MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

INSTITUTE OF ADULT EDUCATION

THE ENHANCEMENT OF ACCESS, EQUITY AND QUALITY TO SECONDARY EDUCATION THROUGH ALTERNATIVE EDUCATION PATHWAY(AEP)

PHYSICS SYLLABUS

FOR ALTERNATIVE SECONDARY EDUCATION PATHWAY

STAGE I & II

2026

Designed and prepared by;
Institute of Adult Education
Dar es Salaam
Tanzania

1.0 Introduction

Physics Syllabus for Alternative Secondary Education Pathway comprises of both Stage I (Equivalent to Form One and Two) and Stage II (Equivalent to Form Three and Four) written in a modular format. It has integrated components that originate from formal education syllabus. The integrated Syllabus has been prepared to allow learners to complete the course within two years' time. It is designed for learners outside the formal education system to enable them sit for Ordinary Certificate of Secondary Education Examination using acquired competences, both competently and professionally in their daily undertakings. The Syllabus uses Competence Based Education and Training (CBET) approach which is result-based, indicating what a learner is expected to do after completing the course.

2.0 Objectives of Education in Tanzania

The objectives of education in Tanzania are to:

a) guide the development and improvement of the personalities of the citizens of Tanzania, their human resources and effective utilization of their resources in bringing about individual and national development;

b) promote the acquisition and appreciation of culture, customs and traditions of the people of Tanzania;

c) promote the acquisition and appropriate use of literary, social, scientific, vocational, technological, professional and other forms of knowledge, skills and understanding for the development and improvement of man and society;

d) develop and promote self-confidence and an inquiring mind; an understanding and respect for human dignity and human rights and readiness to work hard for self-advancement and national improvement;

e) promote and expand the scope of acquisition, improvement and upgrading of mental, practical, productive and other skills needed to meet the changing needs of industry and the economy;

f) enable every citizen to understand and uphold the fundamentals of the National Constitution as well as the enshrined human and civil rights, obligations and responsibilities;

g) promote love and respect for work, self and wage employment and improved performance in the production and service sectors;

h) inculcate principles of national ethics and integrity, national and international cooperation, peace and justice through the study, understanding and adherence to provisions of the National Constitution and other international basic charters; and

i) enable a rational use, management and conservation of the environment.

3.0 Objectives of Secondary Education in Tanzania

The objectives of Secondary Education in Tanzania are to:

(a) strengthen, broaden and develop a deeper understanding of the knowledge, skills and attitudes developed atthe primary Education;

(b) safeguard customs and traditions, national unity, national values, democracy, respect for human and civilrights, duties and responsibilities associated with such rights;

(c) develop self-confidence and the ability to learn in various fields, including science and technology as well astheoretical and technical knowledge;

(d) improve communication using Tanzanian Sign Language (TSL), tactile communication, Kiswahili and English. The student should be encouraged to develop competence in at least one other foreign language, depending onthe school situation;

(e) strengthen accountability for cross-cutting social issues, including health, security, gender equality and sustainable environmental conservation;

(f) develop competence and various skills which will enable the student to employ himself or herself, to be employed and to manage his or her life by exploiting his or her environment well; and

(g) develop readiness to continue to Advanced secondary and tertiary education.

4.0 Objectives of Secondary Education through Alternative Education Pathway in Tanzania

The objectives of Secondary Education through Alternative Education Pathway are to:

a) provide equivalent education to children, youth and adults who could not get the opportunity in the formal education system;

b) complement government efforts of achieving Education for All (EFA) objectives;

c) cater for youth and adults who dropped out of school due to various reasons; and

d) provide education to disadvantaged and marginalized groups including girls.

5.0 General Competence for the Subject

By the end of this course, the learner will demonstrate ability to:

1. applying Physics concepts, measurements and motion in daily life;
2. analysing forces and their effects;
3. analysing mechanical properties, work, energy, power and magnetism;

4. applying the concepts of light and construction of optical instruments;
5. applying principles of static and current electricity in daily life;
6. analysing forces and simple machines;
7. applying principles and theories of temperature and renewable energy in daily life;
8. applying principles and theories of heat energy in daily life;
9. analysing emissions and enhancing electronic technologies; and
10. analysing movement and wave interactions.

6.0 Structure of the Syllabus

The Syllabus for Physics subject comprises the following:

i) **Name of the Module**
This implies set of separate units that can be joined together to form a part of a subject course of study.

ii) **Main Competence**

Main Competence implies set of skills or capabilities that learners should acquire. In this Syllabus, the main competences to be developed will be:

a) Applying knowledge of Physics in various contexts;
b) Conducting experiments in Physics and
c) Evaluating and use information in Physics

iii) **Specific Competence**

This implies a special capability to be developed by learners. In this Syllabus, the specific competences to be developed will be:

a) demonstrating mastery of basic concepts, theories and principles of Physics;

b) demonstrating mastery of basic terminologies, measurements and symbols in Physics;
c) using Mathematics to explain physical principles and phenomena;
d) demonstrating mastery of basic experimental skills in Physics;
e) demonstrating mastery of data analysis, presentation and report writing in Physics;
f) collecting, describing and relating physical data;
g) carrying out a project in Physics.

iv) **Learning Activities**

These are activities designed to bring a meaningful condition for learning.

v) **Specific Learning Outcome**

Specific learning outcome implies what learners are supposed to do after completion of a particular topic.

vi) **Suggested Facilitation and/Learning Strategy**

This part indicates what a facilitator and learners are expected to do in the process of facilitation and learning. This includes self-learning and face to face session.

vii) **Assessment Criteria**

Are specific standard or guidelines that outline what is expected.

viii) **Facilitation/Learning Resources**

These are learning and facilitation materials which are used to support the process of facilitation and learning.

ix) **Estimated Time of Study**

These are proposed hours of learning which can be used for self-study and face to face facilitation.

7.0 Number of Modules

This Syllabus contains 10 Modules namely;

Stage I

Module 1: Applying Physics Concepts, Measurements and Motion in Daily Life

Module 2: Analysing Forces and their Effects

Module 3: Analysing Mechanical Properties, Work, Energy, Power and Magnetism

Module 4: Applying the Concepts of Light and Construction of Optical Instruments

Module 5: Applying Principles of Static and Current Electricity in Daily Life

Stage II

Module 1: Analysing Forces and Simple Machines

Module 2: Applying Principles and Theories of Temperature and Renewable Energy in Daily Life

Module 3: Applying Principles and Theories of Heat Energy in Daily Life

Module 4: Analysing Emissions and Enhancing Electronic Technologies

Module 5: Analysing Movement and Wave Interactions.

8.0 Further Readings

A number of books have been suggested for further readings in each module.

PHYSICS SYLLABUS STAGE I

COMPETENCES FOR PHYSICS STAGE I

Upon completion Stage I Modules of Physics, learners should be able to:

1. Applying Physics Concepts, Measurements and Motion in Daily Life
2. Analysing Forces and their Effects
3. Analysing Mechanical Properties, Work, Energy, Power and Magnetism
4. Applying the Concepts of Light and Construction of Optical Instruments
5. Applying Principles of Static and Current Electricity in Daily Life

PHYSICS SYLLABUS STAGE I

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
1. 0 APPLYING PHYSICS CONCEPTS, MEASUREMENTS AND MOTION IN DAILY LIFE	1.0 Apply knowledge of Physics in various contexts	1.1 Demonstrate mastery of basic concepts, theories and principles of Physics	a) Explain the concept of Physics (Meaning, branches and connection with other disciplines) and the contribution of Physics to the development of modern society	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE. **Online Course Platforms:** A learner to sign up for online Physics courses on for in-depth learning.	**Brainstorming:** Guide learners to brainstorm various natural and man-made physical phenomena in Physics. **Group discussion:** Use ICT to guide groups of learners in defining and exploring Physics branches. **Field trip:** Arrange field trips to help learner explore real-life applications of Physics. **Brainstorming:** Guide learner to brainstorm Physics' contributions to	(a) Concept of Physicsis clearly explained and Contributions of Physics to the development of modern society are clearly discussed.	Online resources, multimedia sources, Balls, conical pendulum, banked road, whirling water in bucket, telescope, solid object, Earth globe, callipers or rulers, jug, F1-10 hydraulics bench and stopwatch	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					modern society's development. **ICT-based learning:**Guide learner using online sources to explore Physics' contributions to modern society's development.				
			(b) Explain concepts of physical quantities (fundamental and derived quantities) and their SI units	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE.	**Brainstorming:** Guide learner to brainstorm measurable objects in their environment **Jigsaw:** Guide learners with Jigsaw to measure objects and assign SI units	(c)The concepts of physical quantities are clearly explained	Tape measure, Vernier calliper, stopwatch, protractor, beam balance, magnetic compass and force gauge	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			(c) Describe concepts of linear motion (speed, velocity, acceleration, distance, and displacement)	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**Circle the sage:** Guide learner using Circle-the-Sage to explore linear motion **Questions and answers:** Guide learners through Q&A on real-life linear motion applications **ICT based learning:** Guide learners with interactive simulations to visualize linear motion concepts.	**(d)**The concepts of linear motion are clearly described	String, bob, fixed point, smooth table surface, single pulley, springs, masses and online resources	**6 Hours**	**2 Hours**
		1.2 Demonstrate mastery of basic terminologies, measurements and symbols in Physics	(a) Describe various instruments used for measurement of physical quantities	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply	**Circle-the-sage:** Guide learner using the circle-the-sage strategy to describe instruments **Project work:** Help learners describe	(a) Measuring instruments used in Physics measurements are correctly described	Online resources, flow-tube, thermometers, stopwatch, retort	**6 Hours**	**1 Hour**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				theoretical concepts, conduct experiments and analyse results in Physics.	instruments used in measuring Physics phenomena **Virtual lab experiment:** Guide learner through virtual labs to conduct experiments measuring various objects.		stand, vernier calliper and steel balls of varying diameters		
			(b) Relate measuring instruments to physical quantities	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse results in Physics.	**Practical work and Experimentation:** Lead learner through practical experiments to measure physical quantities accurately.	Precision and accuracy of measurements are clearly related	Data and online resources	**6 Hours**	**1 Hour**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
		1.3 Use mathematics to explain physical principles and phenomena	(a) Use mathematical knowledge to describe relationship between various physical quantities (velocity, acceleration)	**Self-Paced Learning:** A learner to engage with self-paced learning modules tailored for Physics	**Group discussion**: Organize learner into groups to use math to describe physical quantity relationships **Problem solving:** Help students apply Physics concepts to real-world problem-solving.	The mathematical knowledge is used to describe the relationship between various physical quantities	Online Resources and Physics reference books	**8 Hours**	**2 Hours**
	2.0 Conduct experiments in Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Conduct experiments related to linear motion.	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and	**Experimentation**: Lead learner in experiments exploring linear motion parameters' relationships **ICT based learning**: Guide learner using virtual labs to explore linear motion principles	Experiments are properly conducted following the scientific method	Online resources, Small masses, meter rule, stop watch, trolley model callipers, wooden and metal rods, balances,	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				analyse results in Physics.			string and pulley		
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Explain the methods of analysing experimental data in Physics (statistical analysis) that related to Physical quantities and linear motion	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in Physics.	**Group discussion**: Lead student in groups in analysing experimental Physics data methods. **ICT based approach**:Lead leaner using ICT to explore best Physics data analysis methods	The methods of analysing experimental data are explained correctly	Data and Online resources, Physics reference books	**8 Hours**	**2 Hours**
			b) Use analytical methods to manipulate experimental data in Physical quantities and linear motion.	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics	**Brainstorming:** Guide learner to brainstorm analytical methods for manipulating Physics data **ICT based approach:** Use digital simulations	Analytical methods to manipulate experimental data in Physicsare correctly performed	Data and Online resources, Physics reference books	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				experiments and practical experience in science subjects.	to guide learner in hands-on Physics activities				
	3.0 Evaluate and use information in Physics	3.1 Collect, describe and relate physical data	(a) Collect and analyse data to explain various physical quantities (velocity, acceleration)	**Project based learning:** A learner to participate in project-based learning in Physics, where learners explore concepts through hands-on projects and collaborative research.	**Cooperative learning strategy:** Guide learner in discussing data collection and analysis of physical parameters. **Project work:** Support learners in project-based activities to collect, analyse data, and explain physical parameters like velocity and acceleration	The data used to explain various physical parameters are collected and analysed appropriately	Modules and Online resources	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			(b) Collect and analyse data to explain experimental observations related to linear motion.	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**ICT based approach:** Guide learner using interactive simulations to analyse data and explain linear motion observations. **Experimentation:** Guide learner in manageable groups to conduct experiments and analyse collected data	The physicaldata to explain experimental observations related to given concepts are appropriatelycollected andanalysed	Online resources	**8 Hours**	**2 Hours**
		3.2 Carry out a project in Physics	(a) Develop prototype devices based on the concepts, theories, principles and laws gained from the field	**Use of institute library:** A learner to utilize the resources available at your institution's	**Group discussion:** Organize learner into groups to discuss developing prototype	Prototypes are developed based on Physics	Online resources	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			of linear motion.	library for comprehensive research and study in Physics.	devices using linear motion concepts **Problem based approach:** Guide learner to relate the designed prototypes and real life.				
2.0 ANALYSING FORCES AND THEIR EFFECTS	1.0 Apply knowledge of Physics in various contexts	1.1 Demonstrate mastery of basic concepts, theories and principles of Physics	a) Explain the concepts and principles related to force	**Self-Paced Learning:** A learner to engage with self-paced learning modules tailored for Physics	**Brainstorming:** Learners to brainstorm concepts and principles related to force. **ICT based learning:** Guide learners with simulations to visualize concepts and principles of force. **Questions and answers:** Use Q&A to guide	The concepts and principles related to force.	Water tank, basin, different liquids, different solid materials, worksheet, online resources, spring balance and video	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					learners in explaining force principles.				
			(b) Deduce the relationship between density, sinking and floating	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in Physics.	**Brainstorming:** Guide Learner brainstorm concepts and principles of density, sinking and floating. **ICT based learning:** Use simulations to help learner visualize density, sinking and floating.	The concepts and principles related to density, sinking and floating.	Water tank, basin, different liquids, different solid materials, worksheet, online resources, spring balance and video	**10 Hours**	**3 Hours**
			(c) Explain the concepts and principles related to pressure	**Self-Paced Learning:** A learner to engage with self-paced learning modules tailored for Physics	**Brainstorming:** Guide learner to brainstorm pressure concepts and principles. **ICT based learning**: Use simulations to help learner visualize pressure	The concepts and principles related to pressure are explained clearly	Water, tank, basin, different liquids, different solid materials,	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				Interactive Simulations and Labs: A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	concepts and principles **Questions and answers**:Use questions and answers to guide learner explaining the principle related to pressure.		worksheet, online resources, spring balance and video.		
		1.2 Demonstrate mastery of basic terminologies, measurements and symbols in Physics	(a) Describe various instruments used for measurement in force, density, sinking, floating and pressure	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse	**Circle-the-sage**: Guide learner through circle-the-sage strategy to describe various instruments **Project work:** Facilitate the learner to describe various instruments used in Physics measurement	Measuring instruments used in Physics measurements are correctly described	Online resources, flow-tube, thermometers, stopwatch, retort stand, Vernier calliper and steel balls of varying	**6 Hours**	**1 Hour**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				results in Physics.	**Virtual lab experiment:** Facilitate the learner through the use of Virtual lab to perform experiments to measure various objects		diameters		
			(b) Relate measuring instruments used in force, density, sinking, floating and pressure to physical quantities	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE.	**Practical work and experimentation:** Guide learner in experiments measuring physical quantities with instruments	Precision and accuracy of measurements are clearly related	Data and online resources	**6 Hours**	**1 Hour**
		1.3 Use mathematics to explain physical principles and phenomena	(a) Use mathematical knowledge to describe relationship between various physical	**Use of Physics modules:** A learner to utilize Physics modules and textbooks,	**Group discussion:** Organize learner in groups to relate physical quantities mathematically **Problem solving**:	The mathematical knowledge is used to describe the relationship between	Online Resources and Physics reference books	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			quantities (force, density, sinking, floating and pressure)	including those from TIE.	Guide the learner to use physical principles to solve real life problems.	various physical quantities			
	2.0 Conduct experiments in Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Conduct experiments related to force, density, sinking, floating and pressure.	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse results in Physics.	**Experimentation:** Guide learner in experiments investigating linear motion parameters **ICT based learning:** Facilitate the learner through the use of virtual lab, to investigate the principles related to linear motion.	Experiments are properly conducted following the scientific method	Online resources, Small masses, meter rule, stop watch, trolley model callipers, wooden and metal rods, balances, string and pulley	**10 Hours**	**3 Hours**
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Explain the methods of analysing experimental data in Physics (statistical	**Virtual Study Groups:** A learner to create and join virtual	**Group discussion:** Guide learner in groups to investigate various methods used to analyse	The methods of analysing experimental data are	Data and Online resources, Physics reference	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			analysis) in the field of force, density, sinking, floating and pressure	physics study groups via Zoom, Microsoft Teams for collaborative learning.	experimental data in Physics (statistical analysis) **ICT based approach**:Guide learner throughthe use of ICT to investigate the best methods for analysing experimental data in Physics (statistical analysis)	explained correctly	books		
			b) Use analytical methods to manipulate experimental data in force, density, sinking, floating and pressure	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research	**Brainstorming:** Facilitate the learnersto brainstorm on the analytical methods used to manipulate experimental data in physics. **ICT based approach:**Guide learner in utilizing interactive digital	Analytical methods to manipulate experimental data in Physics are correctly performed	Data and Online resources, Physics reference books	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				and study in Physics.	simulations to explore the hands-on activities for analyticalmethods to manipulate experimental data in Physics				
			(c) Use graphical method to present experimental results in done in a field of force, density, sinking, floating and pressure	**E-Libraries and Databases:** A learner to access digital libraries and academic databases such as TIE-online library.	**Group discussion:** Facilitate learner through the use of graphical method to present experimental results in physics **Use of ICT facility:** Guide learner in utilizing interactive digital simulations and other software to present the experimental results using graphs	The graphical method to present experimental results in Physics is clearly used	Data and Online resources, Physics reference books and different graph papers	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
	3.0 Evaluate and use information in Physics	3.1 Collect, describe and relate physical data	(a) Collect and analyse data to explain various physical quantities (force, density, sinking, floating and pressure)	**Project based learning:** A learner to participate in project-based learning in physics, where learners explore concepts through hands-on projects and collaborative research.	**Cooperative learning strategy**: Guide learner to share their understanding on how to collect and analyse data of (velocity, acceleration) **Project work**: Facilitate learners to do projects to collect, analyse dataand explain various physical parameters (velocity, acceleration)	The data used to explain various physical parameters are collected and analysed appropriately	Text books and Online resources	**8 Hours**	**2 Hours**
			(b) Collect and analyse data to explain experimental observations	**Interactive Simulations and Labs:** A learner to use online	**ICT based approach:** Guide learners in utilizing	The physicaldata to explain experimenta	Online resources	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			related to force, density, sinking, floating and pressure	simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	interactive digital simulations to collect analyse data and explain experimental observations related to linear motion. **Experimentation:** Guide learner in manageable groups to conduct experiments and analyse collected data	l observations related to given concepts are appropriatel ycollected andanalysed			
		3.2 Carry out a project in Physics	(a) Develop prototype devices based on the concepts, theories, principles and laws gained from the field of	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including	**Group discussion**: Organize groups to discuss developing prototypes using linear motion concepts. **Problem based**	Prototypesare developed based on Physics	Online resources	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			force, density, sinking, floating and pressure.	those from TIE.	**approach**: Guide learner to relate thedesigned prototypes and real life.				
3.0 ANALYSING MECHANICAL PROPERTIES, WORK, ENERGY, POWER AND MAGNETISM	1.0 Apply knowledge of Physics in various contexts	1.1 Demonstrate mastery of basic concepts, theories and principles of Physics	(a) Describe the mechanical properties of matter in relation to force and energy	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE. **Online discussion forums:** A learner to join online forums like reddit and stack exchange for Physics discussions.	**Think-ink pair share:** Guide the learner through Think ink pair share to explore the mechanical properties of matter in relation to force and energy **Group discussion**: Organize learner in manageable groups to discuss different terms related to mechanical properties of matter	The concepts and principles of mechanical properties of matter in relation to force and energy are explained clearly	Metal rod, wooden rod, spring and masses, liquid (water), different shapes and sizes container, glass jar with cork and rubber band	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					Experimentation: Guide the learner through experiment to investigate the relationship between various mechanical properties of matter				
			(b) Explain the concepts and principles related to work, energy and power.	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**Brainstorming:** Guide learner to brainstorm on the concepts and principles related to work, energy and power. **ICT based learning:** Guide learner through the use of interactive simulations to visualize the	The concepts and principles related to work, energy and power are explained clearly.	Water tank, basin, different liquids, different solid materials, worksheet, online resources, spring balance and video	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					concepts and principles related to work, energy and power. **Questions and answers**: Use questions and answers to guide learners explaining the principle related to work, energy and power.				
			(c) Describe the concept and principles of magnetism (*magnetization and demagnetization,magnetic fields*)	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in Physics.	**Group discussion:** Guide learner to discuss the concepts and principles of magnetism through hands-on activities **ICT based learning:** Guide the learners through the use of interactive	The concepts and principles of magnetism are described correctly	Different types of magnets, iron fillings, card board, connecting wires and batteries	**6 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					simulations and animations to visualise magnetic field patterns **Project work:** Guide learner in groups to work on different projects on magnetization and demagnetization of different materials.				
		1.2 Demonstrate mastery of basic terminologies, measurements and symbols in Physics	(a) Describe various instruments used for measurement in mechanical properties of matter, work, energy and power,	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics	**Circle-the-sage:** Guide learner through circle-the-sage strategy to describe various instruments **Project work:** Facilitate the learner to describe various	(a) Measuring instruments used in Physics measurements are correctly described	Online resources, flow-tube, thermometers, stopwatch, retort stand, Vernier	**6 Hours**	**1 Hour**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			magnetism.	experiments and practical experience in science subjects.	instruments used in Physics measurement **Virtual lab experiment**: Facilitate the learner through the use of Virtual lab to perform experiments to measure various objects		calliper and steel balls of varying diameters		
			(b) Relate measuring instruments used in mechanical properties of matter, work, energy and power, magnetism to physical quantities	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse	**Practical work and experimentation:** Guide the learner through practical work and experiment to measure different physical quantities by using appropriate instruments	Precision and accuracy of measurements are clearly related	Data and online resources	**6 Hours**	**1 Hour**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				results in Physics.					
		1.3 Use mathematics to explain physical principles and phenomena	(a) Use mathematical knowledge to describe relationship between various physical quantities (in mechanical properties of matter, work, energy and power, magnetism)	**Self-Paced Learning:** A learner to engage with self-paced learning modules tailored for Physics	**Group discussion:** Organize learner in manageable groups through the use of mathematical knowledge to describe the relationship between various physical quantities **Problem solving:** Guide the learner to use physical principles to solve real life problems	The mathematical knowledge is used to describe the relationship between various physical quantities	Online Resources and Physics reference books	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
	2.0 Conduct experiments in Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Conduct experiments related to mechanical properties of matter, work, energy and power, magnetism.	**Virtual Study Groups:** A learner to create and join virtual Physics study groups via Zoom, Microsoft Teams for collaborative learning.	**Experimentation:** Guide learner through experiments to investigate the relationship between various parameters related to mechanical properties, work, energy, power and magnetism **ICT based learning:** Facilitate the learner through the use of virtual lab, to investigate the principles related to mechanical properties, work, energy, power and magnetism.	Experiments are properly conducted following the scientific method	Online resources, Small masses, meter rule, stop watch, trolley model callipers, wooden and metal rods, balances, string and pulley	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Explain the methods of analysing experimental data in Physics found in mechanical properties of matter, work, energy and power, magnetism (statistical analysis)	**Podcasts and Audiobooks:** A learner to listen to educational Physics podcasts and audiobooks to deepen their understanding of study content.	**Group discussion:** Guide learner in groups to investigate various methods used to analyse experimental data in Physics (statistical analysis) **ICT based approach**:Guide learner throughthe use of ICT to investigate the best methods for analysing experimental data in Physics (statistical analysis).	The methods of analysing experimental data are explained correctly	Data and Online resources, Physics reference books	**8 Hours**	**2 Hours**
			(b) Use analytical methods to manipulate experimental data in	**Online discussion forums:** A learner to join online forums like	**Brainstorming:** Facilitate the learnersto brainstorm on the analytical methods used to manipulate	Analytical methods to manipulate experimental data in Physics are	Data and Online resources, Physics reference	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			mechanical properties of matter, work, energy power and magnetism	reddit and stack exchange for Physics discussions.	experimental data in physics. **ICT based approach**:Guide learner in utilizing interactive digital simulations to explore the hands-on activities for analyticalmethods to manipulate experimental data in Physics	correctly performed	books		
			(c) Use graphical method to present experimental results in mechanical properties of matter, work, energy, power and magnetism	**Self-Paced Learning:** A learner to engage with self-paced learning modules tailored for Physics	**Group discussion:** Facilitate learner through the use of graphical method to present experimental results in Physics **Use of ICT facility:** Guide learner in utilizing interactive digital simulations and other software to	The graphical method to present experimental results in Physics is clearly used	Data and 0nline resources, Physics reference books and different graph papers	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					present the experimental results using graphs.				
	3.0 Evaluate and use information in Physics	3.1 Collect, describe and relate physical data	(a) Collect and analyse data to explain various physical quantities (mechanical properties of matter, work, energy and power, magnetism)	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in Physics.	**Cooperative learningstrategy:** Guide learner to share their understanding on howto collect and analyse data to explain various physical parameters (work, energy, and power) **Project work:** Facilitate learner to do projects to collect, analyse dataand explain various physical parameters (mechanical	The data used to explain various physical parameters are collected and analysed appropriately	Text books and Online resources	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					properties, work, energy, power and magnetism)				
			(b) Collect and analyse data to explain experimental observations related to mechanical properties, work, energy, power and magnetism	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**ICT based approach**: Guide learner in utilizing interactive digital simulations to collect analyse data and explain experimental observations related to mechanical properties, work, energy, power and magnetism. **Experimentation:** Guide learners in manageable	The physical data to explain experimental observations related to given concepts are appropriately collected and analysed	Online resources	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					groups to conduct experiments and analyse collected data				
		3.2 Carry out a project in Physics	(a) Develop prototype devices based on the concepts, theories, principles and laws gained from the field of mechanical properties, work, energy, power and magnetism.	**Field Work:** A learner to carry fieldwork to apply Physics concepts in real-world settings and practical investigations.	**Group discussion**: Organise learner in manageable groups to discuss the procedure for the development of prototype devices based on the concepts and theories gained from the field of mechanical properties, work, energy, power and magnetism. **Problem based** approach: Guide learners to relate	Prototypesare developed based on Physics	Online resources	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					thedesigned prototypes and real life.				
4.0 APPLYING THE CONCEPTS OF LIGHT AND CONSTRUCTION OF OPTICAL INSTRUMENTS.	1.0 Apply knowledgeof Physics in various contexts	1.1 Demonstrate mastery of basic concepts, theories and principles of Physics	(a) Describe the concept and principles of light (*sourcesof light, propagation and transmission)*	**Self-Paced Learning:** A learner to engage with self-paced learning modules tailored for Physics **Field Work:** A learner to carry fieldwork to apply Physics concepts in real-world settings and practical investigations.	**Brainstorming**: Guide learner to brainstorm on the concepts and principlesof light (sources of light, propagation and transmission) **Group discussion:** Guide learner in manageable groups to explore the concepts and principles of light **Field trip:** Organise field trips help learners to explore applicationsof	The concepts and principles of light are described correctly	Torch, candle, cardboard with slit, light emitting diodes and fluorescent tube	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					light				
			(b) Describe the concept and principles of light (*image formation, colours,)*	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE.	**Brainstormin**g: Guide learner to brainstorm on the concepts and principlesof light (image formation and colours) **Group discussion:** Guide learner in manageable groups to explore the concepts and principles of light **Field trip:** Organise field trips help learners to explore applicationsof light	The concepts and principles of light are described correctly	Torch, candle, cardboard with slit, light emitting diodes and fluorescent tube	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			(c) Describe the concept and principles of light (*optical instruments,)*	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in Physics.	**Brainstorming**: Guide learner to brainstorm on the concepts and principlesof light (optical instruments) **Group discussion:** Guide learner in manageable groups to explore the concepts and principles of light **Field trip:** Organise field trips help learners to explore applicationsof light	The concepts and principles of light are described correctly	Torch, candle, cardboard with slit, light emitting diodes and fluorescent tube	**10 Hours**	**3 Hours**
		1.2 Use mathematics to explain principles and phenomena of light.	(a) Use mathematical knowledge to describe relationship between	**Online discussion forums:** A learner to join online forums like	**Group discussion:** Organize learner in manageable groups through the	The mathematical knowledge is used to describe the	Online resources and Physics reference books	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			various light phenomena.	reddit and stack exchange for Physics discussions.	use of mathematical knowledge to describe the relationship between various light phenomena. **Problem solving:** Guide the learners to use physical principles to solve real life problems.	relationship between various light phenomena.			
	2.0 Conduct experiments in Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Conduct experiments related to light.	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse results in Physics.	**Experimentation:** Guide learner through experiments to investigate the relationship between various parameters related to light. **ICT based learning:** Facilitate the learner through the use of virtual lab, to investigate	Experiments are properly conducted following the scientific method	Online resources, Small masses, meter rule, stop watch, trolley model callipers, wooden and metal rods, balances, string and	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					the principles related to light.		pulley		
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Explain the methods of analysing experimental data in Physics (statistical analysis) found in light	**Online Course Platforms:** A learner to sign up for online Physics courses on for in-depth learning.	**Group discussion:** Guide learner in groups to investigate various methods used to analyse experimental data in Physics (statistical analysis) **ICT based approach:** Guide learner throughthe use of ICT to investigate the best methods for analysing experimental data in Physics (statistical analysis).	The methods of analysing experimental data are explained correctly	Data and online resources, Physics reference books	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			(b) Use analytical methods to manipulate experimental data in light	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on physics experiments and practical experience in science subjects.	**Brainstorming:** Facilitate the learner to brainstorm on the analytical methods used to manipulate experimental data in Physics. **ICT based approach:**Use digital simulations to guide learner in analysing Physics data.	Analytical methods to manipulate experimental data in Physicsare correctly performed	Data and Online resources, Physics reference books	**10 Hours**	**3 Hours**
			(c) Use graphical method to present experimental results in light	**Online discussion forums:** A learner to join online forums like reddit and stack exchange for Physics discussions.	**Group discussion:** Facilitate learner through the use of graphical method to present experimental results in physics **Use of ICT facility:** Guide learner in utilizing interactive digital simulations and	The graphical method to present experimental results in Physics is clearly used	Data and online resources, Physics reference books and different graph papers	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					other software to present the experimental results using graphs				
	3.0 Evaluate and use information in Physics	3.1 Collect, describe and relate physical data	(a) Collect and analyse data to explain various light phenomena	**Project based learning:** A learner to participate in project-based learning in Physics, where learners explore concepts through hands-on projects and collaborative research.	**Cooperative learning strategy:** Guide learner to share their understanding on howto collect and analyse data to explain various light phenomena Project work: Facilitate learners to do projects to collect, analyse dataand explain various light phenomena	The data used to explain various physical parameters are collected and analysed appropriately	Text books and Online resources	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			(b) Collect and analyse data to explain experimental observations related to light.	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**ICT based approach:** Guide learner in utilizing interactive digital simulations to collect analyse data and explain experimental observations related to light. **Experimentation:** Guide learners in manageable groups to conduct experiments and analyse collected data	The physicaldata to explain experimental observations related to given concepts are appropriatelycollected andanalysed	Online resources	**8 Hours**	**2 Hours**
		3.2 Carry out a project inPhysics	(a) Develop prototype devices based on the concepts, theories,	**Field Work:** A learner to carry fieldwork to apply Physics concepts in	**Group discussion:** Organize learner in manageable groups to discuss the procedure for	Prototypesare developed based on Physics	Online resources	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			principles and laws gained from the field of light.	real-world settings and practical investigations **Self-Paced Learning:** A learner to engage with self-paced learning modules tailored for Physics	the development of prototype devices based on the concepts and theories gained from the field of light. **Problem based approach**: Guide learners to relate thedesigned prototypes and real life.				
5.0 APPLYING PRINCIPLES OF STATIC AND CURRENT ELECTRICITY IN DAILY LIFE	1.0 Apply knowledgeof Physics in various contexts	1.1Demonstrate mastery of basic concepts, theories and principles of Physics	(a) Explain the concept and principles of static electricity (detection of static charges, types of materials, *capacitors, charge distributions and lightning conductor*)	**Project based learning:** A learner to participate in project-based learning in Physics, where learners explore concepts through hands-on	**Practical Work** and Experiment: Guide learner to explore the concepts and principlesof static electricity through hands-on activities. **Interactive simulations**	The concepts and principles of static electricity are clearly explained	Small piecesof paper, plastic comb, polythene rod, capacitor and lighting conductor, rod and	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				projects and collaborative research.	Facilitate learner to visualize and understand the conceptsand principles of static electricity **Brainstorming:** Guidelearners to explore the application of static electricity in their environment		wires		
			(b) Describe the concept and laws of current electricity (electromotive force, potential difference, resistance)	**Podcasts and Audiobooks:** A learner to listen to educational Physics podcasts and audiobooks to deepen their understanding of study content.	**Group discussion:** Guide learner in groups to discuss the concept of current electricity **Hands-on activity:**Guide learner to explore the conceptand laws of current electricity through	The concept and laws of current electricity are described correctly	Ammeter, Voltmeter, switch. Meter bridge, resistors, connecting wire and batteries	**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					hands-on activities. Interactive simulations: Facilitatelearners to visualize the flow of charges				
			(c) Describe the concept and laws of current electricity (effect of electric current, domestic electrical installation)	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE.	**Group discussion:** Guide learner in groups to discuss the concept of current electricity **Hands-on activity**:Guide learner to explore the conceptand laws of current electricity through hands-on activities. **Interactive simulations:** Facilitatelearners	The concept and laws of current electricity are described correctly	Ammeter, Voltmeter, switch. Meter bridge, resistors, connecting wire and batteries	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					to visualize the flow of charges				
		1.2 Use mathematics to explain physical principles and phenomena.	(a) Use mathematical knowledge to describe relationship between various physical quantities (static electricity and current electricity)	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in Physics.	**Group discussion:** Organize learner in manageable groups through the use of mathematical knowledge to describe the relationship between various phenomena charges, current, p.d, resistance. **Problem solving:** Guide the learners to use physical principles to solve real life problems			**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
	2.0 Conduct experiments in Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Conduct experiments related to static electricity and current electricity.	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse results in physics.	**Experimentation:** Guide learner through experiments to investigate the relationship between various parameters related to charges, current, p.d, resistance. **ICT based learning:** Facilitate the learners through the use of virtual lab, to investigate the principles related to charges, current, p.d, resistance.			**10 Hours**	**3 Hours**
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Explain the methods of analysing experimental data in Physics (statistical	**Use of institute library:** A learner to utilize the resources	**Group discussion:** Guide learner in groups to investigate various methods used to analyse			**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			analysis) found in static electricity and current electricity	available at your institution's library for comprehensive research and study in Physics.	experimental data in Physics (statistical analysis) **ICT based approach**:Guide learner throughthe use of ICT to investigate the best methods for analysing experimental data in Physics (statistical analysis)				
			b) Use analytical methods to manipulate experimental data in static electricity and current electricity	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in	**Brainstorming:** Facilitate the learner to brainstorm on the analytical methods used to manipulate experimental data in Physics. **ICT based approach**:Guide learners in utilizing			**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				science subjects.	interactive digital simulations to explore the hands-on activities for analyticalmethods to manipulate experimental data in Physics				
			(c) Use graphical method to present experimental results in static electricity and current electricity	**E-Libraries and Databases:** A learner to access digital libraries and academic databases such as TIE-online library.	**Group discussion:** Facilitate learner through the use of graphical method to present experimental results in Physics **Use of ICT facility:** Guide learner in utilizing interactive digital simulations and other software to present the experimental results using graphs			**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
	3.0 Evaluate and use information in Physics	3.1 Collect, describe and relate physical data	(a) Collect and analyse data to explain various phenomena in static electricity and current electricity	**Project based learning:** A learner to participate in project-based learning in Physics, where learners explore concepts through hands-on projects and collaborative research.	**Cooperative learning strategy:** Guide learner using simulations to analyse and explain data on electrical properties. **Project work:** Facilitate learner to do projects to collect, analyse dataand explain various charges, current, p.d, resistance phenomena			**8 Hours**	**2 Hours**
			(b) Collect and analyse data to explain experimental observations related to static electricity and	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for	**ICT based approach**: Use simulations to help learner analyse and explain data on charge, current,			**8 Hours**	**2 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			current electricity	hands-on Physics experiments and practical experience in science subjects.	voltage, and resistance. **Experimentation:** Guide learner in manageable groups to conduct experiments and analyse collected data				
		3.2 Carry out a project in Physics	(a) Develop prototype devices based on the concepts, theories, principles and laws gained from the field of electricity.	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in physics.	**Group discussion**: Organize learner in manageable groups to discuss the procedure for the development of prototype devices based on the concepts and theories gained from the field of electricity. **Problem based approach**: Guide			**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					learner to relate thedesigned prototypes and real life.				

PHYSICS SYLLABUS STAGE II

COMPETENCES FOR PHYSICS STAGE II

Upon completion stage II modules of Physics, learner should be able to:

1. Analysing Forces and Simple Machines;
2. Applying Principles and Theories of Temperature and Renewable Energy in Daily Life;
3. Applying Principles and Theories of Heat Energy in Daily Life;
4. Analysing Emissions and Enhancing Electronic Technologies; and
5. Analysing Movement and Wave Interactions.

PHYSICS SYLLABUS STAGE II

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
1.0 ANALYSING FORCES AND SIMPLE MACHINES	1.0 Apply knowledgeof Physics in various contexts	1.1 Demonstrate mastery of basic concepts, theories and principles of Physics	(a) Explain the concept and laws of friction (types of friction, laws of friction)	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**Practical work:** Provide learner with hands-on activities that allow them to explore the concepts and laws of friction. **Interactive simulations:** Guide learners through PhET interactive simulations to demonstrate the concept and the laws of friction.	(a) Concepts and laws of friction are explained clearly	Wooden block, rough surface, spring balance and standard masses	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			(b) Describe the concept and principles of equilibrium (moment of force, centre of gravity and types of equilibrium)	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE.	**Group discussion:** Facilitate learner through manageable groups to discuss the concept and principles of equilibrium. **Practical Work:** Facilitate the learner through hands-on activities to explore the concept and principles of equilibrium	(b) Concepts and principles of equilibrium are described correctly	Text books, other relevant materials and knife edge.	**10 Hours**	**3 Hours**
			(c) Explain the principles of simple machines (*lever, pulley, inclined plane,*	**Laboratory activities:** A learner to engage in hands-on laboratory	**Brainstorming:** Guide learner to brainstorm ondifferent	Conceptsand principlesof simple machinesare explained correctly.	Pulleys, pair of scissors, wheel barrow, Spade and bottleopener	**14 Hours**	**4 Hour**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			screw jack, wheel and axle, hydraulic press)	activities to apply theoretical concepts, conduct experiments, and analyse results in Physics.	types of simple machines available in their environment simulations to visualize the concept of linear motion **Group discussion:** Guide learner through manageable groups, to discuss the principles of simple machines **Practical Work:** Provide learner with hands-on				

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					activities to explore the principles of simple machines.				
		1.2 Use mathematics to explain physical principles and phenomena	(a) Apply mathematical knowledge to describe various principles and physical phenomena related to equilibrium, friction and simple machines)	**Podcasts and Audiobooks:** A learner to listen to educational Physics podcasts and audiobooks to deepen their understanding of study content.	**Think-ink-pair-share:** Facilitate Learner through think-ink pair share strategy to apply mathematical knowledge to describe various principles and physical phenomena related to equilibrium, friction force, simple machines.	Mathematical knowledge to describe various principles and physical phenomena are correctly applied	Meter rule, stop watch, spring balance, wooden bar and knife edge	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
	2.0 Conduct experiments in Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Describe types of experimental variables in physics related to equilibrium, friction and simple machines)	**Online Course Platforms:** A learner to sign up for online Physics courses on for in-depth learning.	**Cooperative learning:** Facilitate learner to work in groups to describe types of experimental variables in Physics	Experimental variables are described clearly	Physics module, Online resources	**10 Hours**	**4 Hours**
			(b) Carry out scientific investigations related to waves, laws of motion, equilibrium, friction and simple machines	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**ICT based approach:** Guide learner in using multimedia resources such as videos, animations, and interactive simulations to carry out scientific investigations related to	Scientific investigations related to waves, laws of motion, equilibrium, friction and simple machines are carried out	Text books and charts	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					equilibrium, friction and simple machines				
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Use scientific report to communicate experimental results in Physics	**Podcasts and Audiobooks:** A learner to listen to educational Physics podcasts and audiobooks to deepen their understanding of study content.	**ICT based learning:** Guide learner the proper use of online resources in presenting the scientific investigation report	A scientific report is correctly used to communicate experimental results in Physics	Charts and online resources	**14 Hours**	**4 Hours**
	3.0 Evaluate and use information in Physics	3.1 Collect, describe and relate physical data	(a) Collect and analyse data to explain various physical parameters (equilibrium, friction and simple machines)	**Field Work:** A learner to carry fieldwork to apply Physics concepts in real-world settings and practical	**Collaborative learning:** Guide learner to work in pairs or small groups to analyse and interpret	Collected physical data are correctly analysed to explain various physical parameters	Online resources and other relevant materials	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				investigations.	collected Physics data **Multimedia approach**: Guide learner in utilizing technology such as computer software, online tools, and simulations to analyse collected data explaining various physical quantities				
			(b) Collect and analyse data to explain experimental observations related to equilibrium,	**Interactive Simulations and Labs:** A learner to use online simulations and virtual	**Collaborative learning**: Guide learner to work in pairs or small groups to	Collected Physics data are correctly analysed to explain various	Online resources and other relevant materials stop watch and trolley model	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			friction and simple machines	labs for hands-on Physics experiments and practical experience in science subjects.	analyse collected **ICT based learning**: Guide learner through the use of technology such as computer software, online tools, and simulations to analyse collected data explaining various physical quantities	physical quantities			
		3.2 Carry out a project in Physics	a) Develop and carry out a research project in Physics	**Laboratory activities:** A learner to engage in hands-on laboratory	**Group discussion:** Guide learner through manageable	A research project in Physics is developed and carried out correctly.	Online resources and other relevant materials	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				activities to apply theoretical concepts, conduct experiments, and analyse results in Physics.	groups to discuss various procedure for carrying out a project **Digital interactive simulation:** Facilitate learner to use virtual labs to analyse the collected data **Experimentation:** Guide the learner using real lab instruments to perform scientific investigations				

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
2.0 APPLYING PRINCIPLES AND THEORIES OF TEMPERATURE AND RENEWABLE ENERGY IN DAILY LIFE	1.0 Apply knowledge of Physics in various contexts	1.1 Demonstrate mastery of basic concepts, theories and principles of Physics	(a) Explore the basic tenets of heat (temperature)	**Self-Paced Learning:** A learner to engage with self-paced learning modules tailored for Physics	**Brainstorming:** Guide learner to brainstorm on the concept of Temperature **Experimentation:** Guide learner in manageable groups to carry temperature measurements,	Concepts of temperature are explored appropriately	Thermometer, calorimeter,	**10 Hours**	**3 hours**
			(b) Explore the basic tenets of Vapour and Humidity	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE.	**Brainstorming:** Guide learner to brainstorm on the concept of Vapour and Humidity **ICT based learning**: Guide	Concepts of Vapour and Humidity are explored appropriately	Thermometer, hygrometer	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					learners to use of interactive simulations on the concept of Vapour and Humidity				
			(c) Describe the concept of renewable energy (solar, hydropower, wind and geothermal energy)	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**Brainstorming:** Guide learner to brainstorm on the concepts of renewable energy **Group discussion:** Organize learner in manageable groups to discuss various forms of renewable energy	The concepts of renewable energy are described appropriately	Solar panel, online resources, Charts, wind mill model, batteries, connecting wires and inverters	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					ICT-based learning: Guide learner through interactive simulations to explore the concept of renewable energy				
		1.2 Use mathematics to explain physical principles and phenomena	(a) Apply mathematical knowledge to describe various principles and physical phenomena related to temperature, vapour , humidity and renewable energy	**Webinars and Online Workshops:** A learner to participate in live or recorded Physics webinars and workshops led by experts to enhance their knowledge. **Use of institute library:** A	**Group discussion:** Facilitate learner in groups to apply mathematical knowledge to describe various principles and physical phenomena related to temperature, vapour, humidity and	Mathematical knowledge to describe various principles and physical phenomena are correctly applied	Online resources and modules	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				learner to utilize the resources available at your institution's library for comprehensive research and study in Physics.	renewable energy **Problem based learning:** Guide learner to identify problems related to temperature, vapour, humidity and renewable energy and facilitate them to use mathematical knowledge or identified mathematical formula to find the solutions of identified problems.				

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
	2.0 Conduct experiments in Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Carry out scientific investigations related to temperature, vapour, humidity and renewable energy	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse results in Physics. **E-Libraries and Databases:** A learner to access digital libraries and academic databases such as TIE-online library.	**ICT based learning:** Use different Online sources to guide leaner to conduct the scientific investigations on the application of various instruments in temperature, vapour, humidity and renewable energy **Practical work:** Guide the learner through step-wise procedure to use practical work to carried out	Scientific investigations related to temperature, vapour, humidity and renewable energy are analysed appropriately	Thermometer, calorimeter, online resources (Simulation)	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					scientific investigations				
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Use scientific report to communicate experimental results in Physics	**Virtual Study Groups:** A learner to create and join virtual Physics study groups via Zoom, Microsoft Teams for collaborative learning.	**Cooperative learning:** Guide leaner in the proper use of online resources in presenting a scientific investigation report to communicate experimental results	A scientific report is correctly used to communicate experimental results in Physics	Charts and online resources	**14 Hours**	**4 Hours**
	3.0 Evaluate and use information in Physics	3.1 Collect, describe and relate physical data	(a) Collect and analyse data to explain various physical parameters (*temperature, vapour, humidity and renewable energy*)	**Podcasts and Audiobooks:** A learner to listen to educational Physics podcasts and audiobooks to deepen their understandin	**ICT based learning:** Use different online sources (virtual lab) and web-based information to guide leaners to explore	Collected Physics data are correctly analysed to explain various physical quantities	Online resources	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				g of study content.	different methods of data collection in Physics experiments				
			(b) Collect and analyse data to explain experimental observations related to *temperature, vapour, humidity and renewable energy*	**Project based learning:** A learner to participate in project-based learning in Physics, where learners explore concepts through hands-on projects and collaborative research.	**Group discussion:** Guide leaner in groups to discuss various methods of data collections **Project work:** Guide leaner to conduct mini research work and facilitate them to collect and organize data from the research work	Collected physical data are correctly analysed to explain experimental observations related to *temperature, vapour, humidity and renewable energy*	Online resources and other relevant materials	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					ICT-based learning: Use different online sources and web-based information to guide leaners to visualize and explore different scenarios from variety of sources and present their observation.				
		3.2 Carry out a project in Physics	(a) Complete and submit a report for the research project started in Form III	**Field Work:** A learner to carry fieldwork to apply Physics concepts in real-world settings and practical	**Problem-solving approach:** Guide leaner with real-world problems that require them to analyse	Report for the research project started in Form III is completed and submitted	Online resources	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				investigations **Project based learning:** A learner to participate in project-based learning in Physics, where learners explore concepts through hands-on projects and collaborative research.	collected Physics data to explain various physical parameters **Collaborative Learning:** Guide the leaner to work in pairs or small groups to analyse and interpret collected Physics data **ICT-based learning:** Use different online sources and web-based information to guide to complete and submit				

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					project report.				
3.0 APPLYING PRINCIPLES AND THEORIES OF HEAT ENERGY IN DAILY LIFE	1.0 Apply knowledge of Physics in various contexts	1.1 Demonstrate mastery of basic concepts, theories and principles of Physics	(a) Explore the basic tenets of heat (*thermal expansion*)	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**Brainstorming:** Guide leaner to brainstorm on the concept of thermal expansion. **Experimentation:** Guide leaner in manageable groups to investigate expansively of different materials. **Demonstrations:** Guide leaner to show the expansion of solid and transfer of	Concepts of thermal expansions are explored appropriately	Thermometer, calorimeter, ball and ring, heat source, metal rods and hygrometer	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					heat **ICT based learning:** Guide leaner to use of interactive simulations on the concept of heat.				
			(b) Explore the basic tenets of heat (*measurement of thermal energy*)	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse results in Physics.	**Experimentation:** Guide leaner in manageable groups to investigate melting and boiling point of different liquids **ICT based learning**: Guide leaners to use of interactive simulations on the concept of	Concepts of thermal energy are explored appropriately	Thermometer, calorimeter, ball and ring, heat source, metal rods and hygrometer	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					thermal energy.				
			(c) Explore the basic tenets of heat (transfer of thermal energy)	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in Physics.	**Brainstorming:** Guide leaner to brainstorm on the concept of thermal energy. **Experimentation:** Guide leaner in manageable groups to investigate transfer of thermal energy in different states of matter.	Concepts of thermal energy are explored appropriately	Thermometer, calorimeter, ball and ring, heat source, metal rods and hygrometer	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
		1.2 Use mathematics to explain physical principles and phenomena	(a) Apply mathematical knowledge to describe various principles and physical phenomena related to heat. energy	**Webinars and Online Workshops:** A learner to participate in live or recorded Physics webinars and workshops led by experts to enhance their knowledge.	**Group discussion**: Facilitate leaner in groups to apply mathematical knowledge to describe various principles and physical phenomena related to heat energy **Problem based learning:** Guide leaner to identify problems related to heat. energy	Mathematical knowledge to describe various principles and physical phenomena related to heat are correctly applied	Online resources and modules	**14 hours**	**4 hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
	2.0 Conduct experimentsin Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Describe types of experimental variables in Physics related to heat	**Field Work:** A learner to carry fieldwork to apply Physics concepts in real-world settings and practical investigations.	**Cooperative learning:** Facilitate leaner to work in groups to describe types of experimental variables in Physics	Experimental variables are described clearly	Physics module, Online resources	**14 Hours**	**4 Hours**
			(b) Carry out scientific investigations related to heat.	**E-Libraries and Databases:** A learner to access digital libraries and academic databases such as TIE-online library.	**ICT based learning:** Use different Online sources to guide leaner to conduct the scientific investigations on the application of various instruments in heat energy. **Practical work:** Guide	Scientific investigations related to heat energy are analysed appropriately	Thermometer, calorimeter, online resources (Simulation) and GM counter	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					the learner through step-wise procedure to use practical work to carried out scientific investigations				
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Use scientificreport to communicate experimental results in Physics	**Podcasts and Audiobooks:** A learner to listen to educational Physics podcasts and audiobooks to deepen their understanding of study content.	**Cooperative learning:** Guide leaner in the proper use of online resources in presenting a scientific investigation report to communicate experimental result.	A scientific report is correctly used to communicate experimental results in Physics	Charts and onlineresources	**14 hours**	**4 hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
	3.0 Evaluate and use informationin Physics	3.1 Collect, describe and relate physical data	(a) Collect and analyse data to explain various physical parameters (heat energy)	**Webinars and Online Workshops:** A learner to participate in live or recorded Physics webinars and workshops led by experts to enhance their knowledge.	**ICT based learning:** Use different online sources (virtual lab) and web-based information to guide leaners to explore different methods of data collection in Physics experiments	Collected Physics data are correctly analysed to explain various physical quantities	Online resources	**14 Hours**	**4 Hours**
			(b) Collect and analyse data to explain experimental observations related to heat energy	**Online Course Platforms:** A learner to sign up for online Physics courses on for in-depth learning.	**Group discussion:** Guide leaner in groups to discuss various methods of data collections **Project**	Collected physical data are correctly analysed to explain experimental observations related to heat energy.	Online resourcesand otherrelevant materials	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				Podcasts and Audiobooks: A learner to listen to educational Physics podcasts and audiobooks to deepen their understanding of study content.	**work:** Guide leaner to conduct mini research work and facilitate them to collect and organise data from the research work **ICT-based learning:** Use different online sources and web-based information to guide leaner to visualise and explore different scenarios from variety of sources and present				

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					their observations				
		3.2 Carry out a project in Physics	a) Develop and carry out a research project in Physics	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse results in Physics. **Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments	**Group discussion:** Guide learner through manageable groups to discuss various procedure for carrying out a project **Digital interactive simulation:** Facilitate learner to use virtual labs to analyse the collected data **Experimentation:** Guide the	A research project in Physics is developed and carried out correctly	Online resources and other relevant materials	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				and practical experience in science subjects.	learner using real lab instruments to perform scientific investigations				
4.0 ANALYSING EMISSIONS AND ENHANCING ELECTRONIC TECHNOLOGIES	1.0 Apply knowledge of Physics in various contexts	1.1 Demonstrate mastery of basic concepts, theories and principles of Physics	(a) Explore the basic tenets of the Physics of the atom (*structure of atom and structure nuclear, radioactivity, nuclear radiations, nuclear processes*)	**Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE. **Field Work:** A learner to carry fieldwork to apply Physics concepts in real-world settings and	**Brainstorming:** Guide leaner to brainstorm on the concepts of nuclear Physics, radioactivity, nuclear and radiation. **Field trip:** Organizea field trip to the nearby	The concepts and principles related to the Physics of the atom are explored appropriately	GM counter, Periodic Table and chart showing radioactive elements	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				practical investigations.	industry/ hospital/ airport for learner recognize the application of nuclear Physics **ICT-based learning:** Use different Online sources to guide leaner to analyse concepts related to the Physics of the atom.				

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			(b) Explore the basic tenets of the Physics of the atom (*thermionic emission*)	**E-Libraries and Databases:** A learner to access digital libraries and academic databases such as TIE-online library.	**Brainstorming:** Guide leaner to brainstorm on the concepts of thermionic emission. **Field trip:** Organize a field trip to the nearby industry/ hospital/ airport for learner recognize the application of nuclear Physics **ICT-**	The concepts and principles related to the Physics of the atom are explored appropriately	GM counter, Periodic Table and chart showing radioactive elements	**10 Hours**	**3 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					based learning: Use different Online sources to guide leaner to analyse concepts related to the Physics of the atom.				
			(c) Describe the basic principles of electronics (*semiconductors,diode, transistor, amplifier*)	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in physics.	**Brainstorming:** Guide leaners to brainstorm onelectronic components intheir environment **Scenario:** Organise leaner in manageable groups and provide a	The concepts of electronics are described correctly	Periodic Table, online resources, Text books, CRO, Diode, Transistor, AC Voltage Generator and connecting wires	**14 hours**	**4 hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				Laboratory activities: A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse results in physics.	scenario for themto investigate the conduction of different materials **ICT based learning:** Guide leaner with thehelp of ICT to visualize various electronic components and their functions **Experiment:** Guide leaner in manageable groups to investigate the conduction of a semiconduct				

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					or diode				
		1.2 Use mathematics to explain physical principles and phenomena	(a) Apply mathematical knowledge to describe various principles and physical phenomena related to Physics of the atom and electronics.	**Online Course Platforms:** A learner to sign up for online Physics courses on for in-depth learning. **Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in physics.	**Group discussion**: Facilitate leaner in groups to apply mathematical knowledge to describe various principles and physical phenomena related to Physics of the atom and electronics. **Problem based learning:** Guide leaner to identify problems related to Physics of the atom and	Mathematical knowledge to describe various principles and physical phenomena related to Physics of the atom and electronics are correctly applied	Online resources and modules	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					electronics.				
	2.0 Conduct experimentsin Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Carry out scientific investigations related to Physics of the atom and electronics.	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts, conduct experiments, and analyse results in Physics.	**ICT based learning:** Use different Online sources to guide leaner to conduct the scientific investigations on the application of various instruments in Physics of the atom and electronics. **Practical work:** Guide the learner through step-wise procedure to use practical work to carried out	Scientific investigations related to Physics of the atom and electronics are analysed appropriately	Thermometer, calorimeter, online resources (Simulation) and GM counter	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					scientific investigations.				
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Use scientificreport to communicate experimental results in Physics	**E-Libraries and Databases:** A learner to access digital libraries and academic databases such as TIE-online library.	**Cooperative learning:** Guide leaner in the proper use of online resources in presenting a scientific investigation report to communicate experimental results.	A scientific report is correctly used to communicate experimental results in Physics	Charts and onlineresources	**14 Hours**	**4 Hours**
	3.0 Evaluate and use informationin Physics	3.1 Collect, describe and relatephysical data	(a) Collect and analyse data to explain various physical parameters (Physics of the atom and electronics.)	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research	**ICT based learning:** Use different online sources (virtual lab) and web-based information to guide leaners to explore	Collected Physics data are correctly analysed to explain various physical quantities	Online resources	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				and study in Physics.	different methods of data collection in Physics experiments				
			(b) Collect and analyse data to explain experimental observations related to Physics of the atom and electronics.	**Project based learning:** A learner to participate in project-based learning in Physics, where learners explore concepts through hands-on projects and collaborative research. **Virtual Study Groups:** A learner to create and	**Group discussion:** Guide leaner in groups to discuss various methods of data collections **Project work:** Guide leaner to conduct mini research work and facilitate them to collect and organize data from the research work	Collected physical data are correctly analysed to explain experimental observations related to Physics of the atom and electronics.	Online resourcesand otherrelevant materials	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				join virtual Physics study groups via Zoom, Microsoft Teams for collaborative learning.	**ICT-based learning:** Use different online sources and web-based information to guide leaner to visualize and explore different scenarios from variety ofsources and present their observation.				
		3.2 Carry out a project in Physics	a) Develop and carry out a research project in Physics	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply theoretical concepts,	**Group discussion:** Guide learner through manageable groups to discuss various procedure for	A research project in Physics is developed and carried out correctly	Online resources and other relevant materials	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				conduct experiments, and analyse results in Physics. **Interactive Simulations and Labs:** A learner to use online simulations in science subjects.	carrying out a project **Digital interactive simulation:** Facilitate learner to use virtual labs to analyse the collected data **Experimentation:** Guide the learner using real lab instruments to perform scientific investigations.				
5.0 ANALYSING MOVEMENT AND WAVE INTERACTIONS	1.0 Apply knowledge of Physics in various contexts	1.1 Demonstrate mastery of basic concepts, theories and principles of Physics	(a) Describe the concept of laws of motion (Newton's laws of motion and linear momentum)	**Laboratory activities:** A learner to engage in hands-on laboratory activities to apply	**Digital interactive simulations:** Facilitate leaner through interactive simulations	Concepts of laws ofmotion are correctly described	Text books, inclined plane and roller	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				theoretical concepts, conduct experiments, and analyse results in Physics. **Use of Physics modules:** A learner to utilize Physics modules and textbooks, including those from TIE.	to visualize different concepts, theories and laws related to motion **Practical Work:** Guide leaner through hands- on activities to explore the concepts of motion **Brainstorming:** Guide leaner to brainstorm on the application of the concepts of motion in real life.				

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
			(b) Describe the concept of waves	**Interactive Simulations and Labs:** A learner to use online simulations and virtual labs for hands-on Physics experiments and practical experience in science subjects.	**Digital interactive simulations:** Facilitate leaner through interactive simulations to visualize different concepts, theories and laws related to waves **Practical Work:** Guide leaner through hands- on activities to explore the concepts of waves **Brainstorming:** Guide leaner to brainstorm on the	Concepts of waves are correctly described	Text books, inclined plane and roller Strings, ripple tank, ICT-facilities, stroboscope, tuning forks, pipes, sonometer, resonance tube	**20 Hours**	**6 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					application of the concepts of waves in real life.				
		1.2 Use mathematics to explain physical principles and phenomena	(a) Apply Mathematical knowledge to describe various principles and physical phenomena related to motion and waves.	**Online discussion forums:** A learner to join online forums like reddit and stack exchange for Physics discussions.	**Group discussion**: Facilitate leaner in groups to apply mathematical knowledge to describe various principles and physical phenomena related to motion and waves. **Problem based learning:** Guide leaner to identify problems	Mathematical knowledge to describe various principles and physical phenomena related to motion and waves are correctly applied	Online resources and modules	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
					related to motion and waves.				
	2.0 Conduct experimentsin Physics	2.1 Demonstrate mastery of basic experimental skills in Physics	(a) Describe types of experimental variables in Physics related to motion	**Field Work:** A learner to carry fieldwork to apply Physics concepts in real-world settings and practical investigations.	**Cooperative learning:** Facilitate leaner to work in groups to describe types of experimental variables in Physics	Experimental variables are described clearly	Physics module, Online resources	**14 Hours**	**4 Hours**
			(b) Carry out scientific investigations related to Physics of the motion and waves	**Virtual Study Groups:** A learner to create and join virtual physics study groups via Zoom, Microsoft Teams for	**ICT based learning:** Use different Online sources to guide leaner to conduct the scientific investigations on the application of various	Scientific investigations related to waves and motion are analysed appropriately	Text books andcharts	**14 hours**	**4 hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				collaborative learning.	instruments in waves and motion. **Practical work:** Guide the learner through step-wise procedure to use practical work to carried out scientific investigations.				
		2.2 Demonstrate mastery of data analysis, presentation and report writing in Physics	(a) Use scientificreport to communicate experimental results in Physics	**Online discussion forums:** A learner to join online forums like reddit and stack exchange for Physics discussions.	**Cooperative learning:** Guide leaner in the proper use of online resources in presenting a scientific investigation report to communicate experimental results.	A scientific report is correctly used to communicate experimental results in Physics	Charts and onlineresources	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
	3.0 Evaluate and use informationin Physics	3.1 Collect, describe and relatephysical data	(a) Collect and analyse data to explain various physical parameters (motion and waves)	**Webinars and Online Workshops:** A learner to participate in live or recorded Physics webinars and workshops led by experts to enhance their knowledge.	**ICT based learning:** Use different online sources (virtual lab) and web-based information to guide leaner to explore different methods of data collection in Physics experiments	Collected Physics data are correctly analysed to explain various physical quantities	Online resources	**14 Hours**	**4 Hours**
			(b) Collect and analyse data to explain experimental observations related to motion and waves	**Project based learning:** A learner to participate in project-based learning in Physics, where learners	**Group discussion:** Guide leaner in groups to discuss various methods of data collections	Collected physical data are correctly analysed to explain experimental observations related to motion and waves.	Online resourcesand otherrelevant materials	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				explore concepts through hands-on projects and collaborative research.	**Project work:** Guide leaner to conduct mini research work and facilitate them to collect and organize data from the research work **ICT-based learning:** Use online sources to guide learner in exploring scenarios and presenting observations				

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
		3.2 Carry out a project in Physics	(a) Complete and submit a report for the research project started in STAGE II.	**Use of institute library:** A learner to utilize the resources available at your institution's library for comprehensive research and study in Physics. **Project based learning:** A learner to participate in project-based learning in Physics, where learners explore concepts through hands-on	**Problem-solving approach:** Guide leaner with real-world problems that require them to analyse collected Physics data to explain various physical parameters **Collaborative Learning:** Guide the leaner to work in pairs or small groups to analyse and interpret collected Physics data	Report for the research project started in STAGE II is completed and submitted	Online resources	**14 Hours**	**4 Hours**

NAME OF MODULE	MAIN COMPETENCES	SPECIFIC COMPETENCES	LEARNING ACTIVITIES	SUGGESTED FACILITATION AND LEARNING STRATEGIES		ASSESMENT CRITERIA	FACILITATION/LEARNING RESOURCES	TIME HOURS	
				SELF LEARNING	FACE TO FACE SESSION			SELF LEARNING	FACE TO FACE
				projects and collaborative research.	**ICT-based learning:** Use different online sources and web-based information to guide to complete and submit project report.				