



ST. XAVIER'S TECHNICAL INSTITUTE

To Nurture the Joy of Excellence in the World of High Technology

CURRICULUM FOR MATHEMATICS I

Document Number: PBoS-2324-AUG-23101-00

REV. NO.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
00	11/08/2023	MATHEMATICS-I	SAD	VRR	SBG

EXECUTIVE SUMMARY

Mathematics-I is a foundation-level course designed to provide students with essential mathematical knowledge required for engineering studies. The course develops analytical thinking, logical reasoning, and problem-solving skills necessary for understanding technical subjects in electronics and telecommunication engineering.

The syllabus covers six major areas: **Algebra, Determinants, Matrices, Coordinate Geometry, Trigonometry, and Statistics**. In Algebra, students learn the laws of logarithms and methods of resolving partial fractions, which are useful in solving complex mathematical expressions. The Determinants and Matrices units introduce students to solving simultaneous equations and performing matrix operations, forming an important base for advanced engineering calculations.

Coordinate Geometry focuses on straight-line equations, distances, angles, and relationships between lines such as parallelism and perpendicularity. These concepts are widely used in graphical analysis and engineering applications. Trigonometry introduces trigonometric ratios, identities, allied angles, compound angles, and inverse trigonometric functions. This unit plays a crucial role in solving problems related to waves, signals, and circuit analysis. Statistics provides knowledge of measures of dispersion such as range, mean deviation, standard deviation, and variance, which are important for analyzing and interpreting data.

The course includes regular tutorials, assignments, and micro-projects to strengthen understanding and practical application of mathematical concepts. Assessment is carried out through internal tests, end-semester examinations, and self-learning activities. Students must achieve minimum passing marks in both theory and self-learning components.

Curriculum Development Committee Members

Sr. No.	Faculty Members	Role of Faculty	Signatures
1	Mrs. Sanchita Datta	Subject Expert	
2	Mrs. Gloria Fernandes	Subject Expert	

Program Title			Diploma in Electronics & Telecommunication Engineering																
Course Code			Course Title			MATHEMATICS - I										Course Type		Semester	
23101																AEC		1	
Learning Scheme						Assessment Scheme													
Actual Contact Hrs./Week			SLH	NLH	CREDITS	THEORY				PRACTICAL				SLA		Total			
CL	TL	LL				FA	SA	Total		FA		SA							
								Max	Min	Max	Min	Max	Min	Max	Min				
5	1	---	2	8	4	30	70	100	40	25	10	---	---	25	10	150			
1) IKS of 6 hrs. 2) Theory paper duration 3 hrs. 3) Theory paper assessment is Internal and External. 4) The assessment of Practical is Internal and External. 5) Formative Assessment out of 30 marks is average of 2 periodical tests (PT). 6) The assessment of Self Learning is Internal.																			

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:---The student will be able to

Semester	1	Subject	Mathematics - I
CO 101		1 st Course In Semester One	
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	1 st Course in Semester One								
CO 101	PO1	PO2	PO3	PO4	PO5	PO6	PO7	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	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

	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.	14	02	12	---	14	CO 101.1
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.						
1.2.3	Algebra in Indian Knowledge System : Solution of simultaneous equations Indian Mathematics.						
2	DETERMINANTS						
2.1	Definition, Expansion of determinants of 2 nd & 3 rd Order.	08	---	04	05	09	CO 101.2
2.2	Solution of simultaneous equation in two and three unknowns-(Crammer's method).						
3	MATRICES						
3.1	Definition of matrices of order m x n.	15	---	06	06	12	CO 101.3
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.						

	Section -- 2						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
4	CO-ORDINATE GEOMETRY						
4.1	Straight lines:	13	---	06	04	10	CO 101.4
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.						
4.1.6	Geometry in Sulbasutras in Indian Knowledge system.						
5	TRIGONOMETRY						
5.1	Definition of Radian - Trigonometric ratios of any angle, fundamental identities, examples based on fundamental identities.	15	03	08	04	15	CO 101.5
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.						
5.4	Trigonometry in India Knowledge System: The evolution of Sine Function, Basic Indian Trigonometry-Introduction & terminology by Nilakantha, Pythagorean triples in Sulbasutras.						
6	STATISTICS						
6.1	Range, Co-efficient of a Range of discrete and grouped data.	10	---	06	04	10	CO 101.6
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.						

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 line.	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	14	02	12	---	14
2.	Determinants	08	---	04	05	09
3.	Matrices	15	---	06	06	12
	Section -- 2					
4.	Co-ordinate geometry	13	---	06	04	10
5.	Trigonometry	15	03	08	04	15
6.	Statistics	10	---	06	04	10
	Total	75	05	42	23	70
Legends :: R ::-- Remember , U ::-- Understand , A ::--Application						
This specification table provides guideline to teacher to teach & assess student also a general guideline to frame theory 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/le_ep204.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://econtent.msbte.edu.in/econtent/econtent_home.php



ST. XAVIER'S TECHNICAL INSTITUTE

To Nurture the Joy of Excellence in the World of High Technology

CURRICULUM FOR BASIC ELECTRONICS

Document Number: PBoS-2324-AUG-23102-00

REV. NO.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
00	11/08/2023	BASIC ELECTRONICS	ACG	VRR	SBG



EXECUTIVE SUMMARY

Basic Electronics introduces the fundamental concepts, devices, and principles used in electronic systems and circuits. It focuses on understanding how electronic components operate, interact, and are applied to control and process electrical signals in practical applications.

At its core, electronics deals with the behaviour of charge carriers (electrons and holes) in semiconductor materials. The subject begins with the study of atomic structure, energy bands, and classification of materials into conductors, semiconductors, and insulators. Special emphasis is given to intrinsic and extrinsic semiconductors, including the concept of doping to create N-type and P-type materials.

Electronic devices such as semiconductor diodes form the foundation of the subject. The PN junction diode, along with its forward and reverse bias characteristics, plays a crucial role in controlling current flow. Special diodes like Zener diodes and photodiodes are studied for their unique properties and applications in regulation and sensing.

Basic electronic circuits are built using these devices. Applications such as rectifiers convert alternating current (AC) into direct current (DC), while filters are used to smooth and stabilize output signals. Wave-shaping circuits like clippers and clammers are also introduced to modify signal waveforms for specific applications.

Key circuit components—resistors, capacitors, and inductors—are revisited in the context of electronic behaviour, while important signal parameters such as frequency, amplitude, and time period are analyzed to understand signal processing.

Practical skills form an essential part of the subject, including the use of instruments like multimeters, oscilloscopes, and signal generators, as well as the construction and analysis of basic electronic circuits.

Overall, Basic Electronics provides a strong foundation for advanced studies in areas such as analog electronics, digital systems, communication engineering, and embedded systems, enabling the design, analysis, and troubleshooting of modern electronic devices and systems.

Curriculum Development Committee Members

Sr. No.	Faculty Members	Role of Faculty	Signatures
1	Mr. Anil Gurav	Subject Expert	
2	Dr. Vijay Rathod	Subject Expert	

Program Title			Diploma in Electronics & Telecommunication Engineering														
Course Code			Course Title			BASIC ELECTRONICS								Course Type		Semester	
23102														DSC		1	
Learning Scheme						Assessment Scheme											
Actual Contact Hrs./Week			SLH	NLH	CREDITS	THEORY				PRACTICAL				SLA		Total	
CL	TL	LL				FA	SA	Total		FA		SA					
								Max	Min	Max	Min	Max	Min	Max	Min		
3	---	2	1	6	3	30	70	100	40	25	10	50	20	25	10	200	
1) IKS of 3 hrs. 2) Theory paper duration 3 hrs. 3) Theory paper assessment is Internal and External. 4) The assessment of Practical is Internal and External. 5) Formative Assessment out of 30 marks is average of 2 periodical tests (PT). 6) The assessment of Self Learning is Internal.																	

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 applications.

COURSE OUTCOMES ::--_The student will be able to

Semester	1	Subject	Basic Electronics
CO 102		2nd Course In Semester One	
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	2nd Course In Semester One								
CO 102	P01	P02	P03	P04	P05	P06	P07	PSO 1	PSO 2
CO 102.1	3	2	1	2	-	1	1	2	0
CO 102.2	3	-	2	1	1	1	-	2	0
CO 102.3	3	2	2	2	1	-	1	2	0
CO 102.4	1	2	2	2	1	2	-	2	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	10	0
CORRELATION LEVEL	03	02	02	02	01	01	01	2	0

TABLE TO DECIDE CORRELATION LEVELS

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

	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).	10	04	06	---	10	CO 102.1
1.6	Types of Semiconductors :						
1.6.1	Intrinsic semiconductor.						
1.6.2	Extrinsic Semiconductor, Semiconductor Doping, N type Semiconductor, P type Semiconductor.						
1.7	Drift Current, Diffusion Current.						
1.8	Semiconductor theory in Indian Knowledge. System.--- Aryabhata, Acharya Kashyapa, Kannad, Dr. C.V. Raman.						
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.						
3	SPECIAL DIODES						
3.1	Zener diode, Photo Diode, Symbol, Operation, VI characteristics, Specifications, Applications.						
3.2	Comparison between PN junction diode, Zener diode, Photo Diode.						
		04	03	05	02	10	CO 102.2 CO 102.3

	Section -- 2						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
4	DIODE IN WAVESHAPING CIRCUIT						
4.1	Clipper, Clamper Definition, Use, Types.	07	03	05	04	12	CO 102.4 CO 102.5
4.2	Series & Parallel Clipper Types - Positive & Negative Clipper Definition, Operation, waveforms.						
4.3	Bias Clipper -- Definition & types. Parallel Bias Positive Clipper. Parallel Bias Negative Clipper. Double Bias Clipper Definition, Operation, waveforms, problem based on clippers.						
4.4	Positive & Negative Clamper Definition, Operation, Waveforms.						
5	DIODE IN RECTIFIER CIRCUIT						
5.1	Block diagram of DC regulated power supply.	11	05	05	05	15	.CO 102.4 CO 102.5 CO 102.6
5.2	Rectifiers Definition, need						
5.3	Classification of rectifier circuits :						
5.3.1	Half wave rectifier operation & waveforms merits and demerits of HWR.						
5.3.2	Full wave Center tapped rectifier operation & waveforms merits and demerits of FWR.						
5.3.3	Full wave Bridge rectifier operation & waveforms merits and demerits.						
5.4	Definition & formulas of parameters of rectifiers. (No derivation) Idc, Vdc, Irms Vrms, ripple factor, TUF, PIV, Rectification efficiency, Voltage regulation.						
5.5	Basic Problems / Examples.						
5.6	Compare Rectifier circuit.						
6	FILTERS						
6.1	Introduction, need and types.	04	03	05	---	08	CO 102.4 CO 102.5 CO 102.6
6.2	Capacitor, Inductor, π filter.						
6.2.1	Operation of filter with FWR.						
6.2.2	Advantages & disadvantages.						
6.3	Comparison of C, L and, π filters.						

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 π Filter & plot output wave forms.	CO 102.4 CO 102.5 CO 102.6	6

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.	Introduction to electronics	10	04	06	---	10
2.	Semiconductor diode	09	05	07	03	15
3.	Special diodes	4	03	05	02	10
	Section -- 2					
4.	Diode in wave shaping circuit	07	03	05	04	12
5.	Diode in rectifier circuit	11	05	05	05	15
6.	Filters	04	03	05	----	08
	Total	45	23	33	14	70
Legends :: R ::- Remember , U ::- Understand , A ::-Application						
This specification table provides guideline to teacher to teach & assess student also a general guideline to frame theory paper which student have to undertake. The actual distribution of marks at different taxonomy level in the question paper may vary from above table.						

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 development of writing skills.

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. Sinusoidal Wave: VP-P=6V and Time period T= 3 microsec. 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.	CO 102.4
7.	Simulate Full wave bridge rectifier using simulation tool.	CO 102.4 , CO 102.5 , CO 102.6
8.	Simulate Full wave Center tapped rectifier using simulation tool.	CO 102.4 , CO 102.5 , CO 102.6
9.	Build circuit of a power supply for LED Lighting.	CO 102.4 , CO 102.5 , CO 102.6
10.	Build circuit of for removing extra voltage from given input signal.	CO 102.4 , CO 102.5 , CO 102.6

REFERENCES

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

E REFERENCES :-

- <https://www.electronics-tutorials.ws/>
- <https://electronicsforu.com/resources/electronic-devices-and-circuit-theory>
- <http://www.electroniccomponents.com>
- <http://www.electronics-tutorials.ws>
- <http://www.electricaltechnology.org>
- https://econtent.msbte.edu.in/econtent/econtent_home.php



ST. XAVIER'S TECHNICAL INSTITUTE

To Nurture the Joy of Excellence in the World of High Technology

CURRICULUM FOR FUNDAMENTAL OF ELECTRICAL NETWORKS

Document Number: PBoS-2324-AUG-23103-00

REV. NO.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
00	11/08/2023	FUNDAMENTAL OF ELECTRICAL NETWORKS	SRB	VRR	SBG

EXECUTIVE SUMMARY

Fundamentals of electrical technology introduce the basic principles governing electricity, circuits, and electrical systems. At its core, the field focuses on how electrical energy is generated, controlled, and used in practical applications.

Electricity is based on the movement of electric charge, typically carried by electrons in a conductor. Key quantities include voltage (the potential difference driving current), current (the flow of charge), and resistance (the opposition to current flow). These are related through Ohm's Law, which states that voltage equals current multiplied by resistance.

Electrical circuits are the backbone of the subject and are categorized mainly into direct current (DC) and alternating current (AC) systems. DC circuits provide a constant flow of current in one direction, while AC circuits involve current that periodically reverses direction, which is widely used in power systems due to its efficiency in transmission.

Basic circuit components include resistors, capacitors, and inductors:

- Resistors limit current flow.
- Capacitors store electrical energy in an electric field.
- Inductors store energy in a magnetic field.

Analysis techniques such as Kirchhoff's Laws help determine current and voltage in complex circuits. These laws are essential for solving network problems and designing electrical systems.

Overall, the fundamentals of electrical technology provide the foundation for advanced study in areas such as Units, power systems, electronics, control systems, and communication engineering, enabling the development and maintenance of modern electrical infrastructure.

Curriculum Development Committee Members

Sr. No.	Faculty Members	Role of Faculty	Signatures
1	Mr. Sanjiv Borkar	Subject Expert	
2	Mr. Anil Gurav	Subject Expert	

Program Title			Diploma in Electronics & Telecommunication Engineering													
Course Code 23103			Course Title		FUNDAMENTAL OF ELECTRICAL NETWORK								Course Type		Semester	
													DSC		1	
Learning Scheme					Assessment Scheme											
Actual Contact Hrs./Week			HTS	NLN	CREDITS	THEORY				PRACTICAL				SLA		Total
CL	TL	LL				FA	SA	Total		FA		SA				
								Max	Min	Max	Min	Max	Min	Max	Min	
3	---	2	3	8	4	30	70	100	40	25	10	50	20	25	10	200
1) IKS of 3hrs. 2) Theory paper duration 3 hrs. 3) Theory paper assessment is Internal and External. 4) The assessment of Practical is Internal and External. 5) Formative Assessment out of 30 marks is average of 2 periodical tests (PT). 6) The assessment of Self Learning is Internal.																

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 ::-- The student will be able to

Semester	1	Subject	Fundamental of Electrical Network
CO 103		3 rd Course In Semester One	
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	3rd Course In Semester One								
CO 103	PO1	PO2	PO3	PO4	PO5	PO6	PO7	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	06	0
CORRELATION LEVEL	3	1	1	2	1	1	1	2	0

TABLE TO DECIDE CORRELATION LEVELS

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

	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)	06	06	04	---	10	CO 103.1
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.						
1.4	Indian Knowledge System. -- Aryabhatt, C. V. Raman, S. N. Bose, Homi Bhabha.						
2	AC FUNDAMENTALS						
2.1	Generation of Single-phase AC current and voltage sinusoidal wave.	07	04	08	---	12	CO 103.2
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.						
3	CAPACITOR						
3.1	Construction, working principle of parallel plate capacitor and its charge equation.	08	02	06	05	13	CO 103.3
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).						

	Section -- 2						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
4	FUNDAMENTAL OF AN ELECTRICITY						
4.1	Definition of an electricity Different parameters of electricity with units (definitions, units),	08	04	06	02	12	CO 103.4
4.2	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).						
5	DC NETWORK THEOREMS						
5.1	Basic elements of dc network.	09	02	04	07	13	CO 103.5
5.2	Types of network.						
5.3	Kirchhoff’s current law, Kirchhoff’s voltage law statements examples.						
5.4	Nodal and Mesh analysis methods (simple problems).						
5.5	Superposition theorem: (statement, procedure, simple problem).						
5.6	Thevenin’s theorem: (statement, procedure, problem).						
5.7	Norton’s theorem: (statement, procedure, problem).						
5.8	Maximum power transfer theorem: (statement, example).						
6	ELECTROMAGNETISM						
6.1	Different parameters of magnetic circuit.	07	04	06	---	10	CO 103.6
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.						

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	Topics	Periods Hrs.	Marks Distribution for Theory Paper setting			
			R	U	A	Total Marks
	Section -- 1					
1.	Units And Measurements	06	06	04	00	10
2.	AC Fundamentals	07	04	08	00	12
3.	Capacitor	08	02	06	05	13
	Section -- 2					
4.	Fundamental of an Electricity.	08	04	06	02	12
5.	DC Network Theorems.	09	02	04	07	13
6.	Electromagnetism	07	04	06	00	10
	Total	45	22	34	14	70
Legends :: R ::- Remember , U ::- Understand , A ::-Application						
This specification table provides guideline to teacher to teach & assess student also a general guideline to frame theory paper which student have to undertake. The actual distribution of marks at different taxonomy level in the question paper may vary from above table.						

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

The above strategy can be followed in the classroom teaching-learning process as well as extensively during the tutorial / 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
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 (ie. 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	2 nd	2008	S Chand & Co. Ramnagar, New Delhi
2.	B. H. Deshmukh	Element of Electrical Engineering	5 th	2022	Nirali Prakashan
3.	V. N. Mittale	Basic Electrical Engg.	2 nd	2017	Tata McGraw-Hill
4.	V. K. Mehta	Basic Elect Engg	Revised Ed	2006	S. Chand &Company
5.	R. K. Gaur and S. L. Gupta	Engineering Physics		2012	Dhanpat Rai Publication New delhi
6.	P. G. Kshirsagar & M. N. Avandhunul	A text book of Engg Physics	11 th	2018	S Chand and Co. Ramnagar, New Delhi

E REFERENCES :-

- www.onlinelibrary.wiley.com
- www.electrical-technologies.com
- <http://www.electroniccomponents.com>
- <http://www.electricaltechnology.org>
- <http://www.electrical4u.com>
- https://econtent.msbtte.edu.in/econtent/econtent_home.php



ST. XAVIER'S TECHNICAL INSTITUTE

To Nurture the Joy of Excellence in the World of High Technology

CURRICULUM FOR INTRODUCTION TO IT

Document Number: PBoS-2324-AUG-23104-00

REV. NO.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
00	11/08/2023	INTRODUCTION TO IT	SG	VRR	SBG



EXECUTIVE SUMMARY

The Introduction to IT provides a foundational understanding of Information Technology, focusing on essential computer concepts, software tools, and modern digital technologies. It is designed to equip students with practical skills required for academic, professional, and everyday digital tasks. The syllabus begins with an introduction to basic IT concepts, including the evolution of computers, functional components, and key terminologies such as hardware, software, and firmware. Students gain familiarity with input/output devices, storage systems, and operating systems, including their functions and booting processes. The course then develops hands-on skills in operating systems, particularly DOS and Windows, covering file management, system utilities, and basic commands. It also introduces students to the Internet and World Wide Web, highlighting services such as email, search engines, online learning, and digital communication platforms. A major focus is placed on office productivity tools, including Microsoft Word, Excel, PowerPoint, and Access, along with their Google Workspace equivalents. Students learn document creation, data management, spreadsheet analysis, presentations, and basic database operations, enabling them to handle real-world tasks efficiently. Additionally, the syllabus includes practical digital skills such as file conversion, scanning, cloud storage, and online collaboration tools like Google Drive and Microsoft Teams. Students also gain experience in creating digital content such as forms, templates, and presentations. Finally, the course introduces emerging technologies associated with Industry 4.0, including the Internet of Things (IoT), Artificial Intelligence (AI), machine learning, and cyber-physical systems, providing awareness of current technological trends and future applications.

Overall, this subject builds a strong IT foundation, combining theoretical knowledge with practical competencies, preparing students to effectively use digital tools and adapt to evolving technological environments.

Curriculum Development Committee Members

Sr. No.	Faculty Members	Role of Faculty	Signatures
1	Mrs. Surbhi Gaoshinde	Subject Expert	
2	Dr. Mahesh Munde	Subject Expert	

Program Title			Diploma in Electronics & Telecommunication Engineering														
Course Code			Course Title			INTRODUCTION TO IT								Course Type		Semester	
23104														SEC		1	
Learning Scheme						Assessment Scheme											
Actual Contact Hrs./Week			SLH	NLH	CREDITS	THEORY				PRACTICAL				SLA		Total	
CL	TL	LL				FA	SA	Total		FA		SA					
								Max	Min	Max	Min	Max	Min	Max	Min		
---	---	2	2	4	2	---	---	---	---	25	10	50	20	25	10	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 Online Practical assessment is Internal. 5) Formative Assessment out of 30 marks is average of 2 periodical tests (PT). 6) The assessment of Self Learning 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 ::--- The student will be able to

Semester	1	Subject	Introduction to IT
CO 104	4 th Course In Semester One		
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	4 th Course In Semester One								
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	2
CO 104.5	3	1	2	2	1	1	-	1	2
CO 104.6	3	1	2	-	-	2	-	1	2
CO TOTAL	16	07	10	07	02	07	00	02	09
CORRELATION LEVEL	3	1	2	1	0	1	0	1	2

TABLE TO DECIDE CORRELATION LEVELS

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

	Section -- 1						
Chapter No.	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1	INTRODUCTIONS TO IT						
1.1	Basic concepts of Information Technology.						
1.2	Applications of Information Technology: In Home, education & Training, Entertainment, Science, Technology, Medicine, Engineering.						
1.3	Evolution of Computer & Generations of Computers.						
1.4	Functional block diagram of a computer						
1.5	Terminologies: Hardware, Software, Firmware	---	---	---	---	---	CO 104.1
1.6	Peripherals: Keyboard, monitor, printer, Scanner, Trackpad.						CO 104.2
1.7	Storage devices: RAM, ROM, CD, DVD, Pen drive USB Drive, Portable Disk.						
1.8	Introduction to operating system What is operating system? Need for OS, types of operating system, functions of operating system, booting concepts, BIOS, POST						
2	WORKING WITH DOS & 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. Find Utility: To search file by name.	---	---	---	---	---	CO 104.2
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.						
3	INTERNET						
3.1	Internet Services: Email, Messenger, Newsgroups, Search engines, Forums, Online Shopping, E- learning.	---	---	---	---	---	CO 104.3
3.2	Introduction to World Wide Web.						CO 104.5
4	MICROSOFT WORD						
4.1	Introduction to MS word: Features of MS word.						
4.2	Working with word document. Edit menu, View, Format, Tools Table, Printing Document.	---	---	---	---	---	CO 104.4
4.3	Google Docs.						
5	MICROSOFT EXCEL						
5.1	Introduction to Microsoft Excel: Features of Microsoft excel.						
5.2	Working with worksheet: Entering data, editing worksheet, creating formulas and auditing & formatting work sheet,	---	---	---	---	---	CO 104.4
5.3	Google Sheets.						

	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.						CO 104.4
6.2	Understanding the various views in power point.	---	---	---	---	---	
6.3	Slide view Outline view Slide sorter view Notes pageview Slide show view. Slide Transition Custom animation. Google Slides.						
7	MICROSOFT ACCESS						
7.1	Introduction to MS-Access. How to create table in MS- Access. How to Create a database.						CO 104.5
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).						
8	ACCESSORIES						
8.1	Scanning (document, photo, signature).						CO 104.6
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.						
9	TECHNOLOGIES ASSOCIATED WITH I4.0						
9.1	Cyber physical system.						CO 104.6
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).						

LIST OF LABORATORY EXPERIENCES

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

IMPLEMENTATION STRATEGY:

- 1) Teaching 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, presentation skill.

SUGGESTED LIST OF MICROPROJECTS

Micro project could be group based. A suggestive list of microproject could be added by concern faculty. Assessment done by project guide based on their performance, presentation of minimum three to five assignments & submission.

SR. NO.	TITLE
1	Prepare the chart of Computer parts (Hardware , Software) & theirs details .
2	Make the word documents on subject suggested by teacher.
3	Make the PPT presentation as case study on subject suggested by teacher.

REFERENCES

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

E REFERENCES :-

- <https://bookauthority.org>
- <https://bookboon.com>
- <https://slidshare.com>
- https://econtent.msbte.edu.in/econtent/econtent_home.php



ST. XAVIER'S TECHNICAL INSTITUTE

To Nurture the Joy of Excellence in the World of High Technology

CURRICULUM FOR ENVIRONMENTAL SCIENCE

Document Number: PBoS-2324-AUG-23105-00

REV. NO.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
00	11/08/2023	ENVIRONMENTAL SCIENCE	VRR	VRR	SBG

EXECUTIVE SUMMARY

Environmental Science introduces the fundamental concepts, principles, and practices related to the natural environment and its interaction with human activities. It focuses on understanding ecological systems, environmental issues, and sustainable solutions to protect and preserve natural resources for future generations.

At its core, Environmental Science deals with the structure and functioning of ecosystems, including the study of biotic and abiotic components and their interdependence. The subject begins with an understanding of the environment, natural resources such as air, water, soil, and energy, and their importance in sustaining life. It also emphasizes biodiversity, its conservation, and the role of ecosystems in maintaining ecological balance.

Environmental pollution forms a major area of study, including air, water, soil, and noise pollution. The causes, effects, and control measures of pollution are discussed to develop awareness and responsibility towards environmental protection. Special attention is given to global environmental issues such as climate change, global warming, ozone layer depletion, and sustainable development.

The subject also highlights environmental management practices, including waste management, renewable energy sources, conservation techniques, and environmental policies and regulations. Concepts such as sustainable development and environmental ethics are introduced to promote responsible decision-making in engineering and daily life.

Practical learning plays an important role in this subject, involving activities such as environmental surveys, awareness programs, and case studies that help students understand real-world environmental challenges and solutions.

Overall, Environmental Science provides a strong foundation for developing environmental awareness, sustainability practices, and responsible citizenship, enabling students to contribute effectively towards environmental protection and sustainable development.

Curriculum Development Committee Members

Sr. No.	Faculty Members	Role of Faculty	Signatures
1	Dr. Vijay Rathod	Subject Expert	
2	Mrs. Sanchita Datta	Subject Expert	

Program Title			Diploma in Electronics & Telecommunication Engineering															
Course Code			Course Title			ENVIRONMENTAL SCIENCE										Course Type		Semester
23105																VEC		1
Learning Scheme						Assessment Scheme												
Actual Contact Hrs./Week			SLH	NLH	CREDITS	THEORY				PRACTICAL				SLA		Total		
CL	TL	LL				FA	SA	Total		FA		SA						
								Max	Min	Max	Min	Max	Min	Max	Min			
1	---	---	1	2	1	---	---	---	---	---	---	---	---	50	20	50		
	1) IKS 2 hrs. 2) The assessment of Self Learning 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 :-- Student should able to

Semester	1	Subject	Environmental Science
CO 105		5 th Course In Semester One	
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 Semester One								
CO 105	P01	P02	P03	P04	P05	P06	P07	PS0 1	PS0 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	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

	Section -- 1						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1	MAN AND ENVIRONMENT						
1.1	Dimensions of environment- physical, biological and social	3	---	---	---	---	CO 105.1
1.2	Human being as a rational and social partner in environmental actions.						
1.3	Society and environment in India; Indian traditions, customs and culture - past and present.						
1.3	Population and environment						
1.4	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.						
1.4	Indian Knowledge System – Sant Tukaram, Sant Dyaneshwar, Sundarlal Bhauguna.						
2	ENVIRONMENT AND DEVELOPMENT						
2.1	Economic and social needs – as basic considerations for development.	4	---	---	---	---	CO 105.2 CO 105.3
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 Impact of development on environment – changing pattern of land use; land reclamation, resource depletion, pollution and environmental degradation.						
2.4	Role of society in development and environment - public awareness through education, eco -club, population education programme, campaigns, public participation in decision making.						
2.5	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.	4	---	---	---	---	CO 105.4 CO 105.5
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 & environmental consequences of their use 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 & their environmental consequences, need to promote non-conventional energy sources.						
3.5	Conservation of energy sources - efficiency in production, transportation and utilization of energy.						
3.6	Planning and management of energy; future sources of energy - hydrogen, alcohol, fuel cells. Enhancing efficiency of the devices 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	---	---	---	---	CO 105.5 CO 105.6
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 & animals Disasters natural (earthquakes, droughts, floods, cyclones, landslides, tsunamis, avalanches) and man-made (technological & industrial); their impact on the environment; prevention, control & mitigation.						
4.7	Strategies for reducing pollution and improving environment.						

Self Learning: SLA shall consist of minimum Three 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 Global Warming Alternative Energy Resources
- 7) Renewable Energy Resources
- 8) Biodiversity and its Conservation
- 9) Social Issues and Environment
- 10) Human Population and the Environment
- 11) Multidisciplinary Nature of Environment Studies
- 12) Pollution
- 13) Ecosystems
- 14) Noise Pollution and its Adverse Effects
- 15) Disaster Management
- 16) Bio-geographical Classification of India
- 17) Use of Modern Technology in Environment Conservation
- 18) Types of Environmental Pollution

For SLA which students have to prepare 3 individual Microsoft Word Document files / Microsoft PowerPoint Presentation files for each topic of project or assignment and present the same to the class, as well as submit these completed assignments to the assigned staff member

IMPLEMENTATION STRATEGY

- 1) Teaching / Practical plan
- 2) Use of PowerPoint slide shows and videos
- 3) Minimum number of projects/assignments

REFERENCES

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address
1.	Erach Bharucha,	Text Book of Environmental Studies	5 th	2006	Universities Press/Orient Black
2.	Jagdish K., R J Ranjit Daniels	Environmental Studies	3 rd	2011	Wiley India Private Ltd. New Delhi
3.	Anindita Basak	Environmental Studies	2 nd	2010	Pearson
4.	Benny Joseph	Environmental Studies	2 nd	2018	Tata McGRAW HILL
5.	D L Manjunath	Environmental Studies	3 rd	2009	Pearson
6.	R Rajgopalan	Environmental Studies	7 th	2001	Oxford
7.	Alok Debi	Environmental Science and Engineering	4 th	2000	University Press

E REFERENCES :-

- National Geographic
- ScienceDaily TED Talks: Environment
- https://econtent.msbtte.edu.in/econtent/econtent_home.php



ST. XAVIER'S TECHNICAL INSTITUTE

To Nurture the Joy of Excellence in the World of High Technology

CURRICULUM FOR COMMUNICATION SKILLS

Document Number: PBoS-2324-AUG-23106-00

REV. NO.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
00	11/08/2023	COMMUNICATION SKILLS	CD	VRR	SBG



EXECUTIVE SUMMARY

Communication Skills introduces the fundamental principles and techniques required for effective interaction in academic, professional, and social environments. It focuses on developing the ability to express ideas clearly, confidently, and appropriately through both verbal and non-verbal forms of communication.

At its core, communication involves the exchange of information through speaking, listening, reading, and writing. The subject begins with the basics of communication processes, types of communication, and the importance of clarity, tone, and context in delivering messages effectively. Emphasis is placed on overcoming communication barriers and enhancing interpersonal skills.

The course highlights key language skills such as grammar, vocabulary, and sentence construction to improve written communication. It also introduces formal and informal communication methods, including letter writing, report writing, and professional documentation used in real-world scenarios.

Oral communication is an essential component, where students develop skills in public speaking, presentations, group discussions, and interviews. Special attention is given to pronunciation, body language, and confidence building to ensure effective delivery of ideas.

Listening and comprehension skills are also strengthened to help students interpret information accurately and respond appropriately. Interactive activities and practical exercises are included to enhance participation and real-life application.

Practical learning plays a vital role in this subject, encouraging students to engage in role plays, presentations, and teamwork activities that simulate workplace communication scenarios.

Overall, Communication Skills provides a strong foundation for personal and professional development, enabling students to communicate effectively, collaborate efficiently, and succeed in academic, industrial, and social environments.

Curriculum Development Committee Members

Sr. No.	Faculty Members	Role of Faculty	Signatures
1	Ms. Chevron De'Souza	Subject Expert	
2	Mrs. Janani Natarajan	Subject Expert	

Program Title			Diploma in Electronics & Telecommunication Engineering														
Course Code			Course Title			COMMUNICATION SKILLS								Course Type		Semester	
23106														AEC		1	
Learning Scheme						Assessment Scheme											
Actual Contact Hrs./Week			SLH	NLH	CREDITS	THEORY				PRACTICAL				SLA		Total	
CL	TL	LL				FA	SA	Total		FA		SA					
								Max	Min	Max	Min	Max	Min	Max	Min		
2	---	2	--	4	2	---	---	---	---	25	10	---	---	---	---	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) Formative Assessment out of 30 marks is average of 2 periodical tests (PT). 5) The assessment of Self Learning is Internal.																

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: --- The student will be able to

Semester	1	Subject	Communication Skills
CO 106		6 th Course In Semester One	
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 Semester One								
CO 106	P01	P02	P03	P04	P05	P06	P07	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	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

	Section -- 1						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1	APPLIED GRAMMAR AND LEXIS						
1.1	Parts of speech.	11	---	---	---	---	CO 106.1 CO 106.2
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.						
2	PRINCIPLES OF COMMUNICATION						
2.1	Basics of communication: Introduction, definition and process of communication.	05	---	---	---	---	CO 106.3
2.2	Concept of the types of communication: Formal and informal. Verbal and non-verbal. Written and oral. 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: Voice modulation, Clarity, Intonation, Word stress, Time, Simplification of words.						

	Section -- 2						
Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
3	PROFESSIONAL WRITING						
3.1	The art of precise writing.	05	---	---	---	---	CO 106.4
3.2	Letter Writing – Formal and Informal.						
3.3	Drafting emails, notices and minutes of a meeting.						
3.4	Online form filling.						
4	LISTENING SKILLS AND COMPREHENSION						
4.1	Introduction to listening skills.	11	---	---	---	---	CO 106.5 CO 106.6
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.						

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 / practical class by the teacher.

LIST OF TUTORIAL ASSIGNMENT/ EXPERIENCES

SR. NO.	TITLE	COURSE OUTCOME	CHAPTER NO
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	1 &2
2.	Idioms and Collocations (04 Hours) Use of Idioms and Collocations in sentences (20 Examples).	CO 106.2	1 & 2
3.	Introduction to Phonetics (04 Hours) Sounds: consonant, vowel, diphthongs Transcription of words (IPA) Syllable division.	CO 106.2	2 &3
4.	Listen and Pronounce (04 Hours) Listen to the audio track and record your pronunciation. Repeat sound/words /sentences on Language Lab software after listening to them. Introduction to recorded lectures, interviews and speeches.	CO 106.5	4
5.	Speaking Skills (12 Hours) Group discussion a) Oral presentations b) Conversation practice c) Role playing d) Introduction to mock interviews and business presentations	CO 106.5	4

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

E REFERENCES :-

- <https://www.english-tutorials.ws/>
- <https://www.youtube.com/watch?v=4Rl-QpqWQ>
- <https://www.nptl.com/>
- https://econtent.msbtte.edu.in/econtent/econtent_home.php



ST. XAVIER'S TECHNICAL INSTITUTE

To Nurture the Joy of Excellence in the World of High Technology

CURRICULUM FOR PROFESSIONAL PRACTICES

Document Number: PBoS-2324-AUG-23107-00

REV. NO.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
00	11/08/ 2023	PROFESSIONAL PRACTICES	VRR	JN	SBG

EXECUTIVE SUMMARY

The Professional Practices course is designed to equip first-year Diploma students in Electronics and Telecommunication with essential non-technical competencies required to succeed in modern industry environments. In the context of globalization and increasing competition, technical knowledge alone is insufficient; employers seek candidates with confidence, effective communication skills, teamwork ability, and a positive professional attitude.

This course provides a structured platform for students to develop these attributes through experiential learning. Activities such as industrial visits expose students to real-world engineering practices, organizational culture, and current technologies used in the electronics and telecommunication sector. Expert lectures bridge the gap between academic learning and industry expectations, offering insights into emerging trends and career opportunities. Seminars on technical topics enhance presentation skills and deepen conceptual understanding, while group discussions foster critical thinking, collaboration, and interpersonal communication.

By engaging in these activities, students build self-confidence, improve their professional behavior, and develop readiness for campus interviews and competitive selection processes. The course thus plays a foundational role in shaping well-rounded diploma graduates who can effectively integrate into the workforce and contribute productively to the industry from the early stages of their careers.

Curriculum Development Committee Members

Sr. No.	Faculty Members	Role of Faculty	Signatures
1	Dr. Vijay Rathod	Subject Expert	
2	Dr. Janani Natarajan	Subject Expert	

Program Title			Diploma in Electronics & Telecommunication Engineering																
Course Code			Course Title			PROFESSIONAL PRACTICES										Course Type		Semester	
23107																AEC		1	
Learning Scheme						Assessment Scheme													
Actual Contact Hrs./Week			SLH	NLH	CREDITS	THEORY				PRACTICAL				SLA		Total			
CL	TL	LL				FA	SA	Total		FA		SA							
								Max	Min	Max	Min	Max	Min	Max	Min				
2	---	---	2	4	2	---	---	---	---	---	---	---	---	25	10	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) Formative Assessment out of 30 marks is average of 2 periodical tests (PT). 5) The assessment of Self Learning is Internal.																		

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 :-- The student will be able to

Semester	1	Subject	Professional Practices
CO 107		7 th Course In Semester One	
CO 107.1		Develop confidence to be able to work effectively in a professional environment	
CO 107.2		Acquire information from different sources.	
CO 107.3		Interpret the data acquired from different sources.	
CO 107.4		Prepare reports on industrial visit, expert lecture or for a given topic.	
CO 107.5		Present given topic in a seminar.	
CO 107.6		Interact with peers to share thoughts.	

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

SEM I	Professional Practices								
CO 107	7 th Course In Semester One								
CO 107	P01	P02	P03	P04	P05	P06	P07	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	2	2	3	3	1	1

TABLE TO DECIDE CORRELATION LEVELS

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

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 (Cable layout, devices used/software/costing).	10	---	---	---	---	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 similar 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	6	---	---	---	---	CO 107.3 CO 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	7	---	---	---	---	CO 107.2 CO 107.3 CO 107.4 CO 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: 1) Current issues 2) Load shedding and remedial measures Use of mobile in college campus	7	---	---	---	---	CO 107.5 CO 107.6

LIST OF ASSIGNMENTS/ EXPERIENCES

EXP. NO.	TITLE	COURSE OUTCOME MAPPING
1.	Aim in life and reason/ purpose of joining the engineering field	CO107.1
2.	Use/ objective of providing listing of reference books in the syllabus	CO107.2
3.	Presentation planning, requirements and giving presentation on any technical topic	CO107.3
4.	Group discussion on any topic related to current issues	CO107.5
5.	Group discussion on any topic related to current issues	CO107.6
6.	Writing/ providing "References" for research papers and presentations	CO107.2
7.	Purpose of "back index" and using/reading the same in text books/ reference books	CO107.2
8.	Making/ writing notes from reference books	CO107.4
9.	Writing Bio-data, CVs and Resume	CO107.1

Self Learning: SLA shall consist of minimum Three project assignments

(Project assignments shall be designed on the topics mentioned in the syllabus or on current issues related to activity conducted in class or in workshops)

REFERENCES

Sr. No.	Author	Title	Publisher & Address
1.	MSBTE, Mumbai	Text book of Communication Skills	MSBTE, Mumbai
2.	M. Ashraf Rizvi	Effective Technical communication	Tata McGraw Hill
3.	David Green	Contemporary English grammar, structures and composition	Macmillan
4.	R. C. Jain	English grammar and composition	Macmillan
5.	Rodgers	Thesaurus	Oriental Longman
6.	Oxford	Dictionary	Oxford University
7.	Longman	Dictionary	Oriental Longman

E REFERENCES :-

- <https://swayam.gov.in/>
- <https://nptel.ac.in/>
- <https://www.springboard.com/>
- https://econtent.msbt.edu.in/econtent/econtent_home.php



ST. XAVIER'S TECHNICAL INSTITUTE

To Nurture the Joy of Excellence in the World of High Technology

CURRICULUM FOR SPORTS AND YOGA

Document Number: PBoS-2324-AUG-23108-00

REV. NO.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
00	11/08/2023	SPORTS AND YOGA	AAP	VRR	SBG



EXECUTIVE SUMMARY

Sports and Yoga introduces the fundamental principles, practices, and importance of physical fitness and mental well-being in everyday life. It focuses on developing a healthy lifestyle through physical activities, discipline, and awareness of body and mind coordination.

At its core, this subject emphasizes the role of physical exercise in improving strength, flexibility, endurance, and overall health. It begins with basic physical fitness activities and sports that enhance coordination, teamwork, and sportsmanship among students. Different types of exercises and games are introduced to promote active participation and physical development.

Yoga forms a significant component of the subject, focusing on the integration of body, mind, and breath. Students are introduced to various yogic practices including asanas (postures), pranayama (breathing techniques), and relaxation methods. These practices help in improving concentration, reducing stress, and maintaining emotional balance.

The subject also highlights the importance of discipline, regular practice, and healthy habits. Knowledge of basic rules of sports, injury prevention, and safety measures is included to ensure safe participation in physical activities.

Practical learning plays a vital role, where students actively participate in sports activities and yoga sessions to experience their benefits firsthand. Activities such as drills, exercises, and guided yoga practices help in developing confidence, coordination, and mental clarity.

Overall, Sports and Yoga provide a strong foundation for maintaining physical fitness and mental wellness, encouraging students to adopt a balanced lifestyle and promoting long-term health, teamwork, and self-discipline.

Curriculum Development Committee Members

Sr. No.	Faculty Members	Role of Faculty	Signatures
1	Mr. Abhijit Patil	Subject Expert	
2	Dr. Vijay Rathod	Subject Expert	

Program Title			Diploma in Electronics & Telecommunication Engineering														
Course Code			Course Title			SPORTS & YOGA								Course Type		Semester	
23108														VEC		1	
Learning Scheme						Assessment Scheme											
Actual Contact Hrs./Week			SLH	NLH	CREDITS	THEORY				PRACTICAL				SLA		Total	
CL	TL	LL				FA	SA	Total		FA		SA					
Max	Min					Max	Min	Max	Min	Max	Min	Max	Min	Max	Min		
---	---	2	---	2	1	---	---	---	---	25	10	---	---	---	---	25	
	1) IKS 1hrs. 2) The assessment, Formative Assessment of Practical is Internal																

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 ::--The student will be able to

Semester	1	Subject	Sports & Yoga
CO 108		8 th Course In Semester One	
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								
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	01	04	00	00	11	05	03	00	00
CORRELATION LEVEL	0	1	0	0	2	1	1	0	0

TABLE TO DECIDE CORRELATION LEVELS

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

	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.						CO
1.2	Aims & Objectives of Physical Education.	---	---	---	---	---	108.1
1.3	Changing trends in Physical Education.						CO
							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.						CO
2.5	Yoga for concentration & related Asanas (Sukhasana, Tadasana, Padmasana & Shashankasana).	---	---	---	---	---	108.2
2.6	Relaxation Techniques for improving concentration - Yog- nidra.						CO
2.7	Indian Knowledge System – Maharshi Patanjali, B.K.S. Iyengar.						108.5
							CO
							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.						CO
3.4	Back Pain: Tadasana, Ardh Matsyendrasana, Vakrasana, Shalabhasana, Bhujangasana.	---	---	---	---	---	108.2
3.5	Diabetes: Procedure, Benefits & contraindications for Bhujangasana, Paschimottasana, Pavan Muktasana, Ardh Matsyendrasana.						CO
3.6	Asthema: Procedure, Benefits & contraindications for Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana.						108.5
3.7	Paschimottasana, Matsyasana.						CO
							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.	---	---	---	---	---	CO
4.5	Tournament – Knock-Out, League/Round Robin & 3.8 Combination.						108.3
							CO
							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.						CO 108.3 CO 108.5 CO 108.6
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.						
6	DOPING						
6.1	Meaning and Concept of Doping.						CO 108.4
6.2	Prohibited Substances & Methods.	---	---	---	---	---	
6.3	Side Effects of Prohibited Substances.						
7	SPORTS MEDICINE						
7.1	First Aid – Definition, Aims & Objectives.						CO 108.5 CO 108.6
7.2	Sports injuries: Classification, Causes & Prevention.	---	---	---	---	---	
7.3	Management of Injuries: Soft Tissue Injuries and Bone & Joint Injuries.						
8	SPORTS / GAMES						
8.1	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. • History of the Game/Sport. • Latest General Rules of the Game/Sport. • Specifications of Play Fields and Related Sports Equipment. • Important Tournaments and Venues. Sports Personalities. Proper Sports Gear and its Importance.	---	---	---	---	---	CO 108.5 CO 108.6

For term work students have a complete minimum three activities like online yoga, sport management, participation in inter college leagues etc. Submit these completed assignments (reports, certificates) to the assigned staff member

REFERENCES:

Sr.No.	Author	Title	Edition	Year of Publication	Publisher & Address
1	B. K. S. Iyengar.	Light on Yoga	10 th	1992	Harper Collins, India
2	B. K. S. Iyengar.	Iyengar Yoga for Beginners	4 th	2006	Dorling Kindersley
3	Prof. Ajmer Singh.	Modern Trends and Physical Education	1 st	2019	Kalyani

E REFERENCES :-

- https://econtent.msbte.edu.in/econtent/econtent_home.php



ST. XAVIER'S TECHNICAL INSTITUTE

To Nurture the Joy of Excellence in the World of High Technology

CURRICULUM FOR EXPERIMENTAL LEARNING

Document Number: PBoS-2324-AUG-23109-00

REV. NO.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
00	11/08/2023	EXPERIMENTAL LEARNING	SAD	VRR	SBG

EXECUTIVE SUMMARY

Experimental Learning is an ability enhancement course designed to help students develop practical skills, professional confidence, and social awareness required for success in technical education and industry. The course focuses on real-world learning experiences beyond classroom teaching and encourages students to actively participate in activities that improve communication, teamwork, and professional behaviour.

The main objective of this course is to prepare students for future career opportunities by exposing them to various professional environments and learning platforms. Students participate in activities such as visits to centres of excellence, IT industries, and environmental sites, where they observe practical applications of technology and submit detailed reports based on their observations. These activities help students understand industrial practices and develop teamwork skills.

The course also introduces students to modern online learning platforms such as SWAYAM, NPTEL, and other Massive Open Online Courses (MOOCs). Students are encouraged to explore these platforms to enhance their technical knowledge and support lifelong learning. Career guidance and mentoring form an important component of this course. Expert sessions provide information about career options after completing a diploma, including higher education opportunities and employment in private and government sectors. Additionally, counselling sessions promote awareness about social responsibilities, cyber safety, workplace ethics, and gender sensitivity, helping students become responsible citizens.

Curriculum Development Committee Members

Sr. No.	Faculty Members	Role of Faculty	Signatures
1	Mrs. Sanchita Datta	Subject Expert	
2	Dr. Vijay Rathod	Subject Expert	

Program Title			Diploma in Electronics & Telecommunication Engineering														
Course Code			Course Title			EXPERIMENTAL LEARNING								Course Type		Semester	
23109														AEC		1	
Learning Scheme						Assessment Scheme											
Actual Contact Hrs./Week			SLH	NLH	CREDITS	THEORY				PRACTICAL				SLA		Total	
CL	TL	LL				FA	SA	Total		FA		SA					
								Max	Min	Max	Min	Max	Min	Max	Min		
---	---	2	---	2	1	---	---	---	---	25	10	---	---	---	---	25	
1) The assessment, Formative Assessment of Practical is Internal.																	

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 :--Student should able to

Semester	1	Subject	Experimental Learning
CO 109		9th Course In Semester One	
CO 109.1		Create concern for environment & a sense of concern & responsibility related to conservation of Environment.	
CO 109.2		Explore various online courses & learning platform during Diploma.	
CO 109.3		Develop the skills as per industrial need.	
CO 109.4		Motivate the students to pursue various career after completion of Diploma.	
CO 109.5		Develop social responsibilities among themselves.	

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

SEM I	Experimental Learning								
CO 109	9 th Course In Semester One								
CO 109	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2
CO 109.1				3	3	3	3		
CO 109.2				3	3	3	3	3	3
CO 109.3				3	3	3	3		
CO 109.4				3	3	3	3		
CO 109.5				3	3	3	3		
CO TOTAL	00	00	00	15	15	15	15	3	3
CORRELATION LEVEL	0	0	0	3	3	3	3	1	1

TABLE TO DECIDE CORRELATION LEVELS

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

Chapter No	Topics	Periods	Marks				COs
		Hrs.	R	U	A	Total	
1.	VISIT TO CENTRE OF EXCELLENCE & ENVIRONMENTAL VISIT						
	• A visit to the Centre of Excellence can be arranged and report of same should be submitted by individual student to form a part of team work. • Visitany IT Industry/Computer Center and study their network • During any Industrial visit , the students can witness session on current trends and basics of wireless and mobile communication technologies through audio visuals and presentations with display of their patented Drone project, robotics based working models, microwave test benches, antenna design simulation, AI ML based software projects etc. • An Environmental visit can be arranged and report of same should be submitted by individual student to form a part of team work. Visit like Sanjay Gandhi National Park because it is a renowned natural habitat located in Mumbai, India. Spanning over a vast area, the park is home to numerous species of flora and fauna, making it a significant ecological hotspot. During this visit Students will study diverse ecosystems, including rich forests, lakes, and rocky plateaus. various flora and fauna, pollution level of various harmful gases. Students will make report on beauty and significance of National park and park's efforts in preserving the biodiversity of the region.	---	---	---	---	---	CO 109.1

2.	LECTURE FROM FIELD EXPERTS, PROFESSIONALS /INDUSTRY EXPERTS						
	• Experts, professionals are to be arranged. A brief report has to be submitted by each student to form a part of team work. • Expert Lecture on Computer Technology- Python programming, Web Designing, Mobile App development, • English speaking, SWAYAM, MOOCS, AICTE etc. • During Session for SWAYAM, MOOCS,NADL Speaker will make them aware about Massive Open Online courses available for them for which they can register and learn a particular course during their academic year along with current courses that they are learning during their academic session. Expert will give live demonstration about NADL, SWAYAM, NPTEL etc. and many more learning platforms which they can explore through which knowledge can be gained during their years to come in earning their Diploma and Degree.	---	---	---	---	---	CO 109.2
3.	SIGNIFICANCE OF OUTCOME BASED EDUCATION						
	• A lecture on Significance of Outcome Based Education, CO, PO and Vocational Training can be arranged as a part of Induction Programme where Students will be informed about Need and importance of Outcome Based Education (OBE) • Programme Educational Objectives (PEO),Guidelines for the PEOs, How to achieve the PEOs, Program Outcomes (PO),Guidelines for the POs. Ten POs related to Graduate Attributes, Course Outcomes (CO). Example of CO PO MAPPING with different correlation levels. Training ,Significance of Vocational Training and Process of completion of Vocational Training.	---	---	---	---	---	CO 109.3

4.	CAREER GUIDANCE AND MENTORING						
	• Speaker shall inform about Career options after polytechnic including the scope, job opportunities, higher degree options, best colleges. Basically there are 2 options .Going for higher studies or going for job. Going for higher studies will help student to gain more advanced knowledge in the field, further will open more career opportunities .Going for job in private or govt. sector will help student to gain experience in the field and get promoted later on the basis of expertise.	---	---	---	---	---	CO 109.4
5.	COUNSELLING FOR BOYS AND GIRLS- SOCIAL RESPONSIBILITY						
	• As a part of Induction program an Expert Lecture on Sexual Harassment of women at workplace can be arranged. Awareness about the sexual harassment in the society has become a necessity today not only for the girls but for boys too. Awareness shall help in reducing the various types of harassment. The Speaker will explain various types of harassment methods, provisions for protection against them in the law and the punishments for the same in case anyone gets booked under such provisions • Awareness will developed related to any cyber offense cyber crime etc. • Uses of technology to enhance social responsibility.	---	---	---	---	---	CO 109.5

For term work students have a complete minimum three activities & prepare Microsoft Word Document files / Microsoft PowerPoint Presentation for each activity which shows learning experience from it and present the same to the class, as well as submit these completed assignments to the assigned staff member

REFERENCES :-

- www.nptl.com
- www.infosysprin.com
- www.aicte.gov.in
- www.swayam.co.in
- https://econtent.msbtte.edu.in/econtent/econtent_home.php