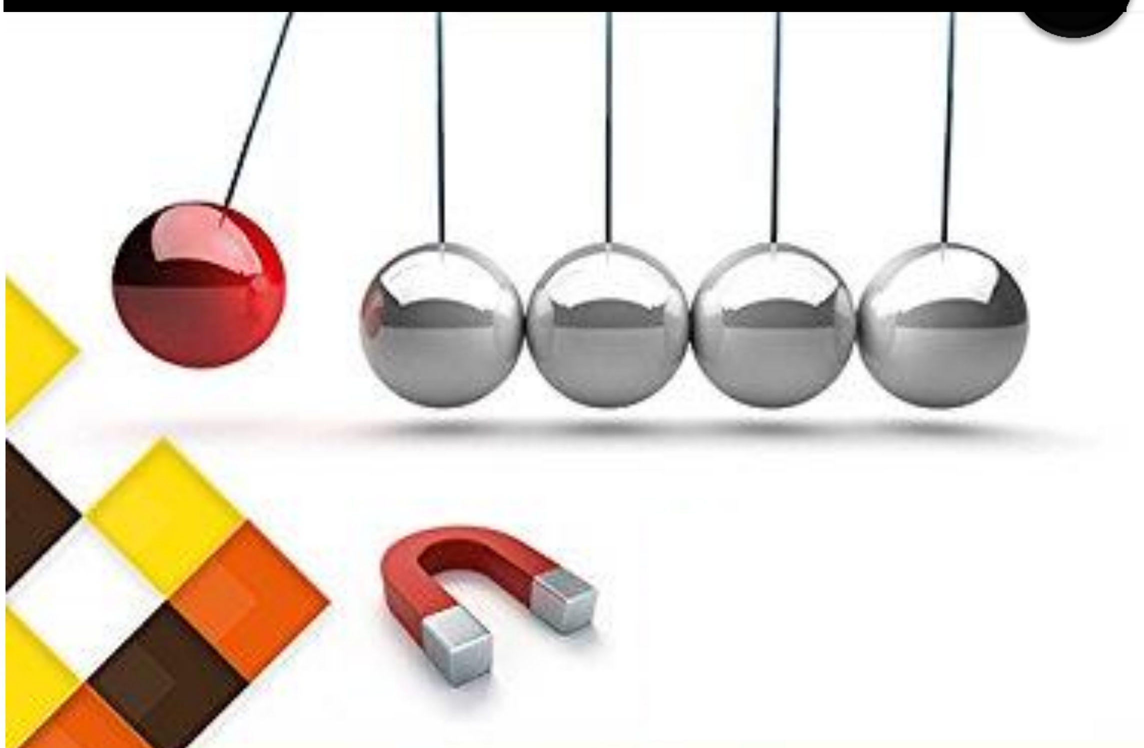
Kingdom of Saudi Arabia
Umm Al-Qura University
Faculty of Applied Science
Physics Department

المملكة العربية السعودية
جامعة أم القرى
كلية العلوم التطبيقية
قســم الفــيزياء

Study Plan for Physics Program

Program Specification – Course Specification: Plan 37



Plan 37


بسم الله الرحمن الرحيم


وقل اعملوا فسيرى الله عملكم ورسوله والمؤمنون

Content

Physics Program

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2017

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مقدمة

الحمد لله رب العالمين والصلاة والسلام على سيدنا ونبينا محمد وعلى آله واصحابه والتابعين الى يوم الدين،

أنشئ قسم الفيزياء في عام ١٣٨٥/١٣٨٤ هـ الموافق ١٩٦٥/١٩٦٤م، كتوأم لقسم الرياضيات، وذلك عندما صدرت أول لائحة لكلية التربية بجامعة الملك عبد العزيز شطر مكة المكرمة، وقد تخرجت عدة دفعات على نظام التخصص المزدوج (فيزياء ورياضيات).

استمر العمل على هذا النظام لمدة عشر سنوات، حتى عام ١٣٩٥/١٣٩٤هـ حيث تم فصل قسم الفيزياء عن قسم الرياضيات، واصبح قسما قائما بذاته يمنح درجة البكالوريوس في الفيزياء والفيزياء الطبية.

و في عام ١٣٩٧/١٣٩٦هـ، ادخل نظام الساعات المعتمدة على جامعة الملك عبد العزيز شطر مكة المكرمة، وأصبح القسم يقدم مقرراته وفقا لنظام الساعات المعتمدة. ويمنح درجة البكالوريوس في الفيزياء. وفى عام ١٤٠١/١٤٠٠ هـ تأسست جامعة أم القرى بمكة المكرمة، ثم انشئت كلية العلوم التطبيقية واصبح القسم تابعا لها. وأصبح يمنح درجة البكالوريوس في الفيزياء و الفيزياء الطبية.

وهناك ثلاث خطط دراسية من أهم الخطط بالنسبة للقسم، وهى الخطة ١٩، والخطة ٣٣، والخطة ٣٧، والأخيرة هي الأحدث وهى قيد التنفيذ الأن، وفيما يلى نستعرض توزيع المقررات وتوصيف البرنامج وتوصيف المقررات للخطة ٣٧.

وفقنا الله وإياكم الى ما يحبه و يرضاه ،،،

لجنة المناهج الدراسية

قسـم الفيزياء

Study plan 37

(Credit hours 130h)

Level 1 : Credit Hours 16					
Course		Hours		Prerequisite	
Code	Title	L	P	Code	Title
4041101-4	Calculus	4	-		
4021101-4	General Chemistry	3	1		
7004101-4	English Language	4	-		
605101-2	The Holy Qura'an (1)	2	-		
601101-2	Islamic Culture (1)	2	-		

Level 2 : Credit Hours 16					
Course		Hours		Prerequisite	
Code	Title	L	P	Code	Title
4041101-4	General Biology	3	1		
4031101-4	General Physics	3	1		
7004102-4	English Language	4	-	7004101-4	English Language
501101-2	Arabic Language	2	-		
102101-2	Biography of prophet Mohamed (PBUH)	2	-		

Level 3 : Credit Hours 16					
Course		Hours		Prerequisite	
Code	Title	L	P	Code	Title
4042501-4	Differentiation and Integration	4	-	4041101-4	Calculus
4042402-4	Linear Algebra	4	-	4041101-4	Calculus
4032102-4	General Physics (2)	3	1	4031101-4	General Physics
4032121-4	Electricity and magnetism	3	1	4031101-4	General Physics

Level 4 : Credit Hours 17					
Course		**Hours**		**Prerequisite**	
Code	**Title**	**L**	**P**	**Code**	**Title**
4032141-4	Theoretical Methods in Physics (1)	4	-	4042501-4	Differentiation and Integration
4032131-4	Optics	3	1	4032102-4	General Physics (2)
4032150-4	Modern Physics	3	1	4032102-4	General Physics (2)
4032122-3	General Physics(3)	2	1	4032121-4	Electricity and magnetism
601201-2	Islamic Culture (2)	2	-	601101-2	Islamic Culture (1)

Level 5 : Credit Hours 17					
Course		**Hours**		**Prerequisite**	
Code	**Title**	**L**	**P**	**Code**	**Title**
4033142-4	Theoretical Methods in Physics (2)	4	-	4032141-4	Theoretical Methods in Physics (1)
4033143-4	Classical Mechanics(1)	4	-	4032102-4	General Physics (2)
4033145-4	Quantum Mechanics (1)	4	-	4032141-4	Theoretical Methods in Physics (1)
4033110-3	Heat and Thermodynamics	3	-	4032102-4	General Physics (2)
605201-2	The Holy Qura'an (2)	2	-	605101-2	The Holy Qura'an (1)

Level 6 : Credit Hours 16					
Course		**Hours**		**Prerequisite**	
Code	**Title**	**L**	**P**	**Code**	**Title**
4033132-3	Electromagnetism (1)	3	-	4032141-4	Theoretical Methods in Physics (1)
4033146-3	Quantum Mechanics (2)	3	-	4033145-4	Quantum Mechanics (1)
4033111-3	Statistical Thermodynamics	3	-	4033110-3	Heat and Thermodynamics
4033144-2	Classical Mechanics (2)	2	-	4033143-4	Classical Mechanics(1)
605301-2	The Holy Qura'an (3)	2	-	605201-2	The Holy Qura'an (2)
601301-3	Islamic Culture (3)	3	-	601201-2	Islamic Culture (2)

Level 7 : Credit Hours 16					
Course		**Hours**		**Prerequisite**	
Code	**Title**	**L**	**P**	**Code**	**Title**
4034133-3	Electromagnetism (2)	3	-	4033132-3	Electromagnetism (1)
4034160-4	Nuclear Physics	3	1	4033145-4	Quantum Mechanics (1)
4034170-4	Solid State Physics (1)	4	-	4033145-4	Quantum Mechanics (1)
4034180-3	Computational Physics	2	1	4033142-4	Theoretical Methods in Physics (2)
605401-2	The Holy Qura'an (4)	2	-	605301-2	The Holy Qura'an (3)

Level 8 : Credit Hours 16					
Course		**Hours**		**Prerequisite**	
Code	**Title**	**L**	**P**	**Code**	**Title**
4034162-3	Radiation Physics	3	-	4034160-4	Nuclear Physics
4034172-4	Solid State Physics (2)	3	1	4034170-4	Solid State Physics (1)
4034173-4	Electronics	3	1	4034170-4	Solid State Physics (1)
4034199-3	Graduated Project	3	-		Agreement of Department
601401-2	Islamic Culture (4)	2	-	601301-3	Islamic Culture (3)

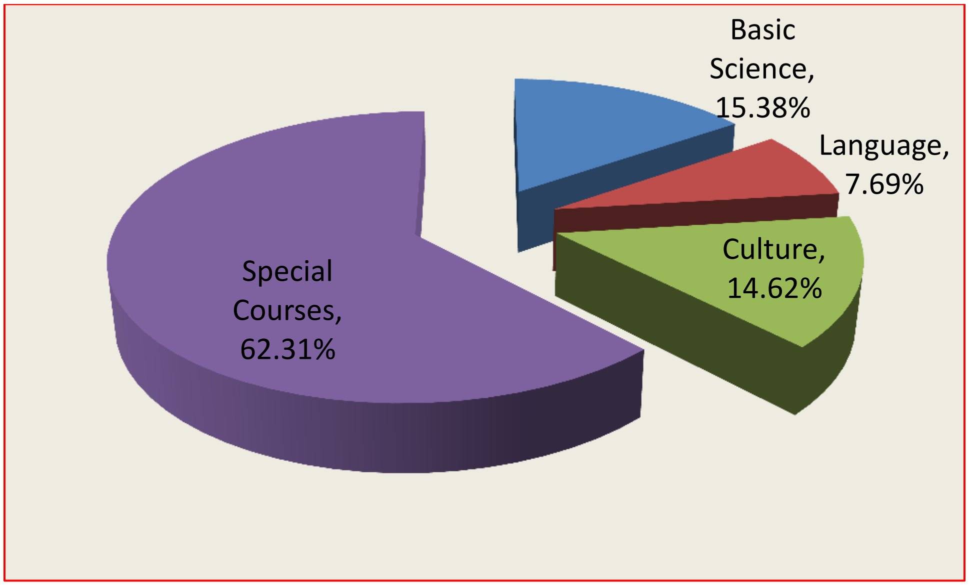

Figure 1: The Curriculum Structure of the program.

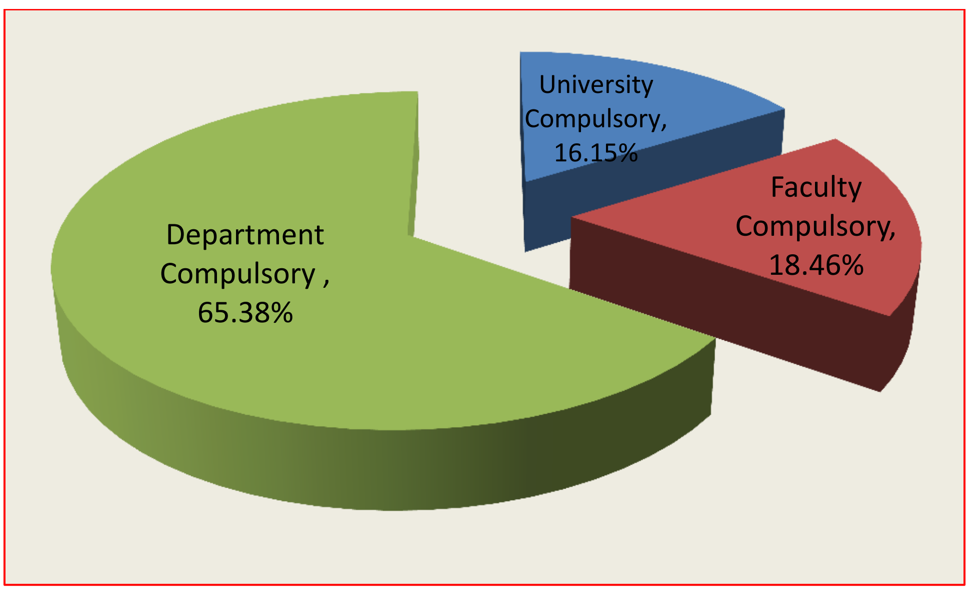

Figure 2: Curriculum Distribution.

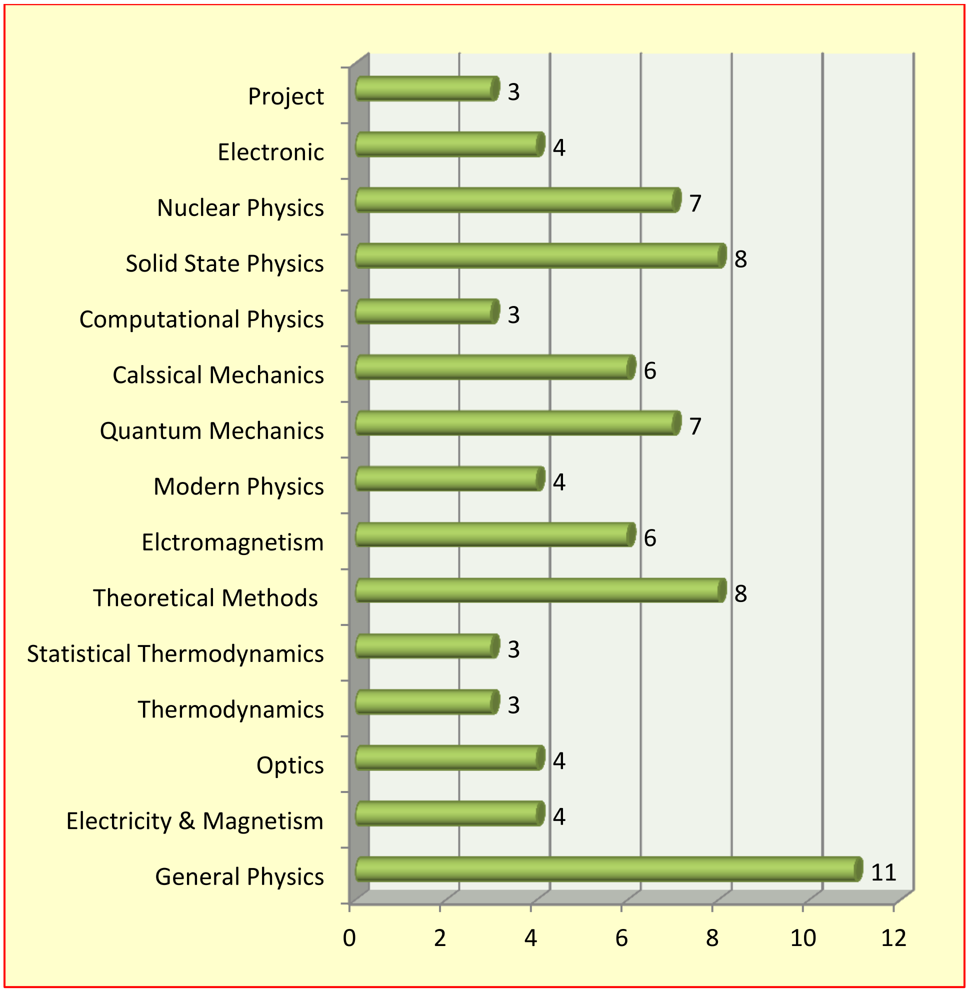

Figure 3: Credit hours distribution.

Program Specification
Plan 37

Kingdom of Saudi Arabia
Umm Al-Qura University
College of Applied Sciences
Physics Department

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T4. Program Specifications (PS)

Program : Physics

Course code: 40300

National Commission for Academic Accreditation & Assessment

Program Specifications

For guidance on the completion of this template, please refer to NCAAA guidebooks.

1. Institution **Umm AL-Qura University**	Date of Report: **April 2016**
2. College/Department: **Faculty of Applied Science / Department of Physics**	

A. Program Identification and General Information

1. Program title and code: **Physics (Phys)**

2. Total credit hours needed for completion of the program: **130 credit hours in 8 semesters (4 years).**

3. Award granted on completion of the program: **Bachelor of Science (B.Sc.) in Physics**

4. Major tracks/pathways or specializations within the program (eg. transportation or structural engineering within a civil engineering program or counselling or school psychology within a psychology program)

N/A

5. Intermediate Exit Points and Awards (if any) (eg. associate degree within a bachelor degree program)

N/A

6. Professional occupations (licensed occupations, if any) for which graduates are prepared. (If there is an early exit point from the program (eg. diploma or associate degree) include professions or occupations at each exit point)

- Work in research centers and universities.
- Work in public and private school as a teacher of physics
- Work as a machine operator and/or a data analyst in one of the following industrial regions: Quality control labs. Electric power stations. Water stations. Standards and measurements bureau Petroleum ministry. Manufactures of plastics, steel, textile, glass, ceramics, rubber, electronics, semiconductors and solar cells, ..etc.

7. (a) New Program ☐ Planned starting date ☐ (b) Continuing Program ✓ Year of most recent major program review: **1437 H** Organization involved in recent major review (eg. internal within the institution, Accreditation review by Submitted for accreditation by German organization ASIIN Other: Departmental curriculum committee The program was revised by external reviewers: (1)- Prof. Mohsen Mohamed Mossad Professor of Solid State Physics – Kafrelshiekh University – Egypt (2)- Prof. Taher Morsi Attia Sharshar Prof. of Nuclear Physics – Taif University –Taif – Saudi Arabia	
8. Name of program coordinator or chair. If a program coordinator or chair has been appointed for the female section as well as the male section, include names of both. **Dr Saleh Alluqmani (Program Chair)**	
9. Location if not on main campus or locations if program is offered in more than one location.	

B. Program Context

1. Explain why the program was established.

a. Summarize economic reasons, social or cultural reasons, technological developments, national policy developments or other reasons.

Program Aims: This program aims to introduce students to the vast world of Physics and its essentials applications which involves directly to the lives of humans. The program has strong practical emphasis, providing students with all basic laboratory skills required for career either in applied or research Physics.

The program will introduce students to the basic concepts of classical Physics (Classical physics, optics, electricity and magnetism, Thermodynamic, Mathematical physics, introduction to modern physics) in the first two years. Then the third and fourth year will introduce the concepts of modern physics and their applications (Quantum physics, Classical mechanical physics Statistical physics, Electromagnetism, Solid State physics, Nuclear physics, Radiation physics, finally carrying out a project in physics).

During their studies, students will be exposed to a variety of information sources and techniques and be trained in various skills, including those used in reasoning, argument and communication. Students will acquire a number of transferable skills, including: design and execution of experiments (including working in a team); accessing information; interpretation of data using statistics; computing; essay and report writing; and oral and poster presentation.

Career Prospect: Umm Al-Qura University Physics graduates are qualified to enter a variety of careers in academia, research centres, and industry. Many of our students continue in a research career or find employment in universities, or Schools, and in Research Institutes. Others have found positions in Industry (petrochemical companies, SABIC, Water companies, Oils and soap factories, etc.). As scientists with developed numeracy and communication skills, our graduates also have qualifications suited to a wide variety of occupations related to the field of Science especially Physics.

b. Explain the relevance of the program to the mission and goals of the institution.
Physics is concerned with the observation, understanding and prediction of natural phenomena and the behavior of manmade systems. It deals with profound questions about the nature of the universe and with some of the most important practical, environmental technology issues. Its scope is broad and involves mathematical theories, experiments and observation, computing technology, materials, nuclear energy and magnetism. Therefore the mission of the Department of Physics focus on preparing a well-qualified graduate who is able to serve the community and able to respond to the requirements of the labor market.
As described above, the program aims clearly shows relevance to the department's mission statement.

2. Relationship (if any) to other programs offered by the institution/college/department.

a. Does this program offer courses that students in other programs are required to take? **Yes**

If yes, what has been done to make sure those courses meet the needs of students in the other programs?

Some of the courses of physics are introduced to other department. General physics (403101-4 are introduced to the student of Mathematics, Biology, and chemistry.

b. Does the program require students to take courses taught by other departments? **Yes**

If yes, what has been done to make sure those courses in other departments meet the needs of students in this program?

By arranging yearly meeting to discuss the best course content to the program. The department of Physics Department will communicate its needs to other departments to ensure that the course coverage fulfills the need of Physics department students. The syllabi of the courses are reviewed by the Undergraduate Committee of the department to ensure compliance to the department's needs. The department must approve the syllabi of the courses offered by the other departments.

Some of these courses are university requirements (a total of 21 credit hours that include Holy Quran, Islamic Culture and Arabic language) and the department has no relevance to involve in the content of these courses.

However, this program include a course offered by the Department of Chemistry (General chemistry), the Department of Biology (General Biology) and Mathematics (Calculus 4041011-4, differentiation and integration (2) and Algebra)

3. Do students who are likely to be enrolled in the program have any special needs or characteristics? (eg. Part time evening students, physical and academic disabilities, limited IT or language skills).

Yes:

- Adequate preparation and achievement in mathematics and sciences at the general education level.
- English language proficiency Knowledge of computer skills.

Students have to be prepared at the general education level and through a preparatory year or at the undergraduate level in English Language, mathematics, sciences, computer skills.

4. What modifications or services are you providing for special needs applicants?

N/A

C. Mission, Goals and Objectives

1. Program Mission Statement (insert)

The mission of the BSc Physics program is to provide basic education in core subjects of modern and advanced Physics and intensive training, with an emphasis on laboratory methodology, in basic and applied Physics, and related areas for students planning careers in applied Physics.

2. List goals and objectives of the program within to help achieve the mission. For each goal and objective describe the major strategies to be followed and list the indicators that are used to measure achievement.

Goals and Objectives	Major Strategies	Measurable Indicators
• Prepare highly qualified educators and technicians. • Develop a curriculum that is responsive to the needs of the employment market.	• Focus on providing intensive training programs for students during the university study. • Establish cooperative relationships with governmental and private sectors.	• Views that were obtained from academic staff members for their opinion in the mission, and the proportionality of this mission with the needs and aspirations of society.
To be well connected with the community to provide all possible educational programs that can solve problems and increase their awareness	• The participation of academic staff members in providing information and services and the establishment of lectures, symposia and meetings. • The contribution of academic staff members to work as part-time advisors for governmental and private sectors institutions	• Awareness and supporting by the academic staff members to the program and its mission
• Prepare Pure and applied research projects and publish them in well-known and respected international journals.	• Collaboration with research centers, local, regional and international, in Physics to conduct joint research - publishing the outcome of the research projects in reputable scientific journals - to support scientific research in the area.	• Keenness of academics staff members on the sophistication in scientific research and increase the number of publications and projects in collaboration with research institutions, national and international.

D. Program Structure and Organization

1. Program Description:

List the core and elective program courses offered each semester from Prep Year to graduation using the below Curriculum Study Plan Table (A separate table is required for each branch IF a given branch/location offers a different study plan).

A program or department manual should be available for students or other stakeholders and a copy of the information relating to this program should be attached to the program specification. This information should include required and elective courses, credit hour requirements and department/college and institution requirements, and details of courses to be taken in each year or semester.

Curriculum Study Plan Table

Year	Course Code	Course Title	Required or Elective	Credit Hours	College or Department
1st Year Semester 1	4041101	Calculus	R	4	Faculty of Applied Science / Dept. of Mathematics
	4021101	General Chemistry	R	4	Faculty of Applied Science / Dept. of Chemistry
	7004101	English Language - General	R	4	English Language Institute
	605101	Holy Quran I	R	2	
	601101	Islamic Culture I	R	2	
1st Year Semester 2	4031101	General Physics	R	4	Faculty of Applied Science / Dept. of Physics
	4011101	General Biology	R	4	Faculty of Applied Science / Dept. of Biology
	7004102	English for Science	R	4	English Language Institute
	501101	Arabic Language	R	2	Faculty of Arabic Language
	102101	The Biography of the Prophet Mohammad (PBUH)	R	2	
2nd Year	4042501	Differentiation and	R	4	Faculty of Applied

Year	Course Code	Course Title	Required or Elective	Credit Hours	College or Department
Semester 1		Integration (2)			Science / Dept. of Mathematics
	4042402	Linear Algebra	R	4	Faculty of Applied Science / Dept. of Mathematics
	4032102	General physics (2)	R	4	Faculty of Applied Science / Dept. of Physics
	4032121	Electricity and magnetism	R	4	Faculty of Applied Science / Dept. of Physics
2nd Year Semester 2	4032141	Theoretical Methods in Physics (1)	R	4	Faculty of Applied Science / Dept. of Physics
	4032131	Optics	R	4	Faculty of Applied Science / Dept. of Physics
	4032150	Modern Physics	R	4	Faculty of Applied Science / Dept. of Physics
	4032122	General Physics(3)	R	3	Faculty of Applied Science / Dept. of Physics
	601201	Islamic Culture II	R	2	
3rd Year Semester 1	4033142	Theoretical Methods in Physics (2)	R	4	Faculty of Applied Science / Dept. of Physics
	4033143	Classical Mechanics(1)	R	4	Faculty of Applied Science / Dept. of Physics
	4033145	Quantum Mechanics (1)	R	4	Faculty of Applied Science / Dept. of Physics
	4033110	Heat and Thermodynamics	R	3	Faculty of Applied Science / Dept. of Physics
	605201	Holy Quran II	R	2	
3rd Year Semester 2	4033132	Electromagnetism (1)	R	3	Faculty of Applied Science / Dept. of

Year	Course Code	Course Title	Required or Elective	Credit Hours	College or Department
					Physics
	4033146	Quantum Mechanics (2)	R	3	Faculty of Applied Science / Dept. of Physics
	4033111	Statistical Thermodynamics	R	3	Faculty of Applied Science / Dept. of Physics
	4033144	Classical Mechanics (2)	R	2	Faculty of Applied Science / Dept. of Physics
	605301	Holy Quran III	R	2	
	601301	Islamic Culture III	R	3	
4th Year Semester 1	4034133	Electromagnetism (2)	R	3	Faculty of Applied Science / Dept. of Physics
	4034160	Nuclear Physics	R	4	Faculty of Applied Science / Dept. of Physics
	4034170	Solid State Physics	R	4	Faculty of Applied Science / Dept. of Physics
	4034180	Computational Physics	R	3	Faculty of Applied Science / Dept. of Physics
	605401	Holy Quran IV	R	2	
4th Year Semester 2	4034162	Radiation Physics	R	3	Faculty of Applied Science / Dept. of Physics
	4034172	Solid State Physics (2)	R	4	Faculty of Applied Science / Dept. of Physics
	4034173	Electronics	R	4	Faculty of Applied Science / Dept. of Physics
	4034199	Graduated Project	R	3	Faculty of Applied Science / Dept. of Physics
	601401	Islamic Culture IV	R	2	

Total credit hours 130.

2. Development of Special Student Characteristics or Attributes

List any special student characteristics or attributes beyond normal expectations that the institution, college or department is trying to develop in all of its students. (eg. Eg. Particularly good at creative problem solving, leadership capacity, commitment to public service, high level of skills in IT). For each special attribute indicate the teaching strategies and student activities to be used to develop it.	
Special Attributes	**Strategies or Student Activities to Develop these Special Attributes**
Commitment to the environmental issues	Special emphasis on environmental awareness in the curriculum throughout the program.
Observing safety rule and regulations	Teaching the safety aspects in the lecture and laboratory courses.
Commitment to societal Needs	Involving senior students with faculty in conducting training programs and other public services.

3. Required Field Experience Component (if any, e.g. internship, cooperative program, work experience).

Summary of practical, clinical or internship component required in the program. Note: see Field Experience Specification Note that a more detailed Field Experience Specification comparable to a course specification should also be prepared in a separate document for any field experience required as part of the program.
a. Brief description of field experience activity The program will require a project program that enables the students to experience the real work environment in laboratories. It also provides an opportunity to participate in group work. The student will spend a time working in a physics Lab. Upon completion of Project, a student will be required to write a brief report on his work experience and present it orally
b. At what stage or stages in the program does the field experience occur? (eg. year, semester) At the fourth year (Level 8)
c. Time allocation and scheduling arrangement. (eg. 3 days per week for 4 weeks, full time for one semester): Full time summer work for 2 ½ months minimum.
d. Number of credit hours (if any) **2** Credit hours

4. Project or Research Requirements (if any)

Summary of any project or thesis requirements in the program. (Other than projects or assignments within individual courses) (A copy of the requirements for the project should be attached.)
a. Brief description At the end of this course student should be able to evaluate the different approaches used and suggest future experiments or alternative strategies for addressing the problem. The student should be able to conversant with writing a scientific report and presenting scientific data in a clear accessible manner. The skills learnt will be applicable to problem solving exercises encountered in all types of employment.
b. List the major intended learning outcomes of the project or research task. 1. Gain first-hand experience of work place environment in the field of scientific research. 2. Gain practical and theoretical knowledge to apply the concepts of basic sciences in a particular area of physics. 3. Gain the ability to perform analysis, design and evaluation of physics problem. 4. Work independently on the research project under the supervision of academic member or staff, and should be able to design experiments to answer the particular question posed, and critically analysed the results. There will be scope for initiative in this element of the project. 5. Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literature. 6. Acquire all the necessary skills to work in relevant work field. 7. Apply all the knowledge gained from previous course in relevant work settings. 8. Develop interpersonal skills / work under pressure / solve work related problems. 9. Improve skills to work independently and in teamwork.
c. At what stage or stages in the program is the project or research undertaken? (e.g. year, semester) **4th Year / final semester**
d. Number of credit hours (if any) **2 credit hours**
e. Description of academic advising and support mechanisms for students. Each student will be assigned an academic advisor who will act as a mentor, providing academic and career advice, and general counseling. Each student will be required to meet his advisor at least twice a semester, one at the beginning of his registration and the other one towards the end of the semester.

The department will provide support to the students in the form of hosting extracurricular activities, field trips, and seminars by inviting guest speakers, and providing an interactive learning environment. The chairman will be available to meet the students and listen to their academic problems and concerns. College club will be formed to help students undertake their activities

f. Description of assessment procedures (including mechanism for verification of standards)

A self-assessment of the program will be carried out every two years to identify areas of weaknesses that require attention, using NCAAA guidelines wherever applicable. Since this is a new program and it will require four years to have the first batch of graduates, no employment and alumni data will be available for the first two years. Self-evaluation will be carried out using faculty input, course files, and students' evaluation of courses to objectively determine the course coverage, students' learning and satisfaction.

4. Learning Outcomes in Domains of Learning, Assessment Methods and Teaching Strategy

Program Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning and teaching. The National Qualification Framework provides five learning domains. Learning outcomes are required in the first four domains and sometimes are also required in the Psychomotor Domain. On the table below are the five NQF Learning Domains, numbered in the left column. For Program Accreditation there are four learning outcomes required for knowledge and cognitive skills. The other three domains require at least two learning outcomes. Additional learning outcomes are suggested.

First, insert the suitable and measurable learning outcomes required in each of the 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 program learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process.

	NQF Learning Domains and Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
	Summary description of the knowledge to be acquired	**Teaching strategies to be used to develop that knowledge**	**Methods of assessment of knowledge acquired**
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.

	NQF Learning Domains and Learning Outcomes	Teaching Strategies	Assessment Methods
2.0	**Cognitive Skills**		
	Cognitive skills to be developed and level of performance expected	**Teaching strategies to be used to develop these cognitive skills**	**Methods of assessment of students cognitive skills**
	Physics graduates Students will have the ability to:	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.
2.1	Apply the laws of physics to calculate some quantities.		
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**		
	Description of the level of interpersonal skills and capacity to carry responsibility to be developed	**Teaching strategies to be used to develop these skills and abilities**	**Methods of assessment of students interpersonal skills and capacity to carry 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**		
	Description of the communication, IT and numerical skills to be developed	**Teaching strategies to be used to develop these skills**	**Methods of assessment of students numerical and communication skills**
4.1	Communicate effectively in oral and written form.	• Incorporating the use and utilization of computer,	1- Evaluating the scientific reports.

	NQF Learning Domains and Learning Outcomes	Teaching Strategies	Assessment Methods
4.2	Collect and classify the material for the course.	software, network and multimedia through courses • preparing a report on some topics related to the course depending on web sites	2- Evaluating activities and homework.
4.3	Use basic physics terminology in English.		
4.4	Acquire the skills to use the internet communicates tools.		
5.0	**Psychomotor**		
	Psychomotor Skills (if applicable)	**Teaching strategies to be used to develop these skills**	**Methods of assessment of students psychomotor skills**
5.1	Use experimental tools safely and correctly.	Follow up the students in lab and during carryout all physical experiments.	Practical exam. Giving additional marks for the results with high and good accuracy
5.2	Determine the physical quantity correctly at the Lab.		

NQF Learning Outcome Verb, Assessment, and Teaching Strategies and Suggestions

NQF Learning Domains	Suggested Verbs
Knowledge	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write
Cognitive Skills	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise
Interpersonal Skills & Responsibility	demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write
Communication, Information Technology, Numerical	demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize
Psychomotor	Perform , draw, operate, Examine, explore,

Suggested ***verbs not to use*** when writing measurable and assessable learning outcomes are as follows:

Consider	Maximize	Continue	Review	Ensure	Enlarge	Understand
Maintain	Reflect	Examine	Strengthen	Explore	Encourage	Deepen

Some of these verbs can be used if tied to specific actions or quantification.

Suggested assessment methods and teaching strategies are:

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

Insert the program learning outcomes, according to the level of instruction, from the above table below and indicate the courses and levels that are required to teach each one; use your program's course numbers across the top and the following level scale. Levels: I = Introduction P = Proficient A = Advanced

	Course Offerings **NQF Learning Domains and Learning Outcomes**	**I-4031101**	**I-4032102**	**I-4032121**	**I-4032141**	**P-4032131**	**P-4032150**	**P-4032122**	**P-4033142**	**P-4033143**	**P-4033145**	**P-4033110**	**P-4033132**	**P-4033146**	**P-4033111**	**P-4033144**	**P-4034133**	**A-4034160**	**A-4034170**	**A-4034180**	**A-4034162**	**A-4034172**	**A-4034173**	**A-4034199**
1.0	**Knowledge**																							
1.1	Define the physical quantities, physical phenomena, and basic principles.	I	I	I	I	P	P	P	P	P	P	P	P	P	p	p	p	A	A	A	A	A	A	A
1.2	Describe the physical laws and quantities using mathematics	I	I	I	I	P	P	P	P	P	P	P	P	P	p	p	p	A	A	A	A	A	A	A
1.3	Determine the physical quantities at the Lab.	I	I	I		P	P	P										A				A	A	
2.0	**Cognitive Skills**																							
2.1	Apply the laws of physics to calculate some quantities.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
2.2	Solve problems in physics by using suitable mathematics.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
2.3	Analyse and interpret quantitative results.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
2.4	Apply physical principle on day life phenomena.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
2.5	Derive the physical laws and formulas.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
3.0	**Interpersonal Skills & Responsibility**																							
3.1	Show responsibility for self-learning to be aware with recent developments in physics	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
3.2	Work effectively in groups and exercise leadership when appropriate.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
4.0	**Communication, Information Technology, Numerical**																							

4.1	Communicate effectively in oral and written form.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
4.2	Collect and classify the material for the course.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
4.3	Use basic physics terminology in English.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
4.4	Acquire the skills to use the internet communicates tools.	I	I	I	I	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	A	A
5.0	**Psychomotor**																							
5.1	Use experimental tools safely and correctly.	I	I	I		P	P	P										A				A	A	
5.2	Determine the physical quantity correctly at the Lab.	I	I	I		P	P	P										A				A	A	

5. Admission Requirements for the program

Attach handbook or bulletin description of admission requirements including any course or experience prerequisites**.**

6. Attendance and Completion Requirements

Attach handbook or bulletin description of requirements for:

a. Attendance.
b. Progression from year to year.
c. Program completion or graduation requirements.

E. Regulations for Student Assessment and Verification of Standards

What processes will be used for verifying standards of achievement (eg check marking of sample of tests or assignments? Independent assessment by faculty from another institution) (Processes may vary for different courses or domains of learning.)

- Samples of all kind of assessment are available in the departmental course of each course
- Group marking and group grading is conducted in some courses where the exam paper of each person is graded by more than one instructor.
- Conducting standardized exams.
- Conducting employers surveys exam paper of each person is graded by more than one instructor.

F Student Administration and Support

1. Student Academic Counselling

Describe the arrangements for academic counselling and advising for students, including both scheduling of faculty office hours and advising on program planning, subject selection and career planning (which might be available at college level).

- Each faculty member will be assigned a group of students for counselling and advising. A student will be required to meet his academic advisor at least twice a semester, the first visit being before the registration.
- Each faculty member will be asked to post his office hours during which a student can visit for receiving counselling and advising.

2. Student Appeals

Attach the regulations for student appeals on academic matters, including processes for consideration of those appeals.

G. Learning Resources, Facilities and Equipment

1a. What processes are followed by faculty and teaching staff for planning and acquisition of textbooks, reference and other resource material including electronic and web based resources? The requirements of text book and other materials for teaching are identified by the instructor teaching the course. The instructor's suggestions are reviewed by the Undergraduate Committee, who may seek the opinion of the other faculty members. The instructor, proposing the text book for a course, is asked to review at least two text books on the subject and submit justifications for the chosen text book. 1b. What processes are followed by faculty and teaching staff for planning and acquisition resources for library, laboratories, and classrooms. The department requests the Purchasing department to procure the text books selected by the department.
2. What processes are followed by faculty and teaching staff for evaluating the adequacy of textbooks, reference and other resource provisions? It is the responsibility of the undergraduate committee formed by the department to valuate the adequacy of text books, and reference materials for each course. The undergraduate committee ensures that the books are current and contents most of the topics covered in syllabuses.
3. What processes are followed by students for evaluating the adequacy of textbooks, reference and other resource provisions?
4. What processes are followed for textbook acquisition and approval?

H. Faculty and other Teaching Staff

1. Appointments

Summarize the process of employment of new faculty and teaching staff to ensure that they are appropriately qualified and experienced for their teaching responsibilities. The department has an established process for recruiting new faculty members in the areas needed. The positions are advertised with the specific requirements of qualification and experience. The department has the policy not to offer a professorial rank to instructors without a doctoral degree in the discipline. Qualifications are verified before appointments are made.

2. Participation in Program Planning, Monitoring and Review

a. Explain the process for consultation with and involvement of teaching staff in monitoring program quality, annual review and planning for improvement.

- The department conducts its affairs through a number of standing committees in the department, each committee is entrusted with some duties and responsibilities.
- The quality of program is reviewed by the Program Assessment Committee.
- The Undergraduate Committee looks after the undergraduate curriculum, and makes changes as and when necessary to main the currency of the program.
- All faculty members are distributed in the standing committees, so that all participate in the academic affairs of the department.
- All decisions of the department are discussed in the Department Council meeting for approval of the department.

b. Explain the process of the Advisory Committee (if applicable)

3. Professional; Development

What arrangements are made for professional development of faculty and teaching staff for:

a. Improvement of skills in teaching and student assessment?

The Academic Development Unit of the University holds periodically workshops on effective teaching, education technology, and better learning environment and on similar topic for the professional development of the faculty.

b. Other professional development including knowledge of research and developments in their field of teaching specialty?

Through seminars and lectures/talks delivered by the invited experts from the academia and universities.
Through conference attendance for which the University provides the support.
Through international collaboration with other universities and research centres

4. Preparation of New Faculty and Teaching Staff

Describe the process used for orientation and induction of new, visiting or part time teaching staff to ensure full understanding of the program and the role of the course(s) they teach as components within it.

A new faculty member will be given a copy of the Faculty Handbook that contains all information about the duties and responsibilities of the faculty, including the rights, privileges and code of conduct. For the first two semesters, he will be assigned multi-section courses which are co-ordinated and courses that are within his area of specialty. If necessary and desired, he will be assigned an experienced senior faculty member for receiving teaching help. His students evaluation will be closely monitored to see that there is no problem with his teaching. He will be asked to attend the workshops on effective teaching and professional development conducted by the Academic Development Unit of the University.

5. Part Time and Visiting Faculty and Teaching Staff

Provide a summary of Program/Department/College/institution policy on appointment of part time and visiting teaching staff. (ie. Approvals required, selection process, proportion to total teaching staff, etc.)

The department, for the time being, relies fully on the full time faculty member. There is no plan to hire part time faculty members, other than those who are invited from the other universities to deliver some lectures in some courses.

I. Program Evaluation and Improvement Processes

1. Effectiveness of Teaching

a. What processes are used to evaluate and improve the strategies for developing learning outcomes in the different domains of learning? (eg. assessment of learning achieved, advice on consistency with learning theory for different types of learning, assessment of understanding and skill of teaching staff in using different strategies)

(i) from current students and graduates of the program?

- graduating students surveys and interviews.
- Alumni surveys.
- Establishing an internet open forum to get student feedback.

(ii) from independent advisors and/or evaluator(s)?

- self-assessment report reviewed by external experts.
- professional chemical societies assessment.

b. What processes are used for evaluating the skills of faculty and teaching staff in using the

planned strategies? Faculty's skills will be evaluated through observation of their performance, expertise, student's evaluation and their own interests. When necessary, a faculty member is trained to perform a special function through seminars and workshops

2. Overall Program Evaluation

a. What strategies are used in the program for obtaining assessments of the overall quality of the program and achievement of its intended learning outcomes:
(i) From current students and graduates of the program? • The entry-level students will be administered a locally developed skill-testing test to measure the level of skill and knowledge. • The graduates will be tested through a locally developed exit exam to measure of the level of attainment of the learning outcomes. • An exit interview with the graduates will be carried out to receive feed back on the program and their learning experience. The department will note their concerns and suggestions for the improvement of the program and the method of teaching and learning. • During the course, students provide feedback to the lecturer via course questionnaires. Questionnaire summaries are discussed each term at the staff student consultative committee providing additional student feedback. At the end of each physics course the lecturer completes a pro-forma report, including a summary of student questionnaire responses.
(ii) From independent advisors and/or evaluator(s)? Peer review, appraising progress and identifying changes that need to be made. The reports are discussed at theme group meetings who monitor the quality of module delivery and syllabus related issues across groups of related modules forming subject themes Every three- year, a team of independent evaluators will be invited to evaluate the program on basis of an on-site visit for which the course files of all courses that will also contain the samples of best and worst student work will be made available. Such an assessment may require inspection of laboratories, equipment, class rooms and interviews with faculty, staff and students for a comprehensive evaluation of the program, facilities and the learning environment. The findings and recommendations of the evaluating team will be used for the improvement of the program.
(iii) From employers and/or other stakeholders. Beginning with the fifth year of the commencement of this new program, every two-year interval a comprehensive survey of the employers and alumni will be carried out to collect data and information on the attainment of the program's educational objectives and outcomes. Additionally, face-to-face exit interviews will be conducted with the graduating students to receive feedback on the program, delivery , learning experience and outcomes.

b. What key performance indicators will be used to monitor and report annually on the quality of the program? • Average score on an overall program quality item on a student survey on completion of the program (50% response rate required) • Completion rate for students in first year of the program. • Proportion of students who complete the full program in minimum time. • Proportion of students (available for employment) who are employed within six months of graduation. • Proportion of full time faculty who completed training programs in teaching or attended conferences during the year. • Number of refereed journal, book or monograph publications during the year per full time faculty member.
c. What processes will be followed for reviewing these assessments and planning action to improve the program? The department will form a standing committee known as Program Assessment Committee (PAC), which will be entrusted with the primary duty of administering every two-years a self-assessment of the program, and to evaluate the findings of this evaluation, the surveys of the employers, alumni, faculty, and the input of the exit interviews with the graduating students. Additionally, PAC will also review the assessment of the external evaluators to propose actions to be taken for the improvement of the program. PAC will propose the recommended actions to the department chair for the improvement of the program. It is departmental practice that lecturers on all but specialist courses should be changed regularly so that lecture courses are constantly refreshed, and the detailed content of lectures regularly reviewed and up-dated. Good practice is identified and shared via teaching and learning committee, the subject theme groups and at the annual courses review meeting. Teaching material.

Attachments.

1. Copies of regulations and other documents referred to in template preceded by a table of contents.
2. Course specifications for all courses.

Program KPI and Assessment Table

KPI #	List of Program KPIs Approved by the Institution	KPI Target Benchmark	KPI Actual Benchmark	KPI Internal Benchmarks	KPI External Benchmarks	KPI Analysis	KPI New Target Benchmark
1							
2							
3							
4							
5							
6							
Analysis of KPIs and Benchmarks: (list strengths and recommendations)							

NOTE The following definitions are provided to guide the completion of the above table for Program KPI and Assessment.

KPI refers to the key performance indicators the programs used in the SSRP and are approved by the institution (if applicable at this time). This includes both the NCAAA suggested KPIs chosen and all additional KPIs determined by the program (including 50% of the NCAAA suggested KPIs and all others).
Target Benchmark refers to the anticipated or desired outcome (goal or aim) for each KPI.
Actual Benchmark refers to the actual outcome determined when the KPI is measured or calculated.
Internal Benchmarks refer to comparable benchmarks (actual benchmarks) from inside the program (like data results from previous years or data results from other departments within the same college).
External Benchmarks refer to comparable benchmarks (actual benchmarks) from similar programs that are outside the program (like from similar programs that are national or international).
KPI Analysis refers to a comparison and contrast of the benchmarks to determine strengths and recommendations for improvement.
New Target Benchmark refers to the establishment of a new anticipated or desired outcome for the KPI that is based on the KPI analysis.

Program Action Plan Table

Directions: Based on your "*Analysis of KPIs and Benchmarks*" provided in the above Program KPI and Assessment Table, list the recommendations identified below.

No.	Recommendations	Action Points	Assessment Criteria	Responsible Person	Start Date	Completion Date
1						
2						
3						
4						
5						
6						
Action Plan Analysis (List the strengths and recommendations for improvement of the Program Action Plan).						

Authorized Signatures

Dean / Program Chair	Name	Title	Signature	Date
Program Dean or Chair of Board of Trustees Main Campus	Dr. Wlid Jameel Altaf	Associate professor		
Vice Rector	Dr. Saleh M Aluqmai	Assistant professor		

Course Specification:
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	Code	Course Title
1.	4031101-4	General Physics
2.	4032102-4	General Physics (2)
3.	4032121-4	Electricity and magnetism
4.	4032141-4	Theoretical Methods in Physics (1)
5.	4032131-4	Optics
6.	4032150-4	Modern Physics
7.	4032122-3	General Physics(3)
8.	4033142-4	Theoretical Methods in Physics (2)
9.	4033143-4	Classical Mechanics(1)
10.	4033145-4	Quantum Mechanics (1)
11.	4033110-3	Heat and Thermodynamics
12.	4033132-3	Electromagnetism (1)
13.	4033146-3	Quantum Mechanics (2)
14.	4033111-3	Statistical Thermodynamics
15.	4033144-2	Classical Mechanics (2)
16.	4034133-3	Electromagnetism (2)
17.	4034160-4	Nuclear Physics
18.	4034170-4	Solid State Physics (1)
19.	4034180-3	Computational Physics
20.	4034162-3	Radiation Physics
21.	4034172-4	Solid State Physics (2)
22.	4034173-4	Electronics
23.	4034199-3	Graduated Project

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكة العربية السعودية
الهيئة الوطنية للتقويم
والاعتماد الأكاديمي

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

T6. Course Specifications (CS)

Course title: General Physics 1

Course code: 4031101-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **General Physics 1 (code: 4031101)**
2. Credit hours: **4 Hrs**
3. Program(s) in which the course is offered. **BSc Physics; BSc Chemistry; BSc Biology; BSc Mathematics.** (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course **Dr. Said M. Attia**
5. Level/year at which this course is offered : **1^{st} Year / Level 2**
6. Pre-requisites for this course (if any) : ---
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

This course is designed to demonstrate and consolidate the basic physics concepts in the branches of physics such as mechanics, properties of matter, heat and optics and also aims to link the mathematical equations to the applied physics.

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- Outlines of the physical laws, principles and the associated proofs.
2. Highlighting the day life applications whenever exist.
3. Encourage the students to see more details in the international web sites and reference books in the library.
4- Encourage the student to build an example of different experiments related to course
5- 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 course will cover the principle of physics, such as measurements, work and energy, Newton's laws, heat, fluid mechanics, and light. 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
❖ **Measurement** 1- The physical quantities, standards, and Units. 2- The international system of units. 3- The Standard of time 4- The Standard of length 5- The Standard of Mass 6- Precision and significant figures. 7- Dimensional analysis.	1	3

❖ **Vectors** 1- Vectors and Scalars. 2- Adding vectors : graphical methods 3- Components of vectors. 4- Adding vector: component method. 5- Multiplications of vectors. 6- Vector laws in physics.	**2**	**6**
❖ **Motion in one dimension** 1- Particles kinematics. 2- Description of motion 3- Average velocity 4- Instantaneous velocity. 5- Accelerated motion. 6- Motion with Constant Acceleration 7- Freely falling Bodies. 8- Measuring free fall acceleration.	**1**	**3**
❖ **Motion in two and three dimensions** 1- Position, velocity, and acceleration. 2- Motion with constant acceleration 3- Projectile motion 4- Uniform circular motion 5- Velocity and acceleration vectors in circular motion	**1**	**3**
❖ **Force and motion** 1- Position, velocity, and accelerations 2- Motion with constant acceleration. . 3- Newton's first and second laws. 4- Forces. 5- Newton's second law 6- Newton's third law. 7- Units of force 8- Weight and mass 9- Measuring forces 10- Applying Newton's laws.	**2**	**6**
❖ **Work and Energy** 1. Work done by constant force. 2. Work done by a variable force: one dimensional case. 3. Work done by a variable force: two dimensional case. 4. Kinetic energy and work-energy theory. 5. Power.	**1**	**3**

❖ **Fluids Statics** 1. Fluids and Solids 2. Density and pressure. 3. Variation of density in a fluid at rest. 4. Pascal Principle. 5. Archimedes' Principle. 6. Surface tension.	**1**	**3**
❖ **Fluid dynamics** 1. General concepts of fluid flow 2. Streamlines and the equation of continuity. 3. Bernoulli's Equation 4. Application of Bernoulli's Equation 5. Viscosity.	**1**	**3**
❖ **Temperature, Heat and the first law of Thermodynamics.** 1. Heat: Energy in transit 2. Heat capacity and specific heat. 3. Heat capacity of solids 4. Temperature. 5. The Celsius and Fahrenheit Scales. 6. Heat transfer.	**2**	**6**
❖ **Reflection and refraction of light at plane surface** 1. Reflection and Refraction 2. Deriving the law of refrlection 3. Image formation by plane mirrors. 4. Deriving the law of refraction. 5. Total internal reflection.	**1**	**3**
❖ **Reflection and refraction of light at plane surface** 1. Spherical mirrors 2. Spherical refracting surfaces. 3. Thin lenses 4. Compound optical systems 5. Optical instruments	**1**	**3**
❖ **Exercises and Solved problems**	**1**	**3**
	15 weeks	**45hrs**

Practical part:

1. Safety and Security at the lab.
1. Introduction to the Lab.
2. Precise measurements.
3. Vectors.
4. Verification of lens formula.
5. Determination of Viscosity
6. Determination of Sound speed.

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: Halliday, Resnick, and Krane, Wiley (1992)
Physics , 4th edition, By: J. Walker (2010)

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

www.uqu.sa/smattia

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.

Name of Instructor: _______S. M. Attia_______________________________________

Signature: ____________________________   Date Report Completed: _____________

Name of Field Experience Teaching Staff _______________________________________

Program Coordinator:____

Signature: ____________________________   Date Received: ____________________

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

T6. Course Specifications (CS)

Course title: General Physics 2

Course code: 4032102-4

Course Specifications

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

A. Course Identification and General Information

1. Course title and code: **General Physics 2 (code: 4032102-4)**
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 academic staff member**
5. Level/year at which this course is offered : **2nd Year / Level 2**
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: **Main campus and Al Zaher**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

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	1	3

6- Time-dependent forces: numerical methods. 7- Drag forces and the motion of projectiles. 8- Limitation of newton's law.		
❖ ***Conservation of energy*** 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.	**1**	**3**
❖ ***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. 6- Quantization of angular momentum.	**1**	**3**
❖ ***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. 3. Power and intensity of sound waves. 4. Standing longitudinal waves. 5. Vibrating systems and sources of sound. 6. Beats 7. The Doppler effect.	**1**	**3**
❖ ***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)	8^{th} week	30%
4	Lab. Reports (Practical)	11^{th} week	5%
5	Final Exam (Practical)	15^{th} week	15%
6	Final Exam (theoretical)	16^{th} 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, 4^{th} 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, 4^{th} edition , By: Halliday, Resnick, and Krane, Wiley (1992)
Physics , 4^{th} 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.

Name of Instructor: _______B. A. Korany_______________________________________

Signature: ____________________________ Date Report Completed: _____________

Name of Field Experience Teaching Staff _______________________________________

Program Coordinator:____

Signature: ____________________________ Date Received: ____________________

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 1

Course code: 4032121-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1438**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Electricity and Magnetism (code: 4032121)**
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 academic staff member
5. Level/year at which this course is offered : **2st Year / Level 3**
6. Pre-requisites for this course (if any) : - **General physics 2 4031101-4**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course is designed to provide and define the fundamental properties of the electric charge, solve technical problems associated with the electrostatic force (Coulomb force), identify that at every point in the space surrounding a charged particle, the particle sets up an electric field , which is a vector quantity and thus has both magnitude and direction, identify how an electric field can be used to explain how a charged particle can exert an electrostatic force on a second charged particle even though there is no contact between the particles, explain how a small positive test charge is used (in principle) to measure the electric field at any given point, define electric capacitance and solve technical problems associated with capacitors of various symmetries, capacitors in series and parallel combination, the microscopic effect of dielectric materials on capacitance and stored energy, define electric current, current density, and solve technical problems involving DC networks of resistors, batteries, and capacitors, Ohm's Law, Kirchhoff's laws, and RC charging and decay circuits, calculate the potential difference between any two points in a circuit, distinguish a real battery from an ideal battery and, in a circuit diagram, replace a real battery with an ideal battery and an explicitly shown resistance. 9. Calculate the net rate of energy transfer in a real battery for current in the direction of the emf and in the opposite direction, define the magnetic field and magnetic flux, solve technical problems associated with the effect of static, non-uniform and uniform magnetic fields on moving charges and current-carrying wires, loops and the magnetic dipole, calculate the magnitude and direction of the magnetic field for symmetric current distributions using the Law of Biot-Savart and Ampere's Law, and state the limitations of Ampere's Law, state Faraday's Law of Induction with Lenz's Law and use these equations to solve technical problems associated with induction, calculate inductance according to the fundamental definition, solve technical problems associated with LR circuits and coils, and calculate the stored energy in magnetic fields. In addition to these items, the students should gain practical skills through performance some experimental class, to demonstrate and consolidate the basic physics concepts in the branches of physics such as mechanics, properties of matter, heat and optics and also aims to link the mathematical equations to the applied physics.
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- Outlines of the physical laws, principles and the associated proofs. 2. Highlighting the day life applications whenever exist. 3. Encourage the students to see more details in the international web sites and reference books in the library. 4- Encourage the student to build an example of different experiments related to course 5- 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 course will cover the principle of physics, electric charge and Coulomb's law, the electric field, Gauss law, Electric potential, capacitors and dielectric, current and resistance, DC circuits. The magnetic field and Ampere's law. 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**
Electric charge and Coulomb's law 1- Introduction. 2- Electric Charge 3- Conductors and Insulators 4- Coulomb's law 5- Charge is Quantized 6- Charge is Conserved	**1**	**3**
The Electric Field 1- Fields. 2- The Electric Field E 3- The Electric Field of a Point Charges and Lines of Force 4- The Electric Field of Continuous Charge Distributions 5- A Point Charge in an Electric Field 6- A Dipole in an Electric Field	**1**	**3**
❖ **Gauss Law** 1- IntroductionThe flux of a Vector Field 2- The Flux of the Electric Field 3- Gauss law 4- A Charged Insolated Conductor 5- Applications of Gauss law 6- Experimental Tests of Gauss law and Coulomb law	**1**	**3**
❖ **Electric Potential** 1- Electrostatic and Gravitational Forces 2- Electrical Potential Energy 3- Electric Potential 4- Calculating the Potential from the Field	**2**	**6**

5- Potential due to Point Charge 6- Potential due to a Collection of Point Charges 7- The Electric Potential of Continuous Charge distribution 8- Equipotential Surfaces 9- Calculating the Field from the Potential 10- An Insulated Conductor		
Capacitors and dielectrics 1- Capacitance 2- Calculating the Capacitance 3- Capacitors in Series and Parallel 4- Energy Storage in an Electric Field 5- Capacitor with Dielectric 6- Dielectrics: an Atomic View 7- Dielectrics and Gauss law	**1.5**	**5**
Current and Resistance 1. Electric Current 2. Current Denstiy 3. Resistance, Resistivity, and Conductivity 4. Ohm's law 5. Ohm's law: A Microscopic View 6. Energy Transfers in an Electric Circuit	**1.5**	**5**
DC Circuits 1. Electromotive Force 2. Calculating the Current in a Single Loop 3. Potential Differences 4. Resistors in Series and Parallel 5. Multiloop Circuits 6. RC Circuits	**1.5**	**5**
The Magnetic Field 1. The Magnetic Field B 2. The Magnetic Force on a Moving Charge 3. Circulating Charges 4. The Hall Effect. 5. The Magnetic Force on a Current 6. Torque on a Current LoopThe Magnetic Force on a Current 7. The Magnetic Dipole	**2**	**6**

Ampere's Law 1. The Biot-Savart Law. 2. Applications of the Biot-Savart Law 3. Lines of Magnetic Field 4. Two Parallel Conductors 5. Ampere's Law 6. Solenoids and Toroids.	**2**	**6**
	14 weeks	**42hrs**

Practical part:

1. Safety and Security at the lab.
2. Introduction.
3. Determining the capacitance of a capacitor / connecting capacitors in series and in parallel
4. Studying Ohm's Law / connecting two resistors in series and in parallel
5. Determining the time constant of an RC circuit
6. Kirchhoff's Rules (The Junction Rule and The Loop Rule)

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**42**		**42**			**84**
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	10 %
2	Participation in activities lectures and labs	All weeks	10 %
3	Midterm Exam (theoretical)	6th week	10%
4	Lab. Reports (Practical)	11th week	10%
5	Final Exam (Practical)	15th week	20%
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)

University Physics with modern Physics, 13th edition, by: Hugh D. Young and Roger A. Freedman, Addison-Wesley, (2012).

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. (eg. www.youtube.com.)
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.) • Class room is already provided with data show • The area of class room is suitable concerning the number of enrolled students (68) and air conditioned. • Library • Laboratory for fundamental of physics
2. Computing resources (AV, data show, Smart Board, software, etc.) • . Computer room • Scientific calculator.
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 • Questionaries • Open discussion in the class room at the end of the lectures
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.

Name of Instructor: _______Mongi Ben Moussa____

Signature: ____________________________ Date Report Completed: _____________

Name of Field Experience Teaching Staff ____

Program Coordinator:____

Signature: ____________________________ Date Received: ____________________

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

T6. Course Specifications (CS)

Course title: Theoretical Methods in Physics (1)

Course code: 4032141-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/2/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Theoretical Methods in Physics (1) (code: 4032141-4)**
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 **Mohamed M.Sabry**
5. Level/year at which this course is offered : **2nd Year / Level 4**
6. Pre-requisites for this course (if any) : **Differentiation and Integration (2) (4042501-4)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course is designed to demonstrate and consolidate the different concepts of mathematics and algebra and ways of using them in the different branches of physics
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) Encourage students to practice in the basics of mathematics and algebra – like differentiation and integration, limits, related to the course

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

Course Description: The course provides a direct preparation for an advanced study in theoretical physics and is also an interesting element in the education of an experimental physicist. The physical principles behind the mathematical models are stressed so that insight and problem solving ability become primary. This course will cover the basic mathematical tools used in physical science and engineering: Vector analysis, partial differentiation, power and series, differential equations, special functions, integral transforms, and complex analysis. The course is designed to supply students for a variety of mathematical methods that need for advanced undergraduate and beginning graduate study in physical science and to develop a solid background for those who will continue into the mathematics of advanced theoretical physics

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Vector Analysis** 1- Triple (Scalar-Vector) products- 2- Differentiation of vectors- 3- grad, Div, Curl and Laplace's operator, 4- Vector integral- 5- Green's, Gauss' and Stokes theorems, 6- General curvilinear coordinates- 7- vector operators in orthogonal curvilinear coordinates	**3**	**12**
❖ **Infinite series, Power series** **1-** Geometric series, **2-** testing series for convergence, **3-** Alternating series, **4-** interval of convergence- **5-** expanding functions in power series, **6-** Taylor and Maclaurin expansions,	**2**	**8**

7- Solving Problems about Series		
❖ **Partial Differentiation** 1- Total differentials- 2- Approximating using differentials, 3- chain rule 4- Implicit differentiation, A 5- pplication to Maximum and Minimum problems, 6- Lagrange Multipliers, Change of Variables, 7- Differentiation of Integrals	**3**	**12**
❖ **Fourier series and transforms** 1- Simple Harmonic Motion and Wave Motion; 2- Periodic Functions, 3- Average Value of a Function, 4- Fourier Coefficients, 5- Complex Form of Fourier Series, 6- Even and Odd Functions, 7- Applications of Fourier Series, Fourier Transforms.	**3**	**12**
❖ **Ordinary differential equations** 1- First order differential equations; 2- separable differential equations, 3- linear 1st order equations, 4- 2nt order differential equations; 5- Homogeneous differential equations, 6- Non-homogeneous differential equations.	**2**	**8**
❖ **Solution of Differential Equations by Laplace Transforms** 1- The Laplace Transform, 2- Convolution, 3- The Dirac Delta Function, 4- A Brief Introduction to Green Functions.	**2**	**8**
	15 weeks	**60hrs**

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**60**		**0**		**10**	**70**
Credit	**4**		**0**			

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	10 %
2	Participation in activities lectures and labs	All weeks	10 %
3	1st Periodic Exam	8th week	15%
4	2nd Periodic Exam	11th week	15%
5	Final Exam	16th week	50%

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)

Students are supervised by academic advisers 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

1- Mary L. Boas, Mathematical methods in the Physical sciences, second edition, John Wiley and Sons (1966) and (1983).

2- G. Dennis Zill, R. Michael Cullen, Advanced engineering mathematics, Jones and Bartlett Publisher (2006), ISBN 9780763745912.

3- Eugene Butkov, Mathematical Physics, World student series edition (1973)

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

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

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.
2. Computing resources (AV, data show, Smart Board, software, etc.) In each class room, there is a data show, and board.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

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 of the grades of students.
3 Processes for Improvement of Teaching • Preparing the course as PPT. • Coupling the theoretical part with real physics problems • 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.

Name of Instructor: _______Mohamed M.Sabry_______________________________________

Signature: __________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff _____________________________________

Program Coordinator:____

Signature: __________________________ Date Received: ___________________

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: Optics

Course code: 4032131-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Optics (code: 4032131)**			
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 academic staff member**			
5. Level/year at which this course is offered : **2st Year / Level 5**			
6. Pre-requisites for this course (if any) : 4032102			
7. Co-requisites for this course (if any) : ---			
8. Location if not on main campus: **Main campus and Alzaher**			
9. Mode of Instruction (mark all that apply)			
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	
Comments:			

B Objectives

1. What is the main purpose for this course?

The objectives of this course are to through light on nature of light. And also through light on different phenomena like interference, diffraction, polarization and their application in life.

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- Explain strategy of the course in the beginning of the semester .
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 and comparing it with experiments in the lab.
6- Cooperate with different institution to find how they deal with the subject.
7- Renew the course references frequently.
8- 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 course will cover the principle of physics, such as aberrations, interference, Fourier analysis for physical optics, diffraction grating, Fourier optics and Polarization. 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
❖ **Aberations** 1- Types of aberrations . 2- Correction of aberrations.	2	6

❖ **Interference** 1- Young double slit 2- Double beam experiments 3- General conditions of interference 4- Superposition 5- Michelson interferometer 6- Plane parallel plates 7- Fabry - Perot interferometer 8- Newtons rings	**3**	**9**
❖ **Fourier analysis for physical optics** 1- Fraunhofer diffraction 2- Fraunhofer diffraction by a single slit (by integration methods) 3- Diffraction maxima and half width for single slit 4- Fraunhofer diffraction by circular slit (by integration methods) 5- Airy disk 6- Rayleigh`s criterion 7- Fresnel diffraction 8- Fresnel integrals (by integration methods) 9- Cornu spiral 10- Fresnel diffraction on single slit 11- Huygens principle	**3**	**9**
❖ **Diffration grating** 1- One dimension gratings. 2- Grating equation. 3- Angular dispersion. 4- Chromatic resolving power. 5- Two dimension grating. 6- X ray diffraction. 7- Braggs law .	**2**	**6**
❖ **Fourier optics** 1. Basic rules for Fourier transform. 2. Spatial filtering. 3. Diffraction theory of image formation in the microscope 4. Optical image processing.	**2**	**6**
❖ **Polarization** 1. Types of polarized light 2. Production of polarized 3. Optical active phenomena 4. Polarization caused by electric and magnetic fields	**2**	**6**
❖ **Exercises and Solved problems**	**1**	**3**

	15 weeks	45hrs

Practical part:

1. Safety and Security in the lab.
2. Introduction.
3. Interference of Light and eye resolving power.
4. Diffraction of Light.
5. Newton's Rings.
6. Polarization of Light and Brewster's angle.
7. Diffraction Grating .
8. Study of prism properties using Spectrometers Thermobiles.
9. Abbe refractometer.
10. Malus law Experiment.

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)	8^{th} week	30%
4	Lab. Reports (Practical)	11^{th} week	5%
5	Final Exam (Practical)	15^{th} week	15%
6	Final Exam (theoretical)	16^{th} 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. (6hrs per week)

E Learning Resources

1. List Required Textbooks

*Introduction to Classical and Modern Optics, by Jurgen R. Meyer-Arendt, Prentic – Hall international , (1995).
*Fundamentals of optics , by Francis Jenkins and Harvey White, Mc Graw Education, (2001)

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

*Introduction to Classical and Modern Optics, by Jurgen R. Meyer-Arendt, Prentic – Hall international , (1995).
*Fundamentals of optics , by Francis Jenkins and Harvey White, Mc Graw Education, (2001)

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

http://www.physicsclassroom.com http://www.learnerstv.com/
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 • Evaluating the instructor by the student using questionnaires • Following up the progress of student in the course • Evaluating the progress of student by the projects and reports • Evaluating the course by specialized committees
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department • Self-evaluation

• Student evaluation • Evaluation by other instructor in the same department or outside it.
3 Processes for Improvement of Teaching • Course report • Program report • Program self study • Handling the weakness point. • By the Accreditation committee in the department
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 2- According to point 1 the plan of improvement should be given. 3- Contact the college to evaluate the course 4- Reviewing the course and updating it.

Name of Instructor: _______Mongi Ben Moussa

Signature: ______________________________ Date Report Completed: ______________

Name of Field Experience Teaching Staff ____

Program Coordinator:____

Signature: ______________________________ Date Received: ______________________

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: Modern Physics

Course code: 4032150-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Modern Physics (code: 4032150)**
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 academic staff member**
5. Level/year at which this course is offered : **5th Level**
6. Pre-requisites for this course (if any) : ---
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode			
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

This course is designed to study and consolidate the modern physics concepts in the branches of physics such as The relativity, the black body radiation, the particles properties of waves, wave properties of particles and the atomic structure.

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- Outlines of the modern physics laws, principles and the associated proofs.
2. Highlighting the day life applications whenever exist.
3. Encourage the students to see more details in the international web sites and reference books in the library.
4- Encourage the student to build an example of different experiments related to course
5- Frequently check for the latest discovery in science.

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

Course Description:

This course will cover the principle of the modern physics concepts in the branches of physics such as The relativity, the black body radiation, the particles properties of waves, wave properties of particles and the atomic structure.

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **THE SPATIAL THEORY OF THE RELATIVITY** 1- Introduction, 2- Reference frame, 3- Inertial reference frame, 4- Galilean relativity. 5- Einstein's postulate of relativity, 6- Relativity of the simultaneity, 7- Time dilatation, length contraction, 8- Lorentz transformations, 9- Relativistic velocity transformations. 10- Relativistic mechanics, 11- Mass,	**3**	**3**

12- Energy, 13- transformation of energy, 14- Momentum and force, 15- Doppler effect, 16- Relativistic collisions.		
❖ **BLACK BODY RADIATION** 1- radiation of heated objects, 2- thermal radiation, 3- cavity radiation treated with classical physics, 4- UV catastrophe, 5- Planck's solution, 6- quantum of energy.	**3**	**3**
❖ **PARTICLE PROPERTIES OF WAVES** 1- The photoelectric effect, 2- The quantum theory of light, 3- X rays X-ray diffraction, 4- The Compton effect, 5- Pair production, 6- Gravitational red shift.	**3**	**3**
❖ **WAVE PROPERTIES OF PARTICLES** 1- De Broglie waves, 2- Wave function, 3- De Broglie wave velocity, 4- Phase and group velocities, 5- The diffraction of particles. 6- The uncertainty principle, 7- Applications of the uncertainty principle, 8- The wave-particle duality.	**2**	**3**
❖ **ATOMIC STRUCTRUE** 1- Atomic models, 2- Alpha-particle scattering, 3- The Rutherford scattering formula. 4- Nuclear dimensions, 5- Electron orbits, 6- Atomic spectra, 7- Energy levels and spectra, 8- Nuclear Motion, 9- Atomic excitation, 10- The correspondence Principle.	**3**	**3**
❖ **Exercises and Solved problems**	**1**	**3**
	15 weeks	**45hrs**

Practical part:

1. Safety and Security at the lab.
2. Introduction to the Lab.
3. Determination of e/m for electron
4. Determination of Planck's constant
5. Determination of ionization Potential
6. Study of Palmer series of Hydrogen lamp
7. Electron Diffraction: Thomson Experiment
8. Transmission & Absorption of X-ray
9. Franck Hertz experiments
10. Zeeman effect
11. Verification of Bragg law
12. Millikan's Experiment
13. Stefan-Boltzmann's law

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

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
1- Jeremy Bernstein, Paul Fishbane and Stephen Gasiorowicz , Modern Physics, 2-Hardback (2000).
2- Randy Harris, Modern Physics (2nd Edition), International Edition
3- A. Beiser (2003). Concepts of Modern Physics (6th ed.). McGraw - Hill.

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

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.

Name of Instructor: _______A. TIMOUMI______________________________________

Signature: ____________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff ____

Program Coordinator:____

Signature: ____________________________ Date Received: ____________________

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T6. Course Specifications (CS)

Course title: General Physics 3

Course code: 4032122-3

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **General Physics 3 (code: 4032122-3)**
2. Credit hours: **2 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 academic staff member**
5. Level/year at which this course is offered : **2nd Year / Level 4**
6. Pre-requisites for this course (if any) : **Electricity and magnetism (4032121-4)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus**
9. Mode of Instruction (mark all that apply)

Mode			
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?
    1. Define the main properties of an alternating current
    2. Use the complex number
    3. Understand the principle of basic components in AC circuit
    4. Understand the concept of the electric power
    5. Understand the theory of RC, RL, RLC circuits
    6. Understand different types of filters (Low pass filter, High pass filter,…)

Understand the theory of the resonant circuit.

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- Outlines of the physical laws, principles and the associated proofs.
2. Highlighting the day life applications whenever exist.
3. Encourage the students to see more details in the international web sites and reference books in the library.
4- Encourage the student to build an example of different experiments related to course
5- 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 course will cover the principle of physics, such as measurements, work and energy, Newton's laws, heat, fluid mechanics, and light. 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
❖ **Principles of alternating current:** AC waveforms, frequency, Angular frequency, Period, Instantaneous value of the voltage, Maximum or peak value of the voltage, Initial phase, Root-Mean- Square (RMS) Values of Current and Voltage	1	2
❖ **Complex number:** Introduction, Vectors and AC waveforms, Simple vector addition,	2	4

Complex vector addition, Polar and rectangular notation, Complex number arithmetic.		
❖ **Passive components in AC circuit:** purely R, C ,L, Voltage, Current, Current leads Voltage	**2**	**4**
❖ **Power in AC circuit:** Power in resistive and reactive AC circuits, True, Reactive, and Apparent power, Calculating power factor	**1**	**2**
❖ **AC circuit analysis:** Reactance and impedance, RC circuit, RL circuit and series-parallel RLC circuits .	**2**	**4**
❖ **Filters:** Filter function , Low-pass filters, High-pass filters, Band-pass filters, Band-stop filters, Decibel, Bode plot,	**2**	**4**
❖ **Resonant circuits**: LC circuit, series- parallel RLC circuit, Quality factor,	**2**	**4**
❖ **AC bridges** : Maxwell's inductance bridge, Maxwell-Wien Bridge, Anderson Bridge, Hay's Bridge, Owen Bridge, De Sauty Bridge Shering bridge, Wien Series Bridge.	**3**	**6**
	15 weeks	**30hrs**

Practical part:

1. Wave AC form
2. Passive components in AC circuit (R, L, C)
3. RL circuit
4. RC circuit
5. RLC circuit
6. RC filter (low and high pass filter)
7. Resonant RLC circuit

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**30**	**12**		**14**	**5**	**71**
Credit	**2**			2		

3. Additional private study/learning hours expected for students per week.	1

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. (6hrs per week)

E Learning Resources

1. List Required Textbooks

Lessons In Electric Circuits, Volume II – AC. By Tony R. Kuphaldt.6 th Edition, 2007
Fundamental of Physics by Halliday & Resnick

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

Lessons In Electric Circuits, Volume II – AC. By Tony R. Kuphaldt.6 th Edition, 2007
Fundamental of Physics by Halliday & Resnick

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

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.) • Class room is already provided with data show • The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.
2. Computing resources (AV, data show, Smart Board, software, etc.) • Providing class rooms with computers and labs with data show.
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 • Questionaries • Open discussion in the class room at the end of the lectures
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 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) • After the agreement of Department and Faculty administrations
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. 3- Contact the college to evaluate the course and the benefit it add to other courses. 4- Add some subject and cut off others depending on the new discoveries in physics.

Name of Instructor: _______ ____

Signature: ___________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff ______________________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: Theoretical Methods in Physics (2)

Course code: 4033142-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **11/3/1439**
College/Department : **College of Applied Science –Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Theoretical Methods in Physics (2) (code: 4033142-4)**
2. Credit hours: **4 Hrs**
3. Program(s) in which the course is offered. **BScPhysics.** (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course **Walid Belkacem Belhadj**
5. Level/year at which this course is offered : **3rd Year / Level 5**
6. Pre-requisites for this course (if any) : **Theoretical Methods in Physics (1) 4032141-4**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

This course is designed to supply students for a variety of mathematical methods that need for advanced undergraduate and beginning graduate study in physical science and to develop a solid background for those who will continue into the mathematics of advanced theoretical physics.

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. Deal with special functions (factorial, gamma, beta and error functions) that are used extensively in physics problems.
2. Use Legendre function, Bessel equation, and Laguerre function as solutions of some types of differential equations
3. Be familiar with the methods of solving partial differential equations (PDE).
4. Translate a physical problem in mathematical form (PDE, boundary value problem).
5. Deal with Functions of a complex variable, and contour integrals, and use them to find residues and to calculate definite integrals.
6. Develop an intuitive feeling for the precise mathematical formulation of physical problems and for the physical interpretation of the mathematical solutions.
7. Be familiar with the mathematical formulae of this course that frequently appear in physics problems.
8. Use computer to verify the solution of some physical problems.
9. Use computer to construct graphs of some functions.

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

Course Description:

The objective of this course is to learn in a practical manner the mathematical techniques and methods useful in physical sciences, not covered by previous courses (Theoretical Methods in Physics (1)). The approach requires a combination of mathematics, skill in making legitimate approximations, and intelligent use of computers to get some motivation and verify the approximations. The course is designed to supply students for a variety of mathematical methods that need for advanced undergraduate and beginning graduate study in physical science and to develop a solid background for those who will continue into the mathematics of advanced theoretical physics.

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Special functions:** Factorial Function, Gamma Function; Recursion Relation, Some Important Formulas Involving Gamma Functions, Beta Functions, Beta Functions in Terms of Gamma Functions, The Error Function, Asymptotic Series, Stirling's Formula, Elliptic Integrals and Functions.	2	8
❖ **Legendre's functions:** Leibniz' Rule, Rodrigues' Formula, Generating Function, Orthogonality of the Legendre Polynomials, Normalization of the Legendre Polynomials, Legendre Series, Associated Legendre Functions, Generalized Power Series.	2.5	10
❖ **Bessel's functions:** First and Second Solution of Bessel's Equation, Graphs and Zeros of Bessel Functions, Recursion Relations, Other Kinds of Bessel Functions, Orthogonality of Bessel Functions.	2.5	10
❖ **Hermite - Laguerre Functions:** Ladder operators, Hermite functions, Hermite polynomials, Laguerre functions, Laguerre polynomials, Associated Laguerre polynomials.	2	8
❖ **Partial Differential Equations:** Laplace's Equation; Steady-State Temperature in a Rectangular Plate, The Diffusion or Heat Flow Equation, The Wave Equation; the Vibrating String, Steady-state Temperature in a Cylinder, Steady-state Temperature in a Sphere, Poisson's Equation Integral Transform Solutions of Partial Differential Equations	2	8
❖ **Functions of a complex variable:** Analytic functions- Cauchy-Riemann conditions, Contour Integrals, Laurent Series, The residue theorem, Methods of finding the residues, Evaluation of Definite Integrals, Mapping.	3	12
	14 weeks	56 hrs

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**56**		**--**			**56**
Credit	**4**		**--**			

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	Online quizzes	All weeks	10%
2	Exercises & Home works	All weeks	10 %
3	Participation in activities lectures and labs	All weeks	10 %
4	Midterm Exam (1)	8^{th} week	15%
5	Midterm Exam (2)	11^{th} week	15%
6	Final Exam	16^{th} 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

1. Mary L. Boas, Mathematical methods in the Physical sciences, third edition, John Wiley and Sons (2006), ISBN-13 978-0-471-19826-0.
2. George B. Arfken, Hans J. Weber and Frank E. Harris, Mathematical Methods for Physicists (Seventh Edition), Elsevier (2012), ISBN: 978-0-12-384654-9.
3. G. Dennis Zill, R. Michael Cullen, Advanced engineering mathematics, Jones and Bartlett Publisher (2006), ISBN 9780763745912.
4. Eugene Butkov, Mathematical Physics, World student series edition (1973).
5. S. Grossman, Elementary Linear Algebra, 6^{th} edition, Wadsworth (2006).

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
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.) • Class room is already provided with data show. • The area of class room is suitable concerning the number of enrolled students (68) and air conditioned. • Library. • Laboratory for fundamental of physics.
2. Computing resources (AV, data show, Smart Board, software, etc.) • Computer room. • MATLAB software.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

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.

Name of Instructor: _______**Walid Belkacem Belhadj**_____________________

Signature:___________________________Date Report Completed:____________

Name of Field Experience Teaching Staff ______________________________________

Program Coordinator:____

Signature: ___________________________ Date Received:___________________

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

T6. Course Specifications (CS)

Course title: Classical Mechanics 1

Course code: 4033143-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **11/3/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Classical Mechanics 1 (code: 4033143)**
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 academic staff member**
5. Level/year at which this course is offered: **3rd Year / Level 5**
6. Pre-requisites for this course (if any): **General Physics (2) (4032101-4)**
7. Co-requisites for this course (if any) : ---
8. Location, if not on the main campus: **Main campus and Al-Zaher**
9. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? **100%** b. blended (traditional and online) What percentage? c. e-learning What percentage? d. correspondence What percentage? f. other What percentage? Comments:

B Objectives

1. What is the main purpose for this course?

This course is designed to demonstrate and consolidate the basic physics concepts in classical mechanics, the general motion of the particles in three dimensions, the noninertial reference systems, the gravitation, central forces, and the dynamics of many-particle systems.

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- Outlines of the physical laws, principles and the associated proofs.
2. Highlighting the day life applications whenever exist.
3. Encourage the students to see more details in the international websites and reference books in the library.
4- Encourage the student to build an example of different experiments related to the course.
5- Frequently check for the latest discovery in science.

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

Course Description:
Chapter 1: A brief preparation in vector algebra and vector differentiation.
Chapter 2: Newton's laws of motion and the rectilinear motion of a single particle.
Chapter 3: Harmonic motion, damped and forced harmonic oscillator.
Chapter 4: The general motion of a particle in three dimensions.
Chapter 5: Noninertial reference systems.
Chapter 6: The central forces and celestial mechanics.
Chapter 7: Many-particle systems, collisions, and the rocket motion.

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Fundamental Concepts Vectors** 1- Physical quantities and units. 2- Scalar and vector quantities. 3- Formal definition and rules. 4- The Scalar and Vector Products. 5- Triple products 6- Derivative of a vector. 7- Position vector of a particle velocity and Acceleration in Rectangular Coordinates. 8- Velocity and Acceleration in Polar Coordinates. 9- Velocity and Acceleration in Cylindrical and Spherical Coordinates.	2	8

❖ **Newtonian Mechanics, Rectilinear Motion of a Particle** 1- Newton's Law of Motion. 2- Rectilinear Motion: Uniform Acceleration Under a Constant Force. 3- Forces that Depend on Position: The Concepts of Kinetic and Potential Energy. 4- Velocity-Dependent Forces: Fluid Resistance and Terminal Velocity.	**2**	**8**
❖ **Oscillations** 1- Linear Resoring Force: Harmonic Motion. 2- Energy Considerations in Harmonic Motion. 3- Damped Harmonic Motion. 4- Forced Harmonic Motion: Resonance.	**2**	**8**
❖ **General Motion of a Particle in Three Dimensions** 1- Introduction. 2- The Potential Energy Function in Three-Dimensional Motion: The Del Operator. 3- Forces of the Separable Type. 4- The Harmonic Oscillator in Two and Three Dimensions. 5- Constrained Motion of a particle.	**2**	**8**
❖ **Noninertial Reference Systems** 1- Accelerated Coordinate Systems and Interial Forces. 2- Rotating Coordinate Systems. 3- Dynamics of a Particle in a Rotating Coordinate System. 4- Effects of Earth's Rotation. 5- The Foucault Pendulum.	**2**	**8**
❖ **Gravitation and Central Forces** 1- Introduction. 2- Gravitational Force between a Uniform Sphere and a Particle. 3- Kepler's Laws of Planetary Motion. 4- Kepler's Second Law: Equal Areas. 5- Kepler's Firs Law: The Law of Ellipses. 6- Kepler's Third Law: The Harmonic Law. 7- Potential Energy in a Gravitational Field: Gravitational Potential. 8- Potential Energy in a General Central Field. 9- Energy Equation of an Orbit in a Central Field. 10- Orbital Energies in an Inverse-Square Field.	**2**	**8**
❖ **Dynamics of Systems of Particles** 1- Introduction: Center of Mass and Linear Momentum of a System. 2- Angular Momentum and Kinetic Energy of a system. 3- Motion of Two Interacting Bodies: The Reduced Mass. 4- Collisions. 5- Oblique Collisions and Scattering: Comparison of Laboratory and Center of Mass Coordinates. 6- Motion of a Body with Variable Mass: Rocket Motion.	**2**	**8**
	14 weeks	**56 hours**

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**56**		**--**		**14**	**70**
Credit	**4**					

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	All weeks	5 %
3	In-Class Problem solving	All weeks	10 %
4	Midterm Exam1 (theoretical)	6th week	15%
5	Midterm Exam2 (theoretical)	11th week	15%
6	Final Exam (theoretical)	16th week	50%

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 an academic adviser in physics Department and the time table for academic advice were given to the student each semester. (4 hours per week)

E Learning Resources

1. List Required Textbooks

G. R. Fowles and G. L. Cassiday, “Analytical Mechanics”, 7th edition, Brooks Cole (2005).
G. R. Fowles, “Analytical Mechanics”, 3rd edition, Holt, Rinehart and Winston (1977).

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

S. T. Thornton, and J. B. Marion, “Classical Dynamics of Particles and Systems”, 5th edition, Brooks Cole (2003).

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
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.) Classroom for 40 students with data show Library
2. Computing resources (AV, data show, Smart Board, software, etc.) Computer room Data show
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Each Classroom data show, and double layer white board.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Evaluating the instructor by the student using questionnaires. • Following up the progress of students in the course. • Evaluating the progress of student by projects.
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

Strategies are modified each term according to the student feedback.

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.

Name of Instructor: _______Fatma El-Sayed Mahrous Othman____________________

Signature: _____Fatma El-Sayed______ Date Report Completed: ___11/3/1439__

Name of Field Experience Teaching Staff ____________________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: Quantum Mechanics 1

Course code: 4033145-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Quantum Mechanics 1 (code: 4033145)**
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 academic staff member**
5. Level/year at which this course is offered : **3rd Year / 5th Level**
6. Pre-requisites for this course (if any) : **Theoretical Methods in Physics (1) (4032141-4)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode			
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

Explain that, the quantum mechanics is a more general theory which contains classical mechanics as a limiting case and in fact historically quantum mechanics was developed by analogy with classical theory. Demonstrate theoretical knowledge and have practical skills and personal attributes that will be required for quantum mechanics. Demonstrate an ability to initiate and sustain in-depth research relevant to quantum mechanics.

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- Outlines of the physical laws, principles and the associated proofs.
2. Highlighting the day life applications whenever exist.
3. Encourage the students to see more details in the international web sites and reference books in the library.
4- Encourage the student to build an example of different experiments related to course
5- Frequently check for the latest discovery in science

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

Course Description:
Course description:
1- **Wave-Particle Duality and Uncertainty**: Probability interpretation for wave-functions; wave packets, momentum representation; group velocity and phase velocity for a free particle, dispersion and time evolution; uncertainty principle for position and momentum.
2- The Schrödinger Equation: Introduction to operators and conjugate variables; eigenfunctions and eigenvalues, time-dependent and -independent wave equations; probability density and current; stationary states.
3- **Unbound Particles:** solutions for a free particle, beams, one-dimensional potentials; boundary conditions; reflection and transmission for a square potential step and barrier; tunnelling.
4- **Bound Particles**: Particle in an infinite potential well; zero-point energy; orthogonality and parity of eigenfunctions, normalization; eigenfunction expansions. Finite potential well. Harmonic oscillator. 3D box; separation of variables; degeneracy.
5- **Operator Methods:** Observables and operators; Hermitian operators. Dirac notation, eigenstates and eigenvalues. Correspondence of observables with operators; orthogonality and completeness of eigenstates. Postulates of quantum mechanics. Probability of outcomes of measurements; expectation values. Compatible and incompatible observables; commuting operators and simultaneous eigenstates; non-commuting operators; generalised uncertainty

relations; minimum uncertainty states. The harmonic oscillator; ladder operators, eigenstates, equipartition. Time dependence; evolution of expectation values. Ehrenfest's theorem. Time-energy uncertainty relation. Symmetry operators and conserved quantities.
6- **Quantum Mechanics in Three Dimensions:** General formulation. Spherically symmetric systems; orbital angular momentum; angular momentum operators; eigenvalues and eigenstates; orbital magnetic moment. Eigenfunctions; spherical harmonics; parity. Rotational invariance and angular momentum conservation. The three-dimensional harmonic oscillator; quantum numbers and degeneracies. Central potentials and conservation of angular momentum. Separation of variables; the radial equation. The hydrogen atom; quantum numbers; overall wavefunctions. Non-central potentials.
7- **Spin:** Stern-Gerlach experiment and spin; spin eigenstates. Matrix methods applied to angular momentum; Pauli matrices; spinors. Combining spin and orbital angular momentum; combining spins; singlet and triplet states.

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Wave Particle Duality, Probability, and the Schrodinger Equation** • Radiation as Particles, Electrons as Waves. • Plane Waves and Wavepackets. • The Probability Interpretation of the Wavefunction. • The Schrodinger Equation. • The Heisenberg Uncertainty Relations. • The Probability Current. • Expectation Values and the Momentum in Wave Mechanics; The Momentum in Wave Mechanics, Wavefunction in Momentum Space.	2	8
❖ **Eigenvalues, Eigenfunctions, and the Expansion Postulate** • The Time-Independent Schrodinger Equation. • Eigenvalue Equations. • The Eigenvalue Problem for a Particle in a Box. • The Expansion Postulate and Its Physical Interpretation. • Momentum Eigenfunctions and the Free Particle; Normalization of the Free Particle Wave Function, Degeneracy. • Parity.	2	8
❖ **One-Dimensional Potentials** • The Potential Step. • The Potential Well. • The Potential Barrier. • An Example of Tunneling. • Bound States in a Potential Well. • The Harmonic Oscillator.	2	8

The General Structure of Wave Mechanics • Eigenfunctions and Eigenvalues; The Hamiltonian Operator. • Other Observables. • Vector Spaces and Operators. • Degeneracy and Simultaneous Observables. • Time Dependence and the Classical Limit.	**2**	**8**
Angular Momentum • The Angular Momentum Commutation Relations. • Raising and Lowering Operators for Angular Momentum. • Representation of $\left\|\ell, \mathbf{m}\right\rangle$ States in Spherical Coordinates.	**1**	**4**
The Schrodinger Equation in Three Dimensions and the Hydrogen Atom • The Central Potential. • The Hydrogen Atom. • The Energy Spectrum. • The Free Particle.	**2**	**8**
Spin • Eigenstates of Spin 1/2. • The Intrinstic Magnetic Moment of Spin 1/2 Particles. • Addition of Two Spins. • The Addition of Spin 1/2 and Orbital Angular Momentum. • General Rules for Addition of Angular Momenta.	**1.5**	**6**
Matrix Representation of Operators • Matrices in Quantum Mechanics. • Matrix Representation of Angular Momentum Operators. • General Relations in Marix Mechanics. • Matrix Representation of Spin 1/2.	**1.5**	**6**
	14 weeks	**56 hrs**

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**56**				**14**	**70**
Credit	**4**					

3. Additional private study/learning hours expected for students per week.	14

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	All weeks	5 %
3	In-Class Problem Solving	13th,7th week	10%
4	Midterm 1	6th week	15%
5	Midterm 2	10th week	15%
6	Final Exam	16th week	50%

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

    1. S. Gasiorowicz, "Quantum Mechanics", John Wiley & Sons, Inc., 3rd Ed. (2003).

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

    1- David J. Griffiths ”Introduction to Quantum Mechanics”, Pearson Prentice Hall, New York, USA, (2005).
    2- Nouredine Zettili, "Quantum Mechanics: Concepts and Applications", John Wiley & Sons, Inc. (2001).

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

- http://en.wikipedia.org/wiki/Quantum Mechanics/
- http://www.dmoz.org/Science/Physics/Quantum Mechanics/

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

regulations and software. N/A

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.
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. • 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.

Name of Instructor: _______Abdelrahman Lashin_______________________________________

Signature: ____________________________ Date Report Completed: _____________

Name of Field Experience Teaching Staff _______________________________________

Program Coordinator:____

Signature: ____________________________ Date Received: ____________________

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

T6. Course Specifications (CS)

Course title: **Heat and Thermodynamics**

Course code: **4033110-3**

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Heat and Thermodynamics (4033110-3)**
2. Credit hours: **2 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 academic staff member**
5. Level/year at which this course is offered : **3th Year / Level 5**
6. Pre-requisites for this course (if any) : --- **General Physics 4032101-4**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode			
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

This course provides the basic concepts in the heat and thermodynamics including basic definitions, laws relating to them and their applications.

After completing this course students should be able to:

-Know definitions, units and laws of heat –heat transfer-methods of measuring the temperature-thermal expansion, its types and its applications-gases' laws

-realize the first law of thermodynamics and the concepts of heat lead to understand it (internal energy-specific heat -latent heat- work).

-differentiate between the types of systems in thermodynamics (open, closed, adiabatic, isolated) and process (cyclic, adiabatic, isobaric, isochronic , isothermal, reversible and irreversible) based on it.

-define the second law of thermodynamics and its applications(heat engine-heat pump)

-measure thermal efficiency of engine and coefficient of performance of heat pump in cooling and heating mood.

-interpret concept of the entropy and calculate it for a variety of processes

-analyze and evaluate various thermodynamic cycles used for energy production work and heat.

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. Outlines of the physical laws, principles and the associated proofs.
2. Encourage the students to see more details in the international websites and reference books in the library.
3. Renew the course references frequently.
4. Frequently check for the latest discovery in science.

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

Course Description:

In this course, chapter1: presents the basic concepts of heat and consequences related to it. Chapter 2: introduces the Kinetic theory of gases and basic concepts related to that. Chapter3: shows the first law of thermodynamics, types of systems and thermodynamic processes. Chapter 4: introduce the second law of thermodynamics, heat engines and pumps. Chapter 5: explain the concept of entropy, the change in entropy in the reversible processes, the third law of thermodynamics. chapter 6: introduce thermodynamics potentials, internal energy U, enthalpy (H), free energy of Gibbs (G) and Helmholtz free energy (A), Maxwell relations and their the application, Tds equations, Clausiuos Claperyron equation.

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Thermal properties of matter** Temperature and Heat, Temperature scales, Type of thermometer, Zero law of Thermodynamic, Thermal transfers, thermal expansion	2	6
Thermodynamics properties equation of ideal gas, kinetic theory, Vander Waal equation for real gas, deduction of the critical constant of a real gas of Van der Waal, Virial equation of state, Reduced equation of state, adiabatic compressibility, P-V-T relationship of real gases, Phase Diagram	3	9
❖ **First law of thermodynamics, Heat and Energy** The types of systems and the processing in thermodynamics, The definition of heat capacity -specific heat capacity, latent heat, apply the first law of thermodynamics to evaluate the temperature - work - The internal energy and energy conversion, explain the enthalpy, The relationship between specific heat for gas, The work done in adiabatic process.	3	9
❖ **Second law of thermodynamics** Heat engines, Refrigerators, and heat pumps, Reversible processes, Statements of Kelvin - Planck and Clausius, Carnot machine and its efficiency, the principles of the Carnot cycle- Efficiency of Otto cycle and diesel fuel and gasoline	2	6
Entropy and third law of thermodynamics Concept of entropy, Entropy in the reversible processes, The third law of thermodynamics	2	6
Thermodynamics potentials Thermodynamics potentials, Internal energy U, Enthalpy (H), Free energy of Gibbs (G) and Helmholtz free energy (A), Maxwell relations and their application, Tds equations, Clausiuos Claperyron equation.	2	6
❖ **Revision**	1	3
	15 weeks	**45hrs**

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**45**		**-**		**28**	**73**
Credit	**3**		**-**			

3. Additional private study/learning hours expected for students per week.	2

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	Home works for each section	All weeks	10 %
2	Participation and attendance	All weeks	5 %
3	activity	3th week	5%
4	Midterm 1	6th week	15%
5	Midterm 2	10th week	15%
6	Final Exam	16th week	50%

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
1. Daniel V. Shroeder, An Introduction to Thermal Physics, Addison-Wesley Publishing Company, San Francisco, CA, 1999, The ISBN is 0-201-38027-7.
2. Physics for Scientists and Engineers, 6th Edn. (R.A.Serway, J.W.Jewett, Thomson 2004, ISBN 053440
3. Giancoli- Physics (6th)

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. Physics for Scientists and Engineers, 6th Edn. (R.A.Serway, J.W.Jewett, Thomson 2004, ISBN

053440 2. Giancoli - Physics (6th).Physics , 4th edition, By: J. Walker (2010)
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. www.uqu.sa/smattia
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.
2. Computing resources (AV, data show, Smart Board, software, etc.) In each class room, 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. • 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.

Name of Instructor: _______M.A. Mohaseb_______________________________________

Signature: ___________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff ______________________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________

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

T6. Course Specifications (CS)

Course title: Electromagnetism 1

Course code: 4033132-3

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Electromagnetism 1 (code: 4033132-3)**
2. Credit hours: **3 Hrs**
3. Program(s) in which the course is offered. **B.Sc. Pure 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 academic staff member**
5. Level/year at which this course is offered : **3nd Year / Level 6**
6. Pre-requisites for this course (if any) : **Theoretical Methods in Physics (2) (4032141-4)**
7. Co-requisites for this course (if any) : **Theoretical Methods in Physics (1) (4033142-4)**
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? Describe, in words, the ways in which various concepts in electromagnetism come into play in particular situations; to represent these electromagnetic phenomena and fields mathematically in those situations; and to predict outcomes in other similar situations.
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. Use the mathematics to express the phenomena in electromagnetism. 2. Define the electric field, the electric potential, and electric dipole 3. Calculate the electrostatic field, electrostatic potential of the charge, dipole and multipoles 4. Apply Gauss's law to solve some problems. 5. Apply Poisson's equation to solve some problems 6. Apply Laplace's equation to solve some problems. 7. Define the electric displacement, polarization of the materials, dielectric constant, and electric susceptibility. 8. Calculate the electric field outside a dielectric materials. 9. Calculate the electrostatic electric and potential fields in dielectric materials, microscopic theory of dielectric and electrostatic energy 10. Define the Ferroelectricity phenomena. 11. Calculate the energy density of the electrostatic field. 12. Calculate the energy of a System of Charged Conductors

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

Course Description: This course deals primarily with a vector calculus based description of static electric field in case of fixed charges, volume and surface charge distribution, dipole, multipole, conductor and dielectric beside the calculation of the electrostatic potentials in each case. The calculation of the electric field by applying Gauss's law for fixed charges and dielectric materials. Also, it concerns the study of the polarization, dielectric constant and the boundary conditions at the interface at the two different dielectric media. The calculation of molecular fields, electrostatic energy and the description of moving charges and steady electric currents are also presented.

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Electrostatics:** 1-Electric Charge 2-Coulomb's law 3-The Electric Field 4-Electrostatic Potential 5-Conductors & Insulators 6-Gauss's Law 7-The Electric Dipole 8-Multipole Expansion	2	6
❖ **Solution of electrostatic problems:** 1-Poisson's Equation 2-Laplace's Equation 3-Laplaces's Equation in one independent Variable 4-Laplace's Equation in Spherical Coordinates 5-Conducting Sphere in Uniform 6-Cylindrical Harmonics 7-Electrostatic Images 8-Point charge & Conducting Sphere 9-Line charges & Line Images 10-System of Conductors 11-Poisson's Equation.	4	12
❖ **The Electrostatic Field in Dielectric Media** 1-Polarization 2-Field Outside of a Dielectric Medium 3-The Electric Field inside a Dielectric 4-The Electric Displacement 5-Electric Susceptibility and Dielectric Constant 6-Point Charge in a Dielectric Field 7-Boundary Conditions on the Field Vector 8-Boundary Value Problem Involving Dielectrics 9-Dielectric Sphere in a Uniform Electric Field.	3	9
❖ **Microscopic Theory of Dielectrics** 1-Molecular Field in Dielectric 2-Induced Dipoles	2	6

3-Polar Molecules 4-Ferroelectricity		
❖ **Electrostatic Energy** 1-Potential Energy of a Group of Point Charges 2-Energy Density of an Electrostatic Field 3-Energy of a System of Charged Conductors 4-Capacitors.	**1.5**	**4.5**
❖ **Electric Current** 1-Current Density & Equation of Continuity 2-Ohm's Law 3-Steady Currents in continuous Media 4-Microscopic Theory of Conduction.	**1.5**	**4.5**
	15 weeks	**42hrs**

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

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

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	10 %
2	Participation in activities lectures	All weeks	10 %
3	Midterm Exam (theoretical)	8th week	30%
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. (3 hrs per week)

E Learning Resources

1. List Required Textbooks

Introduction to Electrodynamics by David J. Griffiths, [Prentice-Hall, Inc., 1999], 3rd Edition.

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Foundations of Electromagnetic Theory by Reitz, John R., Milford, Frederick J., Christy, Robert W. [Addison-Wesley, 2008] 4th Edition
- Electromagnetic Fields and Waves by Paul Lorrain, Dale R. Corson, Francois Lorrain [W. H. Freeman and Company, 1988] 3rd Edition

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
https://www.khanacademy.org/science/physics

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.

Name of Instructor: _______ M. BOUSTIMI____

Signature: ___________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff ______________________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكة العربية السعودية
الهيئة الوطنية للتقويم
والاعتماد الأكاديمي

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: Quantum Mechanics 2

Course code: 4033146-3

Course Specifications

Institution: **Umm AL – Qura University**	Date : **10/3/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Quantum Mechanics 2 (code: 4033146)**
2. Credit hours: **3 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 **Fatma El-Sayed Mahrous Othman**
5. Level/year at which this course is offered: **3rd Year / Level 6**
6. Pre-requisites for this course (if any) : **Quantum Mechanics (1) (4033145-4)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? By the end of the course, students should understand each major concept of the following and be able to demonstrate their understanding in problems resolving as well as in applications in modern physics and in this field: • Method of operators (lowering and rising operators, ...). • Addition of angular momenta and spin. • Matrix representation. • Approximation methods to solve Schrödinger Equation. • Emission and Absorption of Radiation. • Scattering theory.
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- Outlines of the physical laws, principles and the associated proofs. 2. Highlighting the day life applications whenever exist. 3. Encourage the students to see more details in the international websites and reference books in the library. 4- Encourage the student to build an example of different experiments related to the course. 5- Frequently check for the latest discovery in science.

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

Course Description:

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Review of Quantum Mechanics 1** • Postulates. • Wave Mechanics and Schrodinger's Equation. • Operator Methods. • Bound and Unbound states in one-dimension. • Quantum Mechanics in more than one-dimension. • Matrix Mechanics. • Angular Momentum, Commutation Relations. • Spin; Spin Representation and Pauli matrices. • Addition of angular Momenta and spin.	2	6

❖ **Time –Independent Perturbation Theory** • Perturbation Series; First and Second Order Expansion. • Degenerate Perturbation Theory. • The Fine Structure of Hydrogen. • The Stark Effect. • The Zeeman Effect.	**3**	**9**
❖ **Variational Principle** • Theory • The Ground State of Helium.	**2**	**6**
❖ **The WKB Approximation** • The Classical Region. • Tunneling.	**1**	**3**
❖ **Time-Dependent Perturbation Theory** • Two- Level Systems: The Perturbed System, Time-Dependent Perturbation Theory, Sinusoidal Perturbations. • Emission and Absorption of Radiation, Absorption, Stimulated Emission, and Spontaneous Emission, Incoheret Perturbations. • Spontaneous Emission: Einstein's A and B coefficients, The Lifetime of an Excited State, Selection Rules.	**4**	**12**
❖ **Scattering** • Introduction. • Partial Wave Analysis. The Born Approximation.	**2**	**6**
	14 weeks	**42 hrs**

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**42**				**28**	**70**
Credit	**3**					

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	All weeks	5 %
3	In-Class Problem Solving	13th,7th week	10%
4	Midterm 1 (theoretical)	6th week	15%
5	Midterm 2 (theoretical)	10th week	15%
6	Final Exam (theoretical)	16th week	50%

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

David J. Griffiths ”Introduction to Quantum Mechanics”, Pearson Prentice Hall, New York, (2005).
S. Gasiorowicz, "Quantum Mechanics", John Wiley & Sons, Inc., 3rd Ed. (2003).

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

Nouredine Zettili, "Quantum Mechanics: Concepts and Applications", John Wiley & Sons, Inc. (2001).

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. www.uqu.sa/feothman
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

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.) Classroom for 40 students Library
2. Computing resources (AV, data show, Smart Board, software, etc.) Computer room Data show
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Each Classroom requires a data show, and double layer white board.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Evaluating the instructor by the student using questionnaires. • Following up the progress of students in the course. • Evaluating the progress of student by projects.
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 • Strategies are modified each term according to the student feedback.

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.

Name of Instructor: _______Fatma El-Sayed Mahrous Othman__________________

Signature: _____Fatma El-Sayed______ Date Report Completed: ___10/3/1439___

Name of Field Experience Teaching Staff ____________________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: **Statistical thermodynamics**

Course code: **4033111-3**

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Statistical thermodynamic (code: 4033111-3)**
2. Credit hours: **3 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
Dr. Ahmed Mohamed El-Hadi
5. Level/year at which this course is offered : **3st Year / Level 6**
6. Pre-requisites for this course (if any) : **Heat and thermodynamics (4033110-3)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?
   1. Realize the difference between the energy levels and energy states.
   2. Define the concept of the thermodynamic probability and how to deal with some physical applications through this concept.
   3. Differentiate between distinguishable and indistinguishable particles.
   4. Compare between the different distribution functions and the different cases in use every one.
   5. Define the concept of the partition function and redefine the thermodynamic quantities in terms of the partition function.
   6. apply some statistics and some quantum statistics to the systems.

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- Outlines of the physical laws, principles and the associated proofs.
2. Highlighting the day life applications whenever exist.
3. Encourage the students to see more details in the international web sites and reference books in the library.
4- Encourage the student to build an example of different experiments related to course
5- 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 course will give the new mathematical treatment in the concept of probability for some physical quantities for a system consists of a large number of particles such as a monatomic or diatomic ideal gas or steam of electrons or quantity of photons radiated from black body radiation. These quantities are given according to classical or quantum treatment.
.

1 **Topics to be Covered**		
Topic	No of Weeks	Contact hours
❖ **Introduction:** **-Energy states and energy levels, macro states and microstates, thermodynamic probability.**	**2**	**6**
The three statistics and its distribution functions: **-The Bose-Einstein statistics, the Fermi-Dirac statistics , the Maxwell-Boltzmann statistics, The statistical interpretation of entropy, The Bose-Einstein distribution function, the Fermi-Dirac distribution functions, the classical distribution function, comparison of distribution functions for indistinguishable particles, the Maxwell-Boltzmann distribution function.**	**3**	**9**
❖ **The partition function:** **Thermodynamic properties of a system.**	**1**	**3**
❖ **Applications of statistics to gases:** **- The monatomic ideal gas, the distribution of molecular velocities, The principle of equipartition of energy, the quantized linear oscillator and specific heat capacity of a diatomic ideal gas.**	**4**	**12**
❖ **Applications of quantum statistics to other systems :** **The Einstein and Debye theories of the specific heat capacity of a solid, Black body radiation, Para magnetism and the electron gas.**	**4**	**12**
	14 weeks	**42hrs**

2 Course components (total contact hours per semester):			
Lecture : 42	**Tutorial: 12**	**Practical: 0**	**Other:** Office hours 12

3. Additional private study/learning hours expected for students per week. (This should be an average: for the semester not a specific requirement in each week):

12h (reports & essay)

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		
2.0	**Cognitive Skills**		
2.1	Apply the laws of physics to calculate some quantities.	1. Preparing main outlines for teaching.	1. Exams (Midterm, final, quizzes)

2.2	Solve problems in physics by using suitable mathematics.	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.	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.
2.3	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 (NA)**		

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	15 %
2	Participation in activities lectures and labs	All weeks	5 %
3	Midterm Exam (theoretical)	8th week	30%
6	Final Exam (theoretical)	16th week	50%

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)

1- 12-office hours per week in the lecturer schedule.

2- The contact with students by e-mail.

E Learning Resources

1. List Required Textbooks
   1. Thermodynamics, Kinetic theory, and statistical thermodynamics, 3rd edition, Francis W. Sears and Gerhard L. Salinger.
   2. An introduction to thermodynamics and statistical mechanics second edition(2007).
   3. Fundamentals of Statistical and Thermal Physics, by R. Reif, (2008).
   4. Concepts in thermal physics, Stephen J.Blundell and Katherine M.Blundell,2006

.

Recommended Reading List

1. M.D. Sturge, Statistical and Thermal Physics, Fundamentals and Applications (A.K. Peters, Natick, Massachusetts, 2003) ISBN 1-56881-196-9..

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

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

www.uqu.sa/Ahmed El-hadi
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. Lecture room and a board to write on The area of class room is suitable concerning the number of enrolled students (30) and air conditioned.
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 has smart, and double layer white board. Questionaries Open discussion in the class room at the end of the lectures

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.

Name of Instructor: _______Assoc. Dr. El-hadi, Ahmed

Signature: ____________________________ Date Report Completed: _____________

Name of Field Experience Teaching Staff ____

Program Coordinator:____

Signature: ___________________ Date Received: ____12/3/1439________________

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكة العربية السعودية
الهيئة الوطنية للتقويم
والاعتماد الأكاديمي

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course Title: Classical Mechanics (2)

Course Code: 4033144-2

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Classical Mechanics (2)** **(code: 4033144)**
2. Credit hours: **2 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 academic staff member
5. Level/year at which this course is offered : **3rd Year / Level 6**
6. Pre-requisites for this course (if any) : **Classical Mechanics(1) (4033143-4)**
7. Co-requisites for this course (if any) : **General Physics (2)**
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

- Discuss the fundamental concepts in classical mechanics.
- Understand the physical basis of mechanics and dynamics of rigid body.
- Aanalyse the center of mass and moment of inertia of a rigid body.
- Describe the theorems of static equilibrium of rigid body.
- Use of matrices in rigid body dynamics.
- Build the link between Physics theories and ideas with applications in the students daily life.
- Discuss the Euler's equation of motion of a rigid body.
- Realize that the Lagrangian and the Hamiltonian formalism derived from the "least action principle" though they are alternative formulation of Newton's second law they are more general and allow to derive the relation between symmetries and conservation laws
- Use Lagrangian and the Hamiltonian formalisms to solve mechanical problems.
- Use the scientific method to understand the enormous variety of classical mechanics in terms of a few relatively simple laws as an overall goal.

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- Outlines of the physical laws, principles and the associated proofs.
2. Highlighting the day life applications whenever exist.
3. Encourage the students to see more details in the international web sites and reference books in the library.
4. Frequently check for the latest discovery in science

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

Course Description:
This course concern to by study the mechanics of rigid bodies in plan motion and motion of rigid bodies in three dimensions and their applications. Moreover, extensions of Newton's equations due to Lagrange and Hamilton, which allow for simplified treatments of many, interesting problems and which provide the foundation for the modern understanding of dynamics. This course provides students a sufficient background on the basics of classical mechanics enabling students to take more courses that are advanced in physics.

1 Topics to be Covered

Topic	No of Weeks	Contact hours
❖ **Mechanics of Rigid Bodies , Planar Motion:** - Center of mass of a rigid body. - Some theorems of static equilibrium of rigid body. - Rotation of a rigid body about a fixed axis (Moment of inertia). - Calculation of the moment of inertia. - The physical pendulum. - General theorem concerning angular momentum. - Laminar motion of rigid body. - Body rolling down in inclined plane.	**6**	**12**
❖ **Motion of Rigid Bodies in Three Dimensions:** - Angular momentum of a rigid body, Products of inertia. - Use of matrices in rigid body dynamics (the inertia tensor). - Determination of principle axes. - Rotational kinetic energy of a rigid body. - Moment of inertia of a rigid body about an arbitrary axis, the momental ellipsoid. - Euler's equation of motion of a rigid body. - Free rotation of a rigid body under no forces. Geometric description of the motion. - Free rotation of a rigid body with an axis of symmetry. Analytical treatment.	**4**	**8**
❖ **Lagrangian Mechanics:** - Generalized coordinates. - Generalized forces. - Lagrange's equations. - Some Applications of Lagrange's equations. - Generalized moments ignorable coordinate. - Lagrange's equations for impulsive forces. - Hamilton's variational principle. - The Hamiltonian function (Hamiltonian equation). - Lagrange's equations of motion with constrain, Examples.	**4**	**8**
	14 weeks	**28 hrs**

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	28				Office hours : 14 hr	42
Credit	**2**					

3. Additional private study/learning hours expected for students per week.	2

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	Midterm 1	6th week	15 %
2	Midterm 2	11th week	15 %
3	Participation	All weeks	5 %
4	Presence and absence	All weeks	5 %
5	Exercises & Homework	All weeks	10%
6	Final Exam	End of the semester	50%

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 timetable for academic advice were given to the student each semester. (2hrs per week)

E Learning Resources

1. List Required Textbooks

1. G.R. Fowles, and G.L.Cassiday, "Analytical Mechanics" (7th Ed.), Brooks Cole. (2005).
2. G.R. Fowles, "Analytical Mechanics" (3th Ed.), Holt, Rinehart and Winston (1977).

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. Thornton, Stephen T.; Marion, Jerry B. Classical Dynamics of Particles and Systems (5th ed.). Brooks Cole. (2003).
2. Kibble, Tom W. B.; Berkshire, Frank H. Classical Mechanics (5th ed.). Imperial College Press. (2004).

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. http://academicearth.org/lectures/modern-physics-classical-mechanics-2
5. 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.) • Lecture room for 30 students, Black (white) boards • Class room is already provided with data show
2. Computing resources (AV, data show, Smart Board, software, etc.) Providing class rooms with computers , data show, Smart Board, software, etc.)
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Open discussion in the class room at the end of the lectures • Quiz. • Midterm and final exam. • Questionaries • Meeting with students • Open door policy
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department • At the end of term, Students fill an evaluation Sheet (without names). • Analysis the grades of students.
3 Processes for Improvement of Teaching • Handling the weakness point is done each term according to the results of the questionnaires of course evaluation

- Periodical revision of course content.
- Report writing of the course and determine goals.
- Fortification of the student learning.

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)

- In the case of taking more than one group this course, the faculty members (giving this course) cooperate to give unified Exams and use the same marks distribution for the questions in the exams. Students can see their corrected sheets and compare them with the model answers' sheets.

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.
3- Contact the college to evaluate the course and the benefit it add to other courses.
4- Add some subject and cut off others depending on the new discoveries in physics.

Name of Instructor: _______ Doaa Abdallah Said ____

Signature: ___________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff _______________________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course Title: Electromagnetism (2)

Course Code: 4034133-3

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Electromagnetism (2) (code: 4034133-3)**
2. Credit hours: **3 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 academic staff member**
5. Level/year at which this course is offered : **4st Year / Level 7**
6. Pre-requisites for this course (if any) : **Electromagnetism 1 (4033132-3)**
7. Co-requisites for this course (if any) : **Theortical Method in Physics 2 (4033141-4)**
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode			
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

- Define the fundamentals of electromagnetic field and radiations.
- Define the magnetic field, magnetic flux, magnetic scalar potential, magnetic vector potential.
- Apply Biot-Savart law to calculate the magnetic field due to electric current.
- Apply Lorentz law to calculate the force acting on a wire carrying electric current placed in a magnetic field.
- Calculate the magnetic field using Ampere's law.
- Define the Faraday law of electromagnetic induction.
- Calculate the self-inductance and mutual inductance.
- Calculate the magnetic field due to a magnetized object.
- Define the magnetization, magnetic intensity, the magnetic permeability, magnetic susceptibility.
- Define the hysteresis loop.
- Define the diamagnetism, Paramagnetism, and ferromagnetism.
- Calculate the magnetic energy stored within the electric circuits.
- Calculate the density of the magnetic energy.
- List the Maxwell's equations in vacuum and in the materials.
- Define the displacement current.
- Explain the electromagnetism in bulk materials (permittivity and permeability, D and H fields) and investigating the concepts of field potential and energy was spent.
- Discuss the Maxwell's equations and resulted in the triumphal prediction of electromagnetic radiation, but it's surprisingly hard to derive the specific equations for the radiation from an antenna.
- Describe, in words, the ways in which various concepts in electromagnetism come into play in particular situations; to represent these electromagnetic phenomena and fields mathematically in those situations; and to predict outcomes in other similar situations.

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- Outlines of the physical laws, principles and the associated proofs.
2. Highlighting the day life applications whenever exist.
3. Encourage the students to see more details in the international web sites and reference books in the library.
4. Frequently check for the latest discovery and application of magnetism in science

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

Course Description:
The course will cover the principle of electromagnetism, such as calculating the magnetic field due to steady current, calculating the magnetic induction, Calculating the magnetic energy, the magnetic materials and their fields, Maxwell's equations and their applications, Electromagnetic waves, propagation of electromagnetic wave in different media. This course will provide a conceptual background in electromagnetism 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
❖ **The Magnetic Field of Steady Current** 1. Induction to magnetic field, 2. Lorentz force law and its applications. 3. Biot-Savart Law and its applications. 4. Ampere's Law (differential and integral shape) 5. Application of Ampere's law. 6. Divergence and curl of magnetic field. 7. The Magnetic Vector Potential, 8. The Magnetic Scalar Potential 9. The Magnetic Flux	**4**	**12**
❖ **The Electromagnetic Induction** 1- Self Induction 2- Mutual Induction 3- The Neumann Formula	**1.33**	**4**

❖ **Magnetic Properties of Matter** 1. The origin of magnetism in the matter. 2. Magnetic moment of the atom. 3. Magnetization. 4. Magnetic current density. 5. Surface current density. 6. Magnetic Intensity. 7. Calculation of magnetic Field of a Magnetized Object. 8. Magnetic susceptibility, 9. Magnetic Permeability, 10. Hysteresis loop. 11. Classification of magnetic materials. 12. Diamagnetic materials 13. Paramagnetic materials. 14. Ferromagnetic materials. 15. Boundary condition of magnetic field. 16. Electric circuits containing magnetic media. 17. Magnetic circuits. 18. Examples.	**4**	**12**
❖ **Magnetic Energy** 1- Magnetic energy of a solid circuit. 2- Magnetic Energy of Coupled Circuits, 3- Energy Density in Magnetic Field, 4- Force and Torques on Rigid Circuits	**1.33**	**4**

❖ **Maxwell's Equation's and Electromagnetic Waves** 1- Displacement Current, 2- Maxwell's Equation's 3- Wave Equation for Electric and Magnetic Field 4- Plane Wave 5- Plane Waves in Isotropic Insulating Media 6- Transfer of Plane Waves in Conductor 7- Resistance of conductors at ultra high frequencies. 8- Applications of Maxwell's Equations a. Boundary Conditions. b. Refraction and Reflection at the boundary of two non-conducting media. 9- Electromagnetic waves Energy 10- The Wave Equation with Sources	**3.33**	**10**
	14 weeks	**42hrs**

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	42	28	42		22	134
Credit	**3**					

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

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	Midterm 1	5th week	15%
2	Midterm 2	10th week	15%
3	Quizzes and In-Class Problem Solving	Each 2 weeks w	5%
4	Presence of students	All lectures	5%
5	Small project	12th week	5%
6	Homework	Every week	5%

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 timetable for academic advice were given to the student each semester. (4hrs per week).

E Learning Resources

1. List Required Textbooks

  1. Foundations of Electromagnetic Theory by Reitz, John R., Milford, Frederick J., Christy, Robert W. [Addison-Wesley, 2008] 4th Edition
  2. Electromagnetic Fields and Waves by Paul Lorrain, Dale R. Corson, Francois Lorrain [W. H. Freeman and Company, 1988] 3rd Edition
  3. Introduction to Electrodynamics by David J. Griffiths, [Prentice-Hall, Inc., 1999], 3rd Edition.

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

  1. I.S. Grant and W.R. Phillips, Electromagnetism, Second Edition, John Wiley & Sons, New York, 2008.

2. Elements of Electromagnetics : M. N. O. sadiku [Oxford University Press, 2001] 3rd Edition
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. 1. Web Sites, Social Media, Blackboard, Facebook, Twitter, etc.) 2. Consult courses in website of the certified universities,. 3. www.youtube.com.) 4. http://en.wikipedia.org/wiki/Electromagnetism
5. 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.) 1- Lecture room for 30 students, Black (white) boards 2- Class room is already provided with data show
2. Computing resources (AV, data show, Smart Board, software, etc.) Providing classrooms with computers, data show, Smart Board, software, etc.)
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching 3- Questionaries 4- Open discussion in the class room at the end of the lectures 5- Meeting with students 6- Open door policy
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department 7- Revision of student answer paper by another staff member. 8- Analysis the grades of students. 9- E-Learning Suggestions - e-Learning Documentation
3 Processes for Improvement of Teaching 1. Preparing the course as PPT. 2. Using scientific movies. 3. Coupling the theoretical part with laboratory part 4. Periodical revision of course content.

5. Report writing of the course and determine goals.
6. Fortification of the student learning.
7. Handling the weakness point

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)

1. After the agreement of Department and Faculty administrations
2. The instructors of the course are checking together and put a unique process of evaluation.
3. Feedback evaluation of teaching from independent organization.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution for (Student evaluation, Course report, Program report, Program Self-study, Plan of improvement should be given.
- Collect all reports and evaluations at the end of the year for a reviewing purpose.
- Conduct a workshop to presents finding of reports and evaluation to share knowledge.

Name of Instructor: _______ Roshdi Seoudi ______________________________

Signature: ____________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff ______________________________

Program Coordinator:____

Signature: ____________________________ Date Received: ___________________

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: Nuclear Physics

Course code: 403460-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Nuclear Physics (code: 403460-4)**
2. Credit hours: **4hrs (three hours lecture and one hour Lab.)**
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 **Dr. Adel MADANI (ammadani@uqu.edu.sa)**
5. Level/year at which this course is offered : **4th Year / Level 7**
6. Pre-requisites for this course (if any) : **Quantum mechanics (1) (403345-4)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Al-Zaher**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**80%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other	✓	What percentage?	**20%**

Comments: Labs **20%**

B Objectives

1. What is the main purpose for this course?

The objectives of this course are to establish the meaning of the concepts of nuclear physics and elementary particles, and to ease out the theoretical models to describe the nuclear properties.

We want to be able:

The benchmark statement of the main learning outcomes are as follows:

1. *To understand basic fundamentals of nuclear properties.*
2. *The students should be trained on physical and generic skills (knowledge – cognitive – interpersonal – communication – problem solving – IT)*
3. To understand the liquid drop model.
4. To understand the nuclear drop model.
5. To understand the origin of alpha transition within the nucleus.
6. *To understand the origin of Gamma transition within the nucleus.*
7. To understand the origin of Beta transition within the nucleus.
8. To understand the elementary particles.

The overall goal is to understand the fundamentals of nuclear physics.

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. Explain strategy of the course in the beginning of the semester
2. Outlines of the Nuclear concepts, theories 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. Discussing some selected problems in each chapter.
6. Cooperate with different institution to find how they deal with the subject
7. Renew the course references frequently

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 course will cover the principle of Nuclear physics, such as Nuclear Properties of the matter , Liquid Drop and shell Model , radiation… . 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
1- Nuclear Properties		
1- Definitions & Nuclear radii	1	1
2- Nuclear Mass-Binding Energy		1
3- Nuclear Radiation, Energy levels.		1
4- Nuclear Isomers.	1	1
5- Angular Momentum, Parity and Symmetry		1
6- Dipole moment, qudropole moment		1
2- Liquid Drop Model		
1- Finding Energy	1	1
2- Sem-emperical Formula		2
3- Mass Spectrometer	1	1
4- Nuclear Reactions and Q-value		2
3- Nuclear Shell Model		
1- Single Particle model with square well and Harmocia Oscillator	1	1
2- Magic Numbers		1
3- Spin for Different nuclei		1
4- Excited rootes nuclear magnetic moments	1	1
5- Parity		2
6- Isotopic spin		1
4- Gamma Transitions		
1- Multiple Moments	1	1
2- Decay Constants		1
3- Selection Nucles		1
4- Angular Correlation	1	2
5- Internal Conversion		1
5- Alpha Transitions		
1- Heavy Ions-Stalitlity	1	2
2- Decay Constants		1
3- Tunnel Effect	1	2

4- Energy Levels		1
6- Beta Transitions		
1- Theorgy of B-decay	1	2
2- Allowed and Forbiddin transitions		1
3- Selection Nucles	1	2
4- Non Conservation of Parity		1
7- Elementary Particles		
1- Nucler Force and Meson Theory	1	2
2- Pions & Mions		1
3- Kaons & Hyperons	1	2
4- Classi Fiction of demeray Pancles		1
Total	14	42

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**42**		**10**			**52**
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	Midterm 1	5th week	20 %
2	Midterm 2	10th week	20 %
3	Online quizzes	every week	10 %
4	Homework	Every week	10 %
5	Interactive discussions	Every week	10 %
6	Final exam	End of semester	30 %

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 timetable for academic advice were given to the student each semester. (4hrs per week)

E Learning Resources

1. List Required Textbooks

- K. Heyde, Basic ideas and concepts in nuclear Physics, An introductory approach, second edition, Institute of physics publishing, Bristol and Philadelphia (1999) ISBN 0 7503-0534 7 hbk, 07503 0535 pbk.
- Irving Kaplan, Nuclear Physics, Second Edition, Addison-Wesley Publishing Company (1977).
- Kenneth S. Krane , Introductory nuclear Physics, , first edition, Jone Wily & Sons Inc. (1988) ISBN 0 - 471-80553-X .

* Burcham, Nuclear and Particle Physics, 2 Edition, Longman Publisher (1995),ISBN-10 : 0582 450888 , -13: 978 - 0582 4508882

2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Introductory Nuclear Physics, Krene, 1987
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. www.uqu.sa/ammadani
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. • **Power points (use e-learning gate of Umm Al-Qura university)** • **Youtube videos(use e-learning gate of Umm Al-Qura university)**

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, and 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 classroom 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 Classroom 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.

Name of Instructor: ________A.M.MADANI____

Signature: ___________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff ______________________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكة العربية السعودية
الهيئة الوطنية للتقويم
والاعتماد الأكاديمي

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

T6. Course Specifications (CS)

Course title: Solid State Physics 1

Course code: 4034170-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Solid State Physics 1 (code: 4034170-4)**
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 academic staff member**
5. Level/year at which this course is offered : **4st Year / Level 7**
6. Pre-requisites for this course (if any) : **Quantum Mechanics 1 (code : 4033145-4)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

After completing this course student should be able to:
1. Define the principles and concepts of solid state physics.
2. Compare the origin of bonding in materials
3. Define the lattice planes & directions.
4. Explain the different types of defects in solid state and understand how it affect the physical properties of matter.
5. Explain how X-Rays Diffraction can be used in studying the solid structure.
6. Define phonons in crystals and distinguish between their different modes
7. Choose the right formulas to calculate specific heat & thermal conductivity of the lattice.
8. Recognize the main drawbacks of the free electron model in metals.
9. Identify: Bloch's theorem, Brillouin zones & Fermi surface in metals.
10. Classify different types of solid according to The Band Theory.
11. Distinguish between intrinsic & extrinsic Semiconductors and know their properties and applications.
12. Recognize the idea behind the Superconductivity phenomenon and be aware of its applications.

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- Explain the strategy of the course in the beginning of the semester
2- Outlines of the physical laws, principles and the associated proofs.
3- Encourage the students to see more details in the international web sites and reference books in the library.
4- Discussing some selected problems in each chapter.
5- Renew the course references frequently
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 course will cover An introduction to the physics governing the different types of binding in solid state materials, Geometry of Solids and crystalline state of matter, Reciprocal Lattice, Brillouin zone, Modern theories describing lattice vibrations, Energy bands, X-Ray Diffraction, Electrons in solids, and Optical properties of solid materials. Free electron theory in metals, band theory, thermal properties of solid materials, Lecture 4 hours..

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **The atomic Theory and Binding Forces** 1- Review of atomic structure 2- Atomic binding and band theory 3- Binding forces between atoms 4- Lattice Energy Calculations 5- Types of bonds 6- Nucleation and growth kinetic 7- Experimental methods of crystal growth	1.5	6
❖ **Crystal Structure** 1- Long range and short rang order 2- The crystalline state 3- Basic definitions of crystallography 4- The seven crystal systems 5- Wigner Seitz primitive cell 6- Symmetry elements of crystals 7- Important plane systems in a cubic crystals 8- Miller's indices for crystal planes	1.5	6
❖ **Crystal Properties** 1- Crystal Directions and distance between crystal plans 2- Zone , Zone Axis and angles between zones 3- Atomic structure of crystals 4- Cubic and hexagonal close-packed 5- Characteristic of FCC and BCC structure 6- The crystal structure of some simple crystals	1.5	6
❖ **Structural Defects in Crystals** 1- Point defects and Free energy of a crystal 2- Point defects in ionic crystals 3- Line defects and types of dislocation 4- Planer defects 5- Determination of vacancies concentration and the activation energy	1	4
❖ **X-Rays Diffraction in Crystals** 1- Used rays in studying crystal structure 2- Generation and properties of X-rays 3- X-Rays scattering from an atom 4- X-Rays scattering from a crystal and Reciprocal lattice	1.5	6

❖ **Lattice Vibrations** 1. Elastic waves 2. Modes of vibrations and density of states of a continuous medium 3. The phonon 4. Elastic and non-elastic scattering 5. Lattice waves of one-atomic linear chain 6. Vibration Modes of 1D diatomic	**1**	**4**
❖ **Free electrons in metals** 1. The Electrical Conductivity in Metals 2. The Specific Resistance in Metals 3. The Electrical and Thermal Conductivity in Metals 4. The Quantum Theory in Free Electrons 5. Ground State Property of Free Electrons 6. Electronic Specific Heat of Metals 7. Some Problems in Free Electron Model	**2**	**8**
❖ **Band theory in the solids** 1. Origin of the Bands in Solid 2. Periodic Potential 3. Bloch Function 4. Crystal Structure in One-Dimensional Atomic Chain 5. Brillouin Zones 6. Band Theory in Free Electron Model 7. Density of States 8. The Effective Mass 9. Concept of Holes 10. Fermi Surfaces	**2**	**8**
❖ **Thermal properties of solid materials** 1. Specific heat: 2. Einstein model for specific heat, 3. Debye model for specific heat, 4. Heat capacity of solid body, 5. Heat capacity of electron gas, 6. Thermal conductivity of solid body, 7. Thermal expansion	**3**	**12**
	15 weeks	**60hrs**

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**60**	**15**				**75**
Credit						

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	10 %
2	Participation in activities lectures	All weeks	10 %
3	Written Test (1)	6^{th} week	15%
4	Written Test (2)	11^{th} week	15%
5	Final Exam (theoretical)	16^{th} week	50%

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
   1- Charles Kittel, Introduction to Solid State Physics 7^{th} Ed
   2- Walter A. Harrison, Solid State Theory , Dover edition 1979

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
   1- H.P. Myers, Introduction to Solid State Physics, 2^{nd} Ed, 2009 Taylor & Francis
   2- Elementary Solid State Physics by M. Ali Omar, 1997

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
   - http://www.phys.lsu.edu/~jarrell/COURSES/SOLID_STATE_HTML/course_solid.html
   - http://www.encyclopedia.com/topic/solid-state_physics.aspx
   - http://www.physics.byu.edu/research/condensed
   - http://web.utk.edu/~tbarnes/website/cm/cm.html
   - http://www.answers.com/topic/solid-state-physics

• http://www.answers.com/topic/solid-state-physics
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.
2. Computing resources (AV, data show, Smart Board, software, etc.) In each class room 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 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 • Questionaries • Open discussion in the class room at the end of the lectures
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. • 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.

Name of Instructor: _______Loulou Mehrez

Signature: ____________________________ Date Report Completed: _____________

Name of Field Experience Teaching Staff ____

Program Coordinator:____

Signature: ____________________________ Date Received: ____________________

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: Computational Physics

Course code: 4034180-3

Course Specifications

Institution: **Umm AL – Qura University**	Date : **14/3/1439**
College/Department : **College of Applied Science –Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Computational Physics (code: 4034180-3)**
2. Credit hours: **3 Hrs**
3. Program(s) in which the course is offered. **BScPhysics.** (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course **Walid Belkacem Belhadj**
5. Level/year at which this course is offered : **3rd Year / Level 4**
6. Pre-requisites for this course (if any) : **Theoretical Methods in Physics (2) 403242-4**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode			
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course is designed to provide a variety of computational techniques for the Physical Sciences. A major goal of this course is to teach the student how to solve scientific problems using calculus software. In particular, the student will use the computational software, like MATLAB, in order to increase active learning in physics. This will enable student to perform - Physical problems both numerically and analytically. - Interactive simulations.
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. Understand computer hardware 2. Design flowcharts of scientific problems 3. Solve some computational physics problems using MATLAB. 4. Analyze and plot data, 5. Develop algorithms, and create models and applications using MATLAB. 6. Write well-structured C++ programs.

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

Course Description:

The course provides a direct preparation to solve scientific problems using calculus software High Level Languages. In particular, the student will use C/C++ Languages and the computational software, like MATLAB, in order to increase active learning in physics. This will enable student to perform:

- Well-structured C++ programs.
- Physical problems both numerically and analytically.
- Interactive simulations.

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Basics:** Variables and arrays, creating and initializing variables, Multidimensional array, sub-arrays, Special values, Displaying output data, Data files, scalar and array operations, Built in functions, Introduction to plotting, examples.	2	6
❖ **Program Design and Control Structures:** The logical data type, Branches, Additional plotting features, the while Loop, the FOR Loop, Logical arrays, Vectors, examples, Solving exercises.	2	6
❖ **Using defined functions:** MATLAB functions, Variable passing, optional arguments, sharing data using Global memory, Preserving data between calls to a function, sub – Functions and private – functions, examples.	2	6
❖ **Complex data:** Complex variables, using complex numbers with relational operators, Complex functions, plotting complex data, examples and exercises.	2	6
❖ **Linear Algebra:** Solving a linear system, Gaussian elimination and exercises, Finding eigenvalues and eigenvectors, Matrix factorizations and examples.	1	3
❖ **Curve fitting and interpolation:** Polynomial fitting, Least square fitting, non-linear fits and examples, interpolation of data.	1	3
❖ **Numerical integration and differentiations:** Integration, differentiations, solving first order and second order Linear equation.	1	3
❖ **Introduction to programming language C++:** Flow Charts and Algorithms, Basic Elements of C++ language, Constructing, compiling and building simple program, Some programming techniques (looping, branching, etc…), Array Processing, Formatted I/O and File Processing, Some applications.	4	12
	15 weeks	45 hrs

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**45**		**--**			**45**
Credit	**4**		**--**			

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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	Online quizzes	All weeks	10%
2	Exercises & Home works	All weeks	10 %
3	Participation in activities lectures and labs	All weeks	10 %
4	Scientific project	--	10 %
5	Midterm Exam (1)	6th week	15%
6	Midterm Exam (2)	11th week	15%
7	Final Exam	16th week	30%

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

1- Object oriented programming in C++, Robert Lafore, fourth edition, Pearson and Sam Publishing (2001), ISBN 0-672-32308-7.
2- Object oriented programming using C++, Joyce Farrel, fourth edition, 2009, ISBN-13: 978-1-4239-0257-7.
3- Getting started with MATLAB, Rudra Pratap, New York, 2010, ISBN: 978-0-19-973124-4
4- MATLAB, “An introduction with Applications”, fourth edition, Amos Gilat, John Wiley and Sons, INC, 2011, ISBN-13 978-0-470-76785-6.
5- Essentials of MATLAB programming, Second Edition, Stephen J. Chapman, 2009, ISBN-13: 978-0-495-29568-6.

2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Solving Applied Mathematical problems with MATLAB, DINGYU XUE and YANGQUAN CHEN, CRC Press, 2009 by Taylor and Francis Group, ISBN-13: 978-1-4200-8250-0
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. **1.** www.mpipks-dresden.mpg.de/~jochen/methoden/outline.html **2.** People.uncw.edu/hermanr/phy311/mathphysbook/index.html
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.) • Class room is already provided with data show. • The area of class room is suitable concerning the number of enrolled students (68) and air conditioned. • Library. • Laboratory for fundamental of physics.
2. Computing resources (AV, data show, Smart Board, software, etc.) • Computer room. • MATLAB software.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

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.

Name of Instructor: _______**Walid Belkacem Belhadj**______________________

Signature:___________________________Date Report Completed:____________

Name of Field Experience Teaching Staff ______________________________________

Program Coordinator:____

Signature: ___________________________ Date Received:___________________

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Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: General Physics 1

Course code: 4034162-3

Course Specifications

Institution: **Umm AL – Qura University**	Date : **12/3/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Radiation physics (code: 4034162)**
2. Credit hours: **3 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 academic staff member**
5. Level/year at which this course is offered : **4st Year / Level 8**
6. Pre-requisites for this course (if any) : **Nuclear Physics (4034160-4)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**

9. Mode of Instruction (mark all that apply)

Mode			
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1-Acquire basics of information about interaction of radiation with matter.
2-Acquire the basic of the radiation dosimetry.
3-Describe types of radiation Detectors.
4- Acquire information about biological effects of radiation.
5- Acquire information about units of radiation dosimetry.
6-Acquire the basic of external radiation protection.
7- List the natural and the artificial sources of radiation.
8- Acquire procedure of radiation dosimetry.
9- Describe the methods for radiation dosimetry.

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- Outlines of the physical laws, principles and the associated proofs.
2. Highlighting the day life applications whenever exist.
3. Encourage the students to see more details in the international web sites and reference books in the library.
4- Encourage the student to build an example of different experiments related to course
5- 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 course will cover the principle of physics, such as measurements, work and energy, Newton's laws, heat, fluid mechanics, and light. 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.
The course will cover the principle of radiation physics, such as Interaction with matter, dosimetry, detectors, biological effects, measurements and protection sources of radiation. Units procedure and methods of radiation dosimetry.This course will provide a conceptual and experimental background in radiation 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
❖ **Interaction of Radiation with Matter** 1- The energy transfer. 2- Range of heavy charged particles (alpha particles). 3- The specific ionization and the stopping power.	**1**	**3**
❖ **Interaction of Radiation with Matter** 1. The energy transfer from electron to the matter. 2. Energy loss by inelastic collision and by radiation. 3. Absorption of electrons, the half-thickness. 4. Range determination from the absorption curve.	**2**	**6**
❖ Interaction of Radiation with Matter 1. The energy transfer from electron to the matter. 2. Energy loss by inelastic collision and by radiation. 3. Classification of neutrons, the neutrons sources. 4. The neutron elastic and inelastic scattering. 5. The neutron capture, Transmutation. 6. The total neutron cross-section and its determination.	**1**	**3**
❖ **Units of Radiation Dosimetry** 1- Radiation flux density 2- The exposure. 3- Roentgen. 4- The radiation absorbed dose. 5- Relative biological effectiveness.	**1**	**3**
❖ **Units of Radiation Dosimetry** 1- -The radiation-weighting factor. 2- -The tissue equivalent dose. 3- -The tissue-weighting factor. 4- -The effective dose. 5- The collective effective dose, the dose rate.	**2**	**6**
❖ **Biological Effects of Radiation** 1- Interaction of the ionizing radiation with the cell (the physical stage, the - physico-chemical stage, the chemical stage and the biological stage). 2- The deterministic and stochastic effects.	**1**	**3**

3- The late effects. 4- The risk factor. 5- The hereditary effects of radiation.		
❖ **Radiation detectors** 1. motion of electrons and ions in gases - The drift motion. - The attachment - The recombination 2. -The electron and ion currents in gases 3. The gas detectors :the ionization chamber, 4. The proportional counters, Geiger-Muller counters. 5. The scintillation detectors. 6. -The semiconductor detectors. Cerencov detectors.	**2**	**6**
❖ **Dosimeters** 1. Pocket Dosimeters. 2. Film Badges. 3. Thermo-luminescent Dosimeter. 4. Ion Current Chamber	**1**	**3**
❖ **External Radiation Protection** 1. The natural and non-made sources of radiation and their sources (cosmic rays, the terrestrial radiation, the radon gas), 2. The artificial sources of radiation (the diagnostic radiology, therapeutic radiology, the nuclear energy and industries, the radioactive waste, the radioactive dust), 3. Techniques of protection (time, distance, shields).	**1**	**6**
❖ **Fundamental Sciences** 1. -Quantities and units in science and engineering Background information 2. -Excitation and Ionization	**1**	**3**
❖ **Reflection and refraction of light at plane surface** 1. Spherical mirrors 2. Spherical refracting surfaces. 3. Thin lenses 4. Compound optical systems 5. Optical instruments	**1**	**3**

❖ **Exercises and Solved problems**	**1**	**3**
	15 weeks	**45hrs**

Practical part:

1. Safety and Security at the lab.
1. Introduction to the Lab.
2. Precise measurements.
3. Vectors.
4. Verification of lens formula.
5. Determination of Viscosity
6. Determination of Sound speed.

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

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

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		
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	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the
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.	information in different references. 5. Ask the student to attend lectures for practice solving problem.	course. 4. Discussions of how to simplify or analyze some 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 (NA)**		

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)	8^{th} week	30%
4	Lab. Reports (Practical)	11^{th} week	5%
5	Final Exam (Practical)	15^{th} week	15%
6	Final Exam (theoretical)	16^{th} 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

- ✓ "A Primer In Applied Radiation Physics", F.A.SMITH, Ed. World Scientific, 2000.
- ✓ "Radiation Physics for Medical Physicist", E. B. Podgorsak, Ed. Springer. 2006

- ✓ . Radiation physics for medical physicists Ervin B. Podgorsak Springer 2006.

  Electronic Materials, Web Sites

  (eg. Web Sites, Social Media, Blackboard, etc.)
- ✓ http://www.IAEA.com, http://ICRP.com, http://NCRP..com., http://ICRU.com,
- ✓ http://UNSCAR.com, http://ANSI.com, http://WHO.com

2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. www.uqu.sa/eemohamad
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.

Name of Instructor: ________H. T. Mahdy ______________________________________

Signature: ___________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff ______________________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________

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T6. Course Specifications (CS)

Course title: Solid State Physics 2

Course code: 4034172-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Solid State Physics 2 (code: 4034172-4)**
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 academic staff member**
5. Level/year at which this course is offered : **4st Year / Level 7**
6. Pre-requisites for this course (if any) : **Solid State Physics 1 (code : 4034170-4)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? After completing this course student should be able to: 1. Define the dielectrics, ferroelectrics, polarization and their properties, 2. Define the diamagnetics , paramagnetics, ferromagnetic and their properties, 3. Define the suppperconductors and their properties. 4. Define the semiconductors, and their properties.
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- Explain the strategy of the course in the beginning of the semester 2- Outlines of the physical laws, principles and the associated proofs. 3- Encourage the students to see more details in the international web sites and reference books in the library. 4- Discussing some selected problems in each chapter. 5- Renew the course references frequently 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 course will cover An introduction to the physics governing the different types of materials , dielectric materials, magnetic material, and superconductors and semiconductors

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Dielectrics** 1- Review of Dieletric materials 2- The polarization 3- The polarizability 4- Types of polarization 5- Ferroelctricity 6- The microscopic model of ferroelectic domain.	**3**	**9**
❖ **Magnetism and magnetic materials** 1- Review of Basic Formulas and Magnetic susceptibility, 2- The Atomic Origin of Magnetism 3- Diamagnetism and Langevin theory.	**5**	**15**

4- Paramagnetism : Classical and Quantum Theory of Paramagnetism. 5- Ferro-Magnetism: Properties, Curie law and Curie Wise law, 6- Rare Earth and Iron Group Ions and Magnetism in Metals. 7- Ferro-Magnetism in Insulators, the Molecular Field Theory, 8- Anti and Ferri-Magnetism and Ferro-Magnetization Process.		
❖ **Superconductivity:** Zero Resistance, Occurrence of Super Conductivity and the Meissner Effect. The Critical Field, Thermodynamics of the Super Conductivity Transition and the Two-Fluid Model. Superconductivity theory and Copper pair electron. Josephson Junction and SOQUED	**2**	**6**
❖ **Semiconductors** 1- Theory of Electrical Conduction: Drift of electrons in an electric field, Mobility, Drift current, Diffusion current, Transport equations, Quasi-Fermi levels 2- Generation/Recombination Phenomena: Direct and indirect transitions, Generation/recombination centers, Excess carrier lifetime, SRH recombination, Surface recombination 3- The PN Junction Diode: Unbiased and biased PN junction, Current-voltage characteristics, PN junction capacitance. Models for the PN junction, Solar cell, PiN diode 4- Metal-semiconductor contacts: Schottky diode, Ohmic contact 5- Junction Field Effect, JFET and Bipolar Junction Transistors, BJT	**5**	**15**
	15 weeks	**45 hrs**

Practical Part

1- Determination of the activation energy of the semiconductors
2- Determination of the dielectric constant with the frequency for a dielectric
3- Determination of magnetic permeability of the magnetic materials
4- Determination of the M-B hysterics curve.
5- Determination of the Hall effect
6- Determination of the crystal structure of some crystal using x-ray diffractometer.

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**45**	**15**	**45**			**105**
Credit	**45**	**15**	**15**			**75**

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)	8^{th} week	30%
4	Lab. Reports (Practical)	11^{th} week	5%
5	Final Exam (Practical)	15^{th} week	15%
6	Final Exam (theoretical)	16^{th} 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
   1- Charles Kittel, Introduction to Solid State Physics 7^{th} Ed
   2- M. A. Omar "Elementary of Solid State Physics" Addison Wesley publishing company 1997.
   3- Walter A. Harrison, Solid State Theory , Dover edition 1979

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
   1- H.P. Myers, Introduction to Solid State Physics, 2^{nd} Ed, 2009 Taylor & Francis
   2- Walter A. Harrison, Solid State Theory , Dover edition 1979

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
   - http://www.phys.lsu.edu/~jarrell/COURSES/SOLID_STATE_HTML/course_solid.html
   - http://www.encyclopedia.com/topic/solid-state_physics.aspx

- http://www.physics.byu.edu/research/condensed
- http://web.utk.edu/~tbarnes/website/cm/cm.html
- http://www.answers.com/topic/solid-state-physics

- http://www.answers.com/topic/solid-state-physics

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.

2. Computing resources (AV, data show, Smart Board, software, etc.)

In each class room 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 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

- Questionaries
- Open discussion in the class room at the end of the lectures

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.
- 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.

Name of Instructor: _______S. M. Attia

Signature: ____________________________ Date Report Completed: _____________

Name of Field Experience Teaching Staff ____

Program Coordinator:____

Signature: ____________________________ Date Received: ____________________

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

T6. Course Specifications (CS)

Course title: Electronics

Course code: 4034173-4

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/1/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Electronics (code: 4034173-4)**
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 academic staff member**
5. Level/year at which this course is offered : **4th Year / Level 8**
6. Pre-requisites for this course (if any) : **Solid state physics I (4034170-4)**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus & Girls section**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**100%**
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. Summary of the main learning outcomes for students enrolled in the course.

Outcomes of this course are to introduce the basic physical principles and fundamentals of semiconductors and their usage and applications in electronic components like diodes and transistors.

This course introduces basic principles of linear and digital electronic circuits that are used in the everyday experience, like

- Semiconductor Diodes
- Circuit rectifiers.
- Special types of diodes
- Bipolar junction transistors
- Small signal amplifiers and biasing
- Field effect transistors
- Signal operational amplifiers,
- Digital circuits like logic gates
- Applications to memory chips and timers used in most of electronic devices

At the end of this course the student should be able to

1. Understand and analyze relatively simple electronic layouts and circuits

Design special purpose circuits that meet his requirements in his scientific life

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

1. Explain strategy of the course in the beginning of the semester
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. Discussing some selected problems in each chapter.
6. Cooperate with different institution to find how they deal with the subject
7. Renew the course references frequently

Frequently check for the latest discovery in science

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

Course Description:

- Conduction mechanisms in semiconductors: Energy Bands of metals, semiconductors and insulators, Intrinsic semiconductors, Extrinsic (impurity) semiconductors (n-type semiconductors, p-type semiconductors), majority and minority carriers, generation and recombination rates.
- Junction diode physical electronics: The pn junction: Physical model, Current flow, carrier concentration at edge of space charge layer, Current voltage characteristics at direct and reverse bias - Temperature dependence of idealized diode equation- pn dynamic behavior, junction structures, contacts and metal-semiconductor junctions, Examples of diode circuit analysis.
- Bipolar junction transistors (BJT): BJT as control valves, Operation of BJT, Circuit models of low speed active region operation, Examples of transistor circuit analysis.
- Field effet transistors BJT: Electrical properties of semiconductor surfaces, Volt-Amper characteristics of MOSFET, Dynamics for MOSFET and circuit applications, Junction field effect transistors, Static drain characteristics, Comparison of MOSFET and JFET transistors.
- Operational amplifiers: Introduction, connecting the amplifier to the circuits, Ideal and real amplifiers, Linear amplification and negative feedback, Special application of amplification, Addition and subtraction of signal, Memory and timing applications using positive feedback (Multivibrators), Integration and differentiation.
- Digital electronics: Digital logic (binary numbers-logic levels,. Logic gates-truth. Tables logic. Families-Practical circuits, Main gates (AND-OR-NOT-NAND-NOT-AND-OR-NOT-NAND-NOR), Combinations of gates, Logic laws, XOR and XNOR gates, Adding of binary numbers, Memory elements (Multivibrators-Flip flops).

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ Semiconductors and PN Junction Atoms Covalent bonds Conduction in Semiconducting Crystal PN Junction PN Junction Biasing	2	6
❖ Diode and its applications Diodes Calendar Half-wave rectifier Full -wave rectifier Full wave rectifier filters	2	6
❖ Special types of diode Diode "zener" Diode "zener" Applications Variable capacitance diode Optical diodes Other types of diode	2	6
❖ BIPOLAR JUNCTION TRANSISTORS	2	6

BJT as control valves Operation of BJT Circuit models of low speed active region operation An example of transistor circuit analysis ; Transistor operation at extremes of collector voltage		
❖ Bias transistor bipolar DC operating point Base Biasing Emitter Biasing Voltage divider Biasing Collector bias by feedback	**2**	**6**
❖ FIELD-EFFECT TRANSISTORS Electrical properties of semiconductors for surfaces Volt-Ampere characteristics of MOSFET A brief view of dynamics for MOSFET and circuit applications Junction Field-Effect Transistors static drain characteristics; Comparison of MOSFET and FET transistors	**1**	**3**
❖ Operational amplifiers Introduction Connecting the Amplifier to the circuit Ideal and real Amplifiers Linear Amplification and negative feedback Special applications of amplifications Addition and subtraction of signals Memory and timing applications; using positive feedback (Multivibrators) Integration and Differentiation	**1**	**3**
❖ DIGITAL ELECTRONICS Digital logic (Binary numbers, Logic levels, Logic gates; Truth tables; Logic families-practical circuits) Main gates (AND, OR, NOT, NAND, NOR) Combination of gates Logic laws XOR and XNOR gates Adding of binary numbers Memory elements (Multivibrators, Flip-Flops)	**2**	**6**
❖ **Exercises and Solved problems**	**1**	**3**
	15 weeks	**45hrs**

Practical part:

1. Laboratory Safty Guidelines
2. P-N Junction Diode Characteristic
3. Half and Full-wave rectifiers
4. Filters circuits
5. Zener diode

6. Light emitted diodes
7. Characteristic of bipolar junction transistors
8. Transistor Load line
9. Transistor Biasing
10. Small signal amplifiers
11. JEFT transistor
12. Logic circuits

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	**52**	**48**		**14**	**32**	**136**
Credit	**3**		**1**	2		

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	10 %
2	In-Class Problem Solving	5^{th},13^{th} weeks	10 %
3	Midterm Exam 1 (theoretical)	5^{th} week	10%
	Midterm Exam 2 (theoretical)	10^{th} week	10%
4	Lab. Reports (Practical)	11^{th} week	10%
5	project	12^{th} week	10%
6	Final Exam (theoretical)	16^{th} week	50%

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)

8 office hours per week

E Learning Resources

1. List Required Textbooks

Electronic Devices, 9^{th} Edition Thomas L.Floyd
Electronic Devices and Circuits by Jacob Millman and Christos C. Halkias

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

الأجهزة الالكترونية، طوماس فلويد، ترجمة دكتور يسرى مصطفى، جامعة السابع من ابريل، ٢٠٠٧.

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

• http://www.physicsclassroom.com • http://www.electronicstheory.com/ • http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/
5. 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.) • Lecture room for 30 students • Library • Laboratory for electronics there is a special course for laboratory related to electronics)
2. Computing resources (AV, data show, Smart Board, software, etc.) • Computer room • Scientific calculator.
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 • Questionaries • Open discussion in the class room at the end of the lectures
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 movies. • 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) • After the agreement of Department and Faculty administrations
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Periodical revision by Quality Assurance Units in the Department and institution

Name of Instructor: _______ J.A.OUERFELLI ____________________________________

Signature: ___________________________ Date Report Completed: -----------

Name of Field Experience Teaching Staff ______________________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________

كلية العلوم التطبيقية
Faculty of Applied Sciences

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

T6. Course Specifications (CS)

Course title: Project

Course code: 4034199-3

Course Specifications

Institution: **Umm AL – Qura University**	Date : **12/3/1439**
College/Department : **College of Applied Science – Department of Physics**	

A. Course Identification and General Information

1. Course title and code: **Project** **(code: 4034199-3)**
2. Credit hours: **3 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 **Any member from the instructors of the departmrnt**
5. Level/year at which this course is offered : **4th Year / Level 8**
6. Pre-requisites for this course (if any) : **--------**
7. Co-requisites for this course (if any) : ---
8. Location if not on main campus: **Main campus and Alzaher**
9. Mode of Instruction (mark all that apply)

Mode	Mark		Percentage
a. traditional classroom	✓	What percentage?	**20%**
b. blended (traditional and online)	✓	What percentage?	**10%**
c. e-learning		What percentage?	**10%**
d. correspondence	✓	What percentage?	**60%**
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course is dealing with a specific research point. this research point is carried by the student under the supervision of one of the academic stuff. the research point can be classified to two groups: A- Theoretical research projects. B- Experimental research project.
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.Explain strategy of the project in the beginning of the semester 2. Highlighting the day life applications whenever exist. 3. Encourage the students to see more details in the international web sites and reference books in the library. 4- Encourage the student to build an example of different experiments related to course and comparing it with experiments in the lab. 5- Highlighting the day life applications whenever exist. 6. Encourage the students to see more details in the international web sites and reference books in the library. 7- Encourage the student to build an example of different experiments related to course

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

Course Description: The course mainly works on developing the different scientific skills of the student. Improving they way of scientific thinking .

1 Topics to be Covered

Topics	No of Weeks	Contact hours
This course is dealing with a specific research point . this research point is carried by the student under the supervision of one of the academic stuff . the research point can be classified to two groups : A- Theoretical research projects. B- Experimental research project. So the point of study will be varied according to the students and the instructor of the course		

	14 weeks	**42 hrs**

Practical part:

The time of the practical depend on the selected point under study per each project.

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

3. Additional private study/learning hours expected for students per week.	2

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			
2			
3			
4			

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. (2 hrs per week)

E Learning Resources

1. List Required Textbooks

Selected according to the research point under study.

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

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

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.) * Lecture room organized for face to face learning * Library *Laboratory for optics * Boards * Suitable lightening system * Air condition units * Fiber optic networks and wireless * Computers and data show
2. Computing resources (AV, data show, Smart Board, software, etc.) * computers with data show * Available numbers of computers for students * Updating the computer each year.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Checked later if needed

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Evaluating the instructor by the student using questionnaires Following up the progress of student in the course Evaluating the progress of student by the projects and reports Evaluating the course by specialized committees.
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Self-evaluation Student evaluation Evaluation by other instructor in the same department or outside it
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.
- 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.

Name of Instructor: _______Afaf maweed Abdelmageed

Signature: ___________________________ Date Report Completed: ____________

Name of Field Experience Teaching Staff ________optic physic_________________________

Program Coordinator:____

Signature: ___________________________ Date Received: ___________________