



Course Specification

(Bachelor)

| |
|--------------------------------------------------|
| Course Title: General Physics - I |
| Course Code: 129 Phys- 4 |
| Program: Bachelor of Engineering |
| Department: Physics |
| College: Science |
| Institution: King Khalid University (KKU) |
| Version: TP-153- 2024 |
| Last Revision Date: 8/10/2024 |





Table of Contents

| | |
|---------------------------------------------------------------------------------|---|
| A. General information about the course: | 3 |
| B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods: | 4 |
| C. Course Content: | 5 |
| D. Students Assessment Activities: | 5 |
| E. Learning Resources and Facilities: | 6 |
| F. Assessment of Course Quality: | 6 |
| G. Specification Approval Data: | 7 |



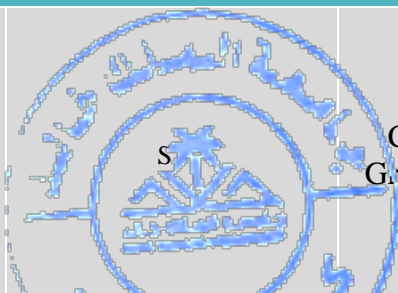


| No | Mode of Instruction | Contact Hours | Percentage |
|----|----------------------------------------------------------------------------------------------------|---------------|------------|
| 3 | Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning | 0 | 0% |
| 4 | Distance learning | 0 | 0% |

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| No | Activity | Contact Hours |
|-------|-----------------------|---------------|
| 1. | Lectures | 48 |
| 2. | Laboratory/Studio | 32 |
| 3. | Field | 0 |
| 4. | Tutorial | 0 |
| 5. | Others (specify)..... | 0 |
| Total | | 80 |

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

| Code | Course Learning Outcomes | Code of PLOs aligned with the program | Teaching Strategies | Assessment Methods |
|------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 1.0 | Knowledge and understanding | | | |
| 1.1 | Define vector, displacement, speed, velocity, force, work, energy, power, pressure, stress, strain, specific heat | K1 | Lecture | <ul style="list-style-type: none">● Quizzes● assignments● Examinations |
| 1.2 | Define stress, strain, young modulus of elasticity, flow rate, Bernoulli theorem, electric field, Ohms law, and resistance | K1 | | |
| 2.0 | Skills | | | |
| 2.1 | Differentiate between vectors and scalars, and understand the concepts of 1D Motion, Laws of Motion, and concept of the work-energy principle. |  | Class lectures Group discussion The internet resources Tutorials | Homework assignments. Research Assignments |





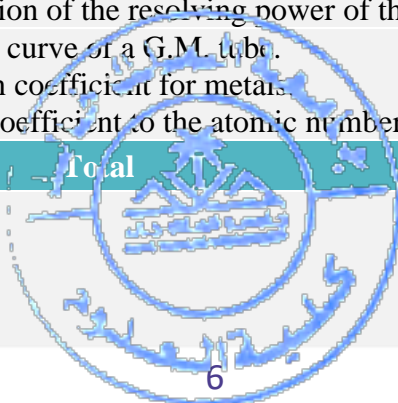
| Code | Course Learning Outcomes | Code of PLOs aligned with the program | Teaching Strategies | Assessment Methods |
|------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------|----------------------------------------------------------------------------------------|
| 2.2 | Demonstrate the concept of equation of continuity, Bernoulli theorem - To differentiate between electric field and electric potential. | S2 | | |
| 2.3 | Apply laws of physics studied in this course to daily life situations. | S3 | Lecture | Practical |
| 2.4 | Apply the concept of electric charge and electric field, laws of resistance from Engineering Physics points of view. | S4 | Lecture | Practical |
| ... | | | | |
| 3.0 | Values, autonomy, and responsibility | | | |
| 3.1 | Able to self-learn and solve the tasks alone | V1 | Solve problems alone | Homework Exercises and solutions Notes Written |
| 3.2 | Work with a team | V1 | Discussion, Working in groups | Homework Exercises and solutions Note Written and verbal tests Homework's •Discussions |
| ... | | | | |

C. Course Content:

| No | List of Topics | Contact Hours |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1. | Measurements, units, and vectors. Standards of Length, Mass and Time, Density, Dimensional Analysis, Conversion of Units, Significant figures Vectors and Scalars, Properties of Vectors, Addition of vectors, Components of a vector and unit vectors, Product of two vectors. | 6 |
| 2. | Motion in one dimension Introduction to position, distance, displacement, average speed, and velocity. Instantaneous speed. Average and instantaneous acceleration, uniformly accelerated motion, freely falling bodies | 6 |
| 3. | Newton's Laws of Motion and Friction | 6 |



| | Concept of Force, Newton's Laws of Motion, Gravitational force and weight, Objects in equilibrium, Force of friction. | |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 4. | Work, Kinetic Energy and Potential Energy Work done by a constant force and a varying force, Kinetic energy and Work energy theorem, Conservation of energy, Power, Potential Energy, Conservative and Non- conservative forces | 6 |
| 5. | Fluid Mechanics Pressure, Variation of pressure with depth, Buoyant forces and Archimedes principle, Fluid dynamics, Equation of continuity, Bernoulli's Equation | 6 |
| 6. | Elasticity Elastic properties of Solids, Stress, Strain, and Young's modulus of elasticity, Bulk and Shear modulus of elasticity | 6 |
| 7. | Heat, Temperature, Specific Heat, Latent Heat Temperature, Thermometers, Temperature Scale, Thermal Expansion of Solids, Heat and Internal Energy, Specific Heat and Principle of Calorimetry, Latent Heat | 3 |
| 8. | Electric Field and Potential Properties of electric charge, Charging objects by induction, Coulomb's Law, Electric field. Potential Difference and electric potential, Electric potential | 3 |
| 9. | Currents and Resistance and Electric Energy and Power Electric Current, Resistance, Ohm's Law, Electric Power, Resistors in Series and Parallel | 6 |
| Total | | 48 |
| No | List of Practical Experiments | Contact Hours |
| 1 | Measurement of errors by Vernier calipers and micrometer | 4 |
| 2 | Specific heat capacity of solid by the method of mixture | 2 |
| 3 | Mechanical Equivalent of heat through an electrical method | 2 |
| 4 | Surface tension of liquids using the direct pull method. Effect of temperature variation on surface tension. | 4 |
| 5 | Study the effect of light refraction through glass and liquid and determination of their refractive indices. | 4 |
| 6 | Coefficient of viscosity of a viscous liquid by the Stokes method | 3 |
| 7 | Determination of the force constant of a helical spring and the acceleration due to gravity using the spring-mass system | 4 |
| 8 | Correction of visual defects (myopia and hypermetropia) in the eye. Comparison of experimental results with theoretical predictions. | 4 |
| 9 | Observation of the interference pattern from Young's double slit experiment and estimation of the resolving power of the human eye. | 3 |
| 10 | Study the characteristic curve of a G.M. tube. Measure the attenuation coefficient for metals. Relate the attenuation coefficient to the atomic number. | 2 |
| Total | | 32 |



D. Students Assessment Activities:

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|----|-------------------------|--------------------------------|--------------------------------------|
| 1. | Quiz and Assignments | 5th & 12 th | 10% |
| 2. | Mid Exam | 10th | 30% |
| 3. | Practical Exam | End of Term | 20% |
| 4. | Final Exam | End of Term | 40% |

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

| | |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Essential References | Physics for Scientists and Engineers by Raymond A. Serway and John W. Jewett. ISBN 0534408427 Thomson Brooks/Cole © 2004; 6th Edition |
| Supportive References | Physics, Volume 1, Robert Resnick, David Halliday, Kenneth S. Krane |
| Electronic Materials | www.lms.kku.edu.sa to access lecture notes, textbook, lab manual, announcements related to the course, etc. |
| Other Learning Materials | |

2. Educational and Research Facilities and Equipment Required:

| Items | Resources |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | A classroom that accommodates 40 students and a laboratory accommodating 25 students |
| Technology equipment (Projector, smart board, software) | Data show, laptop, smart board, and web. |
| Other equipment (Depending on the nature of the specialty) | None. |

F. Assessment of Course Quality:

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---------------------------------------|---------------------------------------------|-----------------------------------|
| Effectiveness of teaching | Students, Program Leaders | Direct (A questionnaire) |
| Effectiveness of students' assessment | Faculty, Peer Reviewers and Q & D Committee | Direct (Exams, quizzes, Homework) |



| Assessment Areas/Issues | Assessor | Assessment Methods |
|---------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------|
| Quality of learning resources | Plans and Curricula Committee of the physics department. | Direct (Check the quality of devices and equipment periodically) |
| The extent to which CLOs have been achieved | Quality and Development Committee | Indirect (Self-evaluation report) |
| Other | | |

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

| | |
|---------------------------|-----------------------------------------------------------------------------|
| COUNCIL /COMMITTEE | Physics Department Council |
| REFERENCE NO. | The meeting No. 6 for the academic year 1446, the recommendation No. 3.6.46 |
| DATE | 2/5/1446 H |

