SCHEME OF WORK 2022-2023 : PHYSICS FOR SENIOR THREE

District: GASABO

Academic year: 2022-2023

School: ……………………………..…………………………………………………

Teacher’s names: …………………………………………………………………….

TERM 1, 2022-2023

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| ***DATES*** | ***UNIT TITLE*** | ***LESSON TITLES***  ***+EVALUATION*** | ***LEARNING OBJECTIVES*** | ***TEACHING METHODS&TECHNIQUES***  ***+EVAUATION*** | ***RESOURCES*** | ***OBERVATION*** |
| ***WEEK 1*** | **Unit 1**: | **Lesson titles** | By the end of the unit the learner should be able to  Describe graphs of uniform  Interpret linear  motion Identify uniform velocity and non-uniform velocity from the graph | Discuss in groups and present suitable scales for plotting graphs.  Interpret linear motion graphs. Discuss determination of distance from velocity-time graph.  Find acceleration from | * Senior 3 Student's Book * New Physics longhorn publisher * Fountain Physics * Advanced   physics |  |
| 26-30/09/2022 | Graphs of | **1.** Illustration of |
|  | linear motion | displacement time |
|  |  | graphs and |
|  |  | velocitytime graphs |
|  |  | **2.** Determinate |
|  |  | distance covered from |
|  |  | a velocity time graph |
| ***WEEK 2*** |  | **3.** Interpretation of | velocity-time graph. | fifth edition   * Physics form III * Internet |  |
| ***3-7/10/2022*** |  | distance/ displacement | Use internet and simulations |
|  |  | and speed/ velocity | to illustrate graphs of linear |
|  |  | time graphs. | motion. |
|  |  |  | **Key unit competence:** |  |  |  |
|  | **Summative evaluation 1** | By the end of this unit the learner should be  able to plot and analyze | Written test |
|  |  | the graphs of linear |  |
|  |  | motion |  |

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| ***WEEK 3***  ***10-14/10/2022*** | ***Unit 2:*** Friction force and newton’s law of motion | **Lesson Titles**  **1,** Review on Newton’s law of motion  **2,** Definition of linear momentum  **3,** Distinction between impulse and linear | By the end of the unit the learners should be able to:   * Explain inertia * State and explain newton’s law * Apply newton’s | Discuss in groups and make presentation on the role of safety belts in car.  Perform an experiment to illustrate momentum change, the Newton’s law of motion, friction force and report.  Devise an experiment to  determine the coefficient of | - |  |

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|  |  | momentum | laws principles in solving motion problems. | friction and report. Solve in groups problems related to Newton’s laws on change of momentum. |  |
| ***WEEK 4***  ***17-21/10/2022*** | **Lesson titles**   1. Conservation of linear momentum 2. Determination of coefficient of friction |
|  |  | **Summative evaluation 2** | **Key unit competence:** By the end of this unit learner should be able to perform experiments  involving Newton’s laws of motion and friction force |  |  |
| ***WEEK 5***  ***24-28/10/2022*** | **Unit 3:** Application of atmosphere pressure | **Lesson Titles**  1, Illustrating the existence of atmospheric pressure  2, Factors influencing the atmospheric pressure | By the end of this unit the learner should be able to :  Explain the existence of force exerted by air on surface  Explain the relationship between atmospheric and altitude Discuss factors | To work in groups to conduct experiments illustrating the existence of force exerted by air on a surface and make presentations |  |
|  |  |  | To discuss in |
|  |  |  | groups, the factors |
|  |  |  | influencing |
|  |  |  | atmospheric |

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|  |  |  |  | pressure and presenting the finding. |  |
| ***WEEK 6***  ***31/10- 4/11/2022*** |  | **3,** Relationship between  atmospheric pressure | affecting atmospheric pressure  Outline the applications of atmospheric pressure. | To work in group to  measure the | - |
|  | and altitude |  | atmospheric |  |
|  | **4,** Instrument for measuring atmospheric pressure |  | pressure using mercury barometer and make presentation |  |
|  | **5,** Applications of |  |  |  |
|  | atmospheric pressure. |  |  |  |
|  |  | **Summative evaluation 3** | **Key unit competence:** By the end of the unit the learner should be able to explain the existence of pressure in gas and the application of atmospheric pressure |  |  |

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| ***WEEK 7*** | **Unit4:** | **Lesson Titles** | By the end of this unit the learners should be able to: Outline renewable and non-renewable energy, classify energy sources as renewable and nonrenewable sources, and Analyze transformation of energy into different forms | Discuss in groups and make presentation on the energy source in Rwanda and related in the world.  Discuss in groups and make presentation on different between renewable and nonrenewable  energy. | - |
| ***7-11/11/2022*** | Renewable | **1,** Energy |  |
|  | and non- | sources |  |
|  | renewable | (renewable and |  |
|  | energy  sources | nonrenewable) |  |
|  |  | **2,** Classification |  |
|  |  | of energy |  |
|  |  | sources in |  |
|  |  | Rwanda and the |  |
|  |  | world: |  |
|  |  | renewable |  |
|  |  | energy sources. |  |
| ***WEEK 8***  ***14-18/11/2022*** |  | **3,**  Transformation | Analyze transformation of energy into different forms | Discuss in groups and make presentation on different between renewable and nonrenewable energy. | - |
| of energy: |  |  |
| (potential |  |  |
| energy to |  |  |
| kinetic energy |  |  |
| and vice versa; |  |  |
| **4,** Electrical |  |  |
| energy to |  |  |
| mechanical and |  |  |
| vice versa etc.) |  |  |
|  |  | **Summative evaluation 4** | **Key unit competence**: By the end of the unit the learner should be able to differentiate between renewable and non- renewable energy sources and give examples. |  |  |

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| ***WEEK 9***  ***21-25/11/2022*** | **Unit 5**:  Heat transfer and quantity | **Lesson Titles 1,** Difference between heat and temperature **2,** Modes of heat transfer  **3,** Applications of heat transfer | By the end of this unit the learner should be able to: Explain the modes of heat transfer Explain thermal expansion of solids, Define the terms heat capacity and specific heat capacity and Determine the coefficient of expansion | * Perform an experiment on thermal expansion of given solid objects and report * Perform experiment s   to illustrate heat transfer | * Senior 3   Student's Book   * New Physics * Fountai n Physics * Advan ced physics fifth edition * Physics |  |
|  | **Lesson Titles 4,** Thermal expansion: linear, surface  and |
|  |  | volume |  |  | form III  - Internet |  |
| ***WEEK 10***  **28/11- 2/12/2022** |  | **Lesson Titles 5,** Heat capacity and specific heat capacity, specific latent heat of vaporization and fusion **6,** Experiment to determine specific heat capacity of a metal block | By the end of this unit the learner should be able to: Explain the modes of heat transfer Explain thermal expansion of solids, Define the terms heat capacity and specific heat capacity and Determine the  coefficient of expansion | - Perform an experiment on thermal expansion of given solid objects and report Perform experiments to illustrate heat transfer | * Senior 3   Student's Book   * New Physics * Fountai n Physics * Advan ced physics fifth edition * Physics form III |  |

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|  |  | **Summative evaluation 5** | **Key unit competence:** By the end of the unit the learner should be able to evaluate modes of heat transfer and determine specific heat capacity of metal block. |  | - |  |
| ***WEEK 11***  ***5-9/12/2022*** | | Revision | | | | |
| ***WEEK 12***  ***12-16/12/2022*** | | Exams | | | | |
| ***WEEK 13***  ***19-23/12/2022*** | | Writing school report & proclamation | | | | |

TERM 2, 2022-2023

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| ***DATES*** | ***UNIT TITLE*** | ***LESSON TITLES***  ***+EVALUATION*** | ***LEARNING OBJECTIVES*** | | ***TEACHING***  ***METHODS&TECHNIQU ES+EVAUATION*** | | ***RESOURCES*** | ***OBERVATION*** |
| ***WEEK 1***  9-13/01/2023 | **Unit 6:** Laws of thermodyna mics | **Lesson Titles**  **1,** The first and second laws of thermodynamics **2,** Application of the principle of thermodynamics | | By the end of the unit the learner should be able to:  State the law of thermodynamics Describe the application of thermodynamics Explain heat exchange | | Demonstrate work done on system using boiling water and report Discuss in groups and present freezing water and melting of ice.  Carry out investigations and write report on melting and freezing. | Senior 3 Student's  Book  New Physics Fountain  Physics Advanced physics fifth edition Physics form  III  Internet |  |

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| ***WEEK 2***  ***16-20/01/2023*** |  | **3,** Heat capacity and specific heat capacity, specific latent heat of vaporization and fusion | By the end of this unit the learner should be able to: Explain the modes of heat transfer Explain thermal | - Perform an  experiment on thermal expansion of given solid objects and report | * Senior 3   Student's Book   * New Physics |  |
|  |  | **4,** Experiment to determine specific heat capacity of a metal block | expansion of solids, Define the terms heat capacity and specific heat capacity and Determine the coefficient of expansion | Perform experiments to illustrate heat transfer | -   * Fountai   n Physics   * Advanc ed physics fifth   edition   * Physics form III |  |

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| ***WEEK 3***  ***23-27/01/2023*** | **Unit 7**: Introduction to electromagn etic induction | **Lesson Titles**   1. Laws of   electromagnetic induction   1. Induced   electromagnetic | By the end of the unit the learner should be able to: State the laws of electromagnetic induction | * Group discussions and presentations * Group works * Questions-answers | Idem |  |

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|  |  | force | Explain |  |  |  |
|  | electromagnetic |
|  | induction Define |
|  | the term |
|  | 1. Formula for the emf induced in a straight conductor   moving in magnetic field   1. Production of an induced emf by a time changing magnetic flux 2. Alternating current | alternating | * Group discussions and presentations * Group works * Questions-answers |
| current To |
| explain the |
| functioning of a |
| transformer |
| ***WEEK 4***  30/01- 3/02/2023 | 1. Induced emf in a coil rotating within uniform magnetic field 2. Operation alternating current generator 3. Effect on the | By the end of the unit the learner should be able to:  State the laws of electromagnetic induction |  |
|  | induced emf by | Explain |
|  | changing the | electromagnetic |
|  |  | induction |

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|  |  | 1. generator frequency 2. Relation between peak and RMS values for sinusoidal current and voltages 3. Problems involving peak and RMS values | Define the term alternating current To explain the functioning of a transformer |  |  |  |
|  |  | **Summative evaluation 2** | **Key unit competence:** By the end of this unit the learner should be able to apply the principle of electromagnetic induction |  |  |  |

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| ***WEEK 5***  ***6-10/02/2023*** | **Unit 8:** Electrical power transmission | **Lesson Titles**   1. Operation of an ideal transformer 2. Transmission of electrical power 3. Power losses in transmission lines and real transformers | By the end of unit the learner should be able to:  - Analyse the operation of ideal transformer Describe the transmission of electrical power Explain the operation of an ideal transformer To be able to explain the step-up and down transformers and power transmission To be able to state the dangers of staying near high-voltage power lines. | Group discussions and presentations   * Group works * Questions-answers | Idem |  |
|  |  | **Summative evaluation 3** | **Key unit competence:** By the end of this unit the learners should be able to analyse the transmission of electrical power |  |  |  |

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| ***WEEK 6***  ***13-17/02/2023*** | **Unit 9**: Conservatio n of mechanical energy in isolated systems | **Lesson Titles**   1. Step-up and down transformers and power transmission 2. Solve problems on transformers and power transmission   Dangers high-voltage lines |  | * Group discussions and presentations * Group works * Questions-answers |  |  |
| ***WEEK 7***  20-24/02/2023 | **Unit 10**: Electric field intensity | **Lesson Titles**   1. Electrostatic force and coulomb’s law 2. Superposition of parallel   electrostatic forces   1. Definition of   electric fields | By the end of this unit the learner should be able to:  Illustrate the electric field patterns due to two charges  State the principle of superposition for point | * Group discussions and presentations * Group works * Questions-answers | Idem |  |

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|  |  | 1. Electric field lines 2. Electric field due to one point charge Superposition of parallel electric fields | charges in electric field  Differentiate electric force and electric field To explain the superposition of parallel electric fields. |  |  |  |
|  |  | **Summative evaluation 5** | **Key unit competence**: By the end of this unit the learners should be able to calculate intensity of electric field due to one or more point charges. |  |  |  |
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| ***WEEK 8***  ***27/02- 03/03/2023*** | Unit 11: House electric installation. | **Lesson Titles**   1. Standard symbols for electrical installation 2. Symbols on circuits diagrams 3. Types of electrical cables and their sizes 4. Function of circuit breakers and fuses | By the end of the unit the learner should be able to:  Describe the electric circuit diagrams Describe symbols used in electrical engineering drawing Explain protecting electric devices and  the installations | * Group discussions and presentations * Group works * Questions-answers | Idem |  |
|  |  | 1. Fuse rating 2. Installation of lightning arrestor   Incandescent lamp, tungsten lamp, gas filled lamps   1. Transmission of electricity 2. Dangers of electricity 9.Installation of earth wire | Explain the functioning of the  fuses in electric circuit |  |  |  |
|  |  | **Summative evaluation 6** | **Key unit competence**: By the end of this unit the learner should be able to analyse and carry out a simple electric installation. |  |  |  |

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| ***WEEK 9***  6-10/03/2023 | **Unit12:** Basic alternating current circuits | **Lesson Titles**   1. Standard   symbols used in  electric circuits and their functions   1. A.C   connected to a single resistor.   1. A.C source connected to a single   capacitor | By the end of this unit the learner should be able to : Identify circuit symbols representing electrical component Differentiate between an alternating current and direct current Design an electric circuit consisting of AC voltage and inductor resistor and capacitor  Explain function of inductor resistor and capacitor in electric circuits. | * Group   discussions and presentations   * Group works * Questions- answers | -  -  -  -  - | Senior 3  's Book New Physics Fountai n Physics Advanc ed physics fifth edition Physics form III |  |
|  |  | **Lesson Titles**  **4.** A.C voltage connected to a single inductor  The RLC series circuit | Group discussions and presentations  Group works Questions-answers |  |  |  |
|  |  | **Summative evaluation 7** | Key unit competence: By the end of the unit the learner should be able to design and analyze simple alternating current circuit. |  |  | |  |
| ***WEEK 10***  ***13-17/03/2023*** | | REVISION | | | | | |
| ***WEEK 11***  ***20-24/03/2023*** | | EXAMS | | | | | |
| ***WEEK 12***  ***27-31/03/2023*** | | Writing School report & proclamation | | | | | |

**TERM 3; 2022-2023**

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| ***DATES*** | ***UNIT TITLE*** | ***LESSON TITLES***  ***+EVALUATION*** | ***LEARNING OBJECTIVES*** | ***TEACHING METHODS&TECHNIQU ES***  ***+EVAUATION*** | ***RESOURCES*** | ***OBERVATION*** |
| ***WEEK 1*** | **Unit 12**: | **Lesson Titles** | To explain phenomenon  of refraction of light  To state the law of refraction.  To explain total internal reflection of light and its applications  To appreciate the applications of thin lenses  Explain the defects of lenses and how they  occur | * Group discussions and presentations * Group works * Questions-answers | Idem |  |
| 17-21/04/2023 | Refraction of light | 1. Bending of light between adjacent media 2. Verification of snell’s |  |
|  |  | law Refraction of |  |
|  |  | ligh**t.** |  |
|  |  | 1. through layers of parallel media. 2. Total internal reflection light 3. Applications |  |
|  |  | of total internal |  |
|  |  | reflection |  |
|  |  | 6. Bending of light between adjacent |  |

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|  |  | media   1. Verification of snell’s law 2. Refraction of light |  |  |  |  |
| ***WEEK 2***  ***24-28/04/2023*** |  | 1. through layers of parallel media. 2. Total internal reflection light 3. Applications of total internal reflection | To explain total internal reflection of light and its applications To appreciate the applications of thin lenses  Explain the defects of lenses and how they occur |  |  |  |
| ***WEEK 3***  ***1-5/05/2023*** |  | 15. Refraction of light through a thin lens |  | - Group discussions | **Lesson Titles** |  |

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| ***WEEk 4***  ***8-12/05/2023*** |  | 1. Location of images formed by thin lenses using ray diagram method 2. Lens formula 3. Power of a lens Power of two lens in contact 4. Lens defects 5. Explanation of refraction of light through a |  | and presentations  - Group works Questions-answers | 21. . Problems solving on refraction of light. |  |

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|  |  | glass prism Dispersion of light by a glass prism |  |  |  |  |
|  |  | Summative evaluation | **Key unit competence**: By the end of this unit the learner should be able to explain refraction of light phenomenon |  |  |  |
| ***WEEK5***  ***15-19/5/2023*** | Unit 13: Telecommun ication channels | **Lesson Titles**   1. Definition of communication 2. Digital and analog signals 3. Types of communication channels 4. Advantages and disadvantages of: wires pairs, coaxial cables, optic fibre, radio waves and satellite   communication | By the end of this unit the learner should be able to :  Define and explain the term communication Outline different channels of communication Distinguish between digital and analogue signals  Describe simple block diagram of communication system | * Group discussions and presentations * Group works * Questions- answers | Idem |  |

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| ***WEEK6***  ***22- 26/05/2023*** |  | **Lesson Titles**   1. Simple block diagram of communication system 2. application |  |  |  |  |
|  |  |  | **Key unit competence**: By the end of this unit the learners should be able to differentiate telecommunication channels |  |  |  |
|  |  |  | By the end this unit | - Group  discussions | Idem |  |

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| ***WEEK7***  ***29/05- 02/06/2023*** | **14:**Properties of physical processes affecting plant growth | **Lesson Titles**   1. Environment factors 2. Composition of the atmosphere, soil aeration and soil structure, soil reaction 3. Biotic factors, supply of mineral nutrients. | By the end this unit the learner should be able to: Explain the environment factors Explain biotic factors, and mineral supply Describe physical properties of soil and their application on plant nutrition and plant growth | and presenta tions   * Group works * Questio ns- answers |  |  |
| ***WEEK 8*** |  | **Lesson Titles** | environment factors Explain biotic factors, and mineral |  |  |  |
| 5-9/06/2023 | **4,** The impact environmental factors on range plant productivity on water temperature, light, atmosphere, nutrients, fire and grazers  **5,** Physical properties of soil | supply Describe physical properties of soil and their application on plant nutrition and plant growth |
|  | in relation to plant nutrition |  |
|  | and plant growth. hydrologic |  |
|  | cycle |  |
|  | **6.** Water, atmosphere and |  |

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|  |  | clouds |  |  |  |  |
|  |  | **Summative evalution** | **Key unit competence**: By the end of this unit the learners should be able to describe the physical properties affecting plant growth. |  |  |  |
| ***WEEK9*** | Unit 15: | **Lesson Titles**   1. Cyclones and anticyclones 2. Global convection currents and wids patterns | - Outline environmental problems such as noise pollution and global warming. |  |  |  |
| ***12-16/06/2023*** | Environmental  factors |
|  | affecting plant |
|  | growth |
|  |  | 1. Warming of the earth surface 2. Thermoregulation and physics laws governing it. | * Group discussion s and presentati ons * Group | Idem |  |
|  | works |  |
|  | Questions- |  |
|  | answers |  |
|  |  | Summative evaluation | **Key unit competence**: By the end of this unit the learners should be able to relate physics concepts with environmental phenomena. | - |  |  |
| ***WEEK 10***  ***19-23/06/2023*** | REVISION | | | | | |
| ***WEEK 11***  ***26-30/06/2023*** | REVISION | | | | | |
| ***WEEK12***  3-7/07/2023 | EXAMS | | | | | |

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| ***WEEK 13***  10-14/07/2023 | Writing school report & proclamation |