

Ministry of Higher Education and Scientific research



Department of Earth sciences and petroleum

College of Science

University of Salahaddin

Subject: General physics

Course Book – Year 1 / Second semester

Lecturer's name: Sirwa Qader Smail (M.Sc)

Academic Year: 2022/2023

Course Book

1. Course name	General physics
2. Lecturer in charge	Sirwa Qader Smail
3. Department/ College	Earth sciences and petroleum / Science
4. Contact	e-mail: sirwa.gardi@su.edu.krd Tel: 07504753127
5. Time (in hours) per week	Theory: 2 Practical: 2
6. Office hours	10 hours per week
7. Course code	
8. Teacher's academic profile	My name is Sirwa Qader Smail; I worked in University of Salahaddin since 2003 as researcher assistance in Department of Geology. I got M.Sc. Degree in Geophysics from Salahaddin University/Department of geology in 2010. I have been lecturer since 2017. I participated in studying many subjects such as; practical environmental Geology (Environmental science department), practical Crystallography, practical Rock forming minerals, Practical Clay mineralogy, Industrial geology and geophysics. In addition to these I participated in summer field course and supervised many undergraduate research students. I taught theoretical and practical Clay Mineralogy, Industrial Geology for fourth year class and electrical resistivity method for fourth year class (First course). I have taught Practical Geophysics (Gravity and magnetic) for third year (First course), theoretical and practical seismic and resistivity course (Second course), Theoretical and practical General physics for first year (Second course).
9. Keywords	Dimensions, Motion, Newton's law,
10. Course overview:	This course survey of major concepts, methods, and applications of physics. Topics include a description of motion, Newton's laws, conservation principles (energy and momentum), waves, electricity, magnetism, and optics.
11. Course objective:	<ul style="list-style-type: none"> Learn a process for critical thinking, and apply it to evaluate physical theories Implement the ideas in some basic problems. Define and analyse the concepts of velocity, acceleration, force, inertia, mass, work, energy (kinetic, potential, etc.) momentum (linear and angular), gravity, tides, power, pressure, density, temperature, thermal expansion, heat, specific heat capacity, waves, sound, electric charge, current, magnetism, electromagnetic waves (including light), photons, and radioactivity Discuss the various types of motion, Newton's Laws (including his Universal Law of Gravitation), the conservation laws of physics, the laws of electricity (e.g. Coulomb's and Ohm's Laws) and magnetism. The properties of waves (viz. sound and electromagnetic, including light) and the basic principles of atomic and nuclear physics, relativity and quantum theory;

- Solve a variety of basic problems in particle kinematics (uniform motion and accelerated motion including "free fall"), dynamics using Newton's Laws of Motion and the conservation laws of energy and momentum (e.g. collisions), fluid mechanics (including Archimedes' and Bernoulli's Principles), thermodynamics,
- wave motion, basic electricity (Coulomb's and Ohm's Laws), and radioactive decay; Interpret the results of simple experiments and demonstrations of physical principles.

12. Student's obligation

Throughout this course, the students contribute in the laboratory by asking and answering. Also they assign by homework during each laboratory. Most of the students attend to the laboratory. All of the students are committed in their exams and instructions.

13. Forms of teaching

Different forms of teaching are used during the course, like:

- White board and power point presentation for the titles, sub-titles and conclusions, in addition to figures and plates, in practical part.
- Homework is given for students during course in practical part.
- Slide presentation for presenting the main aim and clarifying the topic of the laboratory.

14. Assessment scheme

Grading:

There is one practical exam at the end of the semester, in addition to quiz exams during course.

- The final mark of semester is **50%**, and divided to:

15% for theoretical part, and

35% for practical part; also the practical mark is divided to two marks: exam and reports.

- The final exam is from **50% (50% on theory)**.

Therefore the total mark will be **100%**.

15. Student learning outcome:

- Identify and define physical quantities.
- Explain major laws of Physics.
- Apply laws of Mechanics to explain physical phenomena and solve problems.
- Connect and explain contributions of scientists to the development of laws governing physical phenomena and the concepts/theories which integrate them.
- Demonstrate your knowledge of fundamental physical principles through interpretation of everyday phenomena.
- Apply critical analytical skills to evaluate physical phenomena and their effects; develop clarity of definition, consistency of logic and adequacy of evidence.
- Demonstrate clear understanding of scientific method and its application to the fundamental principles of Earth sciences and petroleum specialty.

16. Course Reading List and References:

- Chapman, R. E., 2002. Physics for geologists. Second Edition, Printed in the United States of America, P. 147.
- Urone, P. P., 2012. College physics, California Roger Hinrichs, Oswego County, New

York, 1058p. • How Things Work: The Physics of Everyday Life, 3rd edition, by Louis A. Bloomfield, Wiley, 2006	
17. The Topics:	Lecturer's name
Week 1: Course outline and instructions Week 2: Introduction, Relation between physics and geology Week 3: Dimensions and units, SI units, Prefixes of SI units Week 4: Speed, Velocity and acceleration Week 5: The laws of motion Week 6: Force, Gravity, Universal gravity Week 7: Solids and fluids Week 8: Monthly exam Week 9: Reflection and Refraction of light, Refractive index Week 10: Electricity, Conductivity and Resistivity Week 11: Electric fields, Magnetism Week 12: Elasticity and Elastic Moduli Week 13: Frequency, Wavelength, amplitude and phase Week 14: Electromagnetic radiation, Cosmic radiation, Gamma rays, X- Rays, X- Ray diffraction, X- Ray Fluorescence, Radars Week 15: Terrestrial magnetism, Remnant magnetism, Important electrical definition	Sirwa Qader Smail 2 hrs. per week
18. Practical Topics	Lecturer's name
Week 1: Course outline and instructions Week 2: Introduction, Relation between physics and geology Week 3: Dimensions and units, SI units, Prefixes of SI units Week 4: Speed, Velocity and acceleration Week 5: The laws of motion Week 6: Force, Gravity, Universal gravity Week 7: Solids and fluids Week 8: Monthly exam Week 9: Reflection and Refraction of light, Refractive index Week 10: Electricity, Conductivity and Resistivity Week 11: Electric fields, Magnetism Week 12: Elasticity and Elastic Moduli Week 13: Frequency, Wavelength, amplitude and phase Week 14: Electromagnetic radiation, Cosmic radiation, Gamma rays, X- Rays, X- Ray diffraction, X- Ray Fluorescence, Radars Week 15: Terrestrial magnetism, Remnant magnetism, Important electrical definition	Ms. Sirwa Qadir Smail 2 hrs. per week
19. Examinations: Q1) Fill the following blanks with suitable answers: 1. Physics is the study of the ----- by which the physical world operates. 2. Law uses ----- to describe a ----- in nature that is	

supported by scientific evidence and repeated experiments.

3. Average speed is a ----- quantity while the average velocity is a ----- quantity.
4. The tendency of an object to resist any attempt to change its velocity is called ----.
5. In a ----- the atoms have an ordered structure.

Q2) Answer these questions below.

1. Characteristics of standards for measurements
2. Free Fall – Object Thrown Upward

Q3) The traffic light turns green, and the driver of a high-performance car slams the accelerator to the floor. The accelerometer registers 22.0 m/s^2 . Convert this reading to km/min^2 .

Q4) Find the force exerted by the Moon on a 70kg man on Earth. The Moon has a mass of $36 \times 10^{22} \text{ kg}$ and is $3.84 \times 10^8 \text{ m}$ from Earth.

20. Extra notes:

The course book lacks to the problems which affect the educational process. These problems include the large number of students in each stage, diminution of instruments, and absence of appropriate rooms for lecturers to develop themselves. Finally, about the department of Earth sciences and petroleum absence of financial support to carry out scientific trips and field course in a typical situation.

21. Peer review

M. Abdulwahab Nawshad