

# Government Polytechnic, Mumbai

**Department of Electrical Engineering** 

# P-16 Curriculum [Out Come Based (OBE)]

Semester-I (Course Contents)



# Government Polytechnic Mumbai

(Academically Autonomous Institute of Maharashtra Government)

49, Ali Yawar Jung Marg, Kherwadi, Bandra (E)

#### gpmumbai@gpmumbai.ac.in

Programme: Electrical Engineering					First Semester					With effect from June 2016						
Sr	Course		Award	Compulsory		Teachi	ng Hours	5			minatio	nination Scheme				
No.	Code Course Title	. Code	Code	of Class	/Optional	L	Р	TU	Total (Hrs)	Credits	The TH	eory TS	PR	OR	ТW	Total
1	HU16 101	Basics of Communication		С	2		1	3	3	70	30				100	
2	SC16 104	Engineering Physics		С	3	2		5	5	70	30			50	150	
3	SC16 107	Mathematics I		С	3		1	4	4	70	30				100	
4	AM16 201	Engineering Mechanics		С	3	2		5	5	70	30	0	25*	25*	150	
5	CO16 202	C-Programming		С	2	2		4	4	0	0	50#	0		50	
6	HU16 103	Generic Skills		С			2	2	2				50		50	
7	WS16 201	Workshop Practice		С		4	0	4	4	0	0	0		50	50	
8	CO16 203	Computer Work Shop		С		2		2	2	0	0	50			50	
	NC16 101	Yoga		C		2		2								
	NC16 102	Social Work		С		3		3								
		TOTAL			13	17	4	34	29	280	120	100	75	125	700	

Abbreviations: L- Theory Lecture; P-Practical; TU-Tutorial; TH- Theory Paper; TS- Term Tests (02); PR-Practical Exam; OR-Oral Exam; TW- Term Work.

\* Indicates assessment by External Examiner, # indicates On-Line Exam

Academic Coordinator

Head of Department (Electrical Engineering) Principal Government Polytechnic Mumbai

Program	Programme : CE/ME/EE/IS/EC/CO/IF/LG/LT								
Course Code: HU16101 Course Title: Basics of Communication									
Compul	Compulsory / Optional: Compulsory								
Teachi	ng Sche	eme and	l Credits		Exa	minatio	on 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	<b>Basics of Grammar:</b> 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	<b>Theory and methods of communication:</b> Meaning and definitions of communication, Elements of communication, Communication cycle, Methods of communication, verbal: Oral, Written, Non verbal: Body language ii) Visuals
3	<b>Types and Barriers of communication:</b> Formal - upward, downward, vertical, horizontal, diagonal. Informal, grapevine, Barriers of communication: Mechanical, Physical, Language, Semantic, Psychological, Status
4	<b>Application Letters:</b> 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	<b>Report writing :</b> 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		Teaching	Distribution of Theory Marks					
No	Topic Title	Hours	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.		
	1		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	02	
5		students)		
6	3	Presentation on the given situation with the help of body language	02	
0	5	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	Communication Skills	Oxford Higher
	Sangita Sharma		Education
2	Homai Pradhan	<b>Business Communication</b>	Himalaya Publishing
	D.S.Bhende		House
	Vijaya Thakur		
3	Curriculum Development	A Course in Technical	Somaiya Publications
	Centre	English	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

Head of Department (Science) Principal Government Polytechnic Mumbai

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 PO Matrix

## CO Vs PSO Matrix

# **Electrical Engg.**

	CO/PSOs	PSO1	PSO2	PSO3
CO1	Make use of the basic concepts of grammar and communication techniques.	01	01	02
CO2	Interpret positive feedback at various situations by using appropriate body language.	02	02	03
CO3	Write letters circulars, memos, notices and reports to communicate.	01	02	03
CO4	Apply proper communication technique to cope up with the challenges of the modern world.	03	03	03
CO5	Adopt appropriate approach to take instructions from seniors and pass it on to the subordinates.	03	03	03

# 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

Program	Programme : Diploma in CE/EE/EC/ME/CO/IF/IS/LG/LT/RT Engineering									
Course	Course Code: SC16104 Course Title: Engineering Physics									
Compul	Compulsory / Optional: Compulsory									
Teachi	ng Sche	eme and	l Credits		Exa	minatio	n Scheme			
TH	TU	PR	Total	TH TS PR OR TW Total						
3	-	2	5	70 (3 Hrs.)	70 (3 Hrs.) 30 - 50 150					

#### **Rationale:**

The subject is included under the category of science. The special feature of the subject is to develop the laboratory skill using principles of scientific phenomenon. This course will serve to satisfy the need of the technical student for his development in technical field. Deep thought is given while selecting the topics related to all programmes which will develop intellectual skills of the students. Ultimately the focus of the course is on psychomotor skill.

#### **Course Outcomes:**

After the completion of course, students will be able to

CO1	Know the physical quantities accurately, to measure using different instruments and to interpret the results from observations and calculations.
CO2	Know the physical properties of the various materials that are used by the engineer and to understand the principle and laws of physics.
CO3	Know the basic facts in Physics viz, force, elasticity, viscosity, surface tension, waves and light and to apply the knowledge to correlate the properties of materials, their engineering uses and applications.
CO4	Classify and develop laboratory skills including the use of variety of physics apparatus, the compilation of data, its interpretation and analysis.
CO5	Achieve refined presentation skills through the presentation of coherent and comprehensible written accounts of laboratory work.

# **Course Content Details:**

Unit No	<b>Topics / Sub-topics</b>
	Physical Measurements and Units
1	1.1 Fundamental Physical quantities, examples.
	1.2 Derived physical quantities, examples.
	1.3 Definition and requirements of unit
	1.4 System of units, C. G. S., M. K. S. and S. I. units.
	1.5 Rules to write the unit and conventions of units and numerical.
	1.6 Error – Definition, types of errors and minimization of errors.
2	Motions:
2	<b>2.1 Linear motion</b> –Definition, equation of motions: v = u +at,
	$s = ut + \frac{1}{2}at^2$ , $v^2 = u^2 + 2as$ and numerical.
	2.2Periodic motions- a) Oscillatory motion, b) Vibratory motion, c) Spin motion,
	d) S.H.M. (only definition and examples), e) Circular motion.
	2.3 Circular motion :
	a) Introduction of the terms: Time period, frequency, amplitude, wavelength,
	phase. Uniform circular motion, Radius vector, linear velocity, Angular
	velocity, Angular acceleration,
	b) Relation between linear velocity and angular Velocity, Radial or centripetal
	acceleration (derivation), Three equations of motion (no derivations)
	Centripetal and Centrifugal force, examples and applications.
	c) Banking of Roads, its necessity and applications. Numericals based on the
	topic
	General Properties of Matter:
3	
	3.1 Elasticity: 3.1.1 Elastic plastic and rigid substances, their examples
	3.1.2 Types of deformations
	3.1.2 Types of deformations.
	2.1.4 Hooko's Low and electic limit
	3.1.5 Strass versus Strain curve when the wire is under continuously
	increasing stress wield point, breaking point
	2.1.6 Marticles halfs we delta in the state of the state
	5.1.6 Young's Modulus, bulk modulus and modulus of rigidity –
	Definition, explanation and numerical.

	3.1.7 Factor of safety.
	3.1.8 Applications of elasticity.
	3.2 Viscosity :
	3.2.1 Concept and Definition of viscosity, velocity gradient.
	3.2.2 Newton's law of viscosity, Co-efficient of viscosity, unit of viscosity
	3.2.3 Stokes' law, terminal velocity, derivation of Stokes' formula.
	3.2.4 Streamline flow, turbulent flow, critical velocity, examples.
	3.2.5 Reynolds' number and its significance.
	3.2.6 Applications of viscosity and numerical.
	3.3 Surface Tension :
	3.3.1 Concept of surface tension.
	3.3.2 Adhesive and cohesive forces, examples.
	3.3.3 Laplace's Molecular theory of surface tension
	3.3.4 Angle of contact, its significance.
	3.3.5 Expression for surface tension by capillary rise method.
	3.3.6 Effect of impurity and temperature.
	3.3.7 Applications of surface tension.
	3.3.8 Numericals.
4	Sound and Acoustic :
	4.1 Sound Waves :
	4.1.1 Wave motion, types of waves – progressive, longitudinal and transverse waves.
	4.1.2 Characteristics of longitudinal and transverse waves and comparison.
	4.1.2 Free or natural vibrations and forced vibrations, resonance –
	definition and examples.
	4.1.3 Newton's formula for velocity of sound and Laplace's correction.
	4.1.4 Effect of temperature , pressure & humidity on velocity of sound and numerical.
	4.1.5 Determination of velocity of sound by resonance method.
	4.2 Acoustics :
	4.2.1 Definition of echo, reverberation, reverberation time and acoustic
	4.2.2 Sabine's formula for reverberation time no (derivation)
	4.2.3 Factors affecting acoustics of sound.
	4.2.4 Acoustical planning of building.

	Optics and Optical Fibers :
5	5.1 Optics :
	5.1.1 Revision of reflection and refraction of light.
	5.1.2 Laws of refraction, Snell's law.
	5.1.3 Determination of refractive index.
	5.1.4 Dispersion, dispersive power, Prism formula (no derivation)
	5.1.5 Critical angle, Total internal reflection. Examples and applications.
	5.1.6 Numericals.
	5.2 Optical Fibers :
	5.2.1 Principle of propagation of light through optical fiber.
	5.2.2 Structure of optical fiber.
	5.2.3 Concept of numerical aperture and acceptance angle (formula).
	5.2.4 Types of optical fiber.
	5.2.5 Method of production of optical fiber.
	5.2.6 Applications (electronics and medical) and comparison with electrical cable for
	communication.
6	Nanotechnology, Laser and Ultrasonic:
6	6.1 Nanotechnology :
	6.1.1 Introduction to nanotechnology.
	6.1.2 Definition of nanoscale, nanometer and nanoparticles, nanotechnology.
	6.1.3 Definition and examples of nanostructured materials.
	6.1.4 Methods of production of nanomaterial-
	a. Top down approach.
	b. Bottom up approach.
	6.1.5 Techniques for the measurement of nanoparticles.
	6.1.6 Applications of nanotechnology in different fields -
	a. electronics, b. automobile, c. medical, d. textile, e. cosmetics,
	e. environmental, f. space and defense.
	6.2 LASER and Ultrasonic :
	a) LASER
	6.2.1a) LASER introduction,
	6.2.1b) Properties of laser,
	6.2.1c) Spontaneous and stimulated emission,
	6.2.1d) Population inversion, Optical pumping,
	6.2.1e) Types of LASER, He-Ne Laser- construction and method of production.
	6.2.1f) Applications of LASER.

b) Ultrasonic:
6.2.2a) Ultrasonic waves and infrasonic waves.
6.2.2b) Audible range of soundwave,
6.2.2c) Piezoelectric effect and magnetostriction effect.
6.2.2d) Methods for the production of ultrasonic wave (any one),
6.2.2e) Properties of ultrasonic wave.
6.2.2f) Applications for distance measurement, hidden flaws detection,
signaling, drilling holes, metal cutting.

#### Suggested Specifications Table with Hours and Marks (Theory):

Unit		Teaching	Distribution of Theory Marks					
No	Topic Title	Hours	R Level	U Level	A Level	Total Marks		
1	Physical Measurements and Units	6	2	2	4	8		
2	Motion	8	2	4	2	12		
3	General properties of matter	10	3	3	2	15		
4	Optics and Fiber optics	8	3	3	2	12		
5	Sound and Acoustics	6	3	3	2	8		
6	Nano Technology, Laser and Ultrasonic.	10	3	3	2	15		

**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:

#### (Minimum <u>TEN</u> experiments should be completed by each student)

Sr. No.	Unit	Experiment/Assignment					
1	1	To measure the dimensions of given objects and to determine their volume using Vernier caliper.	2				
2	1	Γο measure the dimensions of given objects and to determine their volume using micrometer screw gauge.					
3	2	To determine Acceleration due to gravity by simple pendulum					
4	3	To determine coefficient of viscosity of liquid by Stokes' method.	2				
5	3	To determine coefficient of viscosity of liquid by Poiseullie's method.	2				
6	3	To determine the surface tension of liquid using capillary rise method.	2				
7	3	To determine the Young's modulus of elasticity of wire using Young's apparatus.	2				
8	4	To determinerefractive index by pin method.	2				

9	4	To determine refractive index by total internal reflection.	2
10	4	To determine refractive index using spectrometer	2
11	5	To determine velocity of sound by resonance method.	2
12	5	To determine sound absorption coefficient of different materials.	2
13	6	Flaws detection using ultrasonic waves.	2
14	6	Experiments on LASER	2
15	6	To plot the characteristics of photo cell.	2
16	All	Showing Video on different applications related to umits,	2
		Total	32

*Notes:* If possible videos should be shown on different topics- especially on topics – LASER, Ultrasonic, TIR, Refractive index and on spectra.

Sr.No.	Name of Book	Author	Publisher		
1	Applied Physics	Manikpure&Deshpan de	S.Chand& Company		
2	Applied Physics	B.G.Bhandarkar	Vrinda Publication		
3	Optics & Optical Fibers	BrijlalSubhramanyan			
4	Engineering Physics	Gaur and S.L.Gupta	S.Chand& Company		
5	Resnick and Halliday	Physics	Tata McGraw Hills		
6	H.C.Varma	Physics part I & II			
7	D.S.Mathur	Properties of Matter			
8	Dr. A. U. Warad	Basic Physics			

#### **References/ Books:**

### **Course Curriculum Development Committee:**

- i. Internal Faculty:- Dr. A. U. Warad.
- ii. External Faculty :- Mrs. S. A. Thorat

Academic Coordinator

Head of Department (Science) Principal Govt. Polytechnic, Mumbai

# CO Vs PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	1	1	-	-	-	-	-	-
CO2	1	2	2	1	-	-	-	-	-	-
CO3	3	2	2	3	-	-	-	-	-	-
CO4	2	2	3	1	-	-	-	-	-	-
CO5	1	1	1	-	-	1	-	-	-	-

#### CO Vs PSO matrix

# **Electrical Engg:**

	CO/PSOs	PSO1	PSO2	PSO3
CO1	Know the physical quantities accurately, to measure using different instruments and to interpret the results from observations and calculations.		1	
CO2	Know the physical properties in the various materials that are used by the engineer and to understand the principle and laws of physics.			
CO3	Know basic facts in Physics viz, force, elasticity, viscosity, surface tension, waves and light and to apply knowledge to correlate the properties of materials, their engineering uses and applications.			1
CO4	Classify and develop laboratory skills including the use of variety of physics apparatus, the compilation of data, its interpretation and analysis.		1	1
CO5	Achieve refined presentation skills through the presentation of coherent and comprehensible written accounts of laboratory work.		1	-

## Unit Number and COs

Sr. No.	Unit No.	Topic Title	COs
1	1	Physical Measurements and Units	CO1,CO4,CO5
2	2	Motion	CO1,CO3,CO4
3	3	General properties of matter	CO1,CO2,CO3,CO4
4	4	Optics and Fibre optics	CO2,CO3,CO4
5	5	Sound and Acoustics	CO2,CO3,CO4
6	6	Nano Technology, Laser and Ultrasonic.	CO2,CO3,CO4

Programme : CE/ME/EE/IS/EC/CO/IF/LG/LT										
Course Code: SC16107 Course Title: Mathematics-1										
Compul	Compulsory / Optional: Compulsory									
Teachi	Teaching Scheme and Credits Examination Scheme									
TH	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	Topics / Sub topics						
No	Topics / Sub-topics						
	Logarithms:						
1	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.						
	Determinants:						
2	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.						
	Matrices:						
3	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 Ad	3.6 Adjoint & inverse of a matrix by adjoint method.									
	3.7 Sol	ution 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 H	Factorization and De-factorization Formulae									
	4.3 I	nverse Circular function (definition and simple problems).									
	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	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.									
	Vectors:										
6	6.1	Definition of vector, position vector									
	6.2	Algebra of vectors(Equality, addition, subtraction and scalar									
	multipl	ication)									
	6.3	Dot (Scalar) product & Vector (Cross) product with properties.									

## Suggested Specifications Table with Hours and Marks (Theory):

Unit		Teaching	Distribution of Theory Marks				
No	Topic Title	Hours	R	U	Α	Total	
			Level	Level	Level	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

Head of Department (Science) Principal Govt. polytechnic, 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

#### **Electrical Engg.**

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

Programme : Diploma in Civil/Mechanical/Electrical Engineering									
Course Code: AM16201 Course Title: Engineering Mechanics									
Compulsory / Optional: Compulsory									
Teachi	Teaching Scheme and Credits Examination Scheme								
TH	TU	PR	Total	TH TS PR OR TW Total					
3	-	2	5	70 (3 Hrs.)	30	-	25*	25*	150

\* TW & OR shall be based on the practicals done during the semester

#### **Rationale:**

In day to day life we come across different structures and at times design of the structures analysis plays an important role. Perfect analysis is possible only when one knows the types and effect of forces acting on the structure. This subject provides knowledge about the different types of forces/loads and their effects while acting in different conditions/systems. It is a branch of Applied Science where laws of physics are applied to solve engineering problems. Broadly speaking Engineering Mechanics can be classified in two categories-Static and Dynamics. In this course, an attempt has been made to apply different laws of science to solve Statics and Dynamics problems. An attempt is also made to strengthen the knowledge of students, so as to make the path for applied technological subjects smoother and logical.

#### **Course Outcomes:**

Student should be able to

AM16 201.1	Identify the different forces & its effects on objects, motion of bodies, and friction with applications.
AM16 201.2	Apply the principles of equilibrium to Engineering problems
AM16 201.3	Compare & analyze the simple machines
AM16 201.4	Interpret the concept of centroid and centre of gravity
AM16 201.5	Analyze and solve the rectilinear & circular motion, work, energy and power problems

#### **Course Content Details:**

Unit No	Topics / Sub-topics
1	Simple Machines:
	1.1 Definitions and formulae, if any, of simple machine, compound machine, load,
	effort, mechanical advantage, velocity ratio, input of a machine, output of a
	machine, efficiency of a machine, ideal machine, ideal effort and ideal load, load
	lost in friction, effort lost in friction

	1.2 Analysis: Law of machine, maximum mechanical advantage and maximum
	efficiency of a machine, reversibility of a machine, condition for reversibility of a
	machine, self locking machine.
	1.3 Identification, use and velocity ratio for following simple machines :
	Simple axle and wheel, differential axle and wheel, Weston's differential pulley
	block, single purchase crab, double purchase crab, worm and worm wheel, geared
	pulley block, screw jack, calculation of mechanical advantage, efficiency
2	Force systems:
	2.1 Fundamentals and Force systems:
	Definitions of mechanics, Engineering mechanics, statics, dynamics, Kinetics,
	Kinematics, rigid body, classification of force system according to plane coplanar
	and non coplanar, sub classification of coplanar force system- collinear,
	concurrent, non concurrent, parallel, like parallel, unlike parallel, general etc.
	Definition of a force, S.I. unit of a force, representation of a force by vector and by
	Bow's notation method. Characteristics of a force, effects of a force, principle of
	transmissibility.
	2.2 Resolution of a force and Moment of a force:
	Definition, Method of resolution, along mutually perpendicular direction and along
	two given direction. Definition of moment, S. I. unit, classification of moments,
	sign convention, law of moments Varignon's theorem of moment and it's use,
	definition of couple, S.I. unit, properties of couple with example.
3	Composition of Forces:
	3.1 Analytical method:
	Definition of Resultant force, methods of composition of forces, Law of
	parallelogram of forces, Algebraic method for determination of resultant for
	concurrent and non concurrent, parallel coplanar force system.
	3.2 Graphical method:
	Space diagram, vector diagram, polar diagram, and funicular polygon. Resultant of
	concurrent and parallel force system only.
4	Equilibrium:
	4.1 Equilibrant and Lami's Theorem:
	Definition of equilibrant, relation between resultant and equilibrant, equilibrant of
	concurrent and non-concurrent force system. Analytical and graphical conditions

	of equilibrium for concurrent, non-concurrent and parallel force system, free body
	and free body diagram. Statement and explanation of Lami's theorem, Application
	of Lami's theorem for solving various engineering problems.
5	Friction:
	5.1 Definition:
	Friction, limiting frictional force, coefficient of friction, angle of friction, angle of
	repose, relation between angle of friction, angle of repose and coefficient of
	friction. Cone of friction, types of friction, laws of friction, advantages and
	disadvantages.
	5.2 Equilibrium of body on Horizontal and inclined plane:
	Equilibrium of body on horizontal plane subjected to horizontal and inclined force.
	Equilibrium of body on inclined plane subjected to forces applied parallel to the
	plane only. Concept of ladder fraction.
6	Centroid and Centre Of Gravity:
	6.1 Centroid:
	Definition of centroid. Moment of an area about an axis. Centroid of basic
	geometrical figures such as square, rectangle, triangle, circle, semicircle and
	quarter circle. Centroid of composite figure with not more than three geometrical
	figures.
	6.2 Center of gravity:
	Definition, center of gravity of simple solids such as cylinder, sphere, hemisphere,
	cone, cube, and rectangular block. Centre of gravity of composite solids with not
	more than Two simple solids. (Hollow solids are not expected.)
7	Dynamics
	7.1 Rectilinear motion:
	Velocity, average velocity, uniform velocity, speed, displacement, acceleration,
	retardation, motion under uniform acceleration & V-T diagram
	7.2 Curvilinear motion:
	Simple circular motion, Angular displacement, Angular velocity, Angular
	acceleration and retardation
	7.3 Work, power & energy:
	Workdone, force-displacement diagram Workdone in stretching the compound
	spring, Torque, workdone by torque.

I.H.P., B.H.P. of engine - Equation of H.P. in terms of torque and R.P.M. -Engineering Problems on it. Kinetic and potential energy & Engineering problems on it

#### Simple numerical problems on all topics

#### Suggested Specifications Table with Hours and Marks (Theory):

Unit		Teaching	Distribution of Theory Marks				
No	Topic Title	Hours	R	U	Α	Total	
110		nours	Level	Level	Level	Marks	
1	Simple Machines	06	02	04	04	10	
2	Force Systems	06	02	02	04	08	
3	Composition of forces	06	02	02	04	08	
4	Equilibrium	06	02	02	04	08	
5	Friction	06	02	04	04	10	
6	Centroid and Centre Of Gravity	06	04	04	00	08	
7	Dynamics	12	04	06	08	18	
	Total	48	18	24	28	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/Practicals:

Sr. No.	Unit	Experiment	Approx. Hours
1	1	<ul> <li>To find MA, VR, Efficiency, Ideal Effort, Effort lost in friction for various loads and establish law of machine. Calculate maximum efficiency and also check the reversibility of machines for the following:</li> <li>a. Differential axle and wheel</li> <li>b. Single purchase crab or Double purchase crab</li> <li>c. Weston's differential pulley block or worm geared pulley block</li> <li>d. Simple Screw jack</li> </ul>	10
2	2	Verify law of moments.	02

		Engineering/Numerical problems on work, power and energy					
6	3	b. Parallel force system : I wo problems	12				
		a. Concurrent force system : Two problems					
		Graphical solutions for the following on A4 Size Graph Paper					
5	4	reactions					
_		Verify the Equilibrium of parallel forces – simply supported beam					
4	4	Verify of Lami's theorem					
3	4	Verify law of polygon of forces					

**Notes:** If possible an industrial visit should be arranged or videos should be shown of different applications of this course.

#### **References/ Books:**

Sr. No.	Author	Title	Publisher
01	R.S.Khurmi	Engineering Mechanics	S. Chand & Company Ltd.
02	Shames and Rao	Engineering Mechanics	Pearson Education.
03	R.C.Hibbeler	Engineering Mechanics	Pearson Education.
04	S. Ramamruthum	Applied Mechanics	Dhanpat Rai & Sones, Delhi.

# **Course Curriculum Development Committee:**

#### a. Internal Faculty

- i. Dr. D. K. Gupta.
- ii. Mrs. S. S. Chavan
- iii. Mrs. Meera Ansarwadekar.

#### b. External Faculty

i. Mr. Sandip Ransur (Lecturer, SBM Ploytechnic, Ville Parle)

#### Academic Coordinator

Head of Department

(Civil Engineering)

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# CO Vs PO matrix

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10
AM16 201.1	3	3	3	3	1	1	1	1	1	3
AM16 201.2	3	3	3	2	1	1	1	1	1	2
AM16 201.3	3	3	3	3	1	2	1	1	1	3
AM16 201.4	2	2	1	1	1	1	1	1	1	1
AM16 201.5	2	1	1	1	1	1	1	1	1	1

# CO Vs PSO matrix

	CO/PSOs	PSO1	PSO2	PSO3
AM16 201.1	Identify the different forces & its effects on objects, motion of bodies, and friction with applications.	3	3	1
AM16 201.2	Apply the principles of equilibrium to Engineering problems	3	2	1
AM16 201.3	Compare & analyze the simple machines	3	3	1
AM16 201.4	Interpret the concept of centroid and centre of gravity	3	2	1
AM16 201.5	Analyze and solve the rectilinear & circular motion, work, energy and power problems	3	2	1

# Unit Number and COs

Sr. No.	Unit No.	Topic Title	COs
1	1	Simple Machines	AM16 201.1, AM16 201.2, AM16 201.1
2	2	Force Systems	AM16 201.1, AM16 201.2
3	3	Composition of forces	AM16 201.1, AM16 201.2
4	4	Equilibrium	AM16 201.1, AM16 201.2
5	5	Friction	AM16 201.1, AM16 201.2
6	6	Centroid and Centre Of Gravity	AM16 201.1, AM16 201.2, AM16 201.4
7	7	Dynamics	AM16 201.1, AM16 201.5

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Progra	imme : ]	Diplom	a in Elect	rical Enginee	ring				
Course	e Code:	CO161	01 162	Course Title	e: C Pro	grammi	ng		
Compu	ulsory / (	Optiona	al: Comp	ulsory					
Teach	ing Sche	eme and	d Credits		Exa	aminatio	n Schem	e	
TH	TU	PR	Total	TH	TS	PR	OR	TW	Tatal
2	-	2	4			50*		1 VV	
*Ex	ternal E	xamine	er.			30"		25	75

#### Rationale:

C is the most widely used computer language, which is being taught as a core subject. C is general-purpose structural language that is powerful, efficient and compact, which combines features of high-level language and low-level language. It is closer to Man and Machine both. Due to this inherent flexibility and tolerance it is suitable for different development environments. Due to these powerful features C has not lost its importance and popularity in recently developed and advanced software industry, C can also be used for system level programming so to develop Operating System like application. C is still considered as first programming language.

This subject covers from the basic concept of C to the pointers and files in C. This subject will act as "Programming Concept developer" for students.

#### Course Outcomes:

Student should be able to

CO1	Understand the basic terminology used in computer programming	
CO2	Write, compile and debug programs in C language.	
CO3	Use different data types in a computer program.	
CO4	Design programs involving decision structures, loops and functions	
CO5	Implement concept of array, string, structure	-
CO6	Understand Pointer and file handling	_

# **Course Content Details:**

Unit No	Topics / Sub-topics
1	Introduction to C-Programming Introduction, History of C,Features of C,Structured Programming concept, Data type & expression, Character Set in C,Variable & data types, Primary & Secondary data type, Arithmetic, Relational & Logical Operators, Constant & keywords Operators & expressions, Hierarchy of operators, Data type conversion
2	Basic Input output C program structure, Input and output using printf()and scanf(),character I/O



	Control Structure
3	Decision making & branching, If Statement, If else statement, Nesting of if- else,
	The switch statement, Ternary operator, Go to statement, While loop, Do while
	loop, For loop, Use of break and continue statements
4	Arrays and String
	One dimension, two dimension and multidimensional arrays, Array declaration
	Array initialization, Operation on array, String input/output, Array of strings
	Structures
5	Basic Concept, Structure declaration, initialization, Structure within structure
	Array of Structure, Union
6	Functions
	Concept of library functions String functions (comparison concatenation length)
-	User-defined functions Local & global variables Parameter passing Storage
	classes
7	Pointers
	Basic concept, Pointer & arrays, Pointer & functions, Pointer arithmetic
8	File Management
	Basic concept Types of files: Text and Binary files Operations on file File
	functions

# Suggested Specifications Table with Hours and Marks (Theory):

Unit No	Unit No Topic Title	
1	Introduction to C-Programming	03
2	Basic Input output	02
3	Control Structure	06
4	Arrays and String	05
5	Structures	05
6	Functions	05
7	Pointers	04
8	File Management	04
-	* Total	32

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# List of experiments/Assignments:

Sr. No.	Unit	Experiment/Assignment	Approx. Hours
1		Program based on Input/output statement	02
2		Program based on arithmetic expression	01
3		Program based on if statement	01
4		Program based on if else statement	02
5		Program based on switch statement	02
6		Program based on While loop	01
7		Program base on Do. While loop	01
8		Program based on For loop	02
9		Program based on one dimensional arrays	01
10		Program based on two dimensional arrays	02
11		Program based on string operations	02
12		Program based on arrays of structure	03
13		Program based on function	04
14		Program based on pointer	04
15	]	Program based on File handling	04
		Total	32

#### **References**/ Books:

Sr. No.	Name of Book	Author	Publisher		
1	Programming in 'C'	Balaguruswami	Mc Graw Hill		
2	Programming in 'C'	Gottfried	Shaum's Series		
3	Let us C	Y. Kanetkar	BPB Publication		

# Course Curriculum Development Committee:

- a. Internal Faculty:
  - i) Bhalerao Moreshvar H.(Lecturer in Computer Engineering)
- b. External Faculty
  - ii) Bangal Satish V.(HOD SV Polytechnic, Borivali)

Academic Coordinator (R. A. Patil)

Head of Department (Electrical Engineering)

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Program	nme : M	ME/CE	/EC/CO/	IF/IS/EE/RT/	LT/LGF	Г			
Course	Code:H	U1610	3	Course Title	: Generic	Skills			
Compu	lsőry / C	Optiona	l: Compu	lsory					
Teachi	ng Sche	eme and	Credits		Exa	minatio	n Schem	e	
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
-	2	-	2	-	-	-	50		50

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#### 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,

C01	Identify his/her role in various areas of life.
C02	Know the various areas in technical education system.
C03	Know importance of curriculum, MIS, IS, etc
C04	Exhibit his/her behavior in proper manner
C05	Develop & adopt self study techniques.
C06	Follow rules & regulation strictly & become a law abiding citizen.

#### **Course Content Details:**

Contents			
<ul> <li><u>Social Aspects:</u> <ol> <li>Role of an individual in the family, in the institute, in the society.</li> <li>Social responsibilities &amp; rights of an individual.</li> </ol> </li> <li>Role of a diploma holder in the present day scenario.</li> </ul>			
<ul> <li><u>Technical education in Maharashtra:</u></li> <li>2.1 Definition of technical education its types, structure (ITI, Diploma &amp; Degree)</li> <li>2.2 Governance in Technical Education (MSBTE, Autonomous &amp; private – structure, fees, faculty, exam, evaluation etc.)</li> </ul>			

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Generic Skills

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3	Awareness of curriculum:
	3.1 Definition of curriculum . Steps observed in its design.
1	3.2 Objectives, rationale, core subjects, other subjects and credit system.
4	<ul> <li>MIS (Management Information System):</li> <li>4.1 Definition, its working, applications &amp; relevance in the present day scenario.</li> <li>4.2 MIS applied to exam section, student registration, subject registration, exam registration.</li> <li>4.3 Department related applications: Work related to office, library &amp; others.</li> </ul>
5	<ul> <li>Library :</li> <li>5.1 Introduction to library, its functioning, its role in an institute.</li> <li>5.2 Facilities available in library. search facility for books on internet, concept of digital library.</li> <li>5.3 Lectures by librarian on Library functioning</li> <li>5.4 Knowing library ethics.</li> </ul>
6	<ul> <li>Health Awareness and Social mannerism:</li> <li>6.1 Introduction to health and hygiene (WHO- definition) Definition, its importance.</li> <li>6.2 Mannerisms- <ul> <li>In the Institute: Overall discipline including pitch and tone of voice .accent, body language, dressing sense.</li> <li>In the Laboratory : Handling of tools and equipments and its Maintenance.</li> <li>In the Classroom: Peer sensitivity and relationship. body posture and attentivity norms.</li> </ul> </li> <li>6.3 Seminar culture -Etiquettes to be observed while attending seminars, And presenting seminar.</li> <li>6.4 Party and Ceremonial functions</li> </ul>
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

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

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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

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Workshop Department

Program	nme : N	AE/CE	/EC/EE/I	S/LG/LT/RT					
Course	Code:	WS16 2	201	Course Title	: Worksh	op Prae	etice		
Compu	lsory / C	Optiona	l: Compu	llsory					
Teachi	ng Sche	eme and	I Credits		Exa	minatio	n Schem	e	
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	<ul> <li>1.1 Introduction to workshop :-</li> <li>1.2 Workshop layout, Importance of various sections/shops of workshop, Types of jobs done in each shop.</li> <li>1.3 Causes of accidents, general safety rules and work procedure in workshop, Safety signs and symbols, First Aid.</li> <li>1.4 Fire, Causes of Fire, Basic ways of extinguishing the fire. Classification of fire, Firefighting equipment, fire extinguishers and their types.</li> <li>1.5 Issue and return system of tools, equipment and consumables.</li> </ul>
2	<ul> <li>Smithy and Forging:-</li> <li>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;</li> </ul>

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WS16 201

		2.2 Demonstration of Smithy and Forging operations like here it
		upsetting etc;
		2.3 Preparation of smithy & forging job
		2.4 Safety precautions & Personal Protective Equipments
		Carpentry Section:-
	3	3.1 Types of woods and their applications
		3.2 Types of carpentry hardware's and their uses
		3.3. Sketching, understanding the specifications material
		methods used in Carpentry shop along with use of table 1
		chisels, hammers, pallet, marking gauge, vice try square rule stat
		3.4 Demonstration of carpentry operations such as marking sawing planning
	1	chiseling, grooving, boring, joining, etc;
		3.5 Preparation of wooden joints.
		3.0 Safety precautions & Personal Protective Equipments.
	4	Welding Section:-
	-	4.1 Types, sketching, understanding the specifications, materials and applications of are &
		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.
ł		4.5 Safety precautions & Personal Protective Equipments.
	5	Filling Section:-
		5.7 Sketching, understanding the specifications, materials, various applications and
		5 2 Demonstration of the fitting, marking, measuring, work holding, cutting & finishing tools.
		5.2 Demonstration of various fitting operations such as chipping, filing, scraping, grinding,
		3 Preparation of male for latit
		5.4 Safety precoutions & D
-		Plumbing
	6	6.1 Types specification material and the standard
		6.2 Types, specifications, material and applications of pipes.
		6.3 Demonstration of pipe fitting exactly in a phications and demonstration of pipe fitting tools.
		assembling, dismantling, etc.
		6.4 Types and application of various spanners and a final first fi
		6.5 Preparation of pipe fitting jobs
		6.6 Concept and conversions of SWG and other
		6.7 Safety precautions & Personal Protective Fault
		Lathe and CNC Operations
	7	7.1 Working principle of lathe class with the start
		maintenance.
		7.2 Demonstration of Lathe machine operation literation to
		chamfering, etc:
		7.3 Simple job demonstration for a group on CNC Mark

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Sr. No. Unit		Unit Practical Exercises/Practical's/Experiments				
1	1	- Causes of accidents, general safety rules and work procedure in workshop, Safety signs and symbols, First Aid.				
1	1	- Perform mock drill session in group of minimum 10 students for Extinguishing fire.	06			
2	2	<ul> <li>Prepare job involving operations like bending, setting down, bulging, upsetting etc; e.g. Pegs (Square/round), Hook, Hammer tongue, Agro equipment etc (Individually)</li> </ul>	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)	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.

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	3	Workshop Practice Manual For Engineering Diploma & ITI Students	Hegde, R.K.	Sapna Book House, 2012,
L	4	Workshop familiarization.	E.Wilkinson	Pitman engineering croft cories
L	5	Mechanical workshop practice.	K.C. John	PHI
	6	Workshop practice manual.	K.Venkata Reddy	B S Publication
	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.) Stadand
- b. External Faculty
  - i. Mr. G. S. Dharme (Workshop Superident, Fr. Agnel Polytechnic, Bandra (W), Mumbai.

#### Academic Coordinator

Head of Department (Mechanical Engineering)

Pri Thal Govt. polytechnic Mumbai

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Diploma in Computer Engineering

		001	(202	C	Titl		mnuter	Work	shop			
Course Code: C016203			Cour	Course little: Computer Workshop								
Com	pulsor	y / Opti	ional: C									
Teac Cred	hing its	Schem	e and	D Ex	uration amina	n of tion		Exa	ninat	ion Sc	heme	1
тн	TU	PR	Total	ТН	TS	PR	TH	TS	PR	OR	TW	Tota
		02	02			02			50			50

#### Rationale

The aim of the subject is to teach the basic working of Electronic and computer components .The students will be able to select the proper peripheral as per their specification and requirement. The subject is practical oriented and its will help to student identify Electronic and Computer Components.

#### **Course Outcomes:**

COI	Identify and test various electronic components.	
CO2	Handle different electronic instruments	
CO3	Identify computer peripherals.	
CO4	Interface peripherals with computer system.	

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Unit	Topic/ Sub-topics				
01	<ul> <li>Introduction To Electronic Components and Instruments <ol> <li>Computer workshop lab.</li> <li>Electronic Tools &amp; instruments.</li> <li>safety precaution, soldering and de- soldering technique etc.</li> <li>Use of analog and digital multi- meters for measurement</li> <li>Of voltage, current &amp; resistance.</li> </ol> </li> <li>Identification of active and passive components with color codes and Verifying their values with multi-meters / LCR meters.</li> </ul>				
02	<ul> <li>Study of CROs</li> <li>2.1To study Front Panel of CRO.</li> <li>2.2 Testing of Component using CRO.</li> <li>2.3 To observe Different waveform using Function Generator</li> </ul>				
03	<ul> <li>Introduction to Computer Hardware         <ol> <li>Block diagram of a computer</li> <li>Identification of Mother Board ,Components and slots</li> <li>Types of Processors and their specifications(Xeon, and -AMD ,dual core, core2 duo,i3,i5,i7)</li> <li>RAM(DDR, DDR1,DDR2,DDR3)</li> <li>ROM</li> <li>Catche memory (hard disk drive and processor )</li> </ol> </li> <li>3.2 Type Interfaces/connectors         <ol> <li>IDE connector ,SATA connector, ps/2 connector, serial (com)port usb connector , parallel (lpt) port</li> </ol> </li> </ul>				
04	Components of Computer System 4.1SMPS 4.2Motherboard 4.3CD/ DVD ROM Drive 4.4HDD(Internal/External)				
05	Peripherals : (Input /Output Devices) of Computer Systems Plug and         Play Devices -         5.1Display Systems ( Monitor)         • Types and Features of CRT, TFT, LCD, LED         5.2Keyboard         • Introduction				
Compu	ter Workshop 2 CO16203 Academic Co-ordinator G. P. Mumbai				

overnm	nent Polytechnic Mumbai Diplar	na in Computer Fraine
	Classification	are university and unighte
	5.3Mouse	
	Introduction	
	• Types	
	5.4 Joystick	
	5.5Light Pen	
06	Peripherals : (Input /Output Devices) of Computer System Devices -	s Installable
	6.1 Printer	
	Introduction	
	Types of Printer (Det Marine Law)	nde des 12 d
	printer, Color printer)	, High speed
	6.2 Scanner	
	• Introduction	
	Scanner Types	
	Hand held scanner	
	<ul> <li>Flatbed scanner</li> </ul>	
	<ul> <li>Special scanner(ICR/OMR technology)</li> </ul>	
	Application	
	Characteristics	
7	Storage Devices	
	7.1HARD DISK(PATA, SATA) 7.2CD /DVD Drives, Blue-ray disks	
	7.3External device (Pen drive, Memory card, External H	ID, NIC)
	Sound card, VGA card, Firewire card, TV Tuner Card, etc.)	N Card,



Government Polytechnic Mumbai

Diploma in Computer Engineering

Suggested Specification Table with Hours and Marks (Practical)

Unit No	Topic Title	Teaching Hours	Distribution of Practical
01	Introduction To Electronic Components and Instruments	05	WATKS
02	Study of CROs	04	
03	Introduction to Computer Hardware	05	
04	Components of Computer System	04	
05	Peripherals : (Input /Output Devices) of Computer Systems Plug and Play Devices -	05	Not Applicable
06	Peripherals : (Input /Output Devices) of Computer Systems Installable Devices	05	
07	Storage Devices	04	
	Total	32	

#### List of Practical's:-

1.	Identification and Demonstration Electronic Components.
2.	Identification and Demonstration Electronic Instruments.
3.	Prepare charts for symbols of components, devices, Electromechanical switches, connectors.
4.	Demonstration of Multi-Meters.
5.	Demonstration of CRO.
6.	Demonstration of Function Generator.
7.	Identification Components of Computer System.
8.	Demonstration of monitor.
9.	Demonstration of different keyboards.
10.	Demonstration of different Mouse.



Computer Workshop

CO16203

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vern	ment Polyt	technic Mumbai Diploma in Computer Enginee
	11.	Demonstration & Installation of Printer.
-	12.	Demonstration & Installation of Scanner.
-	13.	Demonstration of Storage Devices (Internal/External) .
-	14.	Select a small Electronic Circuit for a group 3-4 students Solder the component on PCB and Test the circuit.
-	15.	Identification Components on Motherboard.

#### **Reference Books:**

Go

Sr. No.	Book Title	Author	Publication
01	Electronic Component And Materials	Madhuri Joshi	Shroff Publication
02	Hardware And Networking	Vikas Gupta	Comdex Publication
03	Electronic Components	Dr. K. Padamanabhan, P. Swaminathan	Laxmi Publications
04	Modern Computer Hardware	Manahar Lotia	BPB Publications

#### **Course Curriculum Development Committee:**

a) Internal Faculty:

i)Aswar Varsha M.(Lecturer in Computer Engineering) ii)Kalyankar A. D. (Lecturer in Computer Engineering) iii)Nagargoje S.R.(Lecturer in Computer Engineering)

b) External Faculty:

i) Bangal Satish V.(HOD SV Polytechnic, Borivali)

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Academic Coordinator (R.A. Patil)

Head of Department (Computer Engineering)

Principal

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- Pathutu			

Programm	Programme : Diploma in CO /CE/ EE/EC/ IF/IS/LT/ME/RT/LGFT								
Course Co	de: NC1	6102		Course Title	: Social W	Vork			
Compulso	ry / Opti	onal: C	ompulsor	y.					
Т	eaching	Scheme	á.		Ēxa	minatio	n Schem	e	
TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
-7		3	3						

#### Rationale :

1 de la

The programme aims to inculcate social <u>welfare</u> 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 <u>standard of living</u> 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 in 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

COl	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
	Institute Level Activity:	05
1	1.1 Tree Plantation	
	1.2 Play Ground Forming	
	1.3 Energy Audit	
	I.4 Nature Awareness	
	1.5 Tree Counting	
	1.6 Hunting Hazard	

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Social Work

Course code : NC16102

through the	Institute Organized Initiative:	15
2	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	
	Visit Arrangement:	15
3	1.1 Visit to Old Age Home	
	1.2 Visit to any Village	
	1.3 Visit Orphanage (Children Home)	
	Metropolitan Level Activity :	05
4	1.1 Blood Donation Camp	
	1.2 Health Checkup Camp	
	1.3 General Awareness	
	1.4 New Technology	
	1.5 Woman's Empowerment	
5	National Administration Initiative For Natural/Artificial calamities:	05
	1.1 Earthquake	
	1.2 Flood	
	1.3 Storm	
	1.4 Draught	

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

(Dr. R A. Patil)

Head of Department Department of Computer Engineering

Principal

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Govt. Polytechnic Mumbai

Social Work

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Course code : NC16102

Progran	Programme : Diploma in CE/CO/EC/EE/IS/IT/LT/LGFT/ME/RT								
Course	Course Code: NC16101 Course Title: Yoga								
Compu	Compulsory / Optional: Compulsory								
Т	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

	Psychomotor Outcomes:
	1) Demonstrate proficiency at the poses covered in class (at a basic level)
COL	2) Increase their dynamic flexibility
001	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
	Cognitive Outcomes:
	1) Identify poses using the sanskrit name
CO2	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
	Affective/Social Outcomes:
	1) Work quietly without disturbing classmates
<b>GO2</b>	2) Fun participating in the activity
03	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	<b>Topics / Sub-topics</b>	<b>Teaching Hours</b>
1	The Origin and Philosophy of Yoga	2
	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	Loosening Practices	2
	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	
3	Yogasanas (Standing Postures)	6
	3.1 Tadasana	
	<b>3.2</b> Vrksasana	
	3.3 Pada-Hastasana	
	<b>3.4</b> Ardha Cakrasana	
	3.5 Trikonasana	
4	Yogasanas (Sitting Postures)	6
	4.1 Bhadrasana	
	4.2 Vajrasana	
	4.3 Ardha Ustrasana	
	4.4 Ustrasana	
	4.5 Sasakasana	
	4.6 Uttana Madhukasana	
	4.7 Marichyasana	
5	Yogasanas (Prone Postures)	4
	5.1 Makarasana	
	5.2 Bhujangasana	
	5.3 Salabhasana	-
6	Yogasanas (Supine Postures)	4
	6.1 Setudandhasana	
	0.2 Uttanapadasana	
	0.5 Alunanalasana	
	0.4 ravanmuktasana	
	0.5 Savasana	

	Kapalabhati		2
7			
	Pranayama		2
	7.1 Anuloma vilo ma pra		
8	7.2 Sitali Pranaya ma		
	7.3 Bhramari Pranayama		
	Dhyana and Sankalp a		2
9			

#### **References/ Books:**

Sr.	Book Title	Author	P ublication
No.			
1	Common Yoga Protoco l	Ministry of Ayurvedan Yoga & naturopathy, unani, siddha and Homeopathy (AYUSH)	G overnment of India
	Adiyogi: The Source of Yoga	Sadhguru and Arundhathi	H arper Collins
2		Subramaniam	P ublication
2	Yoga: The Iyengar Wa y	Silva Mehta, Mira Mehta, Shyam	A .A. Knopf
3		Mehta	
4	Asanas; Popular Yoga	Swami Kuvalayananda	P opular Prakashan

#### **Reference Sites:**

http://ayush.gov.in/event/commo n-yoga-protocol-2017

http://web.uvic.ca/~thopper/Pe3 52/2003/Lisa%20Jen%20&%20Mark%20Yoga/index.html http://www.wikihow.com/Do-Y oga-for-Absolute-Beginners

#### **Course Curriculum Developm ent Committee:**

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

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

#### **b.** External Faculty

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

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