كلية العلوم التطبيقية
Faculty of Applied Sciences

Kingdom of Saudi Arabia
The National Commission for Academic Accreditation & Assessment

T6. Course Specifications (CS)

Course title: General Physics (2)

Course code: 23062102-4

2

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

Course Specifications

Institution: **Umm AL – Qura University**	Date : **15/3/1439**
College/Department : **Jamoum University College – Physics Department**	

A. Course Identification and General Information

1. Course title and code: **General Physics (2) 23062102-4**
2. Credit hours: **4 hrs.**
3. Program(s) in which the course is offered. **BSc Physics;**
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course
One of the staff member
5. Level/year at which this course is offered : **2nd Year / Level 3**
6. Pre-requisites for this course (if any) : **General physics 4031101-4**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Al-Jamoum**
9. Mode of Instruction (mark all that apply)

a. traditional classroom	✓	What percentage?	**70%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other	✓	What percentage?	**30%**

Comments: Lab 30%

B Objectives

1. What is the main purpose for this course?

The main purpose of the course to covering some advanced physics principles in mechanics, such as particle dynamics, system of particles, collisions, rotational kinematics, rotational dynamics, oscillations, etc. This course will provide a conceptual and experimental background in physics sufficient to enable students to take courses that are more advanced in related fields.

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)

1- From using the E-learning web based in the university web site, the students improve their IT skill
2- Outlines of the physical laws, principles and the associated proofs.
3- Highlighting the day life applications whenever exist.
4- Encourage the students to see more details in the international web sites and reference books in the library.
5- Encourage the student to build an example of different experiments related to course
6- Frequently check for the latest discovery in science

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

Course Description:

The main purpose of the course to covering some advanced physics principle in mechanics, such as particle dynamics, system of particles, collisions, rotational kinematics, rotational dynamics, oscillations, etc. This course will provide a conceptual and experimental background in physics sufficient to enable students to take courses that are more advanced in related fields.

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ ***Particle dynamics*** 1- Force laws. 2- Frictional Forces. 3- The Dynamics of uniform Circular motion 4- Equation of motion: constant and non-constant forces. 5- Time-dependent forces; analytical methods 6- Time-dependent forces: numerical methods. 7- Drag forces and the motion of projectiles. 8- Limitation of newton's law.	1	3
❖ ***Conservation of energy***	**1**	**3**

1- Conservative force. 2- Potential energy. 3- One dimensional conservative systems. 4- Two-and three-dimensional conservative systems. 5- Conservation of energy of a system of particles. 6- Mass and energy. 7- Quantization of energy.		
❖ ***System of particles*** 1- Two particle system 2- Many particle system 3- Centre of mass of solid objects 4- Linear momentum of system of particles. 5- Conservation of linear momentum 6- Work and energy in system of particles 7- Systems of variable mass.	**1**	**3**
❖ ***Collisions*** 1- What is collisions? 2- Impulse and momentum. 3- Conservation of momentum during collision. 4- Collisions in one dimension. 5- Two dimensional collisions. 6- Center of mass reference frame. 7- Spontaneous decay process. .	**1**	**3**
❖ ***Rotational Kinematics*** 1- Rotational motion. 2- Rotation variables. 3- Rotation with constant angular acceleration. 4- Rotational quantities as vectors. 5- Relationship between linear and angular variables: scalar form. 6- Relationship between linear and angular variables: vector form.	**1.33**	**4**
❖ ***Rotational dynamics*** 1. Rotational dynamics 2. Kinetic energy of rotation and rotational inertia. 3. Rotational inertia of solid bodies 4. Rotational dynamics of rigid body 5. Combined rotational and translational motion.	**1**	**3**
❖ ***Angular momentum*** 1- Angular momentum of a particle 2- System of particles 3- Angular momentum and angular velocity 4- Conservation of angular momentum 5- The spinning top.	**1**	**3**

6- Quantization of angular momentum.		
❖ ***Equilibrium of Rigid bodies*** 1- Condition of equilibrium. 2- Center of Gravity. 3- Examples of equilibrium. 4- Stable, unstable, and Neutral equilibrium or rigid bodies in a gravitational field. 5- Elasticity.	**1**	**3**
❖ ***Gravitation*** 1. Gravitation from the Ancients to Kepler. 2. Newton and the law of universal gravitation. 3. The gravitation constant G 4. Gravity near the Earth's surface. 5. Gravitational Effect of a spherical distribution of matter 6. Gravitational potential energy 7. The gravitational field and potentials 8. The motions of planets and satellites 9. Universal gravitation. .	**1.33**	**4**
❖ ***Oscillations.*** 1. Oscillating systems. 2. The simple harmonic oscillator. 3. Simple harmonic motion 4. Energy considerations in simple harmonic motion. 5. Applications of simple harmonic motion 6. Simple harmonic motion and uniform circular motion. 7. Combinations of harmonic motions 8. Damped harmonic motions 9. Forced harmonic motions. .	**1.33**	**4**
❖ ***Wave Motion*** 1. Mechanical waves. 2. Types of waves. 3. Traveling waves. 4. Wave speed 5. The wave equation 6. Power and intensity in wave motion 7. The principle of superposition 8. Interference of waves 9. Standing wave. 10. Resonance.	**1**	**3**
❖ ***Sound Wave*** 1. The speed of sound. 2. Traveling longitudinal waves.	**1**	**3**

3. Power and intensity of sound waves. 4. Standing longitudinal waves. 5. Vibrating systems and sources of sound. 6. Beats 7. The Doppler effect.		
❖ ***Solved problems***	**2**	**6**
	15 weeks	**45hrs**

Practical part:

1. Safety and Security at the lab.
2. Introduction.
3. Simple Pendulum.
4. Torque pendulum
5. Verification of Hook's law.
6. Moment of inertia of rigid body.
7. Projectiles
8. Determination of sound velocity in air.

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**45**		**42**			**87**
Credit	**3**		**1**			

3. Additional private study/learning hours expected for students per week.	4

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	Define the physical quantities, physical phenomena, and basic principles.	1- Demonstrating the basic principles through lectures. 2. Discussing phenomena with illustrating pictures and diagrams. 3. Lecturing method: Board, Power point. 4. Discussions 5. Brain storming 6. Start each chapter by general idea and the benefit of it.	Solve some example during the lecture. Discussions during the lectures Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) Oral exams .
1.2	Describe the physical laws and quantities using mathematics		
1.3	Determine the physical quantities at the Lab.	1. Doing team research or team project. 2.Doing team work to perform some experiments 3. Perform the experiments correctly. 4. Demonstrate the results correctly. 5. Write the reports about the experiment. 6. Discussion with the student about the results	Writing scientific Reports. Lab assignments Exam.

2.0	**Cognitive Skills**		
2.1	Apply the laws of physics to calculate some quantities.	1. Preparing main outlines for teaching. 2. Following some proofs. 3. Define duties for each chapter 4. Encourage the student to look for the information in different references. 5. Ask the student to attend lectures for practice solving problem.	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the course. 4. Discussions of how to simplify or analyze some phenomena.
2.2	Solve problems in physics by using suitable mathematics.		
2.3	Analyse and interpret quantitative results.		
2.4	Apply physical principle on day life phenomena.		
2.5	Derive the physical laws and formulas.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Show responsibility for self-learning to be aware with recent developments in physics	• Search through the internet and the library. • Small group discussion. • Enhance self-learning skills. • Develop their interest in Science through : (lab work, visits to scientific and research institutes).	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific reports. • Evaluate the team work in lab and small groups. • Evaluation of students presentations.
3.2	Work effectively in groups and exercise leadership when appropriate.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate effectively in oral and written form.	• Incorporating the use and utilization of computer, software, network and multimedia through courses • preparing a report on some topics related to the course depending on web sites	• Evaluating the scientific reports. • Evaluating activities and homework
4.2	Collect and classify the material for the course.		
4.3	Use basic physics terminology in English.		
4.4	Acquire the skills to use the internet communicates tools.		
5.0	**Psychomotor**		
5.1	Use experimental tools safely and correctly.	Follow up the students in lab and during carryout all experimental work.	• Practical exam. • Giving additional marks for the results with high and good accuracy
5.2	Determine the physical quantity correctly at the Lab.		

5. Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)																
Course LOs #	**Program Learning Outcomes (Use Program LO Code #s provided in the Program Specifications)**															
	1.1	**1.2**	**1.3**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**3.1**	**3.2**	**4.1**	**4.2**	**4.3**	**4.4**	**5.1**	**5.2**
1.1	✓															
1.2		✓														
1.3			✓													
2.1				✓												
2.2					✓											
2.3						✓										
2.4							✓									
2.5								✓								
3.1									✓							
3.2										✓						
4.1											✓					
4.2												✓				
4.3													✓			
4.4														✓		
5.1															✓	
5.2																✓

6. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exercises & Home works	All weeks	5 %
2	Participation in activities lectures and labs	All weeks	5 %
3	Midterm Exam (theoretical)	8th week	30%
4	Lab. Reports (Practical)	11th week	5%
5	Final Exam (Practical)	15th week	15%
6	Final Exam (theoretical)	16th week	40%

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)

Each student will supervise by academic adviser in physics Department and the time table for academic advice were given to the student each semester. (4hrs per week)

E Learning Resources

1. List Required Textbooks
Physics, 4th edition , By: Halliday, Resnick, and Krane, Wiley (1992)

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
Physics , 4th edition, By: J. Walker (2010)

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
www.uqu.sa/baewiss

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

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.) There are enough classrooms provided with a good accommodation, including good air condition, good Data show, suitable white board. There are enough laboratories for experimental physics, provided with air conditions, good data show, and experimental equipment.
2. Computing resources (AV, data show, Smart Board, software, etc.) In each class room and laboratories, there is a data show, and board.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Each Class room and laboratories require a TV screen at least 65 inch-and smart, and double layer white board.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Course reports • Course evaluation.
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department • Revision of student answer paper by another staff member. • Analysis the grades of students.
3 Processes for Improvement of Teaching • Preparing the course as PPT. • Using scientific flash and movies. • Coupling the theoretical part with laboratory part • Periodical revision of course content.
4. 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) • The instructors of the course are checking together and put a unique process of evaluation. • Check marking of a sample of papers by others in the department. • Feedback evaluation of teaching from independent organization. • Independent evaluation by another instructor that give the same course in another faculty. • Evaluation by the accreditation committee in the university.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. 1- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report • Program Self study 2- According to point 1 the plan of improvement should be given.