



**ST. Xavier's Technical Institute,
Mahim, Mumbai 400 016**

**Revised Curriculum
For
Diploma Programme in
Electronics and
Telecommunication
Engineering**

From July 2022

A.Y.2022-23



ST. Xavier's Technical Institute, Mahim, Mumbai 400 016
Diploma Programme in Electronics and Telecommunication Engineering
Programme Structure

Programme Educational Objectives (PEO)

(What the student will continue to do even after 3-5 years of working in the industry)

PEO1: To produce diploma holders who have the ability to demonstrate technical competence in the fields of Electronics and Telecommunication engineering and develop solutions to the problems.

PEO2: To produce diploma holders who would be able to take individual responsibility and to work as a part of a team towards the fulfillment of both individual and organizational goals.

PEO3: To prepare the students to engage in professional development through self-study, graduate and professional studies in engineering, management and research.

Program Outcomes (PO) given by NBA.

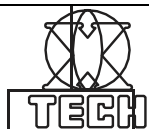
(What the student will be able to do at the entry point of industry soon after diploma programme)

PROGRAM OUTCOMES (POs)

1. **Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
2. **Problem analysis:** Identify and analyse well-defined engineering problems using codified standard methods.
3. **Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
4. **Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
5. **Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.
6. **Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
7. **Life-long learning:** Ability to analyse individual needs and engage in updating in the context of technological changes.

Note for All the Semesters :

1. Every student has to pass in each head of End-Semester-Examination (ESE) i.e Theory, Practical, Term work by securing minimum of 40% marks of the maximum marks i.e. ::--
 - For Theory (ESE) ::--- 28 out of 70 marks
 - For Theory (ESE) ::--- 32 out of 80 marks
 - For Practical (ESE) ::--- 20 out of 50 marks
 - For Term work ::--- 10 out of 25 marks
 - For Term work ::--- 20 out of 50 marks
2. Progressive Assessment (PA) for Theory includes – average of two PTs of 20 marks each. Progressive Assessment (PA) for Practical includes lab performance , micro projects, Assignment/Quiz/Presentations & attendance as per the course. The scheme and schedule for progressive assessment should be informed to the students and discussed with them at the start of the term.
3. For developing self-directed learning skills, from each course about 15-20% of the topics/sub-topics, which are relatively simpler or descriptive in nature are to be given to the students for self-study , proper learning of these topics should be assured by Assignment/Quiz/conducting classroom presentations of students by respective faculty.



ST. XAVIER'S TECHNICAL INSTITUTE, MAHIM, MUMBAI 400 016

TEACHING AND EXAMINATION SCHEME

REVISED AND EFFECTIVE FROM JULY 2022			Program Name ::--- Electronics & Telecommunication Engineering												SEMESTER ::--- ONE						
ACADEMIC YEAR - 2022-23			TEACHING SCHEME					EXAMINATION SCHEME													
SR.NO	COURSE TITLE	COURSE CODE	L	T	P	CREDITS	Exam Duratio n in Hrs	THEORY						PRACTICAL						GRAND TOTAL	
								ESE		PA		TOTAL		ESE		PA		TOTAL			
								Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks				
1	Mathematics-- I	ETBS101	5	1	0	6	3	70	28	30#	00	100	40	----	----	----	----	----	----	100	
2	Basic Electronics	ETPC102	3	0	2	4	3	70	28	30#	00	100	40	50	20	25	10	75	30	175	
3	Fundamental of Electrical Networks	ETES103	3	1	2	5	3	70	28	30#	00	100	40	50	20	25	10	75	30	175	
4	Introduction to IT	ETES104	0	0	4	2	----	----	----	----	----	----	----	50*	20*	25	10	75	30	75	
5	Environmental Science	ETAU105	0	0	2	1	----	----	----	----	----	----	----	----	----	25	10	25	10	25	
6	Communication Skills	ETHS106	2	0	2	3	----	----	----	----	----	----	----	----	----	50	20	50	20	50	
	TOTAL		13	2	12	21		210		90		300		150		150		300		600	
Professional Practices		ETHS107	2 Hour / Week				Non Credit & Non Exam														
Sports and Yoga		ETHS108	1 Hour / Week				Non Credit & Non Exam														
Total No. of Credits = 21											Total No. of Student Contact Hours = 30 Hrs.					Total Marks					600
Theory and Practical periods of 60 minutes each.													Medium of Instruction ::- English								
Abbreviations	TH	Theory	ESE		End Semester Exam					----		Not Applicable									
	TU	Tutorial	PA		Progressive Assessment					*		Online Examination									

Program Title				Diploma in Electronics & Telecommunication Engineering								
Course Code	ETPC 101		Course Title	Mathematics - I						Semester	1	
Teaching Scheme				Examination Scheme								
Credits				Theory			Practical	Oral	Online	Term work	Total	
Lecture	Tutorial	Practical	Total	ESE	PA	Total						
5	1	---	6	70	30#	100	----	-----	-----	---	100	
	1) Theory paper duration 3 hrs. 2) Theory paper assessment is Internal and External. 3) The assessment of practical is Internal and External. 4) The assessment of Online is Internal. 5) # -- Progressive Assessment out of 30 marks, 20 marks is average of 2 periodical tests (PT) and 10 marks are for micro project assessment.											

RATIONALE:

This subject comes under the Foundation Course category and will enable the students to learn the basics of Engineering Mathematics. This course is designed to give a comprehensive coverage at an introductory level to the subject of Trigonometry, coordinate Geometry, Statistics and Basic elements of algebra. Knowledge of Mathematics –I will provide a base for the analysis and understanding of many technical subjects.

COURSE OUTCOMES::--Course theory content, help student to understand basic mathematics, thus student should able to

Semester	1	Subject	Mathematics - I
CO 101		1 st Course in First Year	
CO 101.1		Apply the concepts of Logarithm and Partial Fractions to solve Engineering related problems.	
CO 101.2		Apply the concepts of Determinants to solve Engineering related problems.	
CO 101.3		Apply the concepts of Matrices to solve Engineering related problems.	
CO 101.4		Apply concept of straight lines for solving problems in geometrical applications.	
CO 101.5		Utilize basic concepts of Trigonometry to solve elementary Engineering problems.	
CO 101.6		Calculate measures of dispersion using statistical data	

Mapping of Course outcomes (COs) to Program outcomes (POs)

SEM I	MATHEMATICS - I								
CO 101	(1st COURSE IN FIRST YEAR) PREPARED BY: S. DATTA								
CO 101	P01	P02	P03	P04	P05	P06	P07	PSO 1	PSO 2
CO 101.1	3	1		1		1	1	1	0
CO 101.2	3	2	1	1		1	1	1	0
CO 101.3	3	2	1	1		1	1	1	0
CO 101.4	3	2	1	2		1	1	1	0
CO 101.5	3	2	1	1		1	1	1	0
CO 101.6	3	2	2	2	1	1	1	1	0
CO TOTAL	18	11	06	08	01	06	06	6	0
CORRELATION LEVEL	3	2	1	1	0	1	1	2	0

TABLE TO DECIDE CORRELATION LEVELS

CO SUM TOTAL	06	12	18
CORRELATION LEVEL	1	2	3

CO SUM TOTAL	0,1,2	3,4,5,6,7,8	9,10,11,12,13,14,	15,16,17,18
CORRELATION LEVEL	0	1	2	3

Mrs. Sanchita Datta

Subject Expert

	Section -- 1						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1	Algebra						
	1.1 Logarithms: Concept & laws of logarithm, change of base 1.2 Partial Fractions: 1.2.1 To resolve proper fraction into partial fraction with denominator containing non repeated linear factors, repeated linear factors, irreducible non repeated quadratic factors. 1.2.2 To resolve improper fraction into partial fraction	16	02	12	-----	14	CO 101.1
2	Determinants: 2.1 Definition, Expansion of determinants of 2 nd & 3 rd Order 2.2 Solution of simultaneous equation in two and three unknowns- (Cramer's method)	08	-----	04	05	09	CO 101.2
3	MATRICES: 3.1 Definition of matrices of order m x n 3.2 Types of Matrices, Addition, Subtraction of two matrices 3.3 Multiplication of matrices by a scalar, Multiplication of two matrices (3 x 3 and 2 x 2 only) 3.4 Singular and Non-singular Matrices Transpose of matrices 3.5 Adjoint of a matrix. 3.6 Inverse of a matrix by using adjoint of matrix 3.7 Solution of simultaneous equations using matrices.	16	-----	06	06	12	CO 101.3

	Section -- 2						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
4	Co-ordinate geometry						
	4.1 Straight lines: 4.1.1 Various forms of the equation of a straight line leading to the general equation $Ax + By + C = 0$ 4.1.2 Perpendicular distance of a point from a straight line 4.1.3 Angle between two straight lines 4.1.4 Conditions for two straight lines to be parallel and Perpendicular to each other 4.1.5 Perpendicular distance between two parallel lines	14	--	06	04	10	CO 101.4
5	Trigonometry						
	5.1 Definition of Radian - Trigonometric ratios of any angle, fundamental identities, examples based on fundamental identities 5.2 Trigonometric ratios of Allied angles, compound angles, multiple angles (2A and 3A) – sum and difference of two trigonometric ratios, product formula (Transformation of product to sum, difference and vice versa), (without proof, simple problems only) 5.3 Inverse Circular functions- Definition and simple problems only.	16	03	08	04	15	CO 101.5
6	Statistics						
	6.1 Range, Co-efficient of a Range of discrete and grouped data 6.2 Mean deviation and standard deviation from mean of grouped and ungrouped data 6.3 Variance and Co-efficient of Variance 6.4 Comparison of two sets of observations	10	--	06	04	10	CO 101.6

SUGGESTED LIST OF TUTORIALS

Sr.No.	Tutorials	COURSE OUTCOME
1.	Problems on Laws of Logarithms	CO 101.1
2.	Problems on partial fractions on non repeated linear factor, repeated factors	CO 101.1
3.	Problems on Partial fractions on irreducible non repeated quadratic factors and improper fraction	CO 101.1
4.	Problems on expansion of Determinants of 2 nd and 3 rd order	CO 101.2
5.	Problems on solving simultaneous Linear Equations by Crammer's rule	CO 101.2
6.	Problems on Algebra of matrices	CO 101.3
7.	Problems on Matrix multiplication	CO 101.3
8.	Solving simultaneous equations using matrix method	CO 101.3
9.	Problems on slope, intercept and equation of straight lines	CO 101.4
10.	Problems on Angle between two lines	CO 101.4
11.	Problems on parallel and perpendicular lines	CO 101.4
12.	Problems on Fundamental Identities and Trigonometric ratios of any angle.	CO 101.5
13.	Problems on, sum/difference of two trigonometric ratios	CO 101.5
14.	Problems on compound and multiple angles	CO 101.5
15.	Problem on Statistics-measures of dispersion	CO 101.6
16.	Problems on coefficient of variation and comparison of two sets of observation	CO 101.6

IMPLEMENTATION STRATEGY:

- 1) Teaching plan
- 2) Minimum 10 -- 12 tutorial's taken with the coverage of all COs
- 3) Use of PowerPoint presentations and Videos
- 4) References from the internet **(for teachers as well as students)**
- 5) Extensive use of examples
- 6) Group discussions and micro project

The above strategy can be followed in the classroom teaching-learning process as well as extensively during the tutorial class by the teacher.

SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Chapter No	Topics	Periods Hrs.	Marks Distribution for Theory Paper setting			
			R	U	A	Total Marks
	Section -- 1					
1.	Algebra	16	02	12	-----	14
2.	Determinants	08	-----	04	05	09
3.	Matrices	16	----	06	06	12
	Section -- 2					
4.	Co-ordinate geometry	14	--	06	04	10
5.	Trigonometry	16	03	08	04	15
6.	Statistics	10	--	06	04	10
	Total	80	05	42	23	70
Legends :: R ::- Remember , U ::- Understand , A ::-Application						
This specification table provide guideline to teacher to teach & assess student also a general guideline to frame theory paper & practical theory exam paper which student have to undertake. The actual distribution of marks at different taxonomy level in the question paper may vary from above table.						

SUGGESTED LIST OF MICROPROJECTS

Micro project could be group based. A suggestive list is given here, similar micro projects could be added by concern faculty. Each student will maintain dated work diary with details of individual contribution. Assessment done by project guide based on their performance, presentation of submission.

EXP. NO.	TITLE	COURSE OUTCOME
1	Prepare chart using determinant to find area of regular shapes.	CO 101.2
2	Prepare model using matrices to solve simple problems using Cryptography.	CO 101.3

3	Prepare model using matrices to solve simple mixture problems.	CO 101.3
4	Prepare charts displaying list of trigonometric formulae.	CO 101.5
5	Prepare a model for Trigonometric formula and uses of Trigonometry in Astronomy and Geology	CO 101.5
6	Prepare chart for displaying grouped and ungrouped data	CO 101.6

REFERENCES

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address
1	S.P. Deshpande	Mathematics for Polytechnic students(First Year)	11 th	2006	Pune Vidyarthi Griha Prakashan
2	Dilip T. Gaikwad	Basic Mathematics	2 nd	2011	S.Chand and CO Ltd.
3	Sameer Shah	Basic Mathematics	5 th	2010	Tech-Max Publications
4.	V.K.Nirmale A.D. Wandhekar	Basic Mathematics	2 nd	2018	Technical Publications
5.	Sameer Shah	Engineering Mathematics	3 rd	2009	Tech-Max Publications

E-REFERENCES

<https://www.britannica.com/science/logarithm>

<https://www.cuemath.com/algebra/partial-fractions/>

<https://ncert.nic.in/pdf/publication/exemplarproblem/classXII/mathematics/lep204.pdf>

<https://en.wikipedia.org/wiki/Trigonometry>

<https://www.cuemath.com/geometry/distance-between-two-points/>

<https://ncert.nic.in/ncerts/l/kemh110.pdf>

<https://www.cuemath.com/algebra/solve-matrices/>

https://nios.ac.in/media/documents/SrSec318NEW/318_Economics_Eng/318_Economics_Eng_Lesson9.pdf

Program Title				Diploma in Electronics & Telecommunication Engineering								
Course Code	ETPC 102	Course Title		Basic Electronics						Semester	1	
Teaching Scheme				Examination Scheme								
Credits				Theory			Practical	Oral	Online	Term work	Total	
Lecture	Tutorial	Practical	Total	ESE	PA	Total						
3	-----	2	4	70	30#	100	50	-----	-----	25	175	
	1) Theory paper duration 3 hrs. 2) Theory paper assessment is Internal and External. 3) The assessment of practical is Internal and External. 4) The assessment of Online is Internal. 5) # Progressive Assessment out of 30 marks , 20 marks is average of 2 periodical tests (PT) and 10 marks are for micro project assessment.											

RATIONALE:

This subject comes under the Core Technology group and will enable the students to comprehend the theory, concepts, characteristics and working principles of basic electronic devices and their applications in electronic circuits. The knowledge of various devices acquired by the students will help them to design, test, troubleshoot basic electronic circuits. The course will help the diploma engineers to apply the basic concepts and principles to understand different technology based application.

COURSE OUTCOMES ::--

Course theory content, practical skills, experience help student to understand basic electronics terms & devices , thus student should able to

Semester	1	Subject	Basic Electronics
CO 102		2 nd Course in First Year	
CO 102.1		Understand & Learn fundamentals of electronics	
CO 102.2		Identify & test various components by knowing their symbols ,types & functionality	
CO 102.3		Analyze the characteristics of Semiconductor diodes	
CO 102.4		Interpret different parameters of various devices & their circuits	
CO 102.5		Demonstrate the uses of various semiconductor devices	
CO 102.6		Assemble, Demonstrate & Analyze circuits of power supply using various devices	

Mapping of Course outcomes (COs) to Program outcomes (POs)

SEM I	BASIC ELECTRONICS								
CO 102	(2 nd COURSE IN FIRST YEAR) PREPARED BY : AG								
CO 102	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2
CO 102.1	3	2	1	2		1	1	1	0
CO 102.2	3		2	1	1	1		1	0
CO 102.3	3	2	2	2	1		1	1	0
CO 102.4	1	2	2	2	1	2		1	0
CO 102.5	2	2	2	1	1	1		1	0
CO 102.6	3	2	2	1		1	1	1	0
CO TOTAL	15	10	11	09	04	06	03	6	0
CORRELATION LEVEL	03	02	02	02	01	01	01	2	0

TABLE TO DECIDE CORRELATION LEVELS

CO SUM TOTAL	06	12	18
CORRELATION LEVEL	1	2	3

CO SUM TOTAL	0, 1, 2	3, 4, 5, 6, 7, 8	9, 10, 11, 12, 13, 14	15, 16, 17, 18
CORRELATION LEVEL	0	1	2	3

Mr. Anil Gurav**Subject Expert**

	Section -- 1						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1	Introduction to Electronics						
	1.1 Fundamental of electronics Signal & its types , Cycle, frequency, time period, amplitude (definition units & their relation) 1.2 Introduction of Basic elements 1.2.1 Supply & its types 1.2.2 Basic components Resistor, Capacitor, Inductor (definition, symbol, units, properties) 1.3 Atom structure Atomic Number, Atomic Mass Electron Orbits, sub Orbits/ shell Valence Orbit, Valence Electrons. 1.4 Energy band diagram. 1.5 Material classification Insulator, Semiconductor, Conductor (based on Band theory). 1.6 Types of Semiconductors 1.6.1 Intrinsic semiconductor 1.6.2 Extrinsic Semiconductor 1.6.2.1 Semiconductor Doping 1.6.2.2 N type Semiconductor 1.6.2.3 P type Semiconductor 1.7 Drift Current ,Diffusion Current	10	04	06	----	10	CO 102.1
2	Semiconductor Diode						
	2.1 PN Junction / Semiconductor Diode 2.1.1 Formation of PN junction Depletion Layer, Barrier Voltage, Junction Capacitance 2.1.2 Forward Bias of Diode 2.1.3 Reverse Bias of Diode 2.1.4 V-I Characteristics 2.1.5 Diode Equivalent Circuit 2.1.6 Specifications & Applications Of diode.	10	05	07	03	15	CO 102.2 102.3
3	Special Diodes						
	3.1 Zener diode, Photo Diode, Symbol, Operation, VI characteristics, Specifications, Applications.	4	03	05	02	10	CO 102.2 102.3

	Section -- 2						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
4	Diode in wave shaping circuit						
	3.1 Clipper ,Clamper Definition, Use, Types 3.2 Series & Parallel Clipper Types - Positive &Negative Clipper Definition, Operation, waveforms 3.3 Bias Clipper -- Definition & types 3.2.1 Parallel Bias Positive Clipper 3.2.2 Parallel Bias Negative Clipper 3.2.3 Double Bias Clipper Definition, Operation, waveforms, problem based on clippers 3.4 Positive &Negative Clamper Definition, Operation, waveforms	7	03	05	04	12	CO 102.4 102.5
5	Diode in Rectifier circuit						
	4.1 Block diagram of DC regulated power supply 4.2 RECTIFIERS Definition, Need 4.3 Classification of rectifier circuits. 4.3.1 Half wave rectifier 4.3.1.1 Operation & waveforms 4.3.1.2 Merits and demerits of HWR 4.3.2 Full wave Center tapped rectifier 4.3.2.1 Operation & waveforms 4.3.2.2 Merits and demerits of FWR 4.3.3 Full wave Bridge rectifier 4.3.3.1 Operation & waveforms 4.3.3.2 Merits and demerits 4.4 Definition & formulas of parameters of rectifiers (No derivation) Idc, Vdc, Irms Vrms, ripple factor , TUF, PIV, Rectification efficiency , Voltage regulation 4.5 Basic Problems / Examples 4.6 Compare Rectifier circuits	12	05	05	05	15	CO 102.4 102.5 102.6
6	Filters						
	5.1 Introduction, need and types. 5.2 Capacitor, Inductor ,PYE filter 5.2.1 Operation of filter with FWR 5.2.2 Advantages &disadvantages 5.3 Comparison of C, L and Pye filters	5	03	05	----	08	CO 102.4 102.5 102.6

LIST OF LABORATORY EXPERIENCES

EXP. NO.	TITLE	COURSE OUTCOME	CHAPT. NO.
1	Use of Multi-meters and DC Power Supplies	CO 102.1	1
2	Use of Signal Generators and Oscilloscopes	CO 102.1	1
3	Construct the circuit and plot the Forward Bias VI characteristics of the PN Junction Diode , find cut in voltage.	CO 102.2 CO 102.3	2
4	Construct the circuit and plot the Reverse Bias VI characteristics of the PN Junction Diode , find the reverse saturation current	CO 102.2 CO 102.3	2
5	Construct the circuit and plot the characteristics of a Zener Diode. Find the breakdown voltage, cut in voltage	CO 102.2 CO 102.3	3
6	Construct the circuit and plot the characteristics of a Photo Diode	CO 102.2 CO 102.3	3
7	Construct a Half Wave Rectifier and obtain output waveform, PIV of Diode	CO 102.4 CO 102.5 CO 102.6	5
8	Construct a Full Wave Center tapped Rectifier and obtain output waveform, PIV of Diode	CO 102.4 CO 102.5 CO 102.6	5
9	Construct a Full Wave Bridge Rectifier and obtain output waveform, PIV of Diode	CO 102.4 CO 102.5 CO 102.6	5
10	Demonstrate clipping of given input signal using Positive (Series & Parallel)Clipper circuit	CO 102.4 CO 102.5	4
11	Demonstrate clipping of given input signal using Negative (Series & Parallel)Clipper	CO 102.4 CO 102.5	4
12	Construct & Demonstrate clipping of given input signal using Bias Clipper circuit	CO 102.4 CO 102.5	4
13	Construct a Half Wave Rectifier with C Filter and obtain output waveform	CO 102.4 CO 102.5 CO 102.6	6
14	Construct a Full Wave Center tapped / BRIDGE Rectifier with C filter and obtain output waveform	CO 102.4 CO 102.5 CO 102.6	6
15	Construct a Full Wave Center tapped Rectifier with Pye Filter& plot output wave forms.	CO 102.4 CO 102.5 CO 102.6	6
16	Construct a Full Wave BRIDGE Rectifier with Pye Filter & plot output wave forms.	CO 102.4 CO 102.5 CO 102.6	6

SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Chapter No.	Title	Teaching Hours	Distribution of Theory Marks			
			R level	U level	A level	TOTAL MARKS
Section --- 1						
1	Introduction to Electronics	10	04	06	----	10
2	Semiconductor Diode	10	05	07	03	15
3	Special Diodes	4	03	05	02	10
Section --- 2						
4	Diode in wave shaping circuit	7	03	05	04	12
5	Diode in Rectifier circuit	12	05	05	05	15
6	Filters	5	03	05	----	08

IMPLEMENTATION STRATEGY:

- 1) Use of PowerPoint presentations and Videos
- 2) References from the internet **(for teachers as well as students)**
- 3) Extensive use of examples
- 4) Group discussions and micro project
- 5) Assignments for writing skills, create awareness about selection /purchasing components (Example : Market survey study of latest Diodes with ratings and applications, Power supply ratings, applications etc)

The above strategy can be followed in the classroom teaching-learning process as well as extensively during the practical class by the teacher.

SUGGESTED LIST OF MICROPROJECTS

Micro project could be group based. A suggestive list is given here, similar micro projects could be added by concern faculty. Each student will maintain dated work diary with details of individual contribution. Assessment done by project guide based on their performance ,presentation of submission.

SR. NO.	TITLE	COURSE OUTCOME MAPPING
1	Identify the Color codes of following resistors such as 1E,100E,1KE,4.7KE,1ME and 100ME,prepare chart / model	CO 102.1
2	Draw the following waveforms and display them on the Screen of CRO. Prepare report. a) Sinusoidal Wave: VP-P=6V and Time period T= 3 microsec. b) Square Wave : Amplitude=4V and Time period, T=6microsec	CO 102.1
3	Identify the following materials as Conductors, Insulators or Semiconductors: Iron, Copper, Glass, Rubber and Carbon	CO 102.2
4	Identify the effect of light on Light dependent resistor	CO 102.1
5	Prepare model or chart of material classification based on electrical characteristics.	CO 102.2
6	Simulate half wave rectifier using simulation tool	CO102.4,
7	Simulate Full wave bridge rectifier using simulation tool	CO102.4, 102.5,102.6
8	Simulate Full wave Center tapped rectifier using simulation tool	CO102.4, 102.5,102.6
9	Build circuit of a power supply for LED Lighting	CO102.4, 102.5,102.6
10	Build circuit of for removing extra voltage from given input signal	CO102.4, 102.5,102.6

REFERENCES

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address
1	Robert Boylestad	Electronics devices & circuit theory	9th	2009	PHI publisher
2	G.K.Mital	Electronics devices & circuits	23rd	2006	Khanna Publication
3	DR. R.S.Sedha	Applied electronics	Revised Edition	2015	S CHAND Publication
4	David Bell	Fundamentals of Electronic Devices	1st	1990	D B Taraporevala son & Co Pvt. Ltd. -Mumbai
5	Millman and Halkias	Electronics Devices and Circuits	4th	2015	McGraw Hills Inc., New Delhi-2
6	S. Salivahanan and N. Suresh Kumar	Electronic Devices and Circuits	4th	2017	McGraw Hills Inc., New Delhi-2
7	Albert Malvino & David Bates	Electronic principles	4th	2010	Tata McGraw Hill Publication

LEARNING WEBSITES / WEB REFERENCES :

<https://www.electronics-tutorials.ws/>

<https://www.youtube.com/watch?v=Rx43l-QpeWQ>

<https://electronicsforu.com/resources/electronic-devices-and-circuit-theory>

<http://www.electroniccomponents.com>

<http://www.electronics-tutorials.ws>

<http://www.electricaltechnology.org>

Program Title				Diploma in Electronics & Telecommunication Engineering							
Course Code	ETES 103	Course Title		Fundamental of Electrical Network						Semester	1
Teaching Scheme				Examination Scheme							
Credits				Theory			Practical	Oral	Online	Term work	Total
Lecture	Tutorial	Practical	Total	ESE	PA	Total					
3	1	2	5	70	30#	100	50	-----	-----	25	175
	1) Theory paper duration 3 hrs. 2) Theory paper assessment is Internal and External. 3) The assessment of practical is Internal and External. 4) The assessment of Online is Internal. 5) # Progressive Assessment out of 30 marks , 20 marks is average of 2 periodical tests (PT) and 10 marks are for micro project assessment.										

RATIONALE:

This subject comes under the Core Technology group and will enable the students to understand the different units and it's measurements used in physics. Also this course deals with the basic concepts, theorems and laws of DC electric network and electromagnetism and practical's thereof. The knowledge of this course acquired by the students will help them to assemble, test, troubleshoot and parameters measurement of basic DC electrical network. The course will help the diploma engineers to apply the basic concepts and principles to understand different technology based application. It will also be very useful for students for understanding of other higher level courses in further study.

COURSE OUTCOMES ::--

Student should able to

Semester	1	Subject	Fundamental of Electrical & Electronics Engineering
CO 103		3 RD Course in First Year	
CO 103.1		Understand units and measurements system in physics.	
CO 103.2		Analyze the various parameters and characteristics of AC signal.	
CO 103.3		Describe the working principle and performance characteristics of capacitor.	
CO 103.4		Interpret different parameters and basic laws of electricity.	
CO 103.5		Apply the various laws and theorems of DC network.	
CO 103.6		Understand the various concept of electromagnetism.	

Mapping of Course outcomes (COs) to Program outcomes (POs)

SEM I	FUNDAMENTAL OF ELECTRICAL NETWORK								
CO 103	(3 RD COURSE IN FIRST YEAR) PREPARED BY : SRB								
CO 103	P01	P02	P03	P04	P05	P06	P07	PSO 1	PSO 2
CO 103.1	3	-	-	2	-	-	-	1	0
CO 103.2	2	-	1	2	1	1	-	1	0
CO 103.3	3	1	1	2	2	1	1	1	0
CO 103.4	3	1	1	2	-	1		1	0
CO 103.5	2	2	3	3	1	-	1	1	0
CO 103.6	3	1	-	1	2	2	2	1	0
CO TOTAL	16	05	06	12	06	05	04	6	0
CORRELATION LEVEL	3	1	1	2	1	1	1	2	0

TABLE TO DECIDE CORRELATION LEVELS

CO SUM TOTAL	06	12	18
CORRELATION LEVEL	5	2	3

CO SUM TOTAL	0, 1, 2	3, 4, 5, 6, 7, 8	9, 10, 11, 12, 13, 14	15, 16, 17, 18
CORRELATION LEVEL	0	1	2	3

Mr. Sanjiv Borkar

Subject Expert

Section -- 1							
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1	Units and Measurements						
	1.1 Physical quantities : Fundamentals and derived units and system of units (CGS ,MKS,SI) 1.2 Dimensions of Physical quantities : Dimensions and dimensional formulae of physical quantities , Principle of homogeneity of dimension , Dimensional equations and their applications (conversion from one system of unit to other, checking of Dimensional equations and derivation of simple equation) ,limitation of dimensional analysis. 1.3 Measurement : Need of measuring instruments , Types of measurement (direct, indirect) , Errors of measurement (systematic and random). absolute error, relative error, error propagation, error estimation and significant figures.	07	06	04	--	10	CO 103.1
2	AC Fundamentals						
	2.1 Generation of Single phase AC current and voltage sinusoidal wave. 2.2 Definition of cycle, frequency, angular velocity, Instantaneous value, maximum value, average value, R.M.S. value, Form factor and peak factor. 2.3 Vector representation of sinusoidal AC quantity.: phase angle, phase difference, concept of lagging and leading by waveform. 2.4 power factor ,Active and reactive power, Apparent power.	08	04	08	--	12	CO 103.2

3	Capacitor						
	3.1 Construction, working principle of parallel plate capacitor and its Charge equation. 3.2 Definition of capacitance , Capacitive reactance, Charging time. 3.3 Capacitance in series and parallel. 3.4 Equivalent capacitance calculation. (Simple problems) 3.5 Charging of capacitor through register.(circuit diagram, simple problems)	09	02	06	05	13	CO 103.3
	Section -- 2						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
4	Fundamental of an Electricity						
	4.1, Definition of an electricity. 4.2 Different parameters of electricity with units. (definitions, units) 4.3 Law of resistances, specific resistivity. 4.3 Ohm's law and (limitations and applications.) 4.4 Series and parallel circuit of resistance(characteristics comparison) 4.5 Equivalent resistance of dc circuit. (small problems) 4.6 Voltage and current division rule. (Statement, small problems)	08	04	06	02	12	CO 103.4
5	DC Network Theorems						
	5.1 Basic elements of dc network Types of network. 5.2 Kirchhoff's current law , Kirchhoff's voltage law (statements example) 5.3 Nodal and Mesh analysis methods. (simple problems) 5.4 Superposition theorem: (statement, procedure , simple problem) 5.5 Thevenin's theorem : (statement, procedure , problem) 5.6 Norton's theorem : (statement, procedure , problem) 5.7 maximum power transfer theorem: (statement, example)	09	02	04	07	13	CO 103.5

6	Electromagnetism						
	6.1 Different parameters of magnetic circuit. 6.2 Comparison in between electric and magnetic circuits. 6.3 Faraday's law of electromagnetic induction ,Fleming 's right hand rule,Lenz's law. 6.4 Dynamically and statically induced emf ,Self and Mutual inductance. 6.5 Co-efficient of coupling ,Relation between self and mutual inductance.	07	04	06	--	10	CO 103.6

LIST OF LABORATORY EXPERIENCES

EXP. NO.	TITLE	COURSE OUTCOME	CHAPTER NO.
1	To study the use of Breadboard, multi meter and DC Power supply for measurement.	CO 103.1	1
2	Demonstrate the errors in measurement by using multi meter and DC Power supply.	CO 103.1	1
3	To understand and measure the parameters of the AC fundamental using CRO and function generator.	CO 103.2	2
4	To measure the phase difference in between two AC signals on CRO and identify leading and lagging signal.	CO 103.2	2
5	Construct the circuit for charging of capacitor and Measure the charging voltage across the capacitor and register.	CO 103.3	3
6	Construct the circuit and verify the Ohm's law. Plot V-I characteristics.	CO 103.4	4
7	Construct the voltage divider circuit and verify the Equation of main voltage and drop voltages.	CO 103.4	4
8	Construct the current divider circuit and verify the Equation of main current and divided currents.	CO 103.4	4
9	Construct the circuit and verify the current equation by the Kirchhoff's current law (KCL).	CO 103.5	5

10	Construct the circuit and verify the Voltage equation by the Kirchhoff's voltage law (KVL).	CO 103.5	5
11	Construct the circuit and verify superposition theorem .	CO 103.5	5
12	Construct the circuit for Thevenin's theorem and Measure the Thevenin's voltage (V_{th}) and Thevenin's resistance(R_{th}) to calculate load current.(I_L)	CO 103.5	5
13	Construct the circuit for Norton's theorem and Measure the Norton's current (I_N) and Norton's resistance(R_N) to calculate load current.(I_L)	CO 103.5	5
14	Construct the circuit and verify maximum power Transfer theorem.	CO 103.5	5

SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Chapter No.	Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
Section I						
1	Units and Measurements	7	6	4	0	10
2	AC Fundamentals	8	4	8	0	12
3	Capacitor	9	2	6	5	13
Section II						
4	Fundamental of an Electricity	8	4	6	2	12
5	DC Network Theorems	9	2	4	7	13
6	Electromagnetism	7	4	6	0	10
Total		48	22	34	14	70

IMPLEMENTATION STRATEGY:

- 1) Use of PowerPoint presentations and Videos
- 2) References from the internet **(for teachers as well as students)**
- 3) Extensive use of examples
- 4) Group discussions and micro project
- 5) Assignments for writing skills, create awareness about selection /purchasing components

(Example : Market survey study of resistances with ratings and value and applications, Power supply ratings, applications etc)

The above strategy can be followed in the classroom teaching-learning process as well as extensively during the tutorial class by the teacher.

SUGGESTED LIST OF MICROPROJECTS

Micro project could be group based. A suggestive list is given here, similar micro projects could be added by concern faculty. Each student will maintain dated work diary with details of individual contribution. Assessment done by project guide based on their performance ,presentation of submission.

SR. NO.	TITLE	COURSE OUTCOME
1	Prepare the chart of physics quantity and its units in CGS and MKS systems.	CO 103.1
2	Make the chart of different AC signals . Show them in different Phase angles (i.e 30 ,45 ,60,90 degree).	CO 103.2
3	Collect different types of capacitors . make a chart of them. Write the value of each capacitor.	CO 103.3
4	Collect the device where capacitor is used. Write type and application of capacitor .	CO 103.3
5	Prepare model or chart of electrical parameters with their definition and units.	CO 103.4
6	Assemble simple circuit on general purpose PCB for verifying Ohm's law.	CO 103.4
7	Assemble simple circuit on general purpose PCB of current divider circuit.	CO 103.4
8	Assemble simple circuit on general purpose PCB for verifying Thevenin's Theorem.	CO 103.5
9	Make a chart of different parameters of electromagnetism with their definition and units.	CO 103.6
10	Make a small project for generating magnetic field .	CO 103.6

REFERENCES

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address
1.	B. L. Theraja	Electrical Technology Vol-1	2nd	2008	S Chand and Co. Ramnagar , New Delhi
2.	B.H.Deshmukh	Element of electrical engineering	5th	2022	Nirali prakashan
3.	V. N. Mittale	Basic electrical engineering	2nd	2017	Tata Mcgraw- hill
4.	V. K. Mehta	Basic Elect Engg	Revised edition	2006	S. Chand &Company
5.	R.K. gaur and S.L. Gupta	Engineering physics		2012	Dhanpat rai publication co. New delhi
6.	A text book of engineering physics	P.G.Kshirsagar and M.N.Avandhunulu	11th	2018	S Chand and Co. Ramnagar , New Delhi

LEARNING WEBSITES / WEB REFERENCES :

www.onlinelibrary.wiley.com
www.electrical-technologies.com
<http://www.electroniccomponents.com>
<http://www.electricaltechnology.org>
<http://www.electrical4u.com>

Program Title				Diploma in Electronics & Telecommunication Engineering								
Course Code	ETES 104		Course Title	Introduction to IT						Semester	1	
Teaching Scheme					Examination Scheme							
Credits					Theory			Practical	Oral	Online	Term work	Total
Lecture	Tutorial	Practical	Total		ESE	PA	Total					
-----	-----	4	2					-----	-----	50	25	75
	1) Theory paper duration 3 hrs. 2) Theory paper assessment is Internal and External. 3) The assessment of practical is Internal and External. 4) The assessment of Online is Internal.											

RATIONALE:

The course provides a broad perspective on basics of Information technology, how to use and apply a variety of technologies, and the impact of Information technology on self and society. It is designed to assure a basic level of computer literacy to include word processing, spreadsheet, presentation software, database, LAN, e-mail, and Internet utilization. It also covers application software like MS-Office, which helps for documentation, calculation, presentation purpose etc.

COURSE OUTCOMES ::--

Student should able to

Semester	1	Subject	Introduction to IT
CO 104		4 th Course in First Year	
CO 104.1		Understand the nature and key elements of information technology and Identify the major hardware components of a computer system	
CO 104.2		Learn various operating systems and their purposes, features and how they relate to application software.	
CO 104.3		Prepare Documents, Excel Sheet, Charts and power point presentation.	
CO 104.4		Practice different tools & accessories	
CO 104.5		Demonstrate uses of Database in MS-Access, sending and receiving mails Understand World Wide Web.	
CO 104.6		Identify & Discuss new trends in technology	

Mapping of Course outcomes (COs) to Program outcomes (POs)

SEM I	INTRODUCTION TO IT								
CO 104	(4th COURSE IN FIRST YEAR) PREPARED BY : SG								
CO 104	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2
CO 104.1	3					1		0	1
CO 104.2	2	2	2	2		1		0	1
CO 104.3	2	2	2	2	1	1		0	1
CO 104.4	3	1	2	1		1		0	1
CO 104.5	3	1	2	2	1	1		1	2
CO 104.6	3	1	2			2		1	2
CO 104 TOTAL	16	07	10	07	02	07	00	2	8
CORRELATION LEVEL	3	1	2	1	0	1	0	1	2

TABLE TO DECIDE CORRELATION LEVELS

CO SUM TOTAL	06	12	18
CORRELATION LEVEL	1	2	3

CO SUM TOTAL	0,1,2	3,4,5,6,7,8	9,10,11,12,13,14,	15,16,17,18
CORRELATION LEVEL	0	1	2	3

Subject Expert**Mrs. Surbhi Gaoshinde**

	Section -- 1						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1	Introductions to IT						
	Introduction to Information Technology 1.1 Basic concepts of Information Technology 1.2 Applications of Information Technology: In Home, education and Training, Entertainment, Science, Technology, Medicine, Engineering etc. 1.3 Evolution of Computer & Generations of Computers. 1.4 Functional block diagram of a computer 1.5 Terminologies :- Hardware, Software, Firmware 1.6 Peripherals : Keyboard, monitor, printer, Scanner, Trackpad 1.7 Storage devices: RAM, ROM, CD, DVD, Pen drive USB Drive, Portable Disk. 1.8 Introduction to operating system 1.8.1 What is operating system? 1.8.2 Need for OS. Types of operating system. 1.8.3 Functions of operating system, Booting concepts, BIOS, POST	----	---	---	--	-----	CO 104.1 CO 104.2
2	Working With DOS and WINDOWS						
	2.1 Introduction to Disk Operating System 2.2 Basic DOS commands CLS, DATE, TIME, CD, MD, RD, DIR, COPYCON, COPY, REN, DEL, TYPE 2.3 Introduction to windows OS 2.4 Windows Explorer: Copy, move, delete files, creating folder, copy and paste. 2.4.1 Find Utility: To search file by name. 2.5 Control panel: Purpose, changing date and time, choosing background, getting on line help, and installation of software. 2.6 Accessories: Paint, Calculator, Notepad, Snip and Sketch	----	---	---	--	-----	CO 104.2

3	Internet						
	The Internet 3.1 Internet Services: Email, Messenger, Newsgroups, Search engines, Forums, Online Shopping, E-learning. 3.2 Introduction to World Wide Web.	----	---	---	--	-----	CO 104.3 CO 104.5
4	Microsoft Word						
	4.1 Introduction to Microsoft word: Features of MS word. 4.2 Working with word document. Edit menu ,View , Format, Tools Table , Printing Document 4.3 Google Docs	----	---	---	--	-----	CO 104.4
5	Microsoft Excel						
	5.1 Introduction to Microsoft Excel: Features of Microsoft excel 5.2 Working with worksheet: Entering data, editing worksheet. 5.3 Creating formulas and auditing work sheet. 5.4 Formatting worksheet 5.5 Google Sheets	----	---	---	--	-----	CO 104.4
Section -- 2							
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
6	Microsoft Power Point						
	6.1 Introduction to Microsoft PowerPoint: Title bar and Menu bar. Using Toolbars, Rulers, status bar basic drawing tools, using auto shape tools, inserting text into object. 6.2 Understanding the various views in power point. Slide view Outline view Slide sorter view Notes page view Slide show view. 6.4 Slide Transition 6.5 Custom animation. 6.5.4 Google Slides	----	---	---	--	-----	CO 104.4

Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
7	Microsoft Access						
	7.1 Introduction to MS-Access 7.1.1 How to create table in MS-Access. 7.1.2 How to Create a database. 7.2 Basic Operations on Table (Queries): Select, Insert, Delete, Add 7.3 Import report from Excel to MS Access and view 7.4 Microsoft Teams (Online meetings app)	----	---	---	--	-----	CO 104.5
8	Accessories						
	8.1 Scanning (document, photo, signature) 8.2 Conversion of formats (Word to PDF and others) 8.3 Introduction to G-Suite: Create template, poster, banner, and certificate. 8.4 Use of Google-Drive, creating link, sharing contents, creating google forms	----	---	---	--	-----	CO 104.6
9	Technologies associated with I 4.0						
	9.1 Cyber physical system 9.2 The internet of things (IoT) 9.3 The industrial internet of things (IIoT) 9.4 Cognitive computing (Machine Learning) 9.5 Artificial Intelligence (AI)	----	---	---	--	-----	CO 104.6

LIST OF LABORATORY EXPERIENCES

EXP. NO.	TITLE	COURSE OUTCOME
1.	Understand the components of Computer, its usage and applications in different domains.	CO 104.1
2.	Creating Files, icons, shortcuts and folders in Windows.	CO 104.2
3.	Using Windows Accessories such as Notepad, Paint, Calculator, clock, Snip, Sketch and calendar.	CO 104.2
4.	Executing basic DOS commands CLS, DATE, TIME , CD, MD, RD, DIR, COPY CON, COPY, REN, DEL, TYPE.	CO 104.2
5.	Creating E-mail Id and sending and receiving mails adding signature using outlook and scheduling of mail.	CO 104.4 CO 104.5 CO 104.6
6.	Demonstrate and use various Internet services like news groups, eLearning, online shopping etc.	CO 104.4 CO 104.5 CO 104.6
7.	Using basic features of MS-word and Preparation of Bio-Data in MS-word.	CO 104.4 CO 104.5
8.	Preparation of Application in MS-word (Any two), introduction to Google Docs	CO 104.4 CO 104.5
9.	Using basic features of MS-Excel and Preparation of Student Marksheet in MS-excel.	CO 104.4 CO 104.5
10.	Prepare two Excel sheets using formulas and functions, Introduction to Google Sheets.	CO 104.4 CO 104.5
11.	Using basic features of MS-Power point and Prepare a Power point presentation to display information of any organization.	CO 104.4 CO 104.5 CO 104.6
12.	Prepare a Power point presentation using transition and animation effects.(Any two), Introduction to Google Slides	CO 104.4 CO 104.5 CO 104.6
13.	Understand database concepts and basic operations in MS-Access.	CO 103.4 CO 104.5 CO 104.6
14.	Creating tables and accessing data in MS-access.	CO 104.4 CO 104.5 CO 104.6
15.	Create and conduct Meeting using MS-Teams	CO 104.5
16.	Introduction to G-Suite (Create forms, sync calendar, use of Drive, Text editor, Keep)	CO 104.5

IMPLEMENTATION STRATEGY:

- 1) Practical plan
- 2) Minimum 10 -- 12 practical's need to perform with the coverage of all COs
- 3) Use of PowerPoint presentations and Videos
- 4) References from the internet **(for teachers as well as students)**
- 5) Extensive use of examples
- 6) Group discussions and micro project
- 7) Assignments for writing skills, create awareness about selection /purchasing components

REFERENCES

Sr. No.	Author	Title	Edition	Publisher & Address
1.	Ron Mansfield	Microsoft Office	2 nd	BPB publications New Delhi
2.	Christian Crumlish	ABC'S of the Internet	2 nd	BPB publications New Delhi
3.	Brian Underdahl	Windows2000	2 nd	IDG Book India Pvt. Ltd.
4.	Heidi Steele	Word 2000	2 nd	Techmedia
5.	Sharon Podlin	Excel 2000	2 nd	Techmedia
6.	Clay Shirky	The Internet	2 nd	TCB

LEARNING WEBSITE / WEB REFERENCE

<https://bookauthority.org>

<https://bookboon.com>

<https://slidshare.com>

Program Title				Diploma in Electronics & Telecommunication Engineering							
Course Code	ETAU 105	Course Title		Environmental Science						Semester	1
Teaching Scheme				Examination Scheme							
Credits				Theory			Practical	Oral	Online	Term work	Total
Lecture	Tutorial	Practical	Total	ESE	PA	Total					
--	---	2	1	--	---	----	----	-----	-----	25	25
	1) Theory paper duration 3 hrs. 2) Theory paper assessment is Internal and External. 3) The assessment of practical is Internal and External. 4) The assessment of Online is Internal.										

RATIONALE:

It is now understood that the subject dealing with Environmental Science, which comes under the Foundation courses group, is not merely a subject but is closely connected to the quality of our lives and surrounding, which is why the understanding and knowledge of this subject is a must. It would be most appropriate to bring about awareness of the importance of environmental issues amongst adolescents. Together with theoretical knowledge, its implementation in day-to-day life is desirable. Different activities like project work and assignments are included in this subject. "Preservation is better than cure", is the purpose of including this subject in the first semester of the Diploma course.

COURSE OUTCOMES :--

Semester	1	Subject	Environmental Science
CO 105		5 th Course in First Year	
CO 105.1		Develop an in-depth understanding of various environmental issues and concerns of national and global importance	
CO 105.2		Illustrate basic concepts related to sustainable development & improvement of quality of life	
CO 105.3		Develop a deeper concern for the environment and a sense of Commitment and responsibility to take proactive action	
CO 105.4		Appreciate the role of individual community national and international agencies in resolving environmental problems	
CO 105.5		Respect customs and traditions related to local conservation practices and accepts indigenous eco-friendly technologies	
CO 105.6		Motivate others and participate in dealing with environmental problems	

Mapping of Course outcomes (COs) to Program outcomes (POs)

SEM I	ENVIRONMENTAL SCIENCE								
CO 105	(5TH COURSE IN FIRST YEAR) PREPARED BY: VR								
CO 105	P01	P02	P03	P04	P05	P06	P07	PSO 1	PSO 2
CO 105.1				3	3	3	3	2	0
CO 105.2				3	3	3	3	2	0
CO 105.3				3	3	3	3	2	0
CO 105.4				3	3	3	3		0
CO 105.5				3	3	3	3	2	0
CO 105.6				3	3	3	3	2	0
CO TOTAL	00	00	00	18	18	18	18	10	0
CORRELATION LEVEL	0	0	0	3	3	3	3	2	0

TABLE TO DECIDE CORRELATION LEVELS

CO SUM TOTAL	06	12	18
CORRELATION LEVEL	1	2	3

CO SUM TOTAL	0,1,2	3,4,5,6,7,8	9,10,11,12,13,14,	15,16,17,18
CORRELATION LEVEL	0	1	2	3

Mr. Anil Gurav**Subject Expert****Dr. Vijay Rathod****Subject Expert**

Section -- 1							
Chapter No	Topics		Periods		Marks		COs
		Hrs.	R	U	A	Total	
1	Man and Environment						
	1. Dimensions of environment- physical, biological and social 1.1.1 Human being as a rational and social partner in environmental actions. 1.2 Society and environment in India; Indian traditions, customs and culture - past and present 1.3 Population and environment 1.3.1 Impact of human activities on environment - A - Environmental problems of urban and rural areas B - Natural resources and their depletion C - Stress on civic amenities; supply of water and electricity, waste disposal, transport, health services D - Vehicular emissions E - Urbanization - land use, housing, migrating and floating population	-----	-----	-----	-----	-----	CO 101.1
2	Environment and Development						
	2.1 Economic and social needs - as basic considerations for development 2.2 Agriculture and industry as major sectors of development 2.3 Social factors affecting development - poverty, affluence, education, employment, child marriage and child labour, human health, social, cultural and ethical values 2.4 Impact of development on environment – changing pattern of land use; land reclamation, deforestation,	-----	-----	-----	-----	-----	CO 101.2 101.3

	resource depletion, pollution and environmental degradation 2.5 Role of society in development and environment – public awareness through education eco -club, population education programme, campaigns, public participation in decision making 2.6 Impact of liberalization and globalization on – agriculture and industries, dislocation of manpower and unemployment, implication for social harmony.						
Section -- 2							
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
3	Energy						
	3.1 Changing global patterns of energy consumption from ancient to modern times 3.2 Energy consumption as measure of quality of life 3.3 Rising demand for energy, gap between demand and supply (Indian context) 3.4 Conventional energy sources - fossil fuels and firewood, potential (Indian context) and limitations of each source, methods of harnessing and environmental consequences of their use 3.5 Non-conventional energy sources - types of non-conventional sources (biomass, solar, wind, ocean, hydel, geothermal, nuclear), potential (Indian context) and limitations of each source, methods of harnessing and their environmental consequences, need to	-----	-----	-----	-----	-----	CO 101.4 101.5

	promote non-conventional energy sources 3.6 Conservation of energy sources - efficiency in production, transportation and utilization of energy 3.7 Planning and management of energy; future sources of energy - hydrogen, alcohol, fuel cells Enhancing efficiency of the devices and optimizing energy utilization						
04	Environmental Pollution and Global Issues						
	4.1 Air, water (fresh and marine), soil pollution – sources and consequences including human diseases 4.2 Sound pollution and pollution due to radioactivity sources and consequences including human diseases 4.3 Solid, liquid and gaseous pollutants 4.4 Hazardous materials : processes; handling and management of hazardous wastes 4.5 Ozone layer depletion and its effect 4.6 Greenhouse effect - global warming and climatic changes and their effects on human society, agriculture, plants and animals Disasters - natural (earthquakes, droughts, floods, cyclones, landslides, tsunamis, avalanches) and man-made (technological and industrial); their impact on the environment; prevention, control and mitigation 4.8 Strategies for reducing pollution and improving environment	-----	-----	-----	-----	-----	CO 101.5 101.6

TERM WORK:Term work shall consist of minimum five project assignments
(PROJECT ASSIGNMENTS SHALL BE DESIGNED ON THE TOPICS MENTIONED IN THE SYLLABUS OR ON CURRENT ISSUES RELATED TO ENVIRONMENT CONCERNS
Examples of these are mentioned below:

- 1) Role of Information Technology in Environment and Human Health
- 2) Natural Resources
- 3) International Organizations for Environmental Conservation
- 4) Endangered Species
- 5) Forests and Environment
- 6) Oil Spills and their Effect on Environment
- 7) Global Warming
- 8) Alternative Energy Resources
- 9) Renewable Energy Resources
- 10) Biodiversity and its Conservation
- 11) Social Issues and Environment
- 12) Human Population and the Environment
- 13) Multidisciplinary Nature of Environment Studies
- 14) Pollution
- 15) Ecosystems
- 16) Noise Pollution and its Adverse Effects
- 17) Disaster Management
- 18) Bio-geographical Classification of India
- 19) Use of Modern Technology in Environment Conservation
- 20) Types of Environmental Pollution

OBJECTIVES (FOR COMPUTATION OF ATTAINMENT OF TERM WORK):

The students will be able to achieve the following criteria in the quality of their assignments in relation to the objectives stated below and the term work marks granted will be on the basis of the implementation of the following in their soft copies of the assignments/ files, both .DOCX and .PPTX submitted by them on pen drive:

C115.1 -.Content matter **C115.2** – Formatting **C115.3** – Sequencing and flow **C115.4** – Quality of self work and presentation **C115.5** – References in both .DOCX and .PPTX files and image/ photo credits **C115.6** – Attendance, Interaction and Punctuality/ Timely submission of assignments. The progress level of the assignment activities is to be monitored on a regular basis, based on the student **commitment and interaction, as defined in OBJECTIVES stated above during the practical time** allotted to them for the **ASSIGNMENT/ PRACTICAL WORK** by the concerned teacher. The final table to measure the attainment levels (on a rating scale of “out of 50”) for the attainment levels of course outcomes through **observation of performance** as well as the **ASSIGNMENTS submitted** by students is as shown in the format given below:

The **TERM WORK** for this subject is out of **25 marks**.

IMPLEMENTATION STRATEGY

1. Teaching plan
2. Use of PowerPoint slide shows and videos
3. Referencing from the Internet.
4. Minimum five projects/assignments

THE FIVE ASSIGNMENT TOPICS FOR THE TERM WORK MARKS TO BE DONE ARE IN GENERAL MEANT TO COVER ALL THE COURSE OUTCOMES. Students are assigned with 5 different topics related to environmental issues for which they have to prepare 5 individual Microsoft Word Document files and 5 individual Microsoft PowerPoint Presentation files for each topic and present the same to the class, as well as submit these completed assignments to the assigned staff member on pen drive.

REFERENCES

S. No.	Author	Title	Publisher & Address
1	Erach Bharucha,	Text Book of Environmental Studies	Universities Press/Orient Blackswan
2	Jagdish Krishnaswami, R J Ranjit Daniels	Environmental Studies	Wiley India Private Ltd. New Delhi
3	Anindita Basak	Environmental Studies	Pearson
4	Benny Joseph	Environmental Studies	Tata McGRAW HILL
5	D L Manjunath	Environmental Studies	Pearson
6	R Rajgopalan	Environmental Studies	Oxford
7	Alok Debi	Environmental Science and Engineering	University Press

Program Title				Diploma in Electronics & Telecommunication Engineering							
Course Code	ETHS 106	Course Title		Communication Skills						Semester	1
Teaching Scheme				Examination Scheme							
Credits				Theory			Practical	Oral	Online	Term work	Total
Lecture	Tutorial	Practical	Total	ESE	PA	Total					
2	-----	2	3	--	--	--	--	-----	-----	50	50
	1) Theory paper duration 3 hrs. 2) Theory paper assessment is Internal and External. 3) The assessment of practical is Internal and External. 4) The assessment of Online is Internal. 5) # -- Progressive Assessment out of 30 marks , 20 marks is average of 2 periodical tests (PT) and 10 marks are for micro project assessment.										

RATIONALE:

It is important to note that the subject of Communication Skills is not just about English language, but is concerned with various other aspects of human interaction especially since communication is universal and takes place through various languages and means across the world. This subject attempts to bring about various aspects of skills involved in communication, different methods of communication, principles of communication, hindrances to communication, concepts and importance of verbal and non-verbal communication, visual communication, use of appropriate body language and also writing skills. Thus the target of this subject is to inculcate a greater amount of effectiveness in the manner of communication in formal, informal and social situations.

COURSE OUTCOMES :---

student should able to

Semester	1	Subject	Communication Skills
CO 106		6 th Course in First Year	
CO 106.1		Use sentences with correct grammatical soundness to enhance communication skills	
CO 106.2		Use relevant words as per context for various situations	
CO 106.3		Enumerate the concepts and types of communication	
CO 106.4		Develop writing skills to enhance communication in the written form	
CO 106.5		Enhance communication skills in the oral form	
CO 106.6		Summarize passages using the techniques of comprehension	

Mapping of Course outcomes (COs) to Program outcomes (POs)

SEM I	COMMUNICATION SKILLS								
CO 106	(6th COURSE IN FIRST YEAR) PREPARED BY : CD								
CO 106	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2
CO 106.1		2		2	3	3	3	1	0
CO 106.2		2		2	3	3	3	1	0
CO 106.3		2		2	3	3	3	3	0
CO 106.4		3		2	3	3	3	3	0
CO 106.5		3		2	3	3	3	3	0
CO 106.6		3		2	3	3	3	1	0
CO TOTAL	00	15	00	12	18	18	18	12	0
CORRELATION LEVEL	0	3	0	2	3	3	3	2	0

TABLE TO DECIDE CORRELATION LEVELS

CO SUM TOTAL	06	12	18
CORRELATION LEVEL	5	2	3

CO SUM TOTAL	0, 1, 2	3, 4, 5, 6, 7, 8	9, 10, 11, 12, 13, 14	15, 16, 17, 18
CORRELATION LEVEL	0	1	2	3

Ms. Chevon De Souza

Subject Expert

Section -- 1							
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1	APPLIED GRAMMAR AND LEXIS						
	1.1. Parts of speech 1.2. Articles: definite and indefinite 1.3. Sentence pattern 1.4. Tenses 1.5. Types of sentences: assertive, imperative, exclamatory, interrogative 1.6. Active and passive voice 1.7. Punctuation 1.8. Rules of spelling 1.9. Words often confused 1.10. Collocations 1.11. Idioms	11	----	----	----	--	CO 106.1 106.2
2	PRINCIPLES OF COMMUNICATION						
	2.1. Basics of communication: Introduction, definition and process of communication. 2.2. Concept of the types of communication: 2.2.1 Formal and informal 2.2.2 Verbal and non-verbal 2.2.3 Written and oral 2.2.4 Vertical, horizontal and diagonal 2.3. Barriers to effective communication 2.4. 7 Cs for effective communication: (Considerate, concrete, concise, clear, complete, correct, courteous) 2.5. Art of Effective communication: 2.5.1. Voice modulation 2.5.2. Clarity 2.5.3. Intonation 2.5.4. Word stress 2.5.5. Time 2.5.6. Simplification of words	05	----	----	----	----	CO 106.3

Section -- 2							
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
3	PROFESSIONAL WRITING						
	3.1. The art of precise writing 3.2. Letter Writing – Formal and Informal 3.3. Drafting emails, notices and minutes of a meeting 3.4. Online form filling	5	---	---	---	---	CO 106.4
4	LISTENING SKILLS AND COMPREHENSION						
	4.1. Introduction to listening skills 4.2. Importance of comprehension 4.3. Interpretation of passages 4.4. “Malgudi Days” by R. K. Narayan book will be used for comprehension and reading	11	---	---	---	---	CO 106.5 106.6

IMPLEMENTATION STRATEGY:

- 1) Use of PowerPoint presentations and Videos
- 2) References from the internet (**for teachers as well as students**)
- 3) Extensive use of examples
- 4) Group discussions and micro project
- 5) Assignments for writing skills

The above strategy can be followed in the classroom teaching-learning process as well as extensively during the tutorial class by the teacher.

LIST OF TUTORIAL ASSIGNMENT/ EXPERIENCES

SR. NO.	TITLE	COURSE OUTCOM
1	Applied Grammar (04 Hours) a) Using sentences given by the instructor, the students will complete the assignment as per the instructions in the questions. b) Word games and exercises can be used to enhance the students language skills	CO 106.1
2	Idioms and Collocations (04 Hours) Use of Idioms and Collocations in sentences (20 Examples)	CO 106.2
3	Introduction to Phonetics (04 Hours) Sounds: consonant, vowel, diphthongs Transcription of words (IPA) Syllable division	CO 106.2

4	Listen and Pronounce (04 Hours) Listen to the audio track and record your pronunciation. a) Repeat sound/words /sentences on Language Lab software after listening to them. b) Introduction to recorded lectures, interviews and speeches.	C0106.5
5	Speaking Skills (12 Hours) Group discussion a) Oral presentations b) Conversation practice c) Role playing d) Introduction to mock interviews and business e) presentations	C0106.5

REFERENCES

Sr. No.	Author	Title	Publisher & Address
1	-----	A Course of Technical English Book – 1	Curriculum Development Centre – TTTI Bhopal
2	-----	A Course of Technical English Book – 2	Curriculum Development Centre – TTTI Bhopal
3	MSBTE, Mumbai	Text book of Communication Skills	MSBTE, Mumbai
4	M. Ashraf Rizvi	Effective Technical communication	Tata McGraw Hill
5	Krushna Mohan, Meera Bannerji	Developing Communication Skills	Macmillan
6	Jayakaran	Every ones guide to effective writing	Apple Publishing
7	----	English Workbook I-Scheme	MSBTE
8	Mr. Mangesh Patil, Mrs. Chevon De Souza	English Language	St. Xavier's Technical Institute, Mahim
9	David Green	Contemporary English grammar, structures and composition	Macmillan
10	R. C. Jain	English grammar and composition	Macmillan
11	Rodgers	Thesaurus	Oriental Longman
12	Oxford	Dictionary	Oxford University
13	Longman	Dictionary	Oriental Longman

LEARNING WEBSITES / WEB REFERENCES :

<https://www.english-tutorials.ws/>

<https://www.youtube.com/watch?v=4Rl-QpqWQ>

<https://www.nptl.com/>

Program Title				Diploma in Electronics & Telecommunication Engineering								
Course Code	ETHS 107	Course Title		Professional Practices						Semester	1	
Teaching Scheme				Examination Scheme								
Credits				Theory			Practical	Oral	Online	Term work	Total	
Lecture	Tutorial	Practical	Total	ESE	PA	Total						
--	---	2	--	--	---	----	----	-----	-----	---	---	
	NON CREDIT NON EXAM											

RATIONALE : The objective of most diploma programmes is to produce skilled technicians who can efficiently meet industry requirements. Due to globalization and competition in the industrial and service sectors, generally the selection procedure for the job is based on campus interviews or competitive tests. While selecting candidates the normal practice adopted is to scrutinize the general level of confidence, ability to communicate and attitude, in addition to knowledge of basic technological concepts.

The purpose of introducing Professional Practices, which comes under the Foundation group, is to provide an opportunity to students to undergo activities which will enable them to develop confidence to be able to work effectively in a professional environment. Industrial visits, expert lectures, seminars on technical topics and group discussions are the activities in the planned schedule of this subject.

COURSE OUTCOMES :--

Semester	1	Subject	Professional Practices
CO 107		7 th Course in First Year	
C107.1		Develop confidence to be able to work effectively in a professional environment	
C107.2		Acquire information from different sources.	
C107.3		Interpret the data acquired from different sources.	
C107.4		Prepare reports on industrial visit, expert lecture or for a given topic.	
C107.5		Present given topic in a seminar.	
C107.6		Interact with peers to share thoughts.	

Mapping of Course outcomes (COs) to Program outcomes (POs)

SEM I	PROFESSIONAL PRACTICES								
CO 107	(7TH COURSE IN FIRST YEAR) PREPARED BY: VR & AG								
CO 107	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2
CO 107.1	----	----	-----	2	2	3	3	1	
CO 107.2	----	----	-----	2	2	3	3	1	2
CO 107.3	----	----	-----	2	2	3	3	1	2
CO 107.4	----	----	-----	2	2	3	3	1	2
CO 107.5	----	----	-----	2	2	3	3	1	
CO 107.6	----	----	-----	2	2	3	3	1	
CO TOTAL	00	00	00	12	12	18	18	6	6
CORRELATION LEVEL	0	0	0	3	3	3	3	1	1

TABLE TO DECIDE CORRELATION LEVELS

CO SUM TOTAL	06	12	18
CORRELATION LEVEL	1	2	3

CO SUM TOTAL	0,1,2	3,4,5,6,7,8	9,10,11,12,13,14,	15,16,17,18
CORRELATION LEVEL	0	1	2	3

Mr. Anil Gurav**Subject Expert****Dr. Vijay Rathod****Subject Expert**

Section -- 1							
Chapter No	Topics		Periods		Marks		COs
		Hrs.	R	U	A	Total	
1.	INDUSTRIAL VISITS Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form a part of the term work. Visit any IT industry/computer center. Study their network (Cablelayout, devices used/software/costing).	-----	-----	-----	-----	-----	CO 107.1
2.	The Guest Lecture/s from field/industry experts, professionals is/are to be arranged (minimum 3 nos.) from the following or like topics. The brief report is to be submitted on the guest lecture by each student as part of Term work. IT – Current Scenario Software engineering industrial applications, animation techniques , carries guidance, Preparation of Bio data, Entrepreneurship development, Ecommerce	-----	-----	-----	-----	-----	C 107.3, C 107.4
3.	Information Search Information search can be done through manufacturers catalog, Internet, Magazines, Books etc. and submit the report. Topics can be suggested with the consent of the relevant teacher and the discussion among the students	-----	-----	-----	-----	-----	C 107.2, C 107.3, C 107.4, C 107.6

4.	Group Discussion: The students should discuss in group of six to eight students and write a brief report on the same as a part of term work. The faculty members may select the topic of group discussions. Some of the suggested topics are : i) Current issues ii) Load shedding and remedial measures Use of mobile in college campus	-----	-----	-----	-----	-----	C 107.5, C 107.6
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LIST OF CLASSROOM ASSIGNMENTS/ EXPERIENCES

EXP. NO.	TITLE	COURSE OUTCOME MAPPING
1	Aim in life and reason/ purpose of joining the engineering field	C107.1
2	Use/ objective of providing listing of reference books in the syllabus	C107.2
3	Presentation planning, requirements and giving presentation on any technical topic	C107.3
4	Group discussion on any topic related to current issues	C107.5
5	Group discussion on any topic related to current issues	C107.6
6	Writing/ providing “References” for research papers and presentations	C107.2
7	Purpose of “back index” and using/reading the same in text books/ reference books	C107.2
8	Making/ writing notes from reference books	C107.4
9	Writing Bio-data, CVs and Resume	C107.1

Program Title				Diploma in Electronics & Telecommunication Engineering								
Course Code	ETPC 108	Course Title		Sports & Yoga							Semester	1
Teaching Scheme					Examination Scheme							
Credits					Theory			Practical	Oral	Online	Term work	Total
Lecture	Tutorial	Practical	Total		ESE	PA	Total					
1	-----	----	---		----	---	-----	----	-----	-----	--	--
	NON CREDIT NON EXAM.											

RATIONALE:

YOGA and Sports are very important for our alls life. Sport develops a sense of friendliness among the children and develop their team spirit. It helps children to develop mental and physical toughness. Sports also increases blood circulation. The art of practicing **yoga** helps in controlling an individual's mind, body and soul. YOGA also improves birthing and increases the volume capacity. YOGA also improves nerves activity in human being.

COURSE OUTCOMES :--

student should able to

Semester	1	Subject	Sports & Yoga
CO 108		8 th Course in First Year	
CO 108.1		To make the students understand the importance of sound health and fitness principles as they relate to better health.	
CO 108.2		To expose the students to a variety of physical and yogic activities aimed at stimulating their health and fitness.	
CO 108.3		To create a safe, progressive, methodical and efficient activity based plan to enhance health and fitness.	
CO 108.4		To develop among students an appreciation of physical activity as a lifetime pursuit and a means to better health.	
CO 108.5		To develop immunity power in students.	
CO 108.6		To increases the stress handling capacity.	

Mapping of Course outcomes (COs) to Program outcomes (POs)

SEM I	SPORTS & YOGA								
CO 108	(8TH COURSE IN FIRST YEAR) PREPARED BY : AP								
CO 108	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2
CO 108.1					2			0	0
CO 108.2		1			2		1	0	0
CO 108.3	1	1			2	2	2	0	0
CO 108.4					2	2		0	0
CO 108.5		1			1			0	0
CO 108.6		1			2	1		0	0
CO TOTAL	1	4			11	5	3	0	0
CORRELATION LEVEL	0	1			2	1	1	0	0

TABLE TO DECIDE CORRELATION LEVELS

CO SUM TOTAL	06	12	18
CORRELATION LEVEL	1	2	3

CO SUM TOTAL	0, 1, 2	3, 4, 5, 6, 7, 8	9, 10, 11, 12, 13, 14	15, 16, 17, 18
CORRELATION LEVEL	0	1	2	3

Mr. Abhijit Patil**Subject Expert**

Section -- 1							
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1	Introduction to Physical Education						
	1.1 Meaning & definition of Physical Education 1.2 Aims & Objectives of Physical Education 1.3 Changing trends in Physical Education	---	---	----	----	---	CO 108.1 108.6
2	Yoga						
	2.1 Meaning of Yoga. 2.2 Importance of Yoga 2.3 Elements of Yoga 2.4 Introduction - Asanas, Pranayama, Meditation & Yogic Kriyas 2.5 Yoga for concentration & related Asanas (Sukhasana; Tadasana; Padmasana & Shashankasana) 2.6 Relaxation Techniques for improving concentration - Yog-nidra	---	---	----	----	---	CO 108.2 108.5 108.6
3	Yoga & Lifestyle						
	3.1 Asanas as preventive measures. 3.2 Hypertension: Tadasana, Vajrasana, Pavan Muktasana, Ardha Chakrasana, Bhujangasana, Sharasana. 3.3 Obesity: Procedure, Benefits & contraindications for Vajrasana, Hastasana, Trikonasana, Ardh Matsyendrasana. 3.4 Back Pain: Tadasana, Ardh Matsyendrasana, Vakrasana, Shalabhasana, Bhujangasana. 3.5 Diabetes: Procedure, Benefits & contraindications for Bhujangasana, Paschimottasana, Pavan Muktasana, Ardh Matsyendrasana. 3.6 Asthema: Procedure, Benefits & contraindications for Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottasana, Matsyasana.	---	---	----	----	---	CO 108.2 108.5 108.6

4	Training and Planning in Sports						
	4.1 Meaning of Training 4.2 Warming up and limbering down 4.3 Skill, Technique & Style 4.4 Meaning and Objectives of Planning. 4.5 Tournament – Knock-Out, League/Round Robin & Combination	---	---	---	---	---	CO 108.3 108.5
	Section -- 2						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
5	Psychology & Sports						
	5.1 Definition & Importance of Psychology in Physical Edu. & Sports 5.2 Define & Differentiate Between Growth & Development 5.3 Adolescent Problems & Their Management 5.4 Emotion: Concept, Type & Controlling of emotions 5.5 Meaning, Concept & Types of Aggressions in Sports. 5.6 Psychological benefits of exercise. 5.7 Anxiety & Fear and its effects on Sports Performance. 5.8 Motivation, its type & techniques. 5.9 Understanding Stress & Coping Strategies	-----	---	---	---	---	CO 108.3 108.5 108.6
6	Doping						
	6.1 Meaning and Concept of Doping 6.2 Prohibited Substances & Methods 6.3 Side Effects of Prohibited Substances	-----	---	---	---	---	CO 108.4
7	Sports Medicine						
	7.1 First Aid – Definition, Aims & Objectives. 7.2 Sports injuries: Classification, Causes & Prevention. 7.3 Management of Injuries: Soft Tissue Injuries and Bone & Joint Injuries	---	---	---	---	---	CO 108.5 108.6

8	Sports / Games					
	Following sub topics related to any one Game/Sport of choice of student out of Athletics, Badminton, Basketball, Chess, Cricket, Kabaddi, Lawn Tennis, Swimming, Table Tennis, Volleyball, Yoga etc. 8.1 History of the Game/Sport. 8.2 Latest General Rules of the Game/Sport. 8.3 Specifications of Play Fields and Related Sports Equipment. 8.4 Important Tournaments and Venues. 8.5 Sports Personalities. 8.6 Proper Sports Gear and its Importance.					CO 108.4 108.5

REFERENCES:

Sr.No.	Author	Title	Edition	Year of Publication	Publisher & Address
1	B.K.S. Iyengar.	Light on Yoga	1 st	1992	Harper Collins, India
2	B.K.S. Iyengar.	Iyengar Yoga for Beginners	1 st	2006	Dorling Kindersley
3	Prof. Ajmer Singh.	Modern Trends and Physical Education		2019	Kalyani