methods of communication, verbal: Oral, Written, Non verbal: Body language ii) Visuals
3	**Types and Barriers of communication:** Formal - upward, downward, vertical, horizontal, diagonal. Informal, grapevine, Barriers of communication: Mechanical, Physical, Language, Semantic, Psychological, Status
4	**Application Letters:** Job application, Resume / CV / Bio-Data, Application for loan, (home loan, car loan, education loan)
5	**Business correspondence & Office drafting:** Memorandum, notice, circular, Enquiry and quotation, Order and complaint
6	**Report writing :** Need of report writing, Principles of effective report writing, Types of reports: Individual & committee report, Accident report Feasibility and survey report, Report on fall in sales and production

Unit No	Topic Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Basics of Grammar:	06	4	4	4	12
2	Theory and methods of communication	06	2	4	6	12
3	Types and Barriers of communication	04	2	4	6	12
4	Application Letters	06	4	4	6	14
5	Business correspondence & Office drafting	04	2	4	6	12
6	Report writing	06	2	2	4	08
	Total	**32**	**16**	**22**	**32**	**70**

Legends: R- Remember; U-Understand; A- Apply and above levels (Bloom's revised Taxonomy).

Notes: *This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.*

Sr. No.	Unit	Experiment/Assignment	Approx. Hours
1	1	Grammar related written worksheet.	02
2	2	Dialogue between two students (observing the basics of grammar.) on a formal situation	02
3	2	Dialogue between two students (observing the basics of grammar.) on a informal situation	02
4	2.3	Presentation of communication cycle (4 students)	02
5	3	Presentation on different types of barriers and remedies. (04 students)	02
6	3	Presentation on the given situation with the help of body language and visuals (4 students)	02
7	4	Writing a letter to the editor of a newspaper for social cause.	01
8	4	Writing a job application with bio data.	01
9	5	Activity on business correspondence and office drafting	01
10	6	Report writing	01
		Total	**16**

References/Books

Sr.No.	Author	Title	Publication
1	Meenakshi Raman Sangita Sharma	Communication Skills	Oxford Higher Education
2	Homai Pradhan D.S.Bhende Vijaya Thakur	Business Communication	Himalaya Publishing House
3	Curriculum Development Centre	A Course in Technical English	Somaiya Publications Pvt.Ltd.

Course Curriculum Development Committee:

a. **Internal Faculty**
   1) Smt. S.S. Kulkarni
   2) Mrs. K.S. Pawar

b. **External Faculty :-** 1) Mr. Sandeep Barde

Academic Coordinator
(R. A. Patil)

Head of Department
(Science)

Principal
Government Polytechnic
Mumbai

Approved Copy
Academic Co-ordinator
G. P. Mumbai

CO Vs PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
1	01	01	01	01	03	03	03	03	03	03
2	01	02	02	02	03	03	03	03	03	03
3	01	01	01	01	02	01	02	03	03	03
4	03	03	03	03	03	03	03	03	03	03
5	03	03	03	03	03	03	03	03	03	03

CO Vs PSO Matrix

Civil Engg.

CO/PSOs		PSO1	PSO2	PSO3
CO1	Make use of the basic concepts of grammar and communication techniques.	1	2	3
CO2	Interpret positive feedback at various situations by using appropriate body language.	2	2	3
CO3	Write letters circulars, memos, notices and reports to communicate.	1	2	3
CO4	Apply proper communication technique to cope up with the challenges of the modern world.	1	2	3
CO5	Adopt appropriate approach to take instructions from seniors and pass it on to the subordinates.	2	2	3

Unit number and COs

Sr. No.	Unit No	Topic Title	COs
1	1	Basics of Grammar:	CO1, CO4
2	2	Theory and methods of communication	CO1, CO2, CO4, CO5
3	3	Types and Barriers of communication	CO2, CO4, CO5
4	4	Application Letters	CO3, CO4, CO5
5	5	Business correspondence & Office drafting	CO3, CO4, CO5
6	6	Report writing	CO3, CO4, CO5

Programme : **CE/ME/EE/IS/EC/CO/IF/LG/LT/RT**									
Course Code:**SC16107**				Course Title:**Mathematics-1**					
Compulsory / Optional: **Compulsory**									
Teaching Scheme and Credits				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
3	**1**	**-**	**4**	**70 (3 Hrs.)**	**30**	**-**	**-**	**-**	**100**

Rationale:

This subject is kept under the branch of science. This subject intends to teach student basic facts, concepts, principle and procedure of mathematic as a tool to analyze Engineering problems and as such lays down foundation for understanding the engineering and core technology subjects.

Course Outcomes:

Student will be able to:

CO1	Identify the basic principles of of mathematics about the field analysis of any engineering problem.
CO2	Apply rules, concept and properties to solve the basic problems.
CO3	Establish the relation between two variables.

Course Content Details:

Unit No	Topics / Sub-topics
1	**Logarithms:** 1.1 Definition of logarithm(Natural and Common logarithm) 1.2 Laws of logarithm 1.3 Change of base rule& simple examples based on laws. 1.4 Application of concept.
2	**Determinants:** 2.1 Definition of determinant 2.2 Expansion of determent of order 2&3 2.3 Crammer's rule to solve simultaneous equations in 3 unknowns 2.4 Application of concept.
3	**Matrices:** 3.1 Definition of a matrix of order m x n 3.2 Types of matrices 3.3 Algebra of matrices - equality, addition, subtraction, multiplication & scalar multiplication. 3.4 Transpose of matrix. 3.5 Minor , co-factor of an element.

	3.6 Adjoint & inverse of a matrix by adjoint method. 3.7 Solution of a simultaneous equations by matrix inversion method. 3.8 Application of concept.
4	**Trigonometry:** 4.1 Trigonometric ratios of allied angles, compound angles, multiple angles (2A, 3A), Sub multiple angles 4.2 Factorization and De-factorization Formulae 4.3 Inverse Circular function (definition and simple problems).
5	**Straight line:** 5.1 Slope & intercept of straight line. 5.2 Equation of straight line in slope point form, slope intercept form, two point form, two intercept form, General equation of straight line. 5.3 Angle between 2 straight lines; condition of parallel & Perpendicular lines. 5.4 Intersection of two lines. 5.5 Length of perpendicular from a point on the line & Perpendicular distance between parallel lines.
6	**Vectors:** 6.1 Definition of vector , position vector 6.2 Algebra of vectors(Equality, addition ,subtraction and scalar multiplication) 6.3 Dot (Scalar) product & Vector (Cross) product with properties.

Suggested Specifications Table with Hours and Marks (Theory):

Unit No	Topic Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Logarithms	03	02	04	00	06
2	Determinants	03	00	04	00	04
3	Matrices	14	06	08	06	20
4	Trigonometry	14	06	08	06	20
5	Straight line	10	04	04	06	14
6	Vectors	04	00	02	04	06
	Total	**48**	**18**	**30**	**22**	**70**

Legends: R- Remember; U-Understand; A- Apply and above levels (Bloom's revised Taxonomy).

Notes:*This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.*

List of Tutorials:

Note: 1)Tutorials are to be used to get enough practice.
2)Make group of 20 student and for each group minimum 10 problems are to be given.

Sr. No.	Unit	Tutorials	Approx. Hours
1	1	Logarithms	02
2	2	Determinants	02
3	3	Matrices(Algebra of matrices)	02
4	3	Matrices(Adjoint , inverse& solution of equation using matrix inversion method	02
5	4	Trigonometric ratio of allied, compound, multiple and sub multiple angles.	02
6	4	Factorization and De-factorization formulae	02
7	4	Inverse trigonometric ratios	01
8	5	Straight line	02
9	6	Vectors	01
		Total	**16**

References/ Books:

Sr.No.	Name of Book	Author	Publisher
1	Mathematics for polytechnic students	S.P. Deshpande	Pune Vidyarthi Graha Prakashan
2	Mathematics for polytechnic students (Volume I)	H. K. Das	S .Chand Prakashan
3	Companions to basic math's	G. V. Kumbhojkar	Phadke Prakashan
4	Applied Math's	N. Raghvendra Bhatt Late Shri R Mohan Singh	Tata McGraw Hill Publication

Course Curriculum Development Committee:

a. **Internal Faculty**
   i. Miss.J.J.Ratnanai
   ii. Mr.V.S.Patil
b. **External Faculty**
   i. Prof.P.S.Dave

Academic Coordinator (R. A. Patil)

Head of Department (Science)

Principal
Govt. polytechnic, Mumbai

Approved Copy
Academic Co-ordinator
G. P. Mumbai

Course Name:- Mathematics I **Course Code:-SC16107**

CO Vs PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	--	--	02	02	01	01	01	--	--	--
CO2	03	02	03	02	01	--	02	--	--	--
CO3	03	02	01	01	02	02	02	--	--	--

CO Vs PSO matrix

Civil Engg.

CO/PSOs		PSO1	PSO2	PSO3
CO1	Identify the basic principles of of mathematics about the field analysis of any engineering problem.	01	03	--
CO2	Apply rules, concept and properties to solve the basic problems.	01	03	02
CO3	Establish the relation between two variables.	02	02	01

Unit Number and COs

Sr. No.	Unit No.	Topic Title	COs
1	1	Logarithms	CO1,CO2
2	2	Determinants	CO2,CO3
3	3	Matrices	CO1,CO2,CO3
4	4	Trigonometry	CO1,CO2,CO3
5	5	Straight line	CO2,CO3
6	6	Vectors	CO1,CO2

Approved Copy
Academic Co-ordinator
G. P. Mumbai

Programme : **Diploma in ME/CE/RT**									
Course Code: **SC 16105**				Course Title: **Engineering Chemistry**					
Compulsory / Optional: **Compulsory**									
Teaching Scheme and Credits				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
3	**-**	**2**	**5**	**70 (3 Hrs.)**	**30**	**----**	**----**	**50**	**150**

Rationale: The subject is included under category of basic sciences. The role is to understand the fundamental concepts and facts about infrastructure of physical matters and their interrelationship. This will provide input for better understanding of other foundation and technology subjects

Course Outcomes: Student will:

CO1	Apply knowledge of chemistry (science) to engineering field and to solve problems in engineering field.
CO2	Select a proper metal and alloy for particular engineering use.
CO3	Implement his practical experience in quality control area.
CO4	Deconstruct the impact of pollution in social and environmental field and will detect and solve related problems.
CO5	Identify the composition of different materials and their relation with each other and use in engineering field.
CO6	Select a proper Lubricant for Various types of machinery working under different working conditions of Temperature, Pressure, Load speed.
CO7	Select a proper Insulating material for various Engineering Application.

Unit No.	Topic / Sub Topic
1.	*Atomic Structure* 1.1 Introduction of atom, Molecules, Fundamental Particles, Proton, Neutron, Electron. their mass, charge, location. And symbol Bohr's theory, Postulates, Structure of modern atom 1.2 Atomic number and atomic mass number. Atomic weight

Approved Copy
Academic Co-ordinator
G. P. Mumbai

	Numerical based on atomic number & atomic mass number.Orbits,. Orbital, quantum no. and their significance 1.3 Rules governing filling up of atomic orbital's Aufbau's Principle, Pauli's exclusion principle, Hund's rule. Electronic configuration of inert gases. Electronic configuration of atoms upto atomic number. 30 ,Isotopes and isobars 1.4 Valency and chemical bonding. Valency : Definition, & examples. Types of valancy : Electrovalancy & co- valancy Examples. 1.5 Electrovalent bond: Definition, Formation. Formation of NaCl , $MgCl_2$. 1.6 Co-valent bond : Definition & formation, Formation of following molecules Single bond : Hydrogen, Chlorine. Double bond : Oxygen, Ethylene, Triple Bond : Nitrogen, Acetylene, 1.7 Distinction between electrovalent and covalent compound.
2.	***Electrochemistry*** 2.1 Definition of Electrochemistry, Electrolytes: Definition, Types. Differences between Atom and ion .Definition of ionization & electrolytic dissociation, Arrhenius theory, Degree of ionization with factors affecting it. 2.2 Terms related to Electrolysis Mechanism of electrolysis. Examples of: mechanism of electrolysis. of NaCl in fused & in aqueous state, electrolysis of $CuSo_4$ using Cu and Pt electrodes. 2.3 Faradays First law and its mathematical derivation. Faradays second law & its mathematical derivation, Numericals based on laws of Faraday. 2.4Application of Electrolysis, electro- refining, Electroplating.
3.	***Water*** 3.1 Sources of water, impurities present in water. (suspended, dissolved, colloidal, biological) Types of water: hard & soft Causes of hardness of water. Types of Hardness, Unit of hardness, Definition of hardness. 3.2 Bad effects of Hard Water for Domestic purposes. & Industrial purposes (Textile, Dyeing, Sugar industry, Bakeries) 3.3 Bad effects of hard water in Boiler , Scales and sludges, causes of their formation, their disadvantages and their removal. 3.4 Treatment of hard water for industrial purposes by, Zeolite &Ion Exchange process 3.5 Treatment of hard water for drinking purposes.(city water supply) Various steps Screening, Sedimentation, Coagulation, Filtration, Sterilization Sterilization by boiling.

	3.6 pH value :Definition ,Formula, pH scale, its salient features, Numericals based on pH, Applications of pH related to Engg. field (corrosion of bridges, Electroplating,) ***CASE STUDY: Judge the nature of solutions depend upon their PH***
4.	***Alloys*** 4.1 Metals & their characteristics, (hardness, ductility, malleability, toughness, brittleness, tensile strength, weldability, casting, forging, soldering) 4.2 Definition of alloy: purposes of preparation of Alloy. 4.3 Preparation of binary alloy by fusion method. 4.4 Classification of alloy : Ferrous and non Ferrous Alloy. 4.5 Steel, Definition and classification based on % of C (Mild carbon steel, medium carbon steel, high carbon steel, their properties &uses) 4.6 Alloy Steel and its application (Ferrous alloy) • Heat resistant steel • Magnetic Steel. • Shock resisting steel • Stainless steel. 4.7 Non-Ferrous Alloys • Aluminum Alloys: Duralumin • Solders Alloys (woods metal) • Bearing Alloys(Babbitt metal)
5	***Corrosion.*** 5.1 Definition of corrosion, Types of corrosion, Atmospheric & Electrochemical Corrosion 5.2 Mechanism of atmospheric corrosion, types of oxide films formed, (stable, unstable, volatile, with examples) 5.3 Electrochemical corrosion/immersed corrosion Definition. Example, Factors Affecting It. 5.4 Protection of metals from Corrosion:- By protective coatings a)organic coating(by paints and varnishes), b)inorganic coating (metallic coating) 5.5 Protective metallic coatings(Different methods) a) hot dipping(galvanizing & tinning) b) sherardizing c)metal spraying ***ACTIVITY: Study of corrosion of Aluminum strip in Acidic, Basic and Salt Solutions.***

6.	***Lubricants*** 6.1 Definition of lubricant, with example ,various functions of a lubricant, classification of lubricants(solid, semi-solid and liquid)examples, conditions under which each lubricant is used. 6.2 Lubrication: definition and types and purposes of it. Types of lubrications, Fluid film, Boundary, Extreme pressure lubrication. Definition, diagram & description of each type. 6.3 Characteristic of good lubricant A) Physical Characteristics • Viscosity • Viscosity index • Oiliness • Volatility • Flash point & Fire Point • Cloud and Pour point B) Chemical Characteristics • Acidity /Neutralization no. • Emulsification • Saponification value
7.	***Nonmetallic Engg. Material*** 7.1 Definition of non metallic engineering materials 7.2 **Plastic** :definition , example Polymerization : definition different Types of Polymerization addition and condensation . **Addition polymerization :** definition formation of polyethylene ,PVC , Polystyrene etc. **Condensation-polymerization**: definition and examples (formation Of Bakelite, nylon-66 etc). **Types of plastic**: thermo softening ,thermo setting plastics, Differences between them. **Compounding of plastic** , Materials needed for it (pigments, fillers, Plasticizers accelerators etc.,) Properties and engineering applications. ***ACTIVITY: Preparation of Co-Polymer of Phenol Formaldehyde.*** 7.3 **Rubber :** definition of rubber (elastomer).Natural rubber : Basic unit in natural rubber(isoprene) Occurrence & Processing of Latex .Limitations of natural rubber, Applications and uses.

	Vulcanisation Of rubber: Definition. process, Chemical reactions, Synthetic rubber: Importance, Example Buna-S, Buna-N, Butyl rubber, Thiokol, Neoprene Properties of rubber: Elasticity, Tack, Rebound, Shock absorbance etc Uses of rubber. 7.4 **Thermal insulating materials** Definition, Examples Thermocole, Glasswool. characteristics of ideal thermal insulating material **Thermocole** Definition,. Preparation, Properties & uses **Glasswool.** Definition, Preparation, Properties & uses
8.	***ENVIRONMENTAL EFFECTS*** 1.1: **POLLUTION**: Definition, Types, Causes, Effects. Control. 1.2: **Air Pollution**: Definition, Causes, Effects. Control. 1.3: **Water Pollution**: Definition ,,Causes, Effects. Control. ***ACTIVITY: Preparation of list of different pollutants which causes air and water pollution***

Suggested Specifications Table with Hours and Marks (Theory):

Unit No	Topic Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	**Atomic Structure**	06	02	04	02	08
2	**Electrochemistry**	06	02	04	02	08
3	**Water**	06	02	04	04	10
4	**Alloys**	06	03	04	02	09
5	**Corrosion**	06	02	04	04	10
6	**Lubricants**	06	03	04	02	09
7	**Non-Metallic Engineering Materials**	08	02	06	02	10
8	**Environmental Effects**	04	02	02	02	06
	Total	**48**	**18**	**32**	**20**	**70**

Legends: R- Remember; **U**-Understand; **A**- Apply and above levels (Bloom's revised Taxonomy).

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

List of experiments/Assignments:

Sr. No.	Unit	Experiment/Assignment	Approx. Hours
1.	1	Introduction of chemistry laboratory &safety measures.	02

2.	2	Determination of electrochemical equivalent of copper by using cu –electrodes	02
3.	3	Estimation of Chloride content from given water sample	02
4.	3	Find out the total hardness from given sample of water by EDTA method	02
5.	1	A Qualitative analysis of any three salt solutions. Basic radicals : Cu^{++}, Fe^{++}, Fe^{+++}, Cr^{+++}, Mn^{++}, Ni^{++}, Zn^{++}, Ca^{++}, Ba^{++}, Mg^{++} $NH4^{+}$	06
6.	4	Estimation of percentage purity of iron from the given alloy sample	02
7.	3	To find out pH of different solutions using Lovibond comparator, pH paper, pH meter.	02
8.	7	Preparation of phenol formaldehyde / Bakelite plastic.	02
9.	8	To find out the moisture content from given Soil sample.	02
10.	2	Determination of conductivity of different electrolytes by using conductivity meter.	02
11.	6	Determination of Acid value of given lubricant.	02
12.	6	Determination of Flash Point and Fire Point of given Lubricant.	02
13.	5	Study the effect of acid and alkali over an aluminum strip.	02
Total			**32**

References:

Sr.No.	Author	Title	Publication
1.	V. P. Mehta	Polytechnic Chemistry	Jain Brothers, New Delhi
2.	P. C. Jain & Monica Jain	Applied Chemistry	Dhanpat Rai and Sons, New Delhi
3.	M. M. Uppal	Engineering Chemistry	Khanna Publisher, Delhi
4.	Dr. Nimdeokar D.K.Patne Dr. A.Shaikh Sanjay Zambare	Modern Approch to chemistry	S. Chand

Course Curriculum Development Committee:

a. **Internal Faculty :Mrs. S.M.Patil**

b. **External Faculty: Dr.LeenaKhadake Govt.Polytechnic Thane**

Academic Coordinator (R. A. Patil)

Head of Department (Science Dept.)

Principal Govt. polytechnic Mumbai

Approved Copy
Academic Co-ordinator
G. P. Mumbai

CO Vs PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO 1	3	3	2	1	-	1	-	1	1	1
CO2	3	2	1	1	-	1	1	1	1	1
CO3	3	3	3	1	-	1	1	1	1	1
CO4	2	2	1	1	3	2	1	1	2	2
CO5	2	2	2	2	-	1	1	1	1	1
CO6	2	2	2	2	-	2	2	2	2	2
CO7	2	2	2	2	1	2	2	2	2	2

CO Vs PSO matrix (Civil)

CO/PSO Students will		PSO1	PSO2	PSO3
CO1	apply knowledge of chemistry (science) to engineering field and to solve problems in engineering field.	1	1	1
CO2	select a proper metal and alloy for particular engineering use.	1	2	-
CO3	implement his practical experience in quality control area.	1	2	-
CO4	deconstruct the impact of pollution in social and environmental field and will detect and solve related problems.	1	1	-
CO5	identify the composition of different materials and their relation with each other and use in engineering field.	1	2	-
CO6	Select a proper Lubricant for Various types of machinery working under different working conditions of Temperature,Pressure,Load,speed.	1	2	-
CO7	Select a proper Insulating material for various Engineering Application.	2	2	-

Unit Number and COs

Sr. No.	Unit No.	Topic Title	COs
1	1	Atomic Structure	CO1
2	2	Electrochemistry	CO1,CO3
3	3	Water	CO1,CO3,
4	4	Alloys	CO1,CO5,CO2
5	5	Corrosion	CO1, CO3
6	6	Lubricants	CO1,CO6
7	7	Non-metallic Engineering materials	CO1,CO7
8	8	Environmental Effects	CO1,CO4

Programme : **ME/CE/EC/EE/IS/LG/LT/RT**									
Course Code: **WS16 201**				Course Title: **Workshop Practice**					
Compulsory / Optional: **Compulsory**									
Teaching Scheme and Credits				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
-	-	4	4	-	-	-	-	50	50

Rationale:

Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. The knowledge of basic shops like Wood working, Fitting, Welding, Plumbing and Sheet Metal Shop is essential for technicians to perform their duties in industries. Irrespective of engineering stream, the use of workshop practices in day to day industrial as well domestic life helps to solve various minor but critical problems. Working in workshop develops the attitude of working in a group and the basis for safety awareness is created. This foundation course intends to impart basic know-how of various hand tools and their use in different sections of manufacturing. The students are advised to undergo each skill experience with remembrance, understanding and application with special emphasis on attitude of enquiry to know why and how for the various instructions and practices imparted to them in each shop. Furthermore the demonstration of CNC Machine will give feel of advancement in industry.

Course Outcomes: Student should be able to,

CO1	Lay-outing of shops & Sketching of jobs, tools & equipments.
CO2	Select appropriate tools, machinery, equipment and consumables for given application.
CO3	Use & Operate hand tools, equipment and machinery in different shops.
CO4	Prepare the simple jobs as per specification & drawing.
CO5	Maintain workshop related tools, equipment and machineries.

Course Content Details:

Unit No	Topics / Sub-topics
1	***1.1 Introduction to workshop :-*** ***1.2*** Workshop layout, Importance of various sections/shops of workshop, Types of jobs done in each shop. ***1.3*** Causes of accidents, general safety rules and work procedure in workshop, Safety signs and symbols, First Aid. ***1.4*** Fire, Causes of Fire, Basic ways of extinguishing the fire. Classification of fire, Firefighting equipment, fire extinguishers and their types. ***1.5*** Issue and return system of tools, equipment and consumables.
2	***Smithy and Forging:-*** ***2.1*** Sketching, understanding the specifications, materials, various applications and methods used in Smithy and Forging shop along with use of tools like anvil, hammers, swage block, tongs, chisels, flatters etc;

	2.2 Demonstration of Smithy and Forging operations like bending, setting down, bulging, upsetting etc; *2.3* Preparation of smithy & forging job. *2.4* Safety precautions & Personal Protective Equipments.
3	***Carpentry Section:-*** *3.1* Types of woods and their applications. *3.2* Types of carpentry hardware's and their uses. *3.3* Sketching, understanding the specifications, materials, various applications and methods used in Carpentry shop along with use of tools like saws, planner, chisels, hammers, pallet, marking gauge, vice, try square, rule, etc; *3.4* Demonstration of carpentry operations such as marking, sawing, planning, chiseling, grooving, boring, joining, etc; *3.5* Preparation of wooden joints. *3.6* Safety precautions & Personal Protective Equipments.
4	***Welding Section:-*** *4.1* Types, sketching, understanding the specifications, materials and applications of arc & gas welding accessories and consumables. *4.2* Demonstration of metal joining operations like arc welding, soldering and brazing. Show effect of current and speed. Also demonstrate various welding positions. *4.3* Demonstrate gas cutting operation. *4.4* Preparation of metal joints. *4.5* Safety precautions & Personal Protective Equipments.
5	***Fitting Section:-*** *5.1* Sketching, understanding the specifications, materials, various applications and methods used in fitting, marking, measuring, work holding, cutting & finishing tools. *5.2* Demonstration of various fitting operations such as chipping, filing, scraping, grinding, sawing, marking, drilling, tapping, etc; *5.3* Preparation of male- female joint. *5.4* Safety precautions & Personal Protective Equipments.
6	***Plumbing:-*** *6.1* Types, specification, material and applications of pipes. *6.2* Types, specifications, material, applications and demonstration of pipe fitting tools. *6.3* Demonstration of pipe fitting operations such as marking, cutting, bending, threading, assembling, dismantling, etc; *6.4* Types and application of various spanners such as flat, fix, ring, box, adjustable, etc. *6.5* Preparation of pipe fitting jobs. *6.6* Concept and conversions of SWG and other gauges in use. Use of wire gauge. *6.7* Safety precautions & Personal Protective Equipments.
7	***Lathe and CNC Operations:-*** *7.1* Working principle of lathe along with sketch and procedure for its general maintenance. *7.2* Demonstration of Lathe machine operation like plain turning, taper turning, threading, chamfering, etc; *7.3* Simple job demonstration for a group on CNC Machine.

Approved Copy
Academic Co-ordinator
G. P. Mumbai

SUGGESTED LIST OF EXERCISES/PRACTICAL/EXPERIMENTS			
Sr. No.	**Unit**	**Practical Exercises/Practical's/Experiments**	**Approx. Hours**
1	1	- Causes of accidents, general safety rules and work procedure in workshop, Safety signs and symbols, First Aid. - Perform mock drill session in group of minimum 10 students for Extinguishing fire.	06
2	2	- Prepare job involving operations like bending, setting down, bulging, upsetting etc; e.g. Pegs (Square/round), Hook, Hammer tongue, Agro equipment etc (Individually)	12
3	3	- Prepare two wooden joints as per given drawings. (Individually)	12
4	4	- Prepare lap joint/butt joint using either arc / gas welding as per given drawing. (Individually)	12
5	5	-Prepare one male-female type fitting job as per given drawings (Individually) for plumbing & fitting shop seperately.	16
6	6	- Demonstration of Lathe Machine & CNC machine operations.	06
		Total	**64**

SUGGESTED STUDENT ACTIVITIES: - List of proposed student activities like,

a. Follow safety practices.
b. Practice good housekeeping.
c. Function as a team member.
d. Maintain tools and equipment.
e. Follow ethics & maintain discipline.
f. Prepare work diary based on practical performed in workshop. Work diary consist of job drawing, operations to be performed, required raw materials, tools, equipments, date of performance with signature of the teacher.
g. Prepare journals consisting of free hand sketches of tools and equipments in each shop, detail specifications and precautions to be observed while using tools and equipments.
h. Prepare/Download specifications of followings: a) various tools and equipment in various shops. b) Precision equipment in workshop c) Various machineries in workshop.
i. Undertake a market survey of local dealers for procurement of workshop tools, equipment machineries and raw material.
j. Visit any fabrication/wood working/sheet metal/forging workshop and prepare a report.

References/ Books:

Sr. No.	Name of Book	Author	Publisher
1	Workshop Technology-I.	Hazra and Chaudhary	Media promoters & Publisher private limited.
2	Workshop Technology-I.	W.A. J. Chapman	Taylor & Francis.

Approved Copy
Academic Co-ordinator
G. P. Mumbai

3	Workshop Practice Manual For Engineering Diploma & ITI Students	Hegde, R.K.	Sapna Book House, 2012, ISBN:13: 9798128005830
4	Workshop familiarization.	E.Wilkinson	Pitman engineering craft series.
5	Mechanical workshop practice.	K.C. John	PHI.
6	Workshop practice manual.	K.Venkata Reddy	B.S.Publications.
7	A Course in Workshop Technology	Raghuwanshi, B.S.	Dhanpat Rai sons, New Delhi ; 2006, 2011, ISBN: 10-0000017108

List of Software/Learning Websites:

http://www.asnu.com.au b. c.
http://www.abmtools.com/downloads/Woodworking%20Carpentry%20Tools.pdf d.
http://www.weldingtechnology.org e. http://www.newagepublishers.com/samplechapter/001469.pdf
http://www.youtube.com/watch?v=TeBX6cKKHWY g.
http://www.youtube.com/watch?v=QHF0sNHnttw&feature=related h.
http://www.youtube.com/watch?v=Kv1zo9CAxt4&feature=relmfu i. http://www.piehtoolco.com
http://sourcing.indiamart.com/engineering/articles/materials-used-hand-tools/

Course Curriculum Development Committee:

a. **Internal Faculty**
   i. Mr. R. A. Kulkarni (Workshop Superident, G. P. Mumbai.)
   ii. Dr. V. P. Rathod (LME, G. P. Mumbai.)
   iii. Mr. S. P. Kadam. (LME, G. P. Mumbai.)

b. **External Faculty**
   i. Mr. G. S. Dharme (Workshop Superident, Fr. Agnel Polytechnic, Bandra (W), Mumbai.

Academic Coordinator **Head of Department (Mechanical Engineering)** **Principal Govt. polytechnic Mumbai**

Approved Copy
Academic Coordinator
G. P. [illegible]

Programme : **ME/CE/EC/CO/IF/IS/EE/RT/LT/LGFT**									
Course Code: **ME16201**				Course Title: **Engineering Drawing - I**					
Compulsory / Optional: **Compulsory**									
Teaching Scheme and Credits				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
2	**-**	**4**	**6**	**-**	**-**	**50**	**-**	**50**	**100**

Rationale:

Engineering drawing is the graphical language. Engineers, designers, planners, supervisors and technician to express their thoughts, ideas and concepts use it. Engineering drawing offers students an insight into the methods of exploring engineering problems. It imbibe the principles of accuracy and exactness with regard to the information necessary for the production of an engineering component. This preliminary course aims at building a foundation for the further course in drawing and other allied subjects. This subject is useful in developing imagination, drafting and sketching skills of students.

Course Outcomes: Student should be able to,

CO1	Effectively use drawing instruments for enhancing speed and accuracy in drawing.
CO2	Construct different engineering curves and know their applications.
CO3	Draw Orthographic Projections of line, planes and solids with given orientation.
CO4	Visualize three dimensional objects and draw Isometric Projections.
CO5	Draw the free hand sketches of different thread forms, bolts, screws and nuts.

Course Content Details:

Unit No	Topics / Sub-topics
1	**Principles of Drawing** : Drawing Instruments and their uses, Standard sizes of drawing sheets (ISO-A series), Letters and numbers (single stroke vertical), Convention of lines and their applications, Scale (reduced, enlarged & full size), Dimensioning as per SP-46 (Latest edition), Simple geometrical constructions, Redrawing figures using above geometrical construction.

2	**Engineering curves & Loci of Points:** To draw an ellipse by Arcs of circle method & Concentric circles method, To draw a parabola and hyperbola by Directrix and focus method. To draw involutes of circle & pentagon, To draw a cycloid, epicycloids, hypocycloid, Loci of points on any link of (i) 4 bar mechanism and (ii) Single slider crank mechanism with given specifications.
3	**Orthographic projections:** Introduction to Orthographic projections, Conversion of pictorial view into Orthographic Views (First Angle Projection Method Only) – elevation, plan and end view, Types of sections and Conversion of pictorial view into sectional orthographic views. (complete object involving slots, threads, ribs etc)
4	**Isometric projections:** Isometric scale, comparison of true scale with isometric scale, Conversion of orthographic views into isometric View/projection. (complete object involving slots, ribs, holes etc)
5	**Projection of Lines and planes:** Line inclined to one reference plane (HP or VP) and limited to both ends in one quadrant. Projection of simple planes of circular, square, rectangular, rhombus, pentagonal, and hexagonal, inclined to one reference plane and perpendicular to the other.
6	**Freehand Sketches:** Draw neat & proportionate free hand sketches of given elements and understands its function and use. Different types of thread forms, nuts, bolts, screws and Foundation bolts (Rag, Eye and Lewis type).

Suggested Specifications Table with Hours and Marks (Theory):

Unit No	Topic Title	Teaching Hours	Distribution of Practical Marks			
			R Level	U Level	A Level	Total Marks
1	Principles of Drawing	04	06	-	-	06
2	Engineering curves & Loci of Points	06	-	06	-	06
3	Orthographic projections	06	-	-	12	12
4	Isometric projections	06	-	-	12	12
5	Projection of Lines and planes	06	-	-	06	06
6	Freehand Sketches	04	08	-	-	08
	Total	**32**	**18**	**06**	**30**	**50**

Legends: R- Remember; U-Understand; A- Apply and above levels (Bloom's revised Taxonomy).

Notes: *This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.*

List of Sheets/Assignments:

Sr. No.	Unit	Sheets /Assignment	Approx. Hours
1	1	Drawing types of lines, problems on redraw figures & geometrical construction.	08
2	2	Engineering curves (four problems)	08
3	3	Orthographic projection of objects uses first angle method of projection. (Minimum two problems)	08
4	3	Orthographic projection with section of objects using first angle method of projection. (Minimum two problems)	08
5	4	To draw Isometric planes, Isometric projections with Isometric scale. (Two objects)	08
6	4	To draw Isometric views of objects including slots, holes and sloping faces. (Two objects)	08
7	5	Two problems on projection of lines and two problems on projection of planes	08
8	6	Different types of thread forms, nuts, bolts and screws.	08
Total			**64**

Assignment:- *Assignment on above topic based on the question bank provided for the practical examination.*

Note: *Practical examination will be conducted based on the question bank provided.*

References/ Books:

1. **Books:**

Sr. No.	Name of Book	Author	Publisher
1	Engineering Drawing	N. D. Bhatt	Charotar Publishing House 2010
2	Engineering Drawing	Amar Pathak	Dreamtech Press, 2010
3	Engineering Drawing	D. Jolhe	Tata McGraw Hill Edu., 2010
4	Text Book on Engineering	K. L. Narayan,	Scitech Publications, 24th

	Drawing	P. Kannaiah	Reprint August 2011
5	Engineering Drawing and Graphics + AutoCAD	K. Venugopal	New Age Publication, Reprint 2006.
6	Engineering Drawing practice for schools and colleges	IS Codes SP – 46.	-

2. Video Cassettes / CD's

1. Instructional / Learning CD developed by ARTADDICT.

Course Curriculum Development Committee:

a. **Internal Faculty**

1. Dr. S. B. Mahagaonkar
2. Mr. K. B. Salunke
3. Mr. S. P. Kadam

b. **External Faculty**

1. Mr. K. V. Patil

Academic Coordinator (R. A. Patil)

Head of Department (Mechanical Engineering) (S. V. Joshi)

Principal Govt. polytechnic Mumbai

Approved Copy
Academic Co-ordinator
G. P. Mumbai

Programme : **ME/CE/EC/CO/IF/IS/EE/RT/LT/LGFT**									
Course Code:**HU16103**				Course Title: **Generic Skills**					
Compulsory / Optional: **Compulsory**									
Teaching Scheme and Credits				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
-	**2**	**-**	**2**	**-**	**-**	**-**	**50**		**50**

Rationale:

The inclusion of this course is need of the day. The technicians along with technology must learn the generic skills to be successful technician. The subject is included under the category of humanities. The role of subject is to make the student aware of its importance in the society to inform him/her about technical education system, the institute (library, various dept, curriculums etc.) to help him/her with essential etiquettes & manners.

Course Outcomes: Student should be able to,

CO1	Identify his/her role in various areas of life.
CO2	Know the various areas in technical education system.
CO3	Know importance of curriculum, MIS, IS, etc
CO4	Exhibit his/her behavior in proper manner
CO5	Develop & adopt self study techniques.
CO6	Follow rules & regulation strictly & become a law abiding citizen.

Course Content Details:

Unit No	Contents
1	**Social Aspects:** 1.1 Role of an individual in the family, in the institute, in the society. 1.2 Social responsibilities & rights of an individual. 1.3 Role of a diploma holder in the present day scenario.
2	**Technical education in Maharashtra:** 2.1 Definition of technical education its types, structure (ITI, Diploma & Degree) 2.2 Governance in Technical Education (MSBTE, Autonomous & private – structure, fees, faculty, exam, evaluation etc.)

Approved Copy
Academic Co-ordinator
G. P. Mumbai

3	**Awareness of curriculum:** 3.1 Definition of curriculum . Steps observed in its design. 3.2 Objectives, rationale, core subjects, other subjects and credit system.
4	**MIS (Management Information System) :** 4.1 Definition, its working, applications & relevance in the present day scenario. 4.2 MIS applied to exam section, student registration, subject registration, exam registration. 4.3 Department related applications: Work related to office, library & others.
5	**Library :** 5.1 Introduction to library, its functioning, its role in an institute. 5.2 Facilities available in library, search facility for books on internet, concept of digital library. 5.3 Lectures by librarian on Library functioning 5.4 Knowing library ethics.
6	**Health Awareness and Social mannerism:** 6.1 Introduction to health and hygiene (WHO- definition) Definition, its importance. 6.2 Mannerisms– In the Institute: Overall discipline including pitch and tone of voice ,accent, body language, dressing sense. In the Laboratory : Handling of tools and equipments and its Maintenance. In the Classroom: Peer sensitivity and relationship, body posture and attentivity norms. 6.3 Seminar culture –Etiquettes to be observed while attending seminars, And presenting seminar. 6.4 Party and Ceremonial functions
7	**Self Study Techniques :** 7.1 Extraction / Collection of information from various sources. 7.2 Importance of soft skills . Listening, reading & writing skills 7.3 Safety precautions in laboratories and. workshop.
8	**Self Presentation** 8.1 Resume – 8.1.1 Resume writing tips 8.1.2 Types of resumes

Approved Copy
Academic Co-ordinator
G. P. Mumbai

Sr. No.	Unit	Assignment	Approx. Hours
1	1	Define role and responsibility of individual in the family	04
2	1	State in brief the role of diploma holder in industry.	02
3	2	Draw organization chart / hierarchy in Technical Education System of Maharashtra State Understand about Autonomous and State Governed Curriculum Scheme.	03
4	3	Enumerate in detail steps observed in designs of curriculum	03
5	3	To develop good learning habits, abilities and attitudes for enjoy learning.	04
6	4	To know MIS system and its effect on efficiency of the system.	03
7	5	Functioning of Library and Concept of digital library.	03
8	6	Significance of hygiene for maintaining health.	02
9	7	Development of Listening, Reading and Writing Skills.	04
10	7	Safety precautions in various laboratories and workshop.	02
11	8	Resume writing techniques.	02
		Total	**32**

References/ Books:

Sr.No.	Name of Book	Author	Publisher
1	Generic Skills	A.K.Gupta	S.K.Kataria
2	Generic skill Development Manual.		MSBTE, Mumbai
3	Lifelong learning in Global Knowledge Economy, Challenge for Developing countries.		World Bank Publication

Course Curriculum Development Committee:

a. **Internal Faculty:** 1) Mr. S. V. Joshi - HOD Of Mechanical Engg.
2) Mr . R. A. Kulkarni - Workshop Superintendent
3) Mrs. M. P. Deshpande - Lecturer in Electronics Engg.

b. **External Faculty:** 1) Mr . S.G.Deshpande
2) Mr.U.M. Kantute

Academic Coordinator
(R.A.Patil)

Head of Department
Mechanical Engineering
H.O.D.
Dept. of Mechanical Engineering
Govt. Polytechnic, Mumbai-51.

Principal
Govt. Polytechnic Mumbai

Approved Copy
Academic Coordinator
G. P. Mumbai

Programme : **Diploma in CE/CO/EC/EE/IT/IS/LG/LT/ME/RT**									
Course Code: **HU16104**				Course Title: **Environmental Studies**					
Compulsory / Optional: **Compulsory**									
Teaching Scheme and Credits				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
	2		**2**			**-**	**25***	**25@**	**50**

* Oral exam shall be based on the Term Work

@ TW shall be based on tutorial

Rationale:

Environmental studies is the interdisciplinary academic field which systematically studies human interaction with the environment in the interests of solving complex problems. It is a broad field of study that includes also the natural environment, built environment, and the sets of relationships between them. The turn of the twentieth century saw the gradual onset of its degradation through depletion of resources such as air, water and soil; the destruction of ecosystems and the extinction of wildlife by our callous deeds without any concern for the well-being of our surrounding. We are today facing a grave environmental crisis. It is therefore necessary to study environmental issues to realize how human activities affect the environment and what could possibly be the remedies or precautions which need to be taken to protect the environment.

Course Outcomes:

Student should be able to

CO1	State importance of environment
CO2	Identify key issues about environment
CO3	Analyze the reasons for environment degradation
CO4	Distinguish the various improvement methods
CO5	Identify measures taken by the world bodies to restrict and reduce degradation

Course Content Details:

Unit No	Topics / Sub-topics
1	**Nature of Environmental Studies:** **1.1** Definition, Scope and Importance of the environmental studies **1.2** Importance/significance of the environmental studies irrespective of course **1.3** Need for creating public awareness about environmental issues **1.4** Ways/means/methods of creating public awareness **1.5** Some important terms related with Environmental Studies

2	**Natural Resources and Associated Problems:** **2.1** Introduction **2.2** Renewable Resources **2.3** Forest Resources: ○ General description of forest resources ○ Functions and benefits of forest resources ○ Effects on environment due to over exploitation of forest resources: ▪ Due to deforestation ▪ Due to timber extraction ▪ Due to dams ▪ Due to building of waterways **2.4** Water Resources: ○ Hydrosphere: Different sources of water: Surface Water, Ground Water & Frozen Water ○ Use and overexploitation of surface and ground water ○ Effect of floods, draught, dams etc. on water resources and community **2.5** Mineral Resources: ○ Categories of mineral resources ○ Basics of mining activities ○ Mine safety ○ Effect of mining on environment **2.6** Food Resources: ○ Food for all (Food Security) ○ Effects of modern agriculture ○ World food problem • Case Study: Adverse environmental effect of Bhakra Nangal Dam
3	**Ecosystems:** **3.1** Concept of Ecosystem **3.2** Classification **3.3** Structure and functions of ecosystem: Structure (Components), Functions &Food Chain **3.4** Energy flow in ecosystem: Gross primary product and Net primary product, Autotrophic levels and Bioaccumulation **3.5** Major ecosystems in the world **3.6** Case Study: Silent Spring
4	**Biodiversity and Its Conservation:** 4.1 Definition of Biodiversity 4.2 Levels of biodiversity:

	Genetic, Species, Community & Ecosystem 4.3 Value of biodiversity 4.4 Threats to biodiversity: Habitat destruction, Invasive species, Genetic pollution, Overexploitation, Hybridization, Climate change & Overpopulation 4.5 Conservation of biodiversity: In-situ & Ex-situ 4.6 Case Study of any two endangered species
5	**Environmental Pollution:** 5.1 Definition of environmental pollution 5.2 Air pollution: a. Definition b. Classification: Types of air pollution, Types of air pollutants c. Sources: Anthropogenic & Natural d. Effects: Health effects, Climate change, Global warming, Acid rain, Ozone layer depletion & Photochemical smog e. Prevention: Particulate control, Scrubbers, NOx control, VOC abatement, Acid gas control & Mercury control 5.3 Water Pollution: a. Definition b. Water trivia facts c. Water pollution trivia facts d. Classification: Surface, Groundwater, Oxygen depletion in waters, Nutrient pollution, Microbiological pollution, Suspended matter & Chemical pollution e. Sources/Causes of pollution: Sewage & waste water, Marine dumping, Industrial waste water, Nuclear waste, Oil pollution, Underground storage leakages, Atmospheric deposition and Eutrophication f. Effects of water pollution g. Prevention (What you can do) h. Treating water pollution, Water pollution at home 5.4 Soil Pollution: Definition, sources, effects, prevention 5.5 Noise Pollution: Definition, sources, effects, prevention 5.6 Case Study: Bhopal Gas Tragedy and Minamata Disease
6	**Social Issues and Environment:** 6.1 Concept of development 6.2 Sustainable development: Environmental, Economic, Social & Cultural

	sustainability 6.3 Water conservation and its method 6.4 Watershed management, its components and treatment measure/methods 6.5 Rain water harvesting: Definition, Methods and Benefits 6.6 Climate Change: Causes 6.7 Global warming, Acid rain, Ozone Layer Depletion, 6.8 Nuclear Accidents and Holocaust: Basic Terms, Accidents Myth of a reactor explosion, Effects of Nuclear accidents and Nuclear holocaust 6.9 Concept of Carbon Credits and its advantages 6.10 Case studies of Three mile island, Chernobyl, Fukushima disaster
7	**Environmental Protection:** Brief description of the following acts and their provisions: • Environmental Protection Act, 1986 • Air (Prevention and Control of Pollution) Act, 1981 • Water (Prevention and Control of Pollution) Act, 1974 • Wildlife Protection Act 1972 • Forest Conservation Act, 1980 &1988 • Population Growth: Aspects (Social, Environmental, Ecological & Cultural) • Human Health and Human Rights • Case Studies: Mumbai Trans Harbour Link;

Suggested Specifications Table with Hours and Marks (Theory): Not required

List of Tutorials:

Sr. No.	Unit	Tutorial/Termwork	Approx. Hours
1	All	One write-up on each unit (altogether seven in number) that summarizes the whole chapter and presents all the important points/material on it Weightage in Term Work marks--10	16
2	All	10 MCQs (twenty questions each) at the start of each tutorial based on the topic of previous tutorial unit Weightage in Term Work marks-- 10	06
3	All	A project report on any one project of the following: 1. Visit to a local area to document environmental assets such	10

		as river / forest / grassland / hill / mountain 2. Visit to a local polluted site: Urban/Rural/Industrial/Agricultural 3. Study of common plants, insects, birds 4. Study of simple ecosystems of ponds, river, hill slopes etc Weightage in Term Work marks-- 05	
			Total **32**

References/ Books:

Sr. No.	Author	Title	Publisher
01	Anindita Basak	Environmental Studies	Pearson Education
02	R. Rajgopalan	Environmental Studies from Crises to Cure	Oxford University Press
03	Dr. R. J. Ranjit Daniels, Dr. Jagdish Krishnaswamy	Environmental Studies	Wiley India

Course Curriculum Development Committee:

a. **Internal Faculty**

1. Dr. D. K. Gupta.
2. Mrs. S. S. Chavan
3. Mrs. Meera Ansarwadekar

b. **External Faculty**

Mr. Sudhir Nimbalkar (Engineer, BMC, Building Proposals, Bandra West)

Academic Coordinator
(R. A. Patil)

Head of Department
(Civil Engineering)

Principal
Govt. polytechnic Mumbai

Approved Copy
Academic Co-ordinator
G. P. Mumbai

Programme : **Diploma in Civil/Electrical/Mechanical/Instrumentation**									
Course Code:**CO16201**				Course Title: **Computer Fundamental**					
Compulsory / Optional: **Compulsory.**									
Teaching Scheme and Credits				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
00	-	**04**	**04**			50#			**50**

# indicates online practical

Rationale:

course designed to assure a basic level of computer applications literacy to include introduction toDigital India programme. Spoken tutorials, LAN basics, e-mail, and Internet utilization. It also covers application software like MS-Office/ LibreOffice , which helps for documentation, calculation, presentation purpose etc. With the LaTex, technical and scientific documentation can be prepared.

Course Outcomes:

Student should be able to:

CO1	Have hands on experience on operating system and different application software.
CO2	Use word processors, spreadsheets, presentation software's and Internet.
CO3	Use the Internet to send mail and surf the World Wide Web
CO4	Install Latex & create various documents using it.
CO5	Acquaint with Digital *India*

Course Content Details:

Unit No.	Topic/ Sub-topic
1.	**Digital India** 1.1 Electronic Commerce a. Digital Literacy to understand the concept of Online Banking ,Make bill payments, Make money transaction through online banking, b. Online Ticket Booking 1.2 Digital Locker a. Sign Up with Internet/ Mobile. b. Synchronization with Aadhaar Card c. Get documents from Issuers d. Share documents with Requesters
2.	**Spoken Tutorial** 2.1 Introduction to http://spoken-tutorial.org/ or alike 2.2 Software offered

Approved Copy
Academic Co-ordinator
G. P. Mumbai

	2.3 Downloading Spoken Tutorials (Student may register for any course through faculty organizer and may appear for online certification exam.)
3.	**Introduction to Computer System and Operating System** 3.1 Terminology :- Hardware, Software, firmware 3.2 Peripherals : Keyboard, monitor, printer, Scanner 3.3 Memory :RAM, ROM, Magnetic Disk, Floppy Disk, CD, DVD, Pen drive ,USB Drive , Portable Disk 3.4 Introduction of windows OS , start menu icons, start button, Task bar, starting and Running multiple programs, moving, minimizing, maximizing and resizing windows and window shut down. 3.5 Using My Computer: To view CD, DVD Read/Write contents, using pen drive, changing the icon arrangement, copying a file, to drag and drop, deleting a file. Windows explorer: Copy, move, delete files creating folder, copy and paste. Find Utility: To search file by name. 3.6 Control panel: Purpose, changing date and time, choosing background, getting on line help, and installation of software. 3.7 Accessories: Paint, Calculator, Notepad 3.8 Introduction to Antivirus
4.	**Introduction to Computer Network & Internet** 4.1 Introduction to Networking 4.2 Components of Networking 4.3 Types of Network 4.4 Application of Computer Network a. Using a browser, b. Using search engine, c. Creating an Email account, d. Sending / Receiving mail with Attachments 4.5 Social Networking
5.	**Word processing** 5.1 Introduction to Microsoft word: Introduction to toolbar, advantages and features of MS Word. 5.2 Working with word document. a. Edit menu: go to, replace, find, select all, and cut, copy, paste. b. View: document and map, header and footer, all tool bars. c. Insert: hyperlink, foot note, end note, comment, picture, chart, date and time, page number, etc… d. Format: tab setting, font, borders and shedding, bullets and numbering, background, etc…

	e. Tools: printing envelopes and labels, mail merge, etc… f. Table: draw table, insert table, formula, convert, sort, etc… g. Window: use of split. 5.3 Printing Document 5.4 Page Setup 5.5 Page Formatting 5.6 Mirror Margin 5.7 Line Numbers 5.8 Print Preview 5.9 Printing Document
6.	**Use of Spread sheets** 6.1 Introduction to Microsoft Excel: Advantages of Microsoft excel, Features of Microsoft excel 6.2 Working with worksheet: Entering data, Creating a series, Editing worksheet. 6.3 File handling. a. Saving a new unnamed document b. Saving a named work book c. Closing a work book d. Creating a new work book e. Opening an existing work book 6.4 Creating formulas and auditing work sheet. a. Creating formula b. Creating a simple worksheet c. Creating auto sum method d. Automatic calculation method 6.5 Formatting worksheet a. Text, number, currency, date and time b. Alignment and orientation c. Font, font size, text color. d. Border. 6.6 Printing workbook a. Page set up b. Page formatting. c. Margins d. Header and footer e. Sheet f. Print preview g. Making final formatting adjustments h. Printing a work sheet. 6.7 Concept of Macro
7.	**Making Presentations** 7.1 Introduction to Microsoft PowerPoint: a. What is the use of PowerPoint? b. What is slide show? 7.2 Starting PowerPoint. a. Understanding the PowerPoint i. Window, Title bar, and Menu bar. b. Using Toolbars, Rulers, status bar c. Using basic drawing tools, using auto

Approved Copy

Academic Co-ordinator
G. P. Mumbai

	i. shape tools, inserting text into object 7.3 Understanding the various views in power point. a. Slide view b. Outline view c. Slide sorter view d. Notes page view e. Slide show view. 7.4 Changing Font color and applying effects. a. Font color. b. Line style, Dash style, Arrow style c. Using lines style, dash style, and arrow for objects. d. Applying color fill, Gradient effect, Texture effect, Pattern effect, Picture effect. e. Applying shadow effect, Applying 3d effect. 7.5 Slide Transition 7.6 Custom animation. a. Slide objects without animation. b. Animation orders, Timing. c. Start animation On mouse click or Automatically 7.7 Power point presentation Methods: a. Using Auto Content Wizards b. Using Template method c. Using Blank Presentation method
8.	**Introduction to LaTeX** 8.1 Installation of the software LaTeX. 8.2 Understanding Latex compilation Basic Syntax, Writing equations. Matrix. Tables 8.3 Page Layout – Titles, Abstract Chapters. Sections. References. Equation references, citation. 8.4 List making environments Table of contents, Generating new commands, Figure handling numbering, List of figures, List of tables, Generating index

Approved Copy

Suggested Specification Table with Hours and Marks (Theory):

Unit No	Topic Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1.	Digital India	2	2	--	--	2
2.	Spoken Tutorial	2	2	--	--	2
3.	Introduction to Computer System	6	2	2	2	6
4.	Introduction to Computer Network & Internet	2	2	--	--	2
5.	Word processing	14	2	4	4	10
6.	Spreadsheets	14	2	4	4	10
7.	Presentations	14	2	4	4	10
8.	Introduction to LaTeX	10	2	2	4	8
	Total	**64**	**16**	**16**	**18**	**50**

Legends: R- Remember; U-Understand; A- Apply and above levels (Bloom's revised Taxonomy).

Note: *This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.*

Approved Copy
Academic Co-ordinator
G. P. Mumbai

List of experiments/Assignments: At least 16 programs to be completed .

Sr. No	Unit	Experiment	Approx Hours
1.	1	1.1 Login to DigyLocker. 1.2 Study of various e-Governance portals.	02
2.	2	Download Spoken Tutorial of any course of your choice.	02
3.	3	Identify different computer peripherals and Operating Systems.	02
4.	3	Explore the Windows Explorer.	02
5.	3	Type a paragraph using Notepad. Draw a sketch of Computer System using MS Paint.	02
6.	4	6.1 Create Email account & learn to access. 6.2 Use of Mail Merge to send and receive Mail.	02
7.	5	Type a given paragraph along with a list and try out font and paragraph settings.	02
8.	5	Type a given paragraph along with a list and insert Pages, Tables, Illustrations Headers and Footer, Links, Text and Symbols.	02
9.	5	Type a given paragraph along with a list and try out all the options in Page Layout tab.	02
10.	5	Type a given paragraph along with a list and try out all the options in References and Mailing tabs.	02
11.	5	Type a given paragraph along with a list and try out all the options in Review and View tabs.	02
12.	5	Prepare a student information table and try out all the options in Design and Layout tabs.	02
13.	5	Preparation of BIO-DATA using MS Word using maximum possible functionalities of MS Word.	02
14.	6	Prepare an Excel-sheet for storing students data having following columns: Enrollment No., First Name, Last Name, Address, Phone No., Email Id, SSC Percent, Department Name. Try all the options in Home, Insert and Page Layout tabs.	02
15.	6	For the data in Experiment No. 14, try all the options in Formulae tab	02

Approved Copy
Academic Coordinator
G. P. Mumbai

16.	6	For the data in Experiment No. 14, try all the options in Data tab.	02
17.	6	For the data in Experiment No. 14, try all the options in Review and View tabs.	02
18.	6	Create a following chart using Excel Student Name | Percentage | Grade Calculate the grade of students by using following conditions. a. If the percentage is more than or equal to 85 the grade is "excellent" b. If the percentage is more than or equal to 70 the grade is " distinction" c. If the percentage is more than or equal to 60 the grade is " first class" d. If the percentage is more than or equal to 50 the grade is "second class" e. Otherwise the grade is "fail"	02
19.	6	Prepare an Excel sheet which has company sales figures for 12 months as column and branches as rows. Using formula find Total sale in every month and total sale for every branch.	02
20.	6	Prepare an Excel sheet for Payroll System. a. Calculate HRA as =10% of basic. b. Calculate DA =15% of basic. c. Calculate Conv=5% of basic. d. Calculate total as = basic salary +HRA+DA+conv. e. Calculate PF as =5% of total. f. Calculate designation as = if the employees net salary is more than 5000/- his designation is 'Executive' otherwise he is 'Clerk'.	02
21.	7	Prepare a power point presentation to Display objectives and contents of the Subject "Computer Fundamentals". Try all the options in Home and Insert tabs	02
22.	7	For the Presentation prepared in Experiment No 21	02

Approved Copy
Academic Co-ordinator
G. P. Mumbai

		Try all the options in Design and Transition tabs.	
23.	7	For the Presentation prepared in Experiment No 21 Try all the options in Animations tab.	02
24.	7	For the Presentation prepared in Experiment No 21 Try all the options in Slide Show, Review and View tabs.	02
25.	7	Prepare a power point presentation to display information of our institute.	02
26.	7	Prepare a power point presentation to display information of your department.	02
27.	7	Merge all the above presentations and try to use maximum possible functionalities of MS Powerpoint.	02
28.	8	Installation of Winedt software/texmaker & Installation of Dia software.	02
29.	8	Using Latex: 1. Converting the paragraph into bold, italic and justify it. 2. Adding the bullets to paragraph. 3. Write mathematical equation using latex	04
30.	8	Using latex 1. Add Chapters to your project and add subsections to it. 2. Create a table using latex. 3. Add a diagram to your project using latex.	04

References/ Books:

Sr.No.	Name of Book	Author	Publisher
1	Comdex Computer Course Kit First	Vikas Gupta	Dreamtech
2	Computer Fundamentals Architecture and Organisation Revised 3rd	B.Ram	New Age International Publisher
3	www.tutorialpoint.com		

Course Curriculum Development Committee:

a. **Internal Faculty**
   i. Mrs.Varsha M. Aswar
   ii. Mrs.Rupali V. Molawade
   iii. Ms. Jijnasa S. Patil

b. **External Faculty**
   i. **Mr. S. V. Bangal, HOD Computer Engg. S V P Polytechnic Borivali**

Academic Coordinator (Dr R.A Patil)	Head of Department (Computer Engineering)	Principal Govt. polytechnic Mumbai

Approved Copy
Academic Co-ordinator
G. P. Mumbai

Programme : **Diploma in CE/CO/EC/EE/IS/IT/LT/LGFT/ME/RT**									
Course Code: **NC16101**				Course Title: **Yoga**					
Compulsory / Optional: **Compulsory**									
Teaching Scheme				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
-	-	**02**	**02**	-	-	-	-	-	-

Rationale:

Teenage is that period of our life when we are stuck between school, exams, sports, tuition and many other activities which result in our mental and health disorders. Adolescence is an important time for the development of mental health. Nowadays student's life revolves around academic activities, assignment help, to score good grades in the examination, performing better at the workplace and a lot of other hectic activities. They don't get much time for themselves or to relax their mind. To get first in the race of life, they lack somewhere behind and alleviate more and more stress for themselves. Yoga and meditation directly helps in contributing to improve mental focus and concentration among students. Yoga soothes our mind and body and helps to eliminate social and academic stress from students. Breath and movement combine yoga which helps in soothing cramped and jammed bodies. It also helps students in proper concentration while completing assignments and day to day work.

Course Outcomes:

Student should be able to

CO1	**Psychomotor Outcomes:** 1) Demonstrate proficiency at the poses covered in class (at a basic level) 2) Increase their dynamic flexibility 3) Apply forces and exert themselves using rarely used muscle groups 4) Perform proper breathing techniques 5) Perform each difficult pose to the greatest extent of their ability
CO2	**Cognitive Outcomes:** 1) Identify poses using the sanskrit name 2) Categorize poses from a list by increasing level of difficulty 3) Sequence three poses according to a practice 4) List the correct progressions into a given pose 5) Identify some of the major muscles used in any given pose
CO3	**Affective/Social Outcomes:** 1) Work quietly without disturbing classmates 2) Fun participating in the activity 3) Motivated to continue the activity outside of class 4) Assist a partner when called upon to help them with poses 5) Develop a greater sense of body self esteem and appreciation for the art of yoga

Course Content Details:

Unit No	Topics / Sub-topics	Teaching Hours
1	**The Origin and Philosophy of Yoga** 1.1 What is Yoga? 1.2 Brief history and development of Yoga 1.3 The Fundamentals of Yoga 1.4 Yogic practices for health and wellness 1.5 General Guidelines for Yoga Practice 1.6 Food for thought 1.7 How Yoga can help?	2
2	**Loosening Practices** **2.1** Neck bending **2.2** Shoulder's movement **2.3** Trunk movement **2.4** knee movement **2.5** Effective breathing techniques **2.6** Knowledge of asanas specific to desired health benefits	2
3	**Yogasanas (Standing Postures)** **3.1** Taḍasana **3.2** Vrksasana **3.3** Pada-Hastasana **3.4** Ardha Cakrasana **3.5** Trikonasana	6
4	**Yogasanas (Sitting Postures)** 4.1 Bhadrasana 4.2 Vajrasana 4.3 Ardha Ustrasana 4.4 Ustrasana 4.5 Sasakasana 4.6 Uttana Madhukasana 4.7 Marichyasana	6
5	**Yogasanas (Prone Postures)** 5.1 Makarasana 5.2 Bhujangasana 5.3 Salabhasana	4
6	**Yogasanas (Supine Postures)** 6.1 Setubandhasana 6.2 Uttanapadasana 6.3 Ardhahalasana 6.4 Pavanmuktasana 6.5 Savasana	4

7	**Kapalabhati**	2
8	**Pranayama** 7.1 Anuloma viloma pranayama 7.2 Sitali Pranayama 7.3 Bhramari Pranayama	2
9	**Dhyana and Sankalpa**	2

References/ Books:

Sr. No.	Book Title	Author	Publication
1	Common Yoga Protocol	Ministry of Ayurvedan Yoga & naturopathy, unani, siddha and Homeopathy (AYUSH)	Government of India
2	Adiyogi: The Source of Yoga	Sadhguru and Arundhathi Subramaniam	Harper Collins Publication
3	Yoga: The Iyengar Way	Silva Mehta, Mira Mehta, Shyam Mehta	A.A. Knopf
4	Asanas; Popular Yoga	Swami Kuvalayananda	Popular Prakashan

Reference Sites:
http://ayush.gov.in/event/common-yoga-protocol-2017

http://web.uvic.ca/~thopper/Pe352/2003/Lisa%20Jen%20&%20Mark%20Yoga/index.html

http://www.wikihow.com/Do-Yoga-for-Absolute-Beginners

Course Curriculum Development Committee:

a. **Internal Faculty**

Ms. Pooja L. Chelani (Lecturer, Computer Engineering, Govt. Polytechnic Mumbai)

Ms. Usha C. Khake (Lecturer, Computer Engineering, Govt. Polytechnic Mumbai)

Ms. Sadaf A. H. Shaikh (Lecturer, Information Technology, Govt. Polytechnic Mumbai)

b. External Faculty

Mrs. Mandeep Kaur (Yoga and Meditation Teacher Brahmavidya Course, Mumbai)

Academic Coordinator **Head of Department (Information Technology)** **Principal Govt. Polytechnic Mumbai**

Programme: **Diploma in CO /CE/ EE/EC/ IF/IS/LT/ME/RT/LGFT**									
Course Code: **NC16102**				Course Title: **Social Work**					
Compulsory / Optional: Compulsory									
Teaching Scheme				Examination Scheme					
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
--	---	3	3	---	---	---	---	---	---

Rationale :

The programme aims to inculcate social welfare in students, and to provide service to society without bias. NSS volunteers work to ensure that everyone who is needy gets help to enhance their standard of living and lead a life of dignity. In doing so, volunteers learn from people in villages how to lead a good life despite a scarcity of resources. It also provides help to natural and man-made disasters by providing food, clothing and first aid to the disaster victims.

Course Outcomes:

After the completion of the course student will be able to:

CO1	Understand the community in which they work & themselves in relation to their community.
CO2	Identify the needs and problems of the community and involve them in problem-solving. Acquire leadership qualities and democratic attitudes.
CO3	Develop sense of social and civic responsibility, gain skills in mobilizing community.
CO4	Develop capacity to meet emergencies and natural disasters and practice national integration and social harmony.

Course Content Details:

Unit No	Topics / Subtopics	Hours
1	**Institute Level Activity:** 1.1 Tree Plantation 1.2 Play Ground Forming 1.3 Energy Audit 1.4 Nature Awareness 1.5 Tree Counting 1.6 Hunting Hazard	05

Approved Copy
Academic Co-ordinator
G. P. Mumbai

2	**Institute Organized Initiative:** 1.1 Energy Consumption 1.2 Save Girl Child 1.3 Road Safety 1.4 Child Labour 1.5 Drug Addiction 1.6 Road Show 1.7 Child Marriage 1.8 Poster Making 1.9 Dowry 1.10 Unemployment	15
3	Visit Arrangement: 1.1 Visit to Old Age Home 1.2 Visit to any Village 1.3 Visit Orphanage (Children Home)	15
4	Metropolitan Level Activity : 1.1 Blood Donation Camp 1.2 Health Checkup Camp 1.3 General Awareness 1.4 New Technology 1.5 Woman's Empowerment	05
5	National Administration Initiative For Natural/Artificial calamities: 1.1 Earthquake 1.2 Flood 1.3 Storm 1.4 Draught 1.5 Heavy Rain Fall	05

Course Curriculum Development Committee:
1. Mrs. S.R.Nagargoje (Lecturer in Electronics)
2. Mrs. S.D.Kapse(Lecturer in Instrumentation)
3. Mrs.S.B.Puri(Lecturer in Electronics)

Academic Coordinator (Mr R A Patil)

Head of Department
Department of Computer Engineering

Principal
Govt. Polytechnic Mumbai

Approved Copy