



Course Specifications

Institution: Umm Al-Qura University	Date: 12/12/2018
College/Department : Common first year, Natural Sciences Department.	

A. Course Identification and General Information

1. Course title and code: : General Physics (1), 48021300 - 4 .			
2. Credit hours: 4 credit hours (3+1) - “SECOND_ Term (Semester) = 4 cr. hrs.”			
3. Program(s) in which the course is offered. - Preparatory year Scientific Track.			
4. Name of faculty member responsible for the course : Members of staff.			
5. Level/year at which this course is offered: Preparatory year.			
6. Pre-requisites for this course (if any):): Math 101 (<i>Calculus I</i>).			
7. Co-requisites for this course (if any): None.			
8. Location if not on main campus: Main Campus.			
9. Mode of Instruction (mark all that apply):			
a. traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="75%"/>
b. blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. e-learning	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="25%"/>
d. correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments:			

B Objectives

1. What is the main purpose for this course?

By the end of the course, the student will be able to:

- Distinguish between fundamental and derived physical quantities
- Know how to deduce the unit of any physical quantity from the basic units and to convert any unit from a system of units to another.
- Describe the motion in one dimension, calculate the instantaneous and average velocities and accelerations
- Describe the motion of objects under free falling
- Distinguish between scalar and vector quantities, adding, subtracting and do the multiplication of vectors (cross and dot products)
- Know how to describe the motion in two and three dimensions and calculating the range of a projectile
- Understand the concepts of mass and force and to apply the newton's laws to analyse the motion of an object
- Estimate the work done by a constant and non-constant forces, the kinetic energy and apply the work-energy principle
- Make the difference between conservative and non-conservative forces and to use the principle of mechanical energy conservation
- Know the properties of fluids, the Archimedes' principle, calculate the static pressure, gauge pressure, flow rate, velocity of fluid by applying the equation of continuity and the Bernoulli's theorem
- Define a wave, the harmonic wave function expression, determine the characteristics of harmonic waves (amplitude, frequency wave length, speed)
- Know the conditions of wave interference (destructive and constructive)
- Characterize sound, calculate the speed of sound, the intensity in decibels.
- Make distinction between heat and temperature, and the different scales of temperature, calculate the thermal expansion of a material

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Continues updating for content of lectures as a result of recent achievements and researches in the field.
 - Encouraging the students to deal with electronic books, as they are using many web based reference material and by providing them with continues update for information.
 - Trying to Decrease the direct theoretical teaching load of the course and putting more time for explaining correlations and student-directed learning sessions and seminars.
 - Planning for elective self studies in the course to encourage students to engage in depth study of areas of interest.
- More efforts will be exerted to develop and improve the course to enable the student to clearly understand the Physics basis.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

1. Topics to be Covered			
Week #	Ses #	Activities	Topics
1	1	Class	What Is Physics, Measuring Things, The International System of Units.
	2	Class	Changing Units. Length, Time and Mass.
	3	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased) .
2	4	Class	Motion, Position and Displacement, Average Velocity and Average Speed, Instantaneous Velocity and Speed.
	5	Class	Acceleration, Constant Acceleration: A Special Case, Another Look at Constant Acceleration, Free-Fall Acceleration, Graphical Integration in Motion Analysis.
	6	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
3	7	Class	Vectors and Scalars, Adding Vectors Geometrically, Components of Vectors.
	8	Class	Unit Vectors, Adding Vectors by Components, Vectors and the Laws of Physics, Multiplying Vectors.
	9	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased)
4	10	Class	Newtonian Mechanics, Newton's First Law.
	11	Class	Force, Mass.
	12	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
5	13	Class	Newton's Second Law, Some Particular Force.
	14	Class	Applying Newton's Laws.

	15	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
6	16	Class	Kinetic Energy, Work, Work and Kinetic Energy.
	17	Class	Work Done by the Gravitational Force, Work Done by a Spring Force, Work Done by a General Variable Force, and Power.
	18	Problem solving	REVIEW , SUMMARY and PROBLEMS (calculus biased).
7	19	Class	What Is a Fluid, Density and Pressure, Fluids at Rest.
	20	Class	Measuring Pressure, Pascal's Principle.
	21	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
8	22	Class	Midterm Exam.
	23	Class	Archimedes' Principle, Ideal Fluids in Motion.
	24	Class	The Equation of Continuity, Bernoulli's Equation.
	25	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
9	26	Class	Types of Waves, Transverse and Longitudinal Waves, Wavelength and Frequency, The Speed of a Traveling Wave and Wave Speed on a Stretched String.
	27	Class	Energy and Power of a Wave Traveling Along a String.
	28	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
10	29	Class	The Wave Equation, The Principle of Superposition for Waves, Interference of Waves.
	30	Class	Phasors, Standing Waves, Standing Waves and Resonance.
	31	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
11	32	Class	Sound Waves, The Speed of Sound.

	33	Class	Traveling Sound Waves, Interference.
	34	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
12	35	Class	Sources of Musical Sound, Beats.
	36	Class	The Doppler Effect, Supersonic Speeds, Shock Waves.
	37	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
13	38	Class	Temperature, The Zeroth Law of Thermodynamics, Measuring Temperature, The Celsius and Fahrenheit Scales, Thermal Expansion, Temperature and Heat.
	39	Class	The Absorption of Heat by Solids and Liquids, A Closer Look at Heat and Work, The First Law of Thermodynamics, Some Special Cases of the First Law of Thermodynamics, Heat Transfer Mechanisms.
	40	Problem solving	REVIEW, SUMMARY and PROBLEMS (calculus biased).
14	41	Class	REVIEW, SUMMARY and PROBLEMS (calculus biased).
	42		
	43		
15	44	Class	Revision.
16	45		Final exam.

2. Course components (total contact hours per semester):

Lecture: 45	Tutorial: 13	Laboratory: 26	Practical/Field work/Internship: 28	Other.....
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3. Additional private study/learning hours expected for students per week.

There is no scheduled private study/ learning hours but the students can directly contact the lecturer during his office hours.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	<p>Provide an Introduction to fundamentals of Physics, that gives the students a command of its concepts, such as; MEASUREMENT, MOTION ALONG A STRAIGHT LINE, FORCE AND MOTION—II; VECTORS, MOTION—I, FORCE AND MOTION—II, FLUIDS, WAVES—I, WAVES—II, TEMPERATURE, HEAT, AND THE FIRST LAW OF THERMODYNAMICS.</p> <p>Subject taught using the TEAL (Technology Enabled Active Learning) studio format which utilizes small group interaction and current technology to help students develop intuition about, and conceptual models of physical phenomena.</p>	<p>Provide clear and informative lecture notes with learning objectives that focus on important points.</p> <p>Give clear, informative, and stimulating 50-minute lectures with PowerPoint or other visual electronic aids to enhance the learning experience for students.</p> <p>AnsWER questions either in or outside class or via e-mail or telephone.</p> <p>Compose thoughtful and fair exam questions that assess student learning and application of the course content.</p> <p>Directing the case sessions and facilitators to provide an effective learning experience in small group, team-oriented sessions.</p>	<p>Solve some example during the lecture.</p> <p>AsK the student to clear the misunderstanding of some physical principle.</p> <p>Discussions with the students, and ask quality question.</p> <p>Exams:</p> <p>a) Quizzes b) Mid Term Exam. c) Final Exam d) Oral exams, Lab reports, and Lab Final Exam.</p>

Providing answers and explanations to student inquiries regarding any aspect of the course.

Providing advice and assistance to students for improving their learning strategies and performance in the course.

Reviewing and implementing appropriate changes in the course based on student feedback and evaluations.

Also;

Written Homework

There will be one homework handed in on paper each week. To receive full credit for your hardcopy homework handed in, you must prepare and submit lucid and clearly reasoned written solutions. These problems will be graded and returned.

In-class Group and Personal Assignments

In almost all classes, individuals and groups, will submit answers to questions about desktop experiments done in class, material covered in the lecture in that class, and so on. You must be present in class to receive credit for assignments submitted either by you or by your group.

Group Work

You will be assigned to a group of three for collaborative work. Your group assignment will be announced near the beginning of the term. If you are not satisfied with the way your group is working, first try to discuss it with your group members. If you cannot arrive at a satisfactory solution, then discuss the problems with your instructor.

Laboratory

You will be offered hands-on, inquiry-based activities during the class period. These labs allow you to discover various aspects of a physics concept. Labs will be done in groups.

TASKS	WEIGHTS
Lab report & Lab Exam +Quizzes + Mid + Final Exam.	20%+10%+30%+40%
Quizzes + Homework.	10%
Lab report.	10%
Lab final exam.	10%
Mid Term exam.	30%
Final exam.	40%
Total	100 %

A	Excellent	90 -100
B	Very good	80 – 89
C	Good	70 – 79
D	Pass	60 – 69
F	Fail	59 and below

		<p>Tests</p> <p>There is tests will be given. There will be Midterm and Final exams in the course. The final will be a comprehensive exam and will cover all of the subject material.</p>	
1.2			
2.0	Cognitive Skills		
2.1	<p>The course has an aim to improve the ability in the following cognitive skills:</p> <p>How to use physical laws and principles to understand the subject. How to simplify problems and analyze phenomena. Analyse and explain natural phenomena. Ability to explain the idea with the student own words. Represent the problems mathematically.</p> <p>Also to develop;</p> <p>Effective Learning skills. Problem solving skills. Self-assessment and development. Readng and searching.</p>	<p>Preparing main outlines for teaching. Following some proofs. Define duties for each chapter Homework assignments. Ask the student to do small research. Encourage the student to look for the information in different references. Ask the student to attend lectures for practice solving problem.</p>	<p>Improvement in the overall performance of the student in consequent examinations during the course. Interaction of the course and its effect on other courses offered for the students, which can be measured by their feedback.</p> <p>Also;</p> <p>Discussions of how to simplify or analyze some phenomena. Asking about physical laws previously taught Writing reports on selected parts of the course Midterm Exam. Final Exam, Lab Exam, and short quizzes.</p>
2.2			
3.0	Interpersonal Skills & Responsibility		
3.1	<p>The course has an aim to improve the ability in the following interpersonal skills and responsibilities:</p> <p>Work independently. The students learn independently and take up responsibility. Following the learner manners and ethics including; commitment, respect and communication with confidence.</p>	<p>Students are expected to:</p> <p>Learn how to search on the internet and use the library. Learn how to cover missed lectures. Learn how to summarize lectures or to collect materials of the course. Learn how to solve difficulties in learning: solving problems – enhance educational skills.</p>	<p>Those skills are reflected on the student behaviour inside and outside the class. It can be assessed by the feedback from the lecturer regard the student’s interaction and behaviour. Also; Quizzes on the previous lecture. Checking report on internet use and trips Discussion The accuracy of the result gained by each group will indicate good group</p>

		<p>Develop her interest in Science through :(lab work, field trips, visits to scientific and research.</p> <p>Encourage the student to attend lectures regularly by:</p> <p>Giving bonus marks for attendance</p> <p>Assigning marks for attendance.</p> <p>Give students tasks of duties.</p>	<p>work.</p> <p>Presenting the required research on time and the degree of the quality will show the sense of responsibility.</p>
3.2			
4.0	Communication, Information Technology, Numerical		
4.1	<p>The course has an aim to improve the ability in the following Information Technology and Numerical Skills:</p> <p>Computation, and designing presentations..</p> <p>Problem solving.</p> <p>Feeling physical reality of results.</p> <p>Data analysis and interpretation.</p> <p>Enhance the ability to use the search engines.</p>	<p>Know the basic Physics principles.</p> <p>Use the web for research.</p> <p>Discuss with the student.</p> <p>Exams to measure the mathematical skill.</p> <p>Clear the weakness point that should be eliminated.</p> <p>Encourage the student to ask for help if needed.</p> <p>Computational analysis.</p> <p>Data representation.</p> <p>Focusing on some real results and its physical meaning.</p> <p>Lectures for problem solution.</p> <p>Encourage the student to ask good question to help solve the problem.</p> <p>Display the lecture note and homework assignment at the web.</p>	<p>Their interaction with the lectures and discussions.</p> <p>The reports of different asked tasks.</p> <p>Homework, Problem solutions assignment and exam should focus on the understanding, and Research.</p> <p>Results of computations and analysis.</p> <p>Comments on some resulting numbers.</p>
4.2			
5.0	Psychomotor		
5.1	<p>Contributions in the improvement of Physics education level.</p>	<p>Provide the role and the fundamental of Physics.</p> <p>Develop basic laboratory skills and techniques for the study of Physics.</p>	<p>It is not included in the overall assessment of the students.</p>
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Problem sets.	Around the semester.	10 %
2	Mid-term exam	8	30%
3	Lab report.	Around the semester.	10 %
4	Practical Exam (Lab Final Exam).	15	10%
5	Final Exam	16	40 %
Total Assessment			100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

The student has the right to contact the lecturer or coordinators by their e-mails, or during their office hours for academic advices or consultations.

E. Learning Resources

1. List Required Textbooks

Physics for scientists and engineers D.C Giancoli (Fourth edition).

2. List Essential References Materials (Journals, Reports, etc.)

- Fundamentals of PHYSICS, 9th Edition, by HALLIDAY / RESNICK / WALKER, Wiley, Binder Ready Version edition (March 2010).
- Physics for scientists and engineering by Serway 7th edition, Cengage Learning; (February 20, 2007).
- Fundamentals of Physics: Mechanics, Relativity, and Thermodynamics (The Open Yale Courses Series), Yale University Press (December 2, 2013).

3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

E-learn Portal for Umm Alqura University: <https://elearn.uqu.edu.sa/>

- <http://www.physicsclassroom.com>
- <http://www.eskimo.com>
- <http://ocw.mit.edu/OcwWeb/Physics/8-02Electricity-and-Magnetism/VideoLectures/index.htm>

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Wikipedia.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
Audio-visual equipment for teaching (projector, microphones, speakers, board).

2. Technology resources (AV, data show, Smart Board, software, etc.)
None.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
None.

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Evaluation questionnaires of the staff at the end of the semester.

2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
None.

4. Processes for Improvement of Teaching
Reviewing and implementing appropriate changes in the course based on the student feedback and evaluations.

5. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)
None

6. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
Regular meeting with the staff to review the course effectiveness.

Course Coordinator: _____