Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

Module Handbook

(Courses Contents and Specifications)
for Bachelor's degree program in

Physics

CONTENTS **Page No.**

Vision of Physics Department

Achieving leadership in physics and medical physics at the local and international levels and actively participating in the community institutions.

Mission of Physics Department

Innovation and excellence in higher education and scientific research in physics and medical physics, the graduation of students highly skilled scientifically and technically, and the contribution to the service and development of the community

Objectives of Physics Department

1- **To achieve leadership in higher education, scientific research and community service**

2- **To upgrade graduates level through the achievement of comprehensive quality standards.**

3- **To prepare advanced and innovative educational programs that qualify the graduates to keep up with the requirements of knowledge society and labor market.**

4- **To provide students with basic knowledge and skills in physics and medical physics.**

5- **To promote scientific research and to qualify specialized scientific and professional cadres to contribute to carrying out distinguished scientific and practical researches.**

6- **To serve community organizations through effective partnerships**

7- **To form partnerships with research centers and prestigious global universities.**

8- **To attract distinguished scientific and administrative cadres.**

Study Plan (1437)

(Credit hours 130h)

FIRST YEAR			
LEVEL 1			
Course no.	Course name	Credits	Prerequisite
4041101	CALCULUS 1	4	
4021101	GENERAL CHEMISTRY (1)	4	
7004101	ENGLISH LANGUAGE	4	
605101	THE HOLY QUR'AN (1)	2	
601101	ISLAMIC CULTURE (1)	2	
Total credits		16	

LEVEL 2			
Course no.	Course name	Credits	Prerequisite
4011101	GENERAL BIOLOGY	4	
4031101	GENERAL PHYSICS	4	
7004102	ENGLISH LANGUAGE	4	7004101
501101	ARABIC LANGUAGE	2	
102101	BIOGRAPHY OF PROPHET MOHAMED (PBUH)	2	
Total credits		16	

SECOND YEAR			
LEVEL 3			
COURSE NO.	COURSE NAME	CREDITS	PREREQUISITE
4042501-4	Differentiation and Integration	4	4042101
4042402-4	Linear Algebra	4	4042101
4032102-4	General Physics (2)	4	4031101
4032121-4	Electricity and magnetism	4	4031101
Total credits		16	

LEVEL 4			
Course no.	Course name	Credits	Prerequisite

4032141	THEORETICAL METHODS IN PHYSICS (1)	4	4032141
4032131	OPTICS	4	4032102
4032150	MODERN PHYSICS	4	4032141
4032122	GENERAL PHYSICS (3)	3	4032102
601201	ISLAMIC CULTURE (2)	2	605101
Total credits		17	

THIRD YEAR			
LEVEL 5			
Course no.	Course name	Credits	Prerequisite
4033142	THEORETICAL METHODS IN PHYSICS (2)	4	4032141
4033143	CLASSICAL MECHANICS (1)	4	4032102
4033145	QUANTUM MECHANICS (1)	4	4032141
4033110	HEAT AND THERMODYNAMICS	3	4032102
605201	THE HOLY QUR'AN (2)	2	605101
Total credits		17	

LEVEL 6			
Course no.	Course name	Credits	Prerequisite
4033132	ELECTROMAGNETISM (1)	3	4032141
4033146	QUANTUM MECHANICS (2)	3	4033145
4033111	STATISTICAL THERMODYNAMICS	3	4033110
4033144	CLASSICAL MECHANICS (2)	2	4033143
605301	THE HOLY QUR'AN (3)	2	605201
601301	ISLAMIC CULTURE (3)	3	601201
Total credits		16	

FOURTH YEAR			
LEVEL 7			
Course no.	Course name	Credits	Prerequisite
4034133	ELECTROMAGNETISM (2)	3	4033132
4034160	NUCLEAR PHYSICS	4	4033145

4034170	SOLID STATE PHYSICS (1)	4	4033145
4034180	COMPUTATIONAL PHYSICS	3	4033142
605401	THE HOLY QUR'AN (4)	2	605301
Total credits		16	

LEVEL 8			
Course no.	Course name	Credits	Prerequisite
4034162-3	RADIATION PHYSICS	3	4034160
4034172-4	SOLID STATE PHYSICS (2)	4	4034170
4034173-4	ELECTRONICS	4	4034170
4034199-3	GRADUATED PROJECT	3	
601401-2	ISLAMIC CULTURE (4)	2	601301
Total credits		16	

Course Contents

(A) Specialty requirements

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

T6. Course Specifications (CS)

Course title: General Physics 2

Course code: 4032102-4

Dr. B. A. Korany

Assistant professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: baewiss@uqu.edu.sa, P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

Course Specifications

Institution: **Umm AL – Qura University**	Date : **15/3/1438**
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 **Dr. B. A. Korany** Email: baewiss@uqu.edu.sa
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.

Course Unit/Credit hours	**4 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**60**
	Practical	**42**	**20**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**95**	**115**
	Total Sum:	**210**	
Credit	**7 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**45**	**0**	**0**	**42**	**8**	**95**
Credit	**3**	**0**	**0**	**1**	**0**	**4**
3. Additional private study/learning hours expected of students per week.						**7.67**

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	Recognize facts, principle and concepts of classical mechanics,	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. Exams: a) Quizzes (E-learning) b) Short exams (mid-term exams) c) Long exams (final) d) Oral exams Discussions during the lectures.
1.2	Describe concepts, Procedures of some experiments in physics	1. Demonstrating the basic principle of the experiment. 2. Show the best ways to perform the experiments 3. Show the best ways to demonstrate the results. 4. Show the best way to write the reports about the experiment. 5. Discussion with the student about the results.	Home work. Writing scientific Reports. Doing team research or team project. Doing team work to perform some experiments Discussions during the class.
2.0	**Cognitive Skills**		
2.1 2.2 2.3	Solve problems in Physics by using suitable mathematical principles Analyse and interpret quantitative results Solve scientific problems related to industrial problems	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.Midterm's exam. Exams, short 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

3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2 3.3	Work effectively in groups Show responsibility for self-learning to be aware with recent developments in physics Acts as professional and responsible person	• Search through the internet and use the library. • Lab work. • Small group discussion. • Enhance educational skills. • Develop their interest in Science through :(lab work, field trips, visits to scientific and research. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations
4.0	**Communication, Information Technology, Numerical**		
4.1 4.2 4.3 4.4	Use basic physics terminology in English Collect and classify the material for a course Communicate effectively in oral and written form Acquire the skills to use the internet communicates tools.	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Practical exam • Homework. • Final exams.
5.0	**Psychomotor**		
5.1	Use a perfect experimental tools to solve Physics problems in the Labs	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. 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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
2.1						✓												
2.2							✓											
2.3								✓										
2.4										✓								
3.1																		
3.2									✓									
3.3											✓							
4.1															✓			
4.2														✓				
4.3													✓					
4.4																✓		
5.1																	✓	

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	1st Periodic Exam	5th week	10%
4	2st Periodic Exam	12th week	10%
5	Lab. Reports (Practical)	11th week	5%
6	Final Exam (Practical)	15th week	15%
7	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

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/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: _______ *B. A. Korany* ____ Date Report Completed: ___2018___

Name of Field Experience Teaching Staff Astronomy

Program Coordinator: **Dr. Fahad Alhashmi**

Signature: *Fahad Alhashmi* Date Received:2019

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

T6. Course Specifications (CS)

Course title: Electricity and Magnetism

Course code: 4032121-4

Dr. Mongi Ben Moussa

Assistant Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

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Email: phmoussa@yahoo.fr

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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 **Dr. Mongi Ben Moussa**
Email: phmoussa@yahoo.fr
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. Application of the Biot- Savart Law 3. Line of Magnetic Fields	**3**	**9**

4. Two parallel Conductor 5. Ampere's Law 6. Solenoids and Toroids		
	15	**45 hrs**

Practical

1. Safety and Security at the Lab.
2. Introduction.
3. Determining the capacitance of capacitor/ connecting capacitor in series and in parallel
4. Studying Ohm's Law/ connecting to resistor in series and parallel
5. Determining the time constant of RC circuit
6. Kirchhoff;s Rules (The Junction Rule and The Loop Rule

Course Unit/Credit hours	**4 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**60**
	Practical	**42**	**20**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**95**	**115**
	Total Sum:	**210**	
Credit	**7 ECTS C.Ps**		

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

	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**45**	**0**	**0**	**42**	**8**	**95**
Credit	**3**	**0**	**0**	**1**	**0**	**4**

3. Additional private study/learning hours expected of students per week. **7.67**

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)	6^{th} week	10%
4	Lab. Reports (Practical)	11^{th} week	10%
5	Final Exam (Practical)	15^{th} week	20%
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)

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: ___ *Mongi Ben Moussa* ____ Date Report Completed: __2018__

Name of Field Experience Teaching Staff _______Material Science_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـة العربيـة السعوديـة
الهيئـــة الوطنيـــة للتقـويـم
والاعــتــمــاد الأكــاديــمــي

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

Prof. Dr. Mohamed M.Sabry

Professor Of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: mmsalaheldin@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

Course Specifications

Institution: **Umm AL – Qura University**	Date : **18/2/1438**
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 **Prof. Dr. Mohamed M.Sabry** Email: mmsalaheldin@uqu.edu.sa
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)

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** **8-** Geometric series, **9-** testing series for convergence, **10-** Alternating series, **11-** interval of convergence- **12-** expanding functions in power series, **13-** Taylor and Maclaurin expansions,	**2**	**8**

14- Solving Problems about Series		
❖ **Partial Differentiation** 8- Total differentials- 9- Approximating using differentials, 10- chain rule 11- Implicit differentiation, A 12- pplication to Maximum and Minimum problems, 13- Lagrange Multipliers, Change of Variables, 14- 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	**60 hrs**

Course Unit/Credit hours	**4 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**60**	**105**
	Practical	**0**	**0**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**68**	**140**
	Total Sum:	**208**	
Credit	**7 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	60	0	0	0	8	68
Credit	4	0	0	0	0	4
3. Additional private study/learning hours expected of students per week.					9.33	

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 1.2 1.3	Recognize facts, principles and concepts of treating with vectors and scalars in mathematics and algebra Reproduce structured series of events and numbers in the form of Algebraic series. Describe physics problems in terms of mathematical expressions likepartial differential equations and special functions	1- Demonstrating the basic principles through lectures. 2. Discussing phenomena with illustrating pictures and diagrams 3. Lecturing method: Board, 4. Discussions 5. Brain storming 6. Start each chapter by general idea and the benefit of it.	Solve some example during the lecture. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) Discussions during the lectures. Home work. Discussions during the class.
2.0	**Cognitive Skills**		
2.1 2.2	Differentiate between the mathematical methods to be used for of interpreting physics problems. Interpret special mathematical and algebraic functions and partial differential	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	1.Midterm's exam. Exams, short quizzes 2.Asking about methods previously taught 3.Discussions of how to simplify or analyze some phenomena

2.3	equations in Physics by using suitable mathematical principles Interpret numerical and quantitative events and results in terms of mathematical series and special functions.	5.Ask the student to attend lectures for practice solving problem	
3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2	Show responsibility for self-learning to be aware with recent developments in physics Work effectively in groups.	• Search through the internet and use the library. • Small group discussion. • Enhance educational skills. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the scientific values of solutions. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations
4.0	**Communication, Information Technology, Numerical**		
4.1 4.2 4.3 4.4	Illustrate solution steps effectively in oral and written form Research and classify the material for a course Use basic physics terminology in English Assess the skills to use the internet communicates tools.	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Practical exam • Homework. • Final exams.
5.0	**Psychomotor**		
5.1	N/A		•
5.2	N/A		•

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	3.3	3.4	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																		
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	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.

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. 3- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report • Program Self study 4- According to point 1 the plan of improvement should be given.

Name of Instructor: _______**Mohamed M.Sabry**_________________________

Signature: M. Sab ___ Date Report Completed: __2018___

Name of Field Experience Teaching Staff _______Solar Cell and Theortical Physics____

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

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والاعــتــمـــاد الأكـــاديــمـــي

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

Dr. Mongi Ben Moussa

Assistant Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: phmoussa@yahoo.fr

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **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 **Dr. Mongi Ben Moussa** Email: phmoussa@yahoo.fr
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)

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? *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
❖ **Aberrations** 8- Types of aberrations . 9- Correction of aberrations.	**2**	**6**

❖ **Interference** 15- Young double slit 16- Double beam experiments 17- General conditions of interference 18- Superposition 19- Michelson interferometer 20- Plane parallel plates 21- Fabry - Perot interferometer 22- Newtons rings	**3**	**9**
❖ **Fourier analysis for physical optics** 8- Fraunhofer diffraction 9- Fraunhofer diffraction by a single slit (by integration methods) 10- Diffraction maxima and half width for single slit 11- Fraunhofer diffraction by circular slit (by integration methods) 12- Airy disk 13- Rayleigh`s criterion 14- Fresnel diffraction 15- Fresnel integrals (by integration methods) 16- Cornu spiral 17- Fresnel diffraction on single slit 18- 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** 6. Basic rules for Fourier transform. 7. Spatial filtering. 8. Diffraction theory of image formation in the microscope 9. Optical image processing.	**2**	**6**
❖ **Polarization** 10. Types of polarized light 11. Production of polarized 12. Optical active phenomena 13. 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.

Course Unit/Credit hours	4 credit hours		
Students workload:		Contact hours	Private study
	Lecture	45	60
	Practical	42	20
	Assignments	0	15
	Exams & Quizzes	8	20
	Sum	95	115
	Total Sum:	210	
Credit	7 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	45	0	0	42	8	95
Credit	3	0	0	1	0	4
3. Additional private study/learning hours expected of students per week.						7.67

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**		
	Knowledge that students should know and understand when they complete the course is as follow: * Learning basic fundamentals in physical optics. * Understanding the physics of superposition of waves, interference, diffraction, and polarization * Using mathematical formula to describe the physical principle of diffraction and its relation with Fourier transform * Capable of correcting the different types of lens aberrations. * Classifying the different types of interference techniques.	1.Demonstrating the basic information and principles through lectures and the achieved applications 2. Discussing phenomena with illustrating pictures and diagrams 3. Lecturing method: a. board b. Power point c. e learning 4. Tutorials 5. Experimental learning 6. Discussions 7. Brain storming 8. Start each chapter by general idea and the benefit of it 9. To improve the student background of the subject	1. Solve some example during the lecture. 2. Exams: a) Quizzes b) Short exams (mid- term exams) c) Long exams (final) d) Oral exams f) online quizzes 3. Discussions during the lectures. 4. Ask the student to clear the misunderstanding of some physical principle and asking about quality question. 5- Home work 6- Writing scientific paper 7- Doing team research or team project 8- Reports

		10. Show the best ways to deal with problem 11. Solving problems 12 Encourage the concept of team work 13- Logical thinking. 14- Active teaching 15- Self learning	
2.0	**Cognitive Skills**		
	Apply the laws of physics. 1. Flexibility skills 2. Elaborating information skill 3.Accessing information skill 4. Note taking skill 5. Drawing conclusion skill 6. The skill of determining cause- effect relationship 7. The skill of generation and testing hypnoses 8. Inferring skill 9. Evaluating evidence skill 10. Managing attention skill 11. Problem solving skill 12. Prioritizing skill 13. Questioning skill 14. Thinking systematically skill 15. Sequencing skill 16. The skill of presenting information graphically	1. Preparing main outlines for teaching 2. Following some proofs 3. Define duties for each chapter 4. Home work assignments 5. Encourage the student to look for the information in different references 6. Ask the student to attend lectures for practice solving problem 7. Doing small research 8- Self learning 9-Project based learning 10- Report back sessions 11-Active learning	1. Midterm's exam. Exams, short quizzes 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the course 4. team work projects
3.0	**Interpersonal Skills & Responsibility**		

	1. Responsibility for own learning 2. Group participation and leader ship 3. Act responsibly personal and professional situation. 4. Ethical standards of behaviour 5. Active communication skill 6. Self-learning skill 7. Time management 8. Respect the view of the others 9. Encourage the idea of team work 10- work independent	• Brain storming • Group discussion • Experimental training • Summarizing lectures or collecting materials of the course. • Try to solve difficulties in learning: solving problems – enhance educational skills. • Encourage the student to attend general lectures.	• 1. Quizzes on the previous lecture • 2. Discussion • 3. Seminars • 4- Home work • 5- Reports
4.0	**Communication, Information Technology, Numerical**		
	1. Computation and Problem solving skill 2. Using technology and programs for solving the difficulties in physics 3. Data analysis and interpretation 4- Using technology in presentations 5-Using technology in communications with others	• 1. Know the basic mathematical principles. • 2. Use the web for research. • 3. Computational analysis. • 4. Data representation. • 5. Focusing on some real results and its physical meaning. • 6. Lectures for problem solution. • 7. Experimental training • 9.Exams to measure the mathematical skill. • 10.Clear the weakness point that should be eliminated. • 11.Encourage the student to ask for help if needed.12.Encourage the student to ask good question to help solve the problem	• 1. Their interaction with the lectures and discussions. • 2. The reports using technology. • 3. Homework, Problem solutions assignment and exams • 4. Results of computations and analysis. • 5. doing research using internet
5.0	**Psychomotor**		

	At the end of the course, the student will be able to: 1.Perform the experiments with high accuracy. 2.Operate instruments safely. 3.Draw the data and curves	- 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

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. 5- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report 6- According to point 1 the plan of improvement should be given. 7- Contact the college to evaluate the course 8- Reviewing the course and updating it.

Name of Instructor: _______**Mongi Ben Moussa**

Signature: ___ *Mongi Ben Moussa* ____ Date Report Completed: __2018__

Name of Field Experience Teaching Staff _______Material Science_______

Program Coordinator:_**Dr. Fahad Alhashmi**____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـة العربيـة السعوديـة
الهيئـة الوطنيـة للتقويـم
والاعـتـمـاد الأكـاديـمـي

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

Dr. A. TIMOUMI

Assistant Professor Of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: timoumiabdelmajid@yahoo.fr

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **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
Dr. A. TIMOUMI
Email: timoumiabdelmajid@yahoo.fr
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)

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** **19-** radiation of heated objects, **20-** thermal radiation, **21-** cavity radiation treated with classical physics, 22- UV catastrophe, 23- Planck's solution, 24- 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

Course Unit/Credit hours	**4 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**60**
	Practical	**42**	**20**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**95**	**115**
	Total Sum:	**210**	
Credit	**7 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**45**	**0**	**0**	**42**	**8**	**95**
Credit	**3**	**0**	**0**	**1**	**0**	**4**
3. Additional private study/learning hours expected of students per week.						**7.67**

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	Recognize facts, principle and concepts of elementary Physics	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. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) Oral exams Discussions during the lectures.
1.2	Describe concepts, Procedures of some experiments in physics	1. Demonstrating the basic principle of the experiment. 2. Show the best ways to perform the experiments 3. Show the best ways to demonstrate the results.	Home work. Writing scientific Reports. Doing team research or team project. Doing team work to perform some experiments Discussions during the class.

		4. Show the best way to write the reports about the experiment. 5. Discussion with the student about the results.	
2.0	**Cognitive Skills**		
2.1 2.2 2.3 2.4	Apply the laws of physics. Solve problems in Physics by using suitable mathematical principles Analyse and interpret quantitative results Express the physical phenomena mathematically.	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.Midterm's exam. Exams, short 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
3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2	Show responsibility for self-learning to be aware with recent developments in physics Work effectively in groups and exercise leadership when appropriate.	• Search through the internet and use the library. • Lab work. • Small group discussion. • Enhance educational skills. • Develop their interest in Science through :(lab work, field trips, visits to scientific and research. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations
4.0	**Communication, Information Technology, Numerical**		
4.1 4.2 4.3	Communicate effectively in oral and written form Collect and classify the material for a course Use basic physics terminology in English	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Practical exam • Homework.

4.4	Acquire the skills to use the internet communicates tools.		• Final exams.

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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
2.1				✓														
2.2						✓												
2.3							✓											
2.4						✓												
3.1									✓									
3.2										✓								
4.1													✓					
4.2														✓				
4.3															✓			
4.4																✓		
5.1																	✓	

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- A. Beiser (2003). Concepts of Modern Physics (6th ed.). McGraw - Hill.

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

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.

9- The following points may help to get the course effectiveness
   - Student evaluation
   - Course report
   - Program report
   - Program Self study

10- According to point 1 the plan of improvement should be given.

Name of Instructor: _______**A. TIMOUMI**____

Signature: __________ A. TIMOUMI ___ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Material Science_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ Fahad Alhashmi _ Date Received: ______2019_____

Kingdom of Saudi Arabia
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والاعــتــمــاد الأكــاديــمـــي

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

T6. Course Specifications (CS)

Course title: General Physics 3

Course code: 4032122-3

Dr. J.A.OUERFELLI

Associate Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: jalel.ouerfelli@yahoo.fr

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **General Physics 3 (code: 4032122-3)**
2. Credit hours: **3 Hrs** (2 theoretical and 1 experimental)
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. J.A.OUERFELLI** Email: jalel.ouerfelli@yahoo.fr
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) 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:**	2	4

Introduction, Vectors and AC waveforms, Simple vector addition, 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

Course Unit/Credit hours	3 credit hours		
Students workload:		Contact hours	Private study
	Lecture	30	35
	Practical	42	30
	Assignments	0	15
	Exams & Quizzes	8	20
	Sum	80	100
	Total Sum	180	
Credit	6 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	30	0	0	42	8	80
Credit	2	0	0	1	0	3
3. Additional private study/learning hours expected of students per week.						6.67

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, A brief summary of the knowledge or skill the course is intended to develop
Second, A description of the teaching strategies to be used in the course to develop that knowledge or skill.
Third, The method of student assessment to be used in the course ,to evaluate learning outcomes in the domain concerned

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define the main properties of an alternating current	1. Demonstrating the basic information and principles through lectures and the achieved applications 2. Discussing phenomena with illustrating pictures and diagrams 3. Lecturing method: a.Blackboard b. Power point c.e-learning 4. Tutorials 5. Revisit concepts 6. Discussions 7. Brain storming sessions 8. Start each chapter by general idea and the benefit of it; 9. Learn the student background of the subject;	• Periodical exam and reports 10% • Mid- term (1 and 2) theoretical exams 30% • Mid-term practical exam 5% • Final practical exam 15% • Final exam 40%
1.2	Using the complex number		
1.3	Analyse the equations of R-C and R-C-L circuits and calculating the impedance, power factor, root-mean-square values of current and voltage.		
1.4	To use mathematical formulation to describe the physical principle or phenomena.		
1.5	Improving logical thinking.		

		10. Show the best ways to deal with problem; 11. Keep the question "why" or "how" to explain always there; 12. Build a strategy to solve problem.	
2.0	**Cognitive Skills**		
2.1	How to use physical laws and principles to understand the subject	1. *Preparing main outlines for teaching* 2. Following some proofs 3. Define duties for each chapter 4. Home work assignments 5. Encourage the student to look for the information in different references 6. Ask the student to attend lectures for practice solving problem Ask the student to do small research.	1. Midterm's exam. Exams, short quizzes 2. Asking about physical laws previously taught 3. Writing reports on selected parts of the course Discussions of how to simplify or analyze some phenomena.
2.2	How to simplify problems and analyze phenomena		
2.3	Analyse and explain natural phenomena.		
2.4	Ability to explain the idea with the student own words.		
2.5	Represent the problems mathematically		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Write a report, Develop his English language, Think in solving problems, Search on the internet, Collect the material of the course, Deal with the lost lectures that he missed.	• Lab work • Active learning • Small group discussion	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations
3.2	The students should know how to do that independently and through discussions with the others		
4.0	**Communication, Information Technology, Numerical**		

4.1	Enhancing the ability of students to use computers and internet. Present the electrical circuit	1. Know the basic mathematical principles. 2.Use the web for research. 3.Discuss with the student. 5.Clear the weakness point that should be eliminated. 6.Encourage the student to ask for help if needed. 7.Computational analysis. 8.Data representation. 9.Focusing on some real results and its physical meaning. 10.Lectures for problem solution. 11.Encourage the student to ask good question to help solve the problem	• Evaluation of presentations • Evaluation of reports • Practical exam
4.2	Interpret measurement		
4.3	Present the electrical circuit		
4.4	Know how to write a report.		
5.0	**Psychomotor**		
5.1	Perform the experiments with high accuracy. Operate instruments safely. Draw the data and curves.	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. 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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
2.1				✓														
2.2						✓												
2.3							✓											
2.4						✓												
3.1									✓									
3.2										✓								
4.1													✓					
4.2														✓				
4.3															✓			
4.4																✓		
5.1																	✓	

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

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.

11- The following points may help to get the course effectiveness
- Student evaluation
- Course report
- Program report
- Program Self study

12- According to point 1 the plan of improvement should be given.
13- Contact the college to evaluate the course and the benefit it add to other courses.
14- Add some subject and cut off others depending on the new discoveries in physics.

Name of Instructor: _______ **J.A.OUERFELLI** _______________________
Signature: __ J.A.OUERFELLI __ Date Report Completed: ____2018________

Name of Field Experience Teaching Staff _______Material Science_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ Fahad Alhashmi _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـة العربيـة السعوديـة
الهيئـة الوطنيـة للتقويـم
والاعـتـمـاد الأكـاديـمـي

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

Dr. Walid Belkacem Belhadj

Assistant Professor Of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: belhadj_walid@yahoo.com

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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
Dr. Walid Belkacem Belhadj
Email: belhadj_walid@yahoo.com
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)

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:**	**2**	**8**

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.		
❖ **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.	**2.5**	**10**
❖ **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	**2.5**	**10**
❖ **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**
	15 weeks	**60 hrs**

Course Unit/Credit hours	**4 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**60**	**105**
	Practical	**0**	**0**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**68**	**140**
	Total Sum:	**208**	
Credit	**7 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	60	0	0	0	8	68
Credit	4	0	0	0	0	4
3. Additional private study/learning hours expected of students per week.					9.33	

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. Learning fundamentals of Mathematical Physics. **2.** Understand how to use mathematics as a tool for physics. **3.** Understand how to translate a physical problem in mathematical form. **4.** Ability to solve Physical problems analytically in an efficient way. **5.** Improving the logical thinking. **6.** Developing the learning skills of the students in using computers as an educational tool, problem solving and demonstration.	• The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. • Starting each Chapter by general idea and the benefit of the Mathematical tool. • Solving examples during the lecture time. • Show the best ways to deal with the problem. • Build a problem solving strategy. • All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.	Solve some example during the lecture. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) Oral exams Discussions during the lectures.

		• Using computer simulations. • Enable reference books and scientific websites concerning Theoretical Methods in Physics.	
2.0	**Cognitive Skills**		
	1. Develop analytic skills. **2.** Develop problem-solving skills. **3.** Develop ability to think creatively. **4.** Improve memory skills. **5.** Improve mathematical skills. **6.** Analyse and explain natural physical problem.	**1.** Develop ability to synthesize and integrate information. **2.** Encourage the students to use different learning resources. **3.** Writing the final answer in concise form when possible. **4.** Writing an equation/physical law in wards. **5.** Using shortest way to reach the final answer. **6.** Using appropriate symbols that can be easily memorized. **7.** Discussions of how to simplify or analyse physical problem.	1.Midterm's exam. Exams, short 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
3.0	**Interpersonal Skills & Responsibility**		
	1. Develop ability to work independently. **2.** Develop ability to work productively with others. **3.** Improve self-esteem. **4.** Develop leadership skills.	**1.** Homework assignment for each group of the students. **2.** Homework assignments that should be worked out independently. **3.** Cooperative learning. **4.** Microteaching. **5.** Search through the internet and use the library. **6.** Develop their interest in Science through :(lab work, field trips, visits to scientific and research.	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations

4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate effectively in oral and written form	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Homework. • Final exams.
4.2	Collect and classify the material for a course		
4.3	Use basic physics terminology in English		
4.4	Acquire the skills to use the internet communicates tools.		
5.0	**Psychomotor**		

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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
2.1				✓														
2.2						✓												
2.3							✓											
2.4						✓												
3.1									✓									
3.2										✓								
4.1													✓					
4.2														✓				
4.3															✓			
4.4																✓		
5.1																	✓	

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)	8th week	15%
5	Midterm Exam (2)	11th week	15%
6	Final Exam	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

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, 6th 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. 15- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report • Program Self study 16- According to point 1 the plan of improvement should be given.

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

Signature:_______ *Walid Belkacem Belhadj* ___Date Report Completed:___2018___

Name of Field Experience Teaching Staff _______Theoretical Physics_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

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

T6. Course Specifications (CS)

Course title: Classical Mechanics 1

Course code: 4033143-4

Dr. Fatma El-Sayed Mahrous

Associate Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: feothman@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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 **Dr. Fatma El-Sayed Mahrous** Email: feothman@uqu.edu.sa
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)

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 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** 23- Physical quantities and units. 24- Scalar and vector quantities. 25- Formal definition and rules. 26- The Scalar and Vector Products. 27- Triple products 28- Derivative of a vector. 29- Position vector of a particle velocity and Acceleration in Rectangular Coordinates. 30- Velocity and Acceleration in Polar Coordinates. 31- 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.	**3**	**12**
❖ **Oscillations** 1- Linear Resorting 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**
	15 weeks	**60 hours**

Course Unit/Credit hours	4 credit hours		
Students workload:		Contact hours	Private study
	Lecture	60	105
	Practical	0	0
	Assignments	0	15
	Exams & Quizzes	8	20
	Sum	68	140
	Total Sum:	208	
Credit	7 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	60	0	0	0	8	68
Credit	4	0	0	0	0	4
3. Additional private study/learning hours expected of students per week.					9.33	

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 1.2	Define the physical quantities (vector quantities, scalar quantities, velocity, acceleration, force, linear momentum, angular momentum, work, Newton's law, simple harmonic motion, damped oscillation, Kepler's law, and center of mass of a system). Describe the rectilinear motion, Newton's law of motion, damped harmonic motion, forced harmonic motion, the constrained motion of a particle, Kepler's laws of planetary motion, and motion of two interacting bodies using mathematics.	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 .
2.0	**Cognitive Skills**		
2.1	Calculate some quantities using laws of physics (energy equation of the orbit, periodic time of orbital motion, and orbital energies in an inverse square field).	1. Preparing main outlines for teaching. 2. Following some proofs. 3. Define duties for each chapter	1. Exams (Midterm, final, quizzes) 2. Asking about physical laws previously taught

2.2	Solve problems related to the motion of a particle in a resisting medium, the motion in rotating coordinate system, and the motion in the central field by using suitable mathematics.	4. Encourage the student to look for the information in different references. 5. Ask the student to attend lectures for practice solving problem.	3. Discussions of how to simplify or analyze some phenomena.
2.3	Analyse and interpret quantitative results.		
2.4	Apply physical principles on day life phenomena (vertical motion in air or through any fluid, effects of the earth's rotation, and Rocket motion).		
2.5	Derive the physical laws and formulas related to the motion of particle in rotating coordinate systems, the motion of particle in a central field, and the motion of two interacting bodies.		
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. • Write a scientific report.	• Evaluate the scientific reports. • Evaluate the team work in small groups. • Evaluate the efforts of each student in preparing the report.
3.2	Write a scientific report effectively.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Demonstrate the scientific reports effectively.	• 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	• Evaluation of student presentations. • Evaluating the scientific reports. • Evaluating activities and homework
4.2	Research about the material related to the course.		
4.3	Operate scientific software to calculate some problems related to the course.		
5.0	**Psychomotor (NA)**		
5.1	Prepare the material for the class.	Preparing main outlines for the class.	Discussions during the lectures

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	3.3	3.4	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	5 %
3	In-Class Problem solving	All weeks	5 %
4	Midterm Exam1 (theoretical)	6^{th} week	15%
5	Midterm Exam2 (theoretical)	11^{th} week	15%
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)

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. (2 hours per week)

E Learning Resources

1. List Required Textbooks

G. R. Fowles and G. L. Cassiday, "Analytical Mechanics", 7^{th} edition, Brooks Cole (2005).
G. R. Fowles, "Analytical Mechanics", 3^{rd} edition, Holt, Rinehart and Winston (1977).
Antonio Fasano, Stefano Marmi, "Analytical mechanics: an introduction", translated by Beatrice Pelloni (2013).

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.) 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.

17- The following points may help to get the course effectiveness
- Student evaluation
- Course report
- Program report
- Program Self study

18- According to point 1 the plan of improvement should be given.

Name of Instructor: _______**Fatma El-Sayed Mahrous**____________________

Signature: Fatma El-sayed Date Report Completed: ___2018__

Name of Field Experience Teaching Staff _______Theoretical Physics_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

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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: Quantum Mechanics 1

Course code: 4033145-4

Dr. Abdelrahman Lashin

Associate Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: aylashin@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **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 **Dr. Abdelrahman Lashin** Email: aylashin@uqu.edu.sa
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	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? 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 $\|\ell, \mathbf{m}\rangle$ 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.	**2**	**8**
❖ **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.	**2**	**8**
	15 weeks	**60 hrs**

Course Unit/Credit hours	4 credit hours		
Students workload:		Contact hours	Private study
	Lecture	60	105
	Practical	0	0
	Assignments	0	15
	Exams & Quizzes	8	20
	Sum	68	140
	Total Sum:	208	
Credit	7 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	60	0	0	0	8	68
Credit	4	0	0	0	0	4
3. Additional private study/learning hours expected of students per week.						9.33

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.)

de #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods

1.0	**Knowledge**		
1.1	Define the nature and operations of quantum mechanics.	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. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) E) Discussions during the lectures. F) Home work. G) Discussions during the class.
1.2	Describe familiarity with theories and concepts used in the quantum mechanics.	1. Lectures 2. Tutorials 3. Homework 4. Oral discussion	
1.3	List the steps required to carry out a piece of research on a topic within quantum mechanics	1. Lectures 2. Tutorials 3. Homework 4. Oral discussion	
2.0	**Cognitive Skills**		
2.1 2.2 2.3	Explain appropriate theories, principles and concepts relevant to the quantum mechanics. Analyze the information from a variety of sources relevant to quantum mechanics. prepare a reasoned argument to the solution of familiar and unfamiliar problems relevant to mathematical equations in quantum mechanics.	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.Midterm's exam. Exams, short 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
3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2 3.3	Illustrate practical activities using techniques and procedures appropriate to mathematic related to quantum mechanics. Write a piece of independent research using mathematics media and techniques in quantum mechanics.. Evaluate and solve problems relevant to quantum mechanics	• Search through the internet and use the library. • Lab work. • Small group discussion. • Enhance educational skills. • Develop their interest in Science through :(lab work, field trips, visits to scientific and research. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations

4.0	Communication, Information Technology, Numerical		
4.1	Interpret data relevant to quantum mechanics.	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Practical exam • Homework. • Final exams.
4.2	Operate effectively as part of a group, involving leadership, group dynamics and interpersonal skills such as listening, negotiation and persuasion relevant to mathematics and theoretical physics.		
4.3	Self-appraise and reflect on practice relevant to quantum mechanics.		
5.0	**Psychomotor**		
5.1	N/A	N/A	N/A

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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2	✓																	
1.3									✓									
2.1			✓															
2.2							✓											
2.3					✓													
3.1															✓			
3.2									✓									
3.3						✓												
4.1													✓					
4.2										✓								
4.3															✓			

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, Participation, In-Class Problem Solving	All weeks	10 %
2	Report	All weeks	10 %
4	Midterm 1	6^{th} week	15%
5	Midterm 2	10^{th} week	15%
6	Final Exam	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. S. Gasiorowicz, "Quantum Mechanics", John Wiley & Sons, Inc., 3^{rd} 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. 19- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report • Program Self study 20- According to point 1 the plan of improvement should be given.

Name of Instructor: _______**Abdelrahman Lashin**______________________________

Signature: ________ *Abdelrahman Lashin* _____ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Solid State Physics_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

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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: Heat and Thermodynamics

Course code: 4033110-3

Dr. Mona Mohaseb

Assistant Professor of Physics

Department of Physics, College of Applied Science

Umm Al-Qura University, Fax: (012) 5564560

Email: marefaie@uqu.edu.sa

P.O. Box 715, Makkah 21955

Kingdom of Saudi Arabia

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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: **Heat and Thermodynamics (4033110-3)**
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. Mona Mohaseb** Email: marefaie@uqu.edu.sa			
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)			
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**

Course Unit/Credit hours	3 credit hours		
Students workload:		Contact hours	Private study
	Lecture	45	90
	Practical	0	0
	Assignments	0	15
	Exams & Quizzes	8	20
	Sum	53	125
	Total Sum:	178	
Credit	6 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	45	0	0	0	8	53
Credit	3	0	0	0	0	3
3. Additional private study/learning hours expected of students per week.					8.33	

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	Recognize basic information and principles In heat and thermodynamics	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. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) Oral exams Discussions during the lectures.
1.2	Recognize the laws of thermodynamics and its applications in different fields	1. Demonstrating the basic information and principles through lectures. 2.Lecturing method: Board, Power point. 3.Discussions 4.Brain storming	1. Quizzes, midterm, and final exams. 2. Homework.

2.0	**Cognitive Skills**		
2.1 2.2 2.3 2.4	Solve problems in thermodynamics by using suitable laws Solve problems in Physics by using suitable mathematical principles Analyse and interpret quantitative results Express the physical phenomena mathematically.	1. Following some proofs. 2. Define duties for each chapter. 3. Homework assignments. 4.Encourage the student to look for the 5.information in different references	1.Midterm's exam. Exams, short 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
3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2	Show responsibility for self-learning to be aware with recent developments in physics Work effectively in groups and exercise leadership when appropriate.	• Search through the internet and use the library. • Lab work. • Small group discussion. • Enhance educational skills. • Develop their interest in Science through :(lab work, field trips, visits to scientific and research. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of students presentations
4.0	**Communication, Information Technology, Numerical**		
4.1 4.2 4.3 4.4	Communicate effectively in oral and written form Collect and classify the material for a course Use basic physics terminology in English Acquire the skills to use the internet communicates tools.	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Practical exam • Homework. • Final exams.

5.0	Psychomotor		
5.1	NA	NA	NA
	NA	NA	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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
2.1				✓														
2.2						✓												
2.3							✓											
2.4						✓												
3.1									✓									
3.2										✓								
4.1													✓					
4.2														✓				
4.3															✓			
4.4																✓		

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. 21- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report • Program Self study 22- According to point 1 the plan of improvement should be given.

Name of Instructor: _______**M.A. Mohaseb**_______________________________________

Signature: ________ *M.A. Mohaseb* _____ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Solid State Physics_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـة العربيـة السعوديـة
الهيئـــة الوطنيـــة للتقـويـم
والاعــتــمـــاد الأكـــاديـمـــي

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 1

Course code: 4033132-3

Dr. M. BOUSTIMI

Assistant Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: mohamed.boustimi@gmail.com

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **Electromagnetism 1 (code: 403201-3)**
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 **Dr. M. BOUSTIMI** Email: mohamed.boustimi@gmail.com
5. Level/year at which this course is offered : **3^{nd} Year / Level 6**
6. Pre-requisites for this course (if any) : **Classical Physics (403200-4)**
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? 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	3	9

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.		
❖ **Microscopic Theory of Dielectrics** 1-Molecular Field in Dielectric 2-Induced Dipoles 3-Polar Molecules 4-Ferroelectricity	**2**	**6**
❖ **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.	**2**	**6**
❖ **Electric Current** 1-Current Density & Equation of Continuity 2-Ohm's Law 3-Steady Currents in continuous Media 4-Microscopic Theory of Conduction.	**2**	**6**
	15 weeks	**45hrs**

Course Unit/Credit hours	**3 Credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**65**
	Practical	**0**	**0**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**53**	**100**
	Total Sum:	**153**	
Credit	**5 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**45**	**0**	**0**	**0**	**8**	**53**
Credit	**3**	**0**	**0**	**0**	**0**	**3**

3. Additional private study/learning hours expected of students per week. **6.67**

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 quantity of electrostatic field and electric flux	1. The methodology of teaching that includes a curriculum design, planning and delivering teaching and assessment, combination of lectures and web-interactions by the lecturer. These will give the opportunity of students to understand the basic science of the electromagnetic and its different applications in life. 2. Feedback and evaluation that include:	1. Periodical quizzes, assignments and homework 2. First and second mid- term exam and final exam 3. Emphasis of the students in the presence of the lecture continuously 4. Making the students are working small projects and report for electromagnetically and its applications around us.
1.2	Describe the concepts and theoretical in the electrostatic		
1.3	Identify the new research and application		

		• Flipping the lecture by using quizzes, blackboard, power point and e-learning • Effective by solve some examples during the lecture • Reflective learning, multi-cultural of electromagnetic and emotional intelligence. • Creating productive online electromagnetic for learning and teaching, transition and participation into education. • Observing teaching and learning and creating productive classroom. • Small group teaching and assessment learning. • Designing and implementing an 'outcomes-based' curriculum. • Teaching for reflective learning and research methods. • Seminar presentation and on-line learning process with (images and movies) • Collect the new information about what the new in electromagnetic • Enable the reference books and scientific sites concerning electromagnetic and its application in internet. • Teaching for employability, • Monitoring the student experience	5. Ask the student to clear the miss understanding of the course
2.0	**Cognitive Skills**		
2.1	Analyze the different formation and sources of electrostatic.		

2.2	Apply the theoretical laws and principles relevant to electrostatic	1. Preparing main outlines for teaching in the starting of the lecture 2. Define tasks for each chapter 3. Open discussions during the lectures 4. Brain storming, group work, homework assignments and small project 5. Encourage the student to look for the information in different sources	1. All exams and short quizzes must contain questions that can measure these skills. 2. Asking the students about physical meaning and laws previously taught 3. Emphasize the student writing reports on selected parts of the course 4. Discussions of how to simplify or analyses after the lecture
2.3	Demonstrate a reasoned argument to simplify problems and analyze phenomena in electrostatic.		
2.4	Critically assess, evaluate, explain the idea with the student own words, identify, formulate and solve the electrostatic represent the problems mathematically		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Learn independently and take up responsibility	1. Learn how to search the internet and use the library 2. Teamwork and small group discussion 3. Interactive learning 4. Case Study	1. Making quizzes on the previous lecture. 2. Checking report and evaluate the efforts and scientific values of each student in preparing report. 3. Mini project and evaluate the work in team 4. Evaluation of the role of each student in teamwork assignment 5. Assignments and evaluation of students presentations
3.2	Fluent in dealing with others and collaborative work.		
3.3	Plan, design, record, execute and communicate a piece of independent research in electrostatic		
3.4	Respond to the change of electromagnetic information and analyses electrostatic data.		
3.5	Choose representative examples for each group of electrostatic.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Enhance the ability of students to use computers and internet.	1. Know the basic physical principles of electromagnetic. 2. Discuss with the student	1. Their interaction with the lectures and discussions 2. Evaluation of presentations 3. Evaluation of reports
4.2	Demonstrate the physical phenomena, present physical phenomena orally		

4.3	Know how to write a report.	3. Homework (preparing a report on some topics related to the course depending on web sites). 4. Seminars presentation 5. Field visits to laboratory and factories	4. Oral discussion
4.4	Computation and problem solving		
4.5	Data analysis and interpretation and feeling physical reality of results		
5.0	**Psychomotor**		
5.1	NA		

Course LOs #	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	2.5	3.1	3.2	3.3	3.4	3.5	4.1	4.2	4.3	4.4	4.5	5.1
1.1	✓																			
1.2		✓																		
1.3			✓																	
1.4																				
2.1					✓															
2.2						✓														
2.3							✓													
2.4								✓												
2.5																				
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3.3												✓								
3.4													✓							
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4.1															✓					
4.2																✓				
4.3																	✓			
4.4																		✓		
4.5																				
5.1																				**NA**
5.2																				**NA**

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.

23- The following points may help to get the course effectiveness

- Student evaluation
- Course report
- Program report
- Program Self study

24- According to point 1 the plan of improvement should be given.

Name of Instructor: _______ M. BOUSTIMI_______________________________________

Signature: ________ M. BOUSTIMI _____ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Theoretical Physics_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ Fahad Alhashmi _ Date Received: ______2019_____

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T6. Course Specifications (CS)

Course title: Quantum Mechanics 2

Course code: 4033146-3

Dr. Nuha A. Felemban

Assistant Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: nafelemban@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

Course Specifications

Institution: **Umm AL – Qura University**	Date : **9/1439**
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 **Dr. Nuha A. Felemban** Email: nafelemban@uqu.edu.sa
5. Level/year at which this course is offered: **3rd Year / Level 6**
6. Pre-requisites for this course (if any) : **Quantum Mechanics (1) (4033145-3)**
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?

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

- Construct the spin matrices.
- Fulfilment operation of addition of angular momenta and spin.
- Calculate the commutation relations of angular momentum.
- Explain the motion of charged particle of spin 1/2 in magnetic field.
- Writing the Hamiltonian with taking the energy corrections into account.
- Find the ground state of energy by variational principle.
- Obtain the approximate solutions to the time independent Schrodinger equation by the WKB approximation.
- Apply the time-independent (-dependent) perturbation theory on different system.
- Calculate the scattering amplitude by two techniqes.

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)

- Review the course description frequently and rewrite it according to modern data.
- Develop learning strategies to increas student understanding of physical phenomena.
- Encourage the student to use massive open online courses (MOOCs).
- Increased student understanding by mentioning the applications of physical principle

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.	**2**	**6**

• Spin; Spin Representation and Pauli matrices. • Addition of angular Momenta and spin.		
❖ **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.	**3**	**9**
	15 weeks	**45 hrs**

Course Unit/Credit hours	**3 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**90**
	Practical	**0**	**0**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**53**	**125**
	Total Sum:	**178**	
Credit	**6 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**45**	**0**	**0**	**0**	**8**	**53**
Credit	**3**	**0**	**0**	**0**	**0**	**3**
3. Additional private study/learning hours expected of students per week.						**8.33**

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	Recognize the matrix representation and operator method in quantum mechanics.	• Discussions • Brain storming • Lecturing method: Board, PPT, pictures and diagrams	• Quizzes (E-learning) • Short exams (mid- term exams) • Long exams (final) • Oral exams • Discussions during the lectures.
1.2	Define the princples and quantities in quantum mechanics, like spin, Zeeman effect, Variational principle, scattering amplitude and life time.		
1.3	Describe the motion of charged particle of spin 1/2 in both uiform and inhomogeneouse magnetic field.		
1.4	List the different methods to obtain the approximate solutions to the time independent Schrodinger equation.		
1.5	Outline the different types of energy corrections in Hydrogyn atom.		
2.0	**Cognitive Skills**		

2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 2.10 2.11 2.12 2.13 2.14	The ability to Construct the spin matrices. The ability to addition of angular momentum and spin properly. Calculate the Clebsh-Gordan coefficients by different ways. Conclude the equations describing the motion of electron (s=1/2) in magnetic field and analyse the resuls Write the Hamiltonian of Hydroge atom by taking the correction into account. Apply the time-independent perturbation theory to find the wave function and energy state (first and second order expantion) Apply the time-independent perturbation theory to find the wave function and energy (degenerate and non degenerate states) Find the ground state of energy by variational principle for different systems. Calculate the energy corrections correctly; fine structure, Zeeman effect and hyperfine structure Calculate the approximate solutions of Schrodenger equation by WKB approximation. Explain the tunnelling phenomenon mathematically. Calculate the transition probability and life time by applying time-dependent perturbation theory. Conclude and apply the selection rules of transition between the states. Calculate the scattering amplitude by two teqniqes:partial wave analysis and Bore approximation.	• Show the best ways to deal with the problem. • Keep the question "why" or "how" in explaination. • Training the student to solve the greatest number of issues	• Quizzes (E-learning) • Short exams (mid- term exams) • Long exams (final) • Oral exams • Reports about analyze results of some phenomena
3.0	**Interpersonal Skills & Responsibility**		
3.1	The ability to take responsibility and take the course instructions seriously.	• Groupe assigments	

3.2 3.3	The ability to be an effective member of the working group Accept different nationalities and respect other opinions	• Clarify deadlines for delivery of assignments, reports and exams	• Evaluate the efforts of each student in preparing the report. • Evaluate the work in teams • Evaluation of students presentations
4.0	**Communication, Information Technology, Numerical**		
4.1 4.2 4.3	Ability to use information technology effectively Ability to collect and display information on a topic related to the course. Solve some mathematical problems numericaly	• Deliver assignments and reports at a specific time via e-learning gate • Essay and reports • Homework • presentation • Encourage the student to use massive open online courses (MOOCs).	• Evaluation of presentations • Evaluation ofessay and reports • Homework.
5.0	**Psychomotor**		
5.1	NA	NA	• 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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1	✓	✓																
1.2		✓																
1.3			✓															

1.4		✓																
1.5		✓																
2.1			✓															
2.2				✓	✓													
2.3				✓														
2.4						✓												
2.5				✓														
2.6				✓		✓	✓											
2.7				✓		✓	✓											
2.8					✓	✓	✓											
2.9					✓	✓	✓											
2.10					✓	✓	✓											
2.11			✓		✓	✓	✓											
2.12						✓	✓											
2.13						✓	✓											
2.14					✓	✓	✓											
3.1									✓									
3.2										✓								
3.3											✓							

4.1											✓	✓		✓
4.2										✓				
4.3											✓	✓		✓
5.1														

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	Activity	All weeks	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)

- The time table for each teacher were available to the student each semester.
- Fix 4 office houers per week

E Learning Resources

1. List Required Textbooks

- David J. Griffiths ”Introduction to Quantum Mechanics”, Pearson Prentice Hall, New York, Second edition (2017).

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

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

- Massiah, Quantum Mechanics, 6th prn. (John Wiley & Sons, Inc., NY, London, Sydney, 1965). Physics , 4th edition, By: J. Walker (2014)
- Nouredine Zettili, "Quantum Mechanics: Concepts and Applications", John Wiley & Sons, Inc. second edition (2009).

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. https:www.coursera.org
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 • Library • Student Lounge • Computer lab
2. Computing resources (AV, data show, Smart Board, software, etc.) • Computer lab • Data show • High speed network connection
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 • The student questionnaires. • Course report
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. • Use modern method of learning (e.g. data show, PPT, movies, e-learning,...) • Link the course to the life application.

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.

25- The following points may help to get the course effectiveness

- Student evaluation
- Course report
- Program report
- Program Self study

26- According to point 1 the plan of improvement should be given.

Name of Instructor: _______ _______**Nuha Felemban**______________

Signature: _________ *Nuha Felemban* _____ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Theoretical Physics_______

Program Coordinator:_**Dr. Fahad Alhashmi**______________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

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

T6. Course Specifications (CS)

Course title: Statistical thermodynamics

Course code: 4033111-3

Dr. Ahmed El-hadi

Associate Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: bioplastics.elhadi1962@yahoo.com

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

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: **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
Email: bioplastics.elhadi1962@yahoo.com
5. Level/year at which this course is offered : **3rd 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.**	**4.5**	**13.5**
❖ **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.**	**4.5**	**13.5**
	15week	**45hrs**

Course Unit/Credit hours	**3 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**90**
	Practical	**0**	**0**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**53**	**125**
	Total Sum:	**178**	
Credit	**6 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	45	0	0	0	8	53
Credit	3	0	0	0	0	3
3. Additional private study/learning hours expected of students per week.						8.33

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	Understand and apply the principles of statistical mechanics on ensembles of molecules. Understand and apply the principles of statistical mechanics on ensembles of molecules. Recognize the association between statistical mechanics and thermodynamics. Understanding of how intermolecular interaction affects the properties of matter.	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. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) Oral exams Discussions during the lectures.
1.2	Use statistical mechanical computer programmers to calculate the properties of macroscopic systems.	1. Demonstrating the basic principle of the experiment.	Home work. Writing scientific Reports. Doing team research or team project.

		2. Show the best ways to perform the experiments 3. Show the best ways to demonstrate the results. 4. Show the best way to write the reports about the experiment. 5. Discussion with the student about the results.	Doing team work to perform some experiments Discussions during the class.
2.0	**Cognitive Skills**		
2.1	Apply the laws of physics.	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	Midterm theoretical exams (2) 30% Homework and Activities 10% quizzes 10% Final exam 50% Discussions of how to simplify or analyze some phenomena
2.2	Solve problems in Physics by using suitable mathematical principles		
2.3	Analyse and interpret quantitative results		
2.4	Express the physical phenomena mathematically.		
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 use the library. • Small group discussion. • Enhance educational skills. • Develop their interest in Science through :(lab work, field trips, visits to scientific and research. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • 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	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Practical exam • Homework. • Final exams.
4.2	Collect and classify the material for a 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	• Evaluate the work in team. • Evaluation of student's presentations. • The ability to search through the library and internet to give information on the course. • The ability to understand and the think of problems by solving the exercises and questions in solving problems.	We will apply the principles of statistics to develop (1) The concepts of ensembles and distribution functions. (2) Statistical mechanical expressions for thermodynamic functions. (3) Models of polyatomic gases, monatomic crystals, polymers.	Asking questions during lectures. Midterm exams and quizzes. Doing homework. Discussion same physical method, check the problems solution.

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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																

1.2			✓															
2.1				✓														
2.2						✓												
2.3							✓											
2.4						✓												
3.1									✓									
3.2										✓								
4.1													✓					
4.2														✓				
4.3															✓			
4.4																✓		
5.1																	✓	

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)	8^{th} week	30%
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)

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.

27- The following points may help to get the course effectiveness

- Student evaluation
- Course report
- Program report
- Program Self study

28- According to point 1 the plan of improvement should be given.

Name of Instructor: _______ **Dr. El-hadi, Ahmed**

Signature: ________ . *El-hadi, Ahmed* _____ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Polymer Physics_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـة العربيـة السعوديـة
الـهيئـــة الوطنيـــة للتقـويـم
والاعــتـمــاد الأكــاديـمـــي

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

T6. Course Specifications (CS)

Course Title: Classical Mechanics (2)

Course Code: 4033144-2

Dr. Doaa A. Mahmoud

Assistant Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: damahmoud@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **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 **Dr. Doaa A. Mahmoud** Email: damahmoud@uqu.edu.sa
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
❖ **Dynamics of Systems of Many Particles** - Center of Mass and Linear Momentum. - Angular Momentum of a System. - Kinetic energy of a system of particles. - Motion of two interacting bodies. The reduced mass. - Collisions. - Oblique collisions and Scattering. Comparison of A laboratory and center-of-mass coordinates. - Impulse in collisions. - Motion of a body with variable mass. Rocket motion.	**4**	**8**
❖ **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.	**5**	**10**
❖ **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.	**3**	**6**

❖ **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.	**3**	**6**
	15 weeks	**30hrs**

Course Unit/Credit hours	**2 Credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**30**	**60**
	Practical	**0**	**0**
	Assignments	**0**	**20**
	Exams & Quizzes	**8**	**30**
	Sum	**38**	**110**
	Total Sum:	**148**	
Credit	**5 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**30**	**0**	**0**	**0**	**8**	**38**
Credit	**2**	**0**	**0**	**0**	**0**	**2**
3. Additional private study/learning hours expected of students per week.						**7.33**

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	Develop important physical concepts of classical mechanics.	1. Demonstrating the basic information and principles through lectures and the achieved applications. 2. Discussing phenomena with illustrating pictures and diagrams. 3. Lecturing method: a. Blackboard. b. Power point. c. e-learning. 4. Tutorials. 5. Revisit concepts. 6. Discussions. 7. Brain storming sessions.	1. Solve some example during the lecture. 2. Exams: 3. Quizzes 4. Short exams (midterm exams) 5. Long exams (final) 6. Oral exams 7. Emphasis of the students in the presence of the lecture continuously 8. Making the students are working report for classical mechanics and its applications around us. 9. Discussions with the students.
1.2	Understand mechanics and dynamics of rigid bodies.		
1.3	Derive equations of motion from the least action principle.		
1.4	Classify the motion of rigid bodies (Eular classification).		
1.5	Use mathematical formulae to describe the physical principles or phenomena.		

		8. Start each chapter by general idea and the benefit of it. 9. Learn the student background of the subject. 10. Show the best ways to deal with problem. 11. Keep the question "why" or "how" to explain always there. 12. Build a strategy to solve problem.	10. Ask the student to clear the misunderstanding of some physical principle. 11. Ask quality question
2.0	**Cognitive Skills**		
2.1 **2.2** **2.3** **2.4** **2.5**	Use physical laws and principles to understand the subject. Simplify problems and analyze phenomena. Analyse and explain natural phenomena. Ability to explain the idea with the student own words. Represent the problems mathematically.	1. Preparing main outlines for teaching. 2. Following some proofs. 3. Define duties for each chapter. 4. Homework assignments. 5. Encourage the student to look for the information in different references. 6. Ask students to attend lectures for practice solving problem. 7. Ask students to do small researches.	1. All exams and short quizzes must contain questions that can measure these skills. 2. Asking the students about physical meaning and laws previously taught. 3. Emphasize the student writing reports on selected parts of the course. 4. Discussions of how to simplify or analyse after the lecture.
3.0	**Interpersonal Skills & Responsibility**		
  3.1 **3.2** **3.3** **3.4** **3.5**	The students should learn independently and take up responsibility through: Writing a report Developing his English language Solving problems Searching on the internet Collecting the material of the course	1. Learn how to search the internet and use the library. 2. Learn how to cover missed lectures. 3. Learn how to summarize lectures or to collect materials of the course. 4. Learn how to solve difficulties in learning: solving problems – enhance educational skills.	1. Quizzes on the previous lecture. 2. Checking report on internet use. 3. Discussion. 4. The accuracy of the result gained by each group will indicate good group work.

		5. Encourage the student to attend lectures regularly by giving bonus marks for attendance. 6. Give students tasks of duties. 7. Learn how to write reports some of them in English language. 8. Teamwork and small group discussion 9. Interactive learning 10. Case Study	5. Presenting the required research on time and the degree of the quality shows the sense of responsibility.
4.0	**Communication, Information Technology, Numerical**		
4.1 **4.2** **4.3**	Communication with others: the lecturer – students in the class IT through: the Internet – computer skills Numerical skills through: solving problems- computation – data analysis – feeling physical reality of results.	1. Know the basic mathematical principles. 2. Use the web for research. 3. Discuss with the student. 4. Measure the mathematical skill by Exams. 5. Clear the weakness point that should be eliminated. 6. Encourage the student to ask for help if needed. 7. Computational analysis. 8. Data representation. 9. Focusing on some real results and its physical meaning. 10. Lectures for problem solution. 11. Encourage the student to ask good question to help solve the problem. 12. Display the lecture note and homework assignment at the web.	1. Interact with lectures and discussions. 2. The reports of different asked tasks. 3. Homework, Problem solutions assignment and exam should focus on the understanding. 4. Results of computations and analysis. 5. Comments on some resulting numbers. 6. Research. .
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**	**1.4**	**1.5**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	**4.1**	**4.2**	**4.3**	**5.1**	**5.2**
1	✓	✓	✓	✓	✓															
2						✓	✓	✓	✓	✓										
3											✓	✓	✓	✓	✓					
4																✓	✓	✓		
5																				

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. 29- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report • Program Self study 30- According to point 1 the plan of improvement should be given. 31- Contact the college to evaluate the course and the benefit it add to other courses. 32- Add some subject and cut off others depending on the new discoveries in physics.

Name of Instructor: _______ **Doaa Abdallah Said**
Signature: ___ . *Doaa Abdallah Said* ___ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Computer in Physics_______

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

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

T6. Course Specifications (CS)

Course Title: Electromagnetism (2)

Course Code: 4034133-3

Prof. Dr. Roshdi S. Awed

Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: rsawed@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **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 **Prof. Dr. Roshdi S. Awed** Email: rsawed@uqu.edu.sa
5. Level/year at which this course is offered : **3rd Year / Level 6**
6. Pre-requisites for this course (if any) : **Electromagnetism 1 (403201-3)**
7. Co-requisites for this course (if any) : **Traditional Physics (403200-4)**
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

2. 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	**1.5**	**4.5**

❖ **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	**1.5**	**4.5**

❖ **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	**4**	**12**
	15 weeks	**45hrs**

Course Unit/Credit hours	**3 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**90**
	Practical	**0**	**0**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**53**	**125**
	Total Sum:	**178**	
Credit	**6 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	45	0	0	0	8	53
Credit	3	0	0	0	0	3

3. Additional private study/learning hours expected of students per week. **8.33**

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 quantity of electromagnetic field and magnetic flux	3. The methodology of teaching that includes a curriculum design, planning and delivering teaching and assessment, combination of lectures and web-interactions by the lecturer. These will give the opportunity of students to understand the basic science of the electromagnetic and its different applications in life. 4. Feedback and evaluation that include: • Flipping the lecture by using quizzes, blackboard, power point and e-learning • Effective by solve some examples during the lecture	6. Periodical quizzes, assignments and homework 7. First and second mid- term exam and final exam 8. Emphasis of the students in the presence of the lecture continuously 9. Making the students are working small projects and report for electromagnetically and its applications around us. 10. Ask the student to clear the miss understanding of the course
1.2	Describe the concepts and theoretical in the electromagnetism		
1.3	Identify the new research and application		

		• Reflective learning, multi-cultural of electromagnetic and emotional intelligence. • Creating productive online electromagnetic for learning and teaching, transition and participation into education. • Observing teaching and learning and creating productive classroom. • Small group teaching and assessment learning. • Designing and implementing an ‘outcomes-based’ curriculum. • Teaching for reflective learning and research methods. • Seminar presentation and on-line learning process with (images and movies) • Collect the new information about what the new in electromagnetic • Enable the reference books and scientific sites concerning electromagnetic and its application in internet. • Teaching for employability, • Monitoring the student experience	
2.0	**Cognitive Skills**		
2.1 2.2 2.3	Analyze the different formation and sources of electromagnetism. Apply the theoretical laws and principles relevant to electromagnetism Demonstrate a reasoned argument to simplify problems and analyze phenomena in electromagnetism.	6. Preparing main outlines for teaching in the starting of the lecture 7. Define tasks for each chapter 8. Open discussions during the lectures 9. Brain storming, group work, homework assignments and small project	5. All exams and short quizzes must contain questions that can measure these skills. 6. Asking the students about physical meaning and laws previously taught

2.4	Critically assess, evaluate, explain the idea with the student own words, identify, formulate and solve the electromagnetic represent the problems mathematically	10. Encourage the student to look for the information in different sources	7. Emphasize the student writing reports on selected parts of the course 8. Discussions of how to simplify or analyses after the lecture
3.0	**Interpersonal Skills & Responsibility**		
3.1	Learn independently and take up responsibility	5. Learn how to search the internet and use the library 6. Teamwork and small group discussion 7. Interactive learning 8. Case Study	6. Making quizzes on the previous lecture. 7. Checking report and evaluate the efforts and scientific values of each student in preparing report. 8. Mini project and evaluate the work in team 9. Evaluation of the role of each student in teamwork assignment 10. Assignments and evaluation of students presentations
3.2	Fluent in dealing with others and collaborative work.		
3.3	Plan, design, record, execute and communicate a piece of independent research in electromagnetics		
3.4	Respond to the change of electromagnetic information and analyses electromagnetic data.		
3.5	Choose representative examples for each group of electromagnetic.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Enhance the ability of students to use computers and internet.	6. Know the basic physical principles of electromagnetic. 7. Discuss with the student 8. Homework (preparing a report on some topics related to the course depending on web sites). 9. Seminars presentation 10. Field visits to laboratory and factories	5. Their interaction with the lectures and discussions 6. Evaluation of presentations 7. Evaluation of reports 8. Oral discussion
4.2	Demonstrate the physical phenomena, present physical phenomena orally		
4.3	Know how to write a report.		
4.4	Computation and problem solving		

4.5	Data analysis and interpretation and feeling physical reality of results		
5.0	**Psychomotor**		
5.1	NA		

Course LOs #	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	2.5	3.1	3.2	3.3	3.4	3.5	4.1	4.2	4.3	4.4	4.5	5.1
1.1	✓																			
1.2		✓																		
1.3			✓																	
1.4																				
2.1					✓															
2.2						✓														
2.3							✓													
2.4								✓												
2.5																				
3.1										✓										
3.2											✓									
3.3												✓								
3.4													✓							
3.5														✓						

4.1									✓					
4.2										✓				
4.3											✓			
4.4												✓		
4.5														
5.1														**NA**
5.2														**NA**

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

3. Foundations of Electromagnetic Theory by Reitz, John R., Milford, Frederick J., Christy, Robert W. [Addison-Wesley, 2008] 4th Edition
4. Electromagnetic Fields and Waves by Paul Lorrain, Dale R. Corson, Francois Lorrain [W. H. Freeman and Company, 1988] 3rd Edition
5. 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.) 33- Lecture room for 30 students, Black (white) boards 34- 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 35- Questionaries 36- Open discussion in the class room at the end of the lectures 37- Meeting with students 38- Open door policy
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department 39- Revision of student answer paper by another staff member. 40- Analysis the grades of students. 41- 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: ___ . *Roshdi Seoudi* ___ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Nanotechnology and Spectroscopy

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئـــة الوطنيـــة للتقـويـم
والاعــتــمــاد الأكــاديــمــي

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

T6. Course Specifications (CS)

Course title: Nuclear Physics

Course code: 4034160-4

Prof. Dr. Adel M. Al Madani

Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: ammadani@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **Nuclear Physics (code: 4034160-4)**
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
Email: 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)

7. Explain strategy of the course in the beginning of the semester
8. Outlines of the Nuclear concepts, theories and the associated proofs.
9. Highlighting the day life applications whenever exist.
10. Encourage the students to see more details in the international web sites and reference books in the library.
11. Discussing some selected problems in each chapter.
12. Cooperate with different institution to find how they deal with the subject
13. 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	1.5	3
2- Pions & Mions		1.5
3- Kaons & Hyperons	1.5	3
4- Classi Fiction of demeray Pancles		1.5
Total	15	45

Course Unit/Credit hours	**4 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**60**
	Practical	**42**	**20**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**95**	**115**
	Total Sum:	**210**	
Credit	**7 ECTS C.Ps**		

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

	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**45**	**0**	**0**	**42**	**8**	**95**
Credit	**3**	**0**	**0**	**1**	**0**	**4**

3. Additional private study/learning hours expected of students per week. **7.67**

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	Recognize facts, principle and concepts of elementary Physics	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..	1. Solve some example during the lecture. 2. Exams: a) Online Quizzes b) First mid-term exam c) Second Mid term exam d) Oral exams e) Final exams 3. Discussions with the students. 4. Ask the student to clear the misunderstanding of some mathematical principle. 5. Ask quality question

1.2	Describe concepts, Procedures of some experiments in Nuclear physics.	1. Demonstrating the basic principle of the Nuclear experiment. 2. Show the best ways to perform the experiments 3. Show the best ways to demonstrate the results. 4. Show the best way to write the reports about the experiment. 5. Discussion with the student about the results.	Home work. Writing scientific Reports. Doing team research or team project. Doing team work to perform some experiments Discussions during the class.
2.0	**Cognitive Skills**		
2.1 2.2 2.3 2.4	Apply the laws of physics. Solve problems in Physics by using suitable mathematical principles Analyse and interpret quantitative results Express the physical phenomena mathematically.	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. Midterm's exam. Exams, short 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
3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2	Show responsibility for self-learning to be aware with recent developments in physics Work effectively in groups and exercise leadership when appropriate.	• Search through the internet and use the library. • Lab work. • Small group discussion. • Enhance educational skills. • Develop their interest in Science through :(lab work, field trips, visits to scientific and research. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations

4.0	**Communication, Information Technology, Numerical**		
4.1 4.2 4.3 4.4	Communicate effectively in oral and written form Collect and classify the material for a course Use basic physics terminology in English Acquire the skills to use the internet communicates tools.	• Homework • Preparing a report on some topics related to the course depending on web sites. • Computation • Problem solving • Data analysis and interpretation. • Feeling physical reality of results •	• Evaluation of presentations • Evaluation of reports • Practical exam • Homework. • Final exams. •
5.0	**Psychomotor**		
5.1	Use a perfect experimental tools to solve Physics problems in the Labs	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. 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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
2.1				✓														
2.2						✓												
2.3							✓											
2.4						✓												
3.1									✓									
3.2										✓								
4.1													✓					
4.2														✓				
4.3															✓			
4.4																✓		
5.1																	✓	

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	5^{th} week	20 %
2	Midterm 2	10^{th} 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. 42- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report • Program Self study 43- According to point 1 the plan of improvement should be given.

Name of Instructor: _______**A.M.MADANI**____________________________

Signature: ___ . *A.M.MADANI* ___ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Solid State Physics

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـة العربيــة السعوديــة
الهيئـــة الوطنيـــة للتقـويـم
والاعــتــمــاد الأكــاديــمـــي

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

Dr. Mehrez Lolo

Assisstant Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: mehrezl@yahoo.fr

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **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 **Dr. Mehrez Lolo** Email: mehrezl@yahoo.fr
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)

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 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** 10- Review of atomic structure 11- Atomic binding and band theory 12- Binding forces between atoms 13- Lattice Energy Calculations 14- Types of bonds 15- Nucleation and growth kinetic 16- Experimental methods of crystal growth	**1.5**	**6**
❖ **Crystal Structure** 32- Long range and short rang order 33- The crystalline state 34- Basic definitions of crystallography 35- The seven crystal systems 36- Wigner Seitz primitive cell 37- Symmetry elements of crystals 38- Important plane systems in a cubic crystals 39- Miller's indices for crystal planes	**1.5**	**6**
❖ **Crystal Properties** 15- Crystal Directions and distance between crystal plans 16- Zone , Zone Axis and angles between zones 17- Atomic structure of crystals 18- Cubic and hexagonal close-packed 19- Characteristic of FCC and BCC structure 20- The crystal structure of some simple crystals	**1.5**	**6**
❖ **Structural Defects in Crystals** 25- Point defects and Free energy of a crystal 26- Point defects in ionic crystals 27- Line defects and types of dislocation 28- Planer defects 29- Determination of vacancies concentration and the activation energy	**1**	**4**
❖ **X-Rays Diffraction in Crystals** 8- Used rays in studying crystal structure 9- Generation and properties of X-rays 10- X-Rays scattering from an atom 11- X-Rays scattering from a crystal and Reciprocal lattice	**1.5**	**6**

❖ **Lattice Vibrations** 10. Elastic waves 11. Modes of vibrations and density of states of a continuous medium 12. The phonon 13. Elastic and non-elastic scattering 14. Lattice waves of one-atomic linear chain 15. Vibration Modes of 1D diatomic	**1**	**4**
❖ **Free electrons in metals** 14. The Electrical Conductivity in Metals 15. The Specific Resistance in Metals 16. The Electrical and Thermal Conductivity in Metals 17. The Quantum Theory in Free Electrons 18. Ground State Property of Free Electrons 19. Electronic Specific Heat of Metals 20. 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**

Course Unit/Credit hours	**4 credit hours**		
		Contact hours	**Private study**
Students workload:	**Lecture**	**60**	**107**
	Practical	**0**	**0**
	Assignments	**0**	**15**

	Exams & Quizzes	**8**	**20**
	Sum	**68**	**142**
	Total Sum:	**210**	
Credit	**7 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**60**	**0**	**0**	**0**	**8**	**68**
Credit	**4**	**0**	**0**	**0**	**0**	**4**
3. Additional private study/learning hours expected of students per week.					**9.46**	

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	At the end of the program the student should be able to : 1- List the atomic theory and binding forces 2- Describe the crystal structure 3- Describe the crystal properties 4- List the structural defects in crystals 5- Understand the X-Rays diffraction in crystals 6- Describe the lattice vibrations 7- Understand the free electrons in metals 8- Describe the band theory in the solids 9- Describe the Thermal properties of solid materials	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. Homework. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) Oral exams Discussions during the lectures.
2.0	**Cognitive Skills**		
2.1	Differentiate between the different types of binding in solid materials.	1. Preparing main outlines for teaching 2.Following some proofs	1.Midterm's exam. Exams, short quizzes

2.2 2.3 2.4	List the different types of crystal structure Analyse the electrical and thermal conductivity in Metals Interpret the band theory in solids and Explain methods of measurement and assessment of properties of solids.	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
3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2 3.3 3.4	Evaluate solid state physics information. Analyse solid state physics data. Judge the importance of solid state physics. Choose representative examples for each group of solid state physics.	• Search through the internet and use the library. • Small group discussion. • Enhance educational skills. • Develop their interest in Science through: field trips, visits to scientific and research. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of students presentations
4.0	**Communication, Information Technology, Numerical**		
4.1 4.2 4.3 4.4	Communicate effectively in oral and written form Collect and classify the material for a course Use basic physics terminology in English Acquire the skills to use the internet communicates tools.	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Homework. • Final exams.
5.0	**Psychomotor**		
5.1			

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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
1.3			✓															
1.4			✓															
1.5			✓															
1.6			✓															
1.7			✓															
1.8			✓															
1.9			✓															
2.1				✓														
2.2					✓													
2.3							✓											
2.4					✓													
3.1									✓									
3.2										✓								
3.3											✓							

3.4												✓						
4.1													✓					
4.2														✓				
4.3															✓			
4.4																✓		

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)	6th week	15%
4	Written Test (2)	11th week	15%
5	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
   1- Charles Kittel, Introduction to Solid State Physics 7th 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, 2nd 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. 44- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report • Program Self study 45- According to point 1 the plan of improvement should be given.

Name of Instructor: _______**Loulou Mehrez**

Signature: ___ . *Loulou Mehrez* ___ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Solar Cells

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

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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

Dr. Walid Benlhadj

Assistant Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

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Kingdom of Saudi Arabia

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

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والاعـتـمـاد الأكـاديـمـي

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 **Dr. Walid Belkacem Belhadj** Email: belhadj_walid@yahoo.com
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) 4033142-4**
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 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:**	**2**	**6**

The logical data type, Branches, Additional plotting features, the while Loop, the FOR Loop, Logical arrays, Vectors, examples, Solving exercises.		
❖ **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**

Course Unit/Credit hours	**3 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**90**
	Practical	**0**	**0**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**53**	**125**
	Total Sum:	**178**	
Credit	**6 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**45**	**0**	**0**	**0**	**8**	**53**
Credit	**3**	**0**	**0**	**0**	**0**	**3**
3. Additional private study/learning hours expected of students per week.						**8.33**

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**		
	7. Learning fundamentals of computational Physics. **8.** Understand how to translate a physical problem in mathematical form. **9.** Ability to solve Physical problems numerically in an efficient way. **10.** Improving the logical thinking. **11.** Understand how to Use mathematical software to describe the physical principle or phenomena. **12.** Developing the learning skills of the students in using computers as an educational tool, problem solving and demonstration.	• The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. • Starting each Chapter by general idea and the benefit of the Mathematical and numerical tools. • Solving examples during the lecture time. • Show the best ways to deal with the problem. • Build a problem solving strategy. • All students will be involved in on-line learning process and each student is	Solve some example during the lecture. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) Oral exams Discussions during the lectures.

		required to create an E-mail address to facilitate student web interactions. • Using computer simulations. • Enable reference books and scientific websites concerning computational techniques in Physics.	
2.0	**Cognitive Skills**		
	7. Develop analytic skills. **8.** Develop problem-solving skills. **9.** Develop ability to think creatively. **10.** Improve memory skills. **11.** Improve mathematical skills. **12.** Analyse and explain natural physical problem. **13.**	**8.** Develop ability to synthesize and integrate information. **9.** Encourage the students to use different learning resources. **10.** Writing the final answer in concise form when possible. **11.** Writing an equation/physical law in wards. **12.** Using shortest way to reach the final answer. **13.** Using appropriate symbols that can be easily memorized. **14.** Discussions of how to simplify or analyse physical problem.	1.Midterm's exam. Exams, short 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
3.0	**Interpersonal Skills & Responsibility**		

	5. Develop ability to work independently. **6.** Develop ability to work productively with others. **7.** Improve self-esteem. **8.** Develop leadership skills.	**7.** Homework assignment for each group of the students. **8.** Homework assignments that should be worked out independently. **9.** Cooperative learning. **10.** Microteaching. **11.** Search through the internet and use the library. **12.** Develop their interest in Science through :(lab work, field trips, visits to scientific and research.	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate effectively in oral and written form	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Homework. • Final exams.
4.2	Collect and classify the material for a course		
4.3	Use basic physics terminology in English		
4.4	Acquire the skills to use the internet communicates tools.		
5.0	**Psychomotor**		

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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
2.1				✓														
2.2						✓												
2.3							✓											
2.4						✓												
3.1									✓									
3.2										✓								
4.1													✓					
4.2														✓				
4.3															✓			
4.4																✓		
5.1																	✓	

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. 46- The following points may help to get the course effectiveness • Student evaluation • Course report • Program report • Program Self study 47- According to point 1 the plan of improvement should be given.

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

Signature: ___ . *Walid Belkacem* ___ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Theoretical Physics

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـــة العربيـــة السعوديـــة
الهيئـــــة الوطنيـــــة للتقـويـــم
والاعــتــمــاد الأكــاديــمـــي

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

T6. Course Specifications (CS)

Course title: Radiation physics

Course code: 4034162-3

Dr. Elhusseiny E. Mohamad

Assistant professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: eemohamad@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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 **Dr. Elhusseiny E. Mohamad** Email: eemohamad@uqu.edu.sa
5. Level/year at which this course is offered : **4^{st} 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	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-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** 40- The energy transfer. 41- Range of heavy charged particles (alpha particles). 42- 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** 30- Radiation flux density 31- The exposure. 32- Roentgen. 33- The radiation absorbed dose. 34- Relative biological effectiveness.	1	3
❖ **Units of Radiation Dosimetry** 12- -The radiation-weighting factor. 13- -The tissue equivalent dose. 14- -The tissue-weighting factor. 15- -The effective dose. 16- 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** 21. motion of electrons and ions in gases - The drift motion. - The attachment - The recombination 22. -The electron and ion currents in gases 23. The gas detectors :the ionization chamber, 24. The proportional counters, Geiger-Muller counters. 25. The scintillation detectors. 26. -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** 10. The natural and non-made sources of radiation and their sources (cosmic rays, the terrestrial radiation, the radon gas), 11. The artificial sources of radiation (the diagnostic radiology, therapeutic radiology, the nuclear energy and industries, the radioactive waste, the radioactive dust), 12. Techniques of protection (time, distance, shields).	**1**	**6**
❖ **Fundamental Sciences** 11. -Quantities and units in science and engineering Background information 12. -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:

14. 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.

Course Unit/Credit hours	**3 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**45**	**90**
	Practical	**0**	**0**
	Assignments	**0**	**15**
	Exams & Quizzes	**8**	**20**
	Sum	**53**	**125**
	Total Sum:	**178**	
Credit	**6 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**45**	**0**	**0**	**0**	**8**	**53**
Credit	**3**	**0**	**0**	**0**	**0**	**3**
3. Additional private study/learning hours expected of students per week.						**8.33**

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	Recognize facts, principle and concepts of elementary Physics	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. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) Oral exams Discussions during the lectures.
1.2	Describe concepts, Procedures of some experiments in physics	1. Demonstrating the basic principle of the experiment. 2. Show the best ways to perform the experiments 3. Show the best ways to demonstrate the results.	Home work. Writing scientific Reports. Doing team research or team project. Doing team work to perform some experiments Discussions during the class.

		4. Show the best way to write the reports about the experiment. 5. Discussion with the student about the results.	
2.0	**Cognitive Skills**		
2.1	Apply the laws of physics.	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.Midterm's exam. Exams, short 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 mathematical principles		
2.3	Analyse and interpret quantitative results		
2.4	Express the physical phenomena mathematically.		
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 use the library. • Lab work. • Small group discussion. • Enhance educational skills. • Develop their interest in Science through :(lab work, field trips, visits to scientific and research. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • 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	• Homework	• Evaluation of presentations • Evaluation of reports
4.2	Collect and classify the material for a course		

4.3	Use basic physics terminology in English	• preparing a report on some topics related to the course depending on web sites.	• Practical exam • Homework. • Final exams.
4.4	Acquire the skills to use the internet communicates tools.		
5.0	**Psychomotor**		
5.1	Use a perfect experimental tools to solve Physics problems in the Labs	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. 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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
2.1				✓														
2.2						✓												
2.3							✓											
2.4						✓												
3.1									✓									
3.2										✓								
4.1													✓					
4.2														✓				
4.3															✓			
4.4																✓		
5.1																	✓	

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.

48- The following points may help to get the course effectiveness

- Student evaluation
- Course report
- Program report
- Program Self study

49- According to point 1 the plan of improvement should be given.

Name of Instructor: _______**H. T. Mahdy** ____

Signature: ___ . *H. T. Mahdy* ___ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Radiation Physics

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

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National Commission for
Academic Accreditation & Assessment

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T6. Course Specifications (CS)

Course title: Solid State Physics II

Course code: 4034172-4

Prof. Dr. Y.M. MOUSTAFA

Professor Of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: ymmoustafa@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **Solid State Physics II (PH 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 **Prof. Dr. Y.M. MOUSTAFA** Email: ymmoustafa@uqu.edu.sa
5. Level/year at which this course is offered: **Fourth year (8th level)**
6. Pre-requisites for this course (if any): **Solid State Physics I (433471-3, PH471)**
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 introduces students to continue her/his research in solid state field. At the end of the course, the student must be able to :

- Gain knowledge on Solid State Physics.
- Be familiar with the basic physics knowledge on Solid State Physics.
- Understand how X-Rays Diffraction can be used in studying the solid structure
- Understand and appreciate of the physical laws governing solids.
- Define and describe the Super conducting phenomena.
- Illustrate the band theory of solids.
- Discuss the different theories of electron in solids.
- Be familiar with the basic physical properties of solids.
- Deep understanding of the importance of solids in our lives.
- Be trained on physical and generic skills (knowledge – cognitive – interpersonal – communication – problem solving)
- Describe, in words, the origin of the different properties of solids.

The overall goal is to understand the origin of the different properties and phenomena play role in solids and control its application.

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
6. Discussing some selected problems in each chapter.
   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:

1 Topics to be Covered :-

Primarily for senior physics majors. Superconductivity phenomena, X-Rays diffraction in crystals , free electron theory in metals ,band theory, thermal, electrical, dielectrically, magnetic properties of solids, and semiconductors		
Topics	No of Weeks	Contact hours
1- Superconducting Properties of Solids	2 weeks	8 hrs
1- Properties of Superconductor		
2- Magnetic Flux in Superconductor		
3-Thermodynamic Properties of Superconductor		
4- Superconduction Theory		
5- Josephson Effect		
2- X-Rays Diffraction in Crystals	2 weeks	8 hrs
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		
5- Using of X-Rays for structural analysis of solids		
3- Free Electron Theory in Metals	1 weeks	4 hrs
1- Origin of conduction electrons		
2- The classical model of free-electron		
3- Electrical Conductivity of Metals According to the Classical Model		
4- Temperature Dependence of Electrical Conductivity		
5- Thermal capacity according to free electron gas model	1 week	4 hrs

6- Fermi surface and its Effect on electrical conductivity		
7- Thermal conductivity in metals		
8- Electron motion in a magnetic field		
9- AC Conductivity and Optical Properties		
4- Thermal Properties of Crystal Lattice		
1- Specific heat	1 week	4 hrs
2- Specific heat according the exact theory		
3- Thermal conductivity of solid		
4- Thermal expansion		

5- Energy Band Theory in Solids	1 week	4 hrs
1-Origin of Energy Bands in Solids and Classification of Solids		
2- Bloch Theorem for Energy Bands		
3- Energy Bands Symmetry Properties in k-Space		
4- Kronig-Penney Model for Calculating Energy Bands	1 week	4 hrs
5- The Nearly-Free Electron Model For Determining Energy Bands		

6- The Tight-Binding Model		
6- Dielectric Properties of Solids	2 weeks	8 hrs
1- Polarization and Polarizability		
2- Local Field		
3- Sources and types of Polarizability		
4-Specification of Solids according to the dielectric loos		
5- Properties of Dielectric Material with AC Field		
6- Ferro-electricity		
7- Piezo-electric Effect		

7- Magnetic Properties of Solids	1 weeks	4 hrs
1- Basic Concepts		
2- The Origin of Magnetism in Solids		
3- Magnetic Susceptibility		
4- Classification of Magnetic Materials		
5- DIAMAGNETIC MATERIALS AND L ANGVIN THEORY		

6- Paramagnetic Materials	1 weeks	4 hrs
7- Pauli's Magnetic Susceptibility		
8- Ferromagnetic Materials		
9- Classification Ferromagnetic Materials		
10- Magnetic Domains and Some of Magnetic Applications		
8- The Semiconductors: Theory and Application	2 weeks	8 hrs
1- Energy Bands in Semiconductors		
2- Concentration of Intrinsic Charge Carriers		
3- Donors and Acceptors		
4- Electron Mobility in Semiconductors		
5- Resistivity and Conductivity of Semiconductors		
6- Photoconductivity and Photoluminescence		
7- p-n Junction		
8- Bipolar Junction transistors		
	15 weeks	**60 hrs**

Course Unit/Credit hours	4 credit hours		
Students workload:		**Contact hours**	**Private study**
	Lecture	60	105
	Practical	0	0
	Assignments	0	15
	Exams & Quizzes	8	20
	Sum	68	140
	Total Sum:	208	
Credit	7 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	60	0	0	0	8	68
Credit	4	0	0	0	0	4
3. Additional private study/learning hours expected of students per week.					9.33	

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	analyze the nature and atomic structure of solid state materials	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. Exams: a) Quizzes (E-learning) b) Short exams (mid- term exams) c) Long exams (final) d) E) Discussions during the lectures. F) Home work. G) Discussions during the class.
1.2	Interpret physical properties of solid state matter.	5. Lectures 6. Tutorials 7. Homework 8. Oral discussion	

1.3	Relate the physical properties to the structure of solid state matter.	5. Lectures 6. Tutorials 7. Homework 8. Oral discussion	
		9.	
2.0	**Cognitive Skills**		
2.1	Explain appropriate theories, principles and concepts relevant to the solid-state physics.	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.Midterm's exam. Exams, short 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	Analyze the information from a variety of sources relevant to solid state physics.		
2.3	prepare a reasoned argument to the solution of familiar and unfamiliar problems relevant to solid state physics.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Illustrate practical activities using techniques and procedures appropriate to mathematic related to solid state physics.	• Search through the internet and use the library. • Lab work. • Small group discussion. • Enhance educational skills. • Develop their interest in Science through :(lab work, field trips, visits to scientific and research. • Encourage the student to attend lectures regularly • Give students tasks of duties	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations
3.2	Write a piece of independent research in solid state physics using literature and internet.		
3.3	Evaluate and solve problems relevant to the physical properties of solid state matter.		
4.0	**Communication, Information Technology, Numerical**		

4.1	Interpret data relevant to solid state physics.	• Homework • preparing a report on some topics related to the course depending on web sites.	• Evaluation of presentations • Evaluation of reports • Practical exam • Homework. • Final exams.
4.2	Operate effectively as part of a group, involving leadership, group dynamics and interpersonal skills such as listening, negotiation and persuasion relevant to solid state physics.		
4.3	Self-appraise and reflect on practice relevant to solid state physics.		
5.0	**Psychomotor**		
5.1	N/A	N/A	N/A

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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2	✓																	
1.3									✓									
2.1			✓															
2.2							✓											
2.3						✓												
3.1															✓			
3.2									✓									
3.3						✓												
4.1													✓					
4.2										✓								
4.3															✓			

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, Participation, In-Class Problem Solving	All weeks	10 %
2	Report	All weeks	10 %
4	Midterm 1	6^{th} week	15%
5	Midterm 2	10^{th} week	15%
6	Final Exam	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

2. **C. Kittel / Introduction to Solid State Physics. 7th edition .**
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)

فيزياء الحالة الصلبة وتطبيقاتها (المرجع الشامل)، تأليف د. يسري مصطفى، د. احمد الغامدي، دار كنوز المعرفة بجدة، 2017.

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

- Electronic Materials, Web Sites etc

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.

50- The following points may help to get the course effectiveness
- Student evaluation
- Course report
- Program report
- Program Self study

51- According to point 1 the plan of improvement should be given.

Name of Instructor: _______**Prof. YM Moustafa**____________

Signature: ___ . *YM Moustafa* ___ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Solid State Physics

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئـــة الوطنيـــة للتقـويـم
والاعــتــمــاد الأكــاديــمـــي

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

T6. Course Specifications (CS)

Course title: ELECTRONICS

Course code: 4034173-4

Dr. Jalal Ourfelli

Associate Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: jalel.ouerfelli@yahoo.fr

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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: **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
Dr. Jalal Ourfelli
Email: jalel.ouerfelli@yahoo.fr
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)

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)

14. Explain strategy of the course in the beginning of the semester
15. Outlines of the physical laws, principles and the associated proofs.
16. Highlighting the day life applications whenever exist.
17. Encourage the students to see more details in the international web sites and reference books in the library.
18. Discussing some selected problems in each chapter.
19. Cooperate with different institution to find how they deal with the subject
20. 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 BJT as control valves Operation of BJT Circuit models of low speed active region operation	2	6

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

Course Units/Credit Hours	4 credit hours		
Student workload		Contact hours	Private study
	Lecture	45	62
	Assignments	0	15
	Practical	42	20
	Exams & Quizzes	6	20
	Sum	93	117
	Total Sum	210	
Credits	7 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	45	0	0	42	8	93
Credit	3	0	0	1	0	4
3. Additional private study/learning hours expected of students per week. 7.8						

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, A brief summary of the knowledge or skill the course is intended to develop.

Second, A description of the teaching strategies to be used in the course to develop that knowledge or skill.

Third, The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	1 Learning fundamentals in electronics and electronic elements 2 Understanding the physics of electronics and their applications mentioned in the text. 3 Improving logical thinking. 4 Ability to understand and design simple electronic circuits Ability to explain how things work.	13. Demonstrating the basic information and principles through lectures and the achieved applications 14. Discussing phenomena with illustrating pictures and diagrams 15. Lecturing method: a. Blackboard b. Power point c. e-learning 16. Tutorials 17. Revisit concepts 18. Discussions 19. Brain storming sessions 20. Start each chapter by general idea and the benefit of it; 21. Learn the student background of the subject; 22. Show the best ways to deal with problem;	Solve some example during the lecture: **6.** Exams**:** a) Quizzes b) Short exams (midterm exams) c) Long exams (final) d) Oral exams 7. Discussions with the students. 8. Ask the student to clear the misunderstanding of some physical principle. Ask quality question.

		23. Keep the question "why" or "how" to explain always there; Build a strategy to solve problem.	
1.2	Describe concepts, Procedures of some experiments in physics	1. Demonstrating the basic principle of the experiment. 2. Show the best ways to perform the experiments 3. Show the best ways to demonstrate the results. 4. Show the best way to write the reports about the experiment. 5. Discussion with the student about the results.	Home work. Writing scientific Reports. Doing team research or team project. Doing team work to perform some experiments Discussions during the class.
2.0	**Cognitive Skills**		
2.1	How to use physical laws and principles to understand the subject	1. Preparing main outlines for teaching 2. Following some proofs 3. Define duties for each chapter 4. Homework assignments 5. Encourage the student to look for the information in different references 6. Ask the student to attend lectures for practice solving problem Ask the student to do small research.	4. Midterm's exam; short quizzes 5. Asking about physical laws previously taught 6. Writing reports on selected parts of the course Discussions of how to simplify or analyze some phenomena
2.2	How to simplify problems and analyze phenomena		
2.3	Analyse and explain natural phenomena.		
2.4	A bility to explain the idea with the student own words.		
2.5	Represent the problems mathematically.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Work independently.	13. Learn how to search the internet and use the library. 14. Learn how to cover missed lectures. 15. Learn how to summarize lectures or to collect materials of the course. 16. Learn how to solve difficulties in learning: solving problems – enhance educational	1. Quizzes on the previous lecture 2. Checking report on internet use and trips 3. Discussion 4. The accuracy of the result gained by each group will indicate good group work
3.2	The students learn independently and take up responsibility.		

		skills. **17.** Develop his interest in Science through :(lab work, field trips, visits to scientific and research institutions. **18.** Encourage the student to attend lectures regularly by: i. Giving bonus marks for attendance ii. Assigning marks for attendance. **19.** give students tasks of duties	5. Presenting the required research on time and the degree of the quality will show the sense of responsibility.
4.0	**Communication, Information Technology, Numerical**		
4.1	Computation	1. Know the basic mathematical principles. 2. Use the web for research. 3. Discuss with the student. 4. Exams to measure the mathematical skill. 5. Clear the weakness point that should be eliminated. 6. Encourage the student to ask for help if needed. 7. Computational analysis. 8. Data representation. 9. Focusing on some real results and its physical meaning. 10. Lectures for problem solution. 11. Encourage the student to ask good question to help solve the problem. Display the lecture note and homework assignment at the web.	1. Their interaction with the lectures and discussions. 2. The reports of different asked tasks. 3. Homework, Problem solutions assignment and exam should focus on the understanding. 4. Results of computations and analysis. 5. Comments on some resulting numbers. 6. Research
4.2	Problem solving		
4.3	Data analysis and interpretation.		
4.4	Feeling physical reality of results		

5.0	Psychomotor		
5.1	Perform the experiments with high accuracy.	Follow up the students in lab and during carryout all experimental work.	Practical exam. Giving additional marks for the results with high and good
5.2	Operate instruments safely, Draw the data and curves.		

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	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2
1.1		✓																
1.2			✓															
2.1				✓														
2.2						✓												
2.3							✓											
2.4						✓												
2.4								✓										
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، 2007.

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: ___ . *J.A.OUERFELLO* ___ Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Solid State Physics

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ *Fahad Alhashmi* _ Date Received: ______2019_____

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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

Prof Dr. Roshdi Seoudi

Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: rsawed@uqu.edu.sa

P.O. Box 715

Makkah 21955
Kingdom of Saudi Arabia

Final Year Project 4014923-5

A. Course Identification and General Information

1. Course title Graduation Project. Course code: 4014923-5.
2. Credit hours: 3hrs.
3. Name of faculty member responsible for the course: Course Coordinator: Dr. Roshdi Seoudi (rsawed@uqu.edu.sa). Dr. Abdelrahman Lashin. (aylashin@uqu.edu.sa) All Physics academic staff members / Physics academic staff members are involved in teaching this course.
4. Level/year at which this course is offered: 4th Year.
5. Pre-requisites for this course (if any): None.
6. Co-requisites for this course (if any): None.
7. Location if not on main campus: Main Campus &Female campus.

B. Objective

After completing this course student should be able to:

- Gain practical and/or theoretical knowledge about area of physics.
- Work independently on the research project under the supervision of academic member of staff and should be able to design experiments to answer the question posed, and critically analyzed the results.
- There will be scope for initiative in this element of the project.
- Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literature

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

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.

1 Topics to be Covered		
Topic	**No of Weeks**	**Contact hours**
Introduction to research project	1	3
Where and how I start? Thinking of research ideas, Purpose of research, Research questions or hypothesis, are these questions/hypotheses feasible to achieve? Problems with research questions/ hypothesis, research title.	2	6
Project preparing: Project management, project timeline, project e	1	3
The literature review: Primary and secondary sources, quality of sources, Your literature review should tell a story, how to make it a story?, Speed reading and taking notes, Critical awareness while reading, How to search for information, Managing references, Various style of referencing systems.	2	6
Research methodology I: Research design, Research approach, building your way from research purpose, to question, to approach, to data gathering.	1	3
Methodology II: Types of research methods: experimental, Case studies, Cross-sectional studies, Longitudinal studies, surveys, Comparative studies, how to structure and write up your methodology?	1	3
Results analysis: Types of results, comparative analysis, statistical analysis, results presentation (tables, graphs, figures)	1	3
Concluding and writing up: Writing a discussion, writing a conclusion, writing an abstract and finalizing the title, general points about writing a research/review article and presentation coda	1	3
Set up a small project at (laboratory or field) parallel with theoretical lectures, for each student or a group of three students to begin to implement theoretical ideas on the ground (small training research point), collecting their own actual data, analyzing, representing the collected data, commenting, and critical discussing it	4 Open time for student	12

and writing an assay about it. This assay will be revised by supervisor and critically discussed with the student/students group by examiners board (usually two departmental scientific staff members).		
	14 weeks	42

Course Units/Credit Hours	3 Credit hours		
Student workload		Contact hours	Private study
	Lecture	21	70
	Assignments	21	70
	Practical	0	0
	Exams & Quizzes	0	0
	Sum	42	140
	Total Sum	182	
Credits	6 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	21	0	0	21	0	42
Credit	2	0	0	1	0	3
3. Additional private study/learning hours expected of students per week. 9.33						

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)

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessments to be used in the course to evaluate learning outcomes in the domain concerned.

l. Knowledge : Description of the knowledge to be acquired **(i) Upon successful completion of this course the student will be able to:** • **Gain practical and theoretical knowledge about area of physics.** • **Work independently on the research project under the supervision of academic member of staff and should be able to design experiments to answer the particular question posed, and critically analyzed the results.** • **There will be scope for initiative in this element of the project.** • **Be able to set the work in the context of work done by other experimentalists and provide a concise summary of relevant literature.**
(ii) Teaching strategies to be used to develop that knowledge • **The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important organisms in different applications and human service.** • **At the end of the program, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.** • **All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.** • **Using images and movies.** • **Encouraging students to collect the new information about what the new in physics.** • **Enable the reference books and scientific sites concerning physics in internet.**
(iii) Methods of assessment of knowledge acquired: • **Submission of a literature review.** • **Submission of research report.**
b. Cognitive Skills **(i) Cognitive skills to be developed having successfully completed the course students should be able to:** • **Displaying and organizing different types of data.** • **Representing the data.** **(ii) Teaching strategies to be used to develop these cognitive skills:**

- Reading relevant research and review articles.
- Brain storming.
- Discussion.

(iii) Methods of assessment of students cognitive skills

- Submission of a literature review.
- Submission of research report.

c. Interpersonal Skills and Responsibility

(i) At the end of the course, the student will be able to:

- Gain practical and theoretical knowledge about particular area of physics.
- Work independently on the research project under the supervision of academic member of 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.
- Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literature.

(ii) Teaching strategies to be used to develop these skills and abilities

- Lab work.
- Case Study.
- Active learning.
- Small group discussion.

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team.
- Evaluation of the role of each student in lab group assignment.
- Evaluation of student's presentations.

d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain. At the end of the course, the student will be able to:

- Enhancing the ability of students to use computers and internet.
- Interpret statistics data
- Present experimental physics data.
- Know how to write a report.

(ii) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).
- Seminars presentation.
- Field visits.

(iii) Methods of assessment of students numerical and communication skills

- Evaluation of presentations.
- Evaluation of reports.
- Practical exam.

e. Psychomotor Skills (if applicable)

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

(ii) Teaching strategies to be used to develop these skills

(iii) Methods of assessment of students psychomotor skills

5. 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	Writing a literature review, and a proposal for research	7	30%
2	Participation / discussion/ set up of small research project	All weeks	25%
3	Writing a brief assay for a graduation project	15	45%
	Total Marks		100%

D. Student Support

- Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)
- Office hours: 10 hrs.

E. Learning Resources

Recommended Reading List

- **Writing Scientific Research Articles: Strategy and Steps.2nd Edition. By Margaret Cargill, Patrick O'Connor, ISBN-13:978-1118570708. 2013. Wiley-Black Well Press.**
- **Enjoy Writing Your Science Thesis or Dissertation: A Step by Step Guide to Planning and Writing a Thesis or Dissertation for Undergraduate and Graduate Science Students. 2ndEdition by Elizabeth M Fisher, Richard C Thompson. ISBN-13:978-1783264216. 2014. Imperial College Press.**

Electronic Materials, Web Sites

- **www.columbia.edu/cu/physics/ug/research/paper.html**
- **https://www.youtube.com/watch?v=0oAFVHb21HM**
- **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3474301/**

Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

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

1- Accommodation (Lecture rooms, laboratories, 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

- **Providing class rooms with computers and labs with data show.**

3.Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

C ourse Evaluation and Improvement Processes

○ 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 (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in 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.

H. Faculty member responsible for the course:

Prepared by faculty staff:	Signature:
• Dr Abdelrahman Lashin. • Prof. Dr.Roshdi Seoudi.	

Date Report Completed: 04/2018

Revised by:	Signature:
• Dr. Saleh Alluqmani • Dr. Badie Ewiss	

Name of Instructor: **Dr Abdelrahman Lashin and Prof. Dr.Roshdi Seoudi**

Signature: ___ R. Seoudi Date Report Completed: _____2018_

Name of Field Experience Teaching Staff _______Nanotechnology and Spectroscopy

Program Coordinator:_**Dr. Fahad Alhashmi**_____________

Signature: ______ Fahad Alhashmi _ Date Received: ______2019_____

(B) Faculty Requirements

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

General Chemistry 1

4021101-4

Course Specifications

Institution: **Umm Al-qura University**	Date of Report: **2017**
College/Department : **Faculty of Applied Science/ department of chemistry**	

A. Course Identification and General Information

1. Course title and code: General Chemistry 1, 4021101-4
2. Credit hours: Four (3 theoretical + 1 practical) hrs.
3. Program(s) in which the course is offered (If general elective available in many programs indicate this rather than list programs): • **Chemistry** • **Industrial Chemistry** • **Physics** • **Medical Physics** • **Biology** • **Microbiology** • **Mathematics**
4. Name of faculty member responsible for the course: Prof. Mohamed Ismail Awad
5. Level/year at which this course is offered: 1^{st} / 1
6. Pre-requisites for this course (if any): ---------
7. Co-requisites for this course (if any): ---------
8. Location if not on main campus: ---------------

B. Objectives

1. Summary of the main learning outcomes for students enrolled in the course.   This course is an introductory chemistry course designed to prepare students for college level chemistry courses. The course introduces some basic principles of physicl, organic and inorganic chemistry.
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).*   • The use of teaching intelligent classes for lectures.   • Encourage students to prepare reports in general topics in chemistry.   • The use of information technology or the Internet in order to increase awareness of the concepts of chemistry.   • Link the theoretical and practical sides of the course to help the students to understand and interpret the properties of the chemical compounds.

C. Course Description:*(Note: General description in the form to be used for the Bulletin or Handbook should be attached).*

1. Topics to be Covered		
Topic	No of Weeks	Contact hours
Units of measurements; SI- units, intensive and extensive properties, uncertainty in measurements (precision and accuracy).	1	3
Significant figures: Rounding significant figures, Using significant figures in addition, subtraction, multiplication and divisions.	1	3
States of matter and measurement, molecules and molecular compounds.	2	6
The periodic table, nomenclature, electronic structure of atoms, simple periodic properties of the elements.	2	6
Chemical bonding, molecular geometry, and properties of various states of matter.	1	3
Ions and ionic compounds, chemical reaction types.	1	3
Stoichiometry, atomic and molecular weights.	1	3
The mole, simple quantitative calculations with chemical reactions.	1	3

Basics of chemical equilibrium.	1	3
Acids and bases.	1	3
Thermochemistry.	1	3
Hydrocarbons, nomenclature and simple reactions.	1	3

Laboratory Experiments Outline

Topics to be Covered		
List of Experiments The practical part includes the following experiments:	No of Weeks	Contact hours
Introduction	**1**	**3**
Density and viscosity of liquids.	**1**	**3**
Compound type (polar – nonpolar – ionic).	**1**	**3**
Chemical reactions.	**1**	**3**
Acids and bases and pH measurements and calculations.	**1**	**3**
Titration of vinegar.	**1**	**3**
Oxidation-reduction reactions.	**1**	**3**
Molar mass of acid.	**1**	**3**
Qualitative analysis (acidic and basic radicals).	**1**	**3**
Collegative properties (determination of molecular weight).	**1**	**3**
Determination of the heat capacity of the calorimeter.	**1**	**3**
Determination of the critical solution temperature of phenol - water system	**1**	**3**
Review	**1**	**3**
Final Exam.	**1**	**3**

Course Units/Credit Hours	**Lecture: 4 credit hours**		
Student workload		**Contact hours**	**Private study**
	Lecture	**45**	**68**
	Assignments	**0**	**15**
	Practical	**42**	**42**
	Exams & Quizzes	**10**	**30**
	Sum	**97**	**155**
	Total Sum	**252**	
Credits	**8 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	*Total*
Contact Hours	45	0	0	42	10	*97*
Credit	3	0	0	1	0	*4*

3. Additional private study/learning hours expected of students per week. **10.0**

4. Development of Learning Outcomes in Domains of Learning
For each of the domains of learning shown below indicate:
A brief summary of the knowledge or skill the course is intended to develop;
A description of the teaching strategies to be used in the course to develop that knowledge or skill.
The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

Knowledge

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0			
1.1	Knows International system of units	Lectures Scientific discussion Library visits Web-based study	Exams portfolios long and short essays posters lab manuals
1.2	Familiar with the laws that describe the behavior of ideal gases.		
1.3	Knows atom structure		
1.4	Describe types of solids.		
1.5	Mention the first law of thermodynamics.		
1.6	List the factors affecting equilibrium position and equilibrium concentration.		
2.0	Cognitive Skills		
2.1	Summarize gases laws	Lectures Scientific discussion homework assignment containing problem thinking activities	1. Midterm exam 2.quizzes 3.Final exam
2.2	Compare between ideal and real gases		
2.3	Apply Hess's law for the calculation of heat of reaction.		
2.4	Apply Faraday's laws for calculating the amount deposited at electrodes		
2.5	Predict the spontaneity of chemical reaction.		
3.0	Interpersonal Skills & Responsibility		

	• Manage resources, time and collaborate with members of the group. • Ability to work independently to handle Chemicals and perform laboratory illustrations safely. • Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task	Team work groups General discussion with students for solving a problrm.	Assessment of the solution of problem submitted by the students.
4.0	Communication, Information Technology, Numerical		
	• Work effectively both in a team, and independently on solving chemistry problems. • Communicate effectively with his lecturer and colleagues • Use university library and web search engines for collecting information and search about different topics .	Write a Report Use libraries	Evaluation of the report presented
5.0	Psychomotor		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester:			
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Class activities, Attendances and Duties	Throughout the Term	10%
2	Mid-Term Exam (s)	5-14	20%
3	Lab Activity and Final Exam on Lab	Throughout the Term	30%
4	Final Exam.(2 hours exam)	End of the Term	40%
5	Total		100%

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)
Presence of faculty members to provide counselling and advice.
Office Hours: weekly during working hours, and to create appropriate means.
Academic Advising for students to those who need it, and taking into account the appropriate test for that Member.

E Learning Resources

1. Required Text(s)
P. Atkins and J. de Paula, Physical Chemistry, 10th ed., 2006, New York.

2. Essential References

Steven S. Zumdahl, Susan A. Zumdahl, 9th ed., 2009, New York.
3. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) Chemistry, R. Chang, 10th Edition, McGraw-Hill Higher Education, 2011.
4. Electronic Materials, Web Sites etc Power point lectures.
5. Other learning material such as computer-based programs/CD, professional standards Microsoft PowerPoint, Microsoft Word

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) Classroom capacity (60) students. To supply the classrooms with the appropriate educational means.
2. Computing resources Hall is equipped with a computer and Data Show and TV.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) None

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete thequestionnaireevaluation of the coursein particular. **Assess the progress of the operation by the students using the evaluation forms or group discussion in order to reach weaknesses and processed.**
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor **Observations and the assistance of colleagues.** **Independent evaluation for extent to achieve students the standards.** **Iindependent advice of the duties and tasks.**
3 Processes for Improvement of Teaching • Workshops for teaching methods. • Continuous training of member staff. • Review of strategies proposed. • Providing new tools for learning. • The application of e-learning. • Exchange of experiences internal and external.

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)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

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

- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

Faculty or Teaching Staff: Professor Mohamed Awad
Signature: Date Report Completed: 2017
Received by: Dr. Ismail Althagafi Department Head
Signature: ________________________________ Date: _______________

kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

(Calculus 1 4041101-4)

COURSE SPECIFICATIONS

Institution	Umm Al-Qura University
College/Department	Faculty of Applied Science/ Department of Mathematical Science

Course Identification and General Information

1. Course title and code: **Calculus(I)** (4041011-4)
2. Credit hours 4 Hours
Program(s) in which the course is offered. **BSc. Mathematics** (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course ****
5. Level/year at which this course is offered First year/first semester
6. Pre-requisites for this course (if any) Non
7. Co-requisites for this course (if any)
8. Location if not on main campus Al-Abdia 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?	

B Objectives

What is the main purpose for this course?

By the end of the course the students will be able to use the concepts of introductory calculus
-have concise and authoritative definitions of mathematical terms
-solve linear equations and inequalities
-solve quadratic equations and inequalities
-evaluate the limit of functions.
-find derivatives of functions using theorems and rules.
-extend the concept of limits to infinity.
-differentiate implicit and explicit functions .
-study a function :where it goes, how it evolves, studying its monotonicity and critical points, concavity and inflexion points
-integrate functions

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)
Encouraging students to collect problems from web based reference material and supervise classroom discussions.
Update references used in teaching process.
Use e-learning facilities more efficiently.

Use computer packages for solving exercise

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Real numbers, Exponents and Radicals, Polynomials: Basic Operations and Factoring . Solving Equations, Rational Expressions: Basic Operations, Inequalities, Absolute Values.	2	8
Definition of Functions(Domain and Range), Graphs of Functions, Operations on Functions, Trigonometric Functions and Identities	2	8
Introduction to Limits, Theorems on limits, Limit from Right and from Left, Definition of Continuity	2	8
Definition of Derivative (Using Limits), Rules and Theorems for Finding Derivatives, Derivative of Trigonometric Functions, Chain Rule, Higher Order Derivatives, Implicit Differentiation	2	8
Maxima and Minimam, Monotonicity, Local Maxima and Minimam, Concavity, Sketching the Graphs	2	8
Integration of Functions, Definite Integrals	2	8
Revision	1	4
Total	**13**	**52**

Course Units/Credit Hours	**Lecture: 4 credit hours**		
Student workload		**Contact hours**	**Private study**
	Lecture	**60**	**115**
	Assignments	**2**	**11**
	Practical	**0**	**0**
	Exams & Quizzes	**8**	**20**
	Sum	**70**	**145**
	Total Sum	**215**	
Credits	**7 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	60	0	0	0	8	68
Credit	4	0	0	0	0	4
3. Additional private study/learning hours expected of students per week.	9.67					

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

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define the related basic scientific facts, concepts, principles and techniques calculus	Lectures Tutorials Discussion Problem Solving	Exams Home work.
1.2	Recognize the relevant theories and their applications in basic mathematics.		
2.0	**Cognitive Skills**		
2.1	Representing problems mathematically.	Lectures Tutorials Solve Problem Brain Storming	Exams Quizzes. Homework. Discussion
2.2	How to distinguish different rules in calculus.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Develop connections of calculus with other disciplines	Cooperative education Competitive education	Home work. Reports. Quizzes. Discussion
	Solve problems using a range of formats and approaches in basic science		
3.2	show the ability to work independently and within groups.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Learn how to summarize lectures or to collect materials of the course.	Lectures tutorials	Home work. Reports. Discussion

4.2	Learn how to solve difficulties in learning: solving problems – enhance educational skills	brain storming	
5.0	**Psychomotor**		
Not applicable			

5. Schedule of Assessment Tasks for Students During the Semester			
No.	Assessment task	Week due	Proportion of Final Assessment
1	Midterm 1	6^{th} week	20 %
2	Midterm 2	12^{th} week	20%
3	Homework + reports + Quizzes	During semester	10%
4	Final exam	End of semester	50 %

D. Student Academic Counseling and Support

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) Office hours per week in the lecturer schedule (6 hours per week). 2- Contact with students by e-mail,SMS, and e-learning facilities.

E. Learning Resources

Required Text(s)
Mathematics for preparatory year program, Book1, Oxford University Press,2013
Essential References
Calculus (Ninth Edition)by Dale Varberg, Edwin Purcell and Steven Rigdon
Recommended Books and Reference Material (Journals, Reports, etc) (Attach List): ---
4.Electronic Materials, Web Sites etc http://en.wikipedia.org/wiki/Calculus
5. Other learning material such as computer-based programs/CD, professional standards/regulations: Maple

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)	
Accommodation (Lecture rooms, laboratories, etc.) -Classroom with capacity of 25-students. - Library.	
2. Computing resources:	Not available

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list): None

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: Student feedback through electronic facilities organized by the deanship of registration and acceptance.
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Evaluation of the teachers by internal & external faculty members. Visiting to the classrooms. Mutual visits between colleagues and giving advices to each other after each lecture
3 Processes for Improvement of Teaching Analysis of student course evaluation and feedback Peer evaluation and feedback Review of course portfolios Workshops on pedagogical methods
Processes for Verifying Standards of Student Achievement (eg. 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) Analysis of course assessments by other reviewers on a periodic basis.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. Material and learning outcomes are periodically reviewed internally and externally. Comparing course content and teaching methodologies with similar courses offered at other departments and universities. Studying the outcomes of the students' evaluations of the course and use it to improve teaching strategies.

Faculty or Teaching Staff: ____

Signature: ___________________________ Date Report Completed: _____________________

Received by: ________________________________ Dean/Department Head

Course Specifications Plan 37

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

T6. Course Specifications (CS)

Course title: General Physics 1

Course code: 4031101-4

Dr. Said Mohamed Attia

Associate Professor of Physics

Department of Physics

College of Applied Science

Umm Al-Qura University

Fax: (012) 5564560

Email: smattia@uqu.edu.sa

P.O. Box 715

Makkah 21955

Kingdom of Saudi Arabia

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** Email: smattia@uqu.edu.sa
5. Level/year at which this course is offered : **1st 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) 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** 17- The physical quantities, standards, and Units. 18- The international system of units. 19- The Standard of time 20- The Standard of length 21- The Standard of Mass 22- Precision and significant figures. 23- Dimensional analysis.	**1**	**3**

❖ **Vectors** 43- Vectors and Scalars. 44- Adding vectors : graphical methods 45- Components of vectors. 46- Adding vector: component method. 47- Multiplications of vectors. 48- Vector laws in physics.	**2**	**6**
❖ **Motion in one dimension** 21- Particles kinematics. 22- Description of motion 23- Average velocity 24- Instantaneous velocity. 25- Accelerated motion. 26- Motion with Constant Acceleration 27- Freely falling Bodies. 28- Measuring free fall acceleration.	**1**	**3**
❖ **Motion in two and three dimensions** 35- Position, velocity, and acceleration. 36- Motion with constant acceleration 37- Projectile motion 38- Uniform circular motion 39- Velocity and acceleration vectors in circular motion	**1**	**3**
❖ **Force and motion** 17- Position, velocity, and accelerations 18- Motion with constant acceleration. . 19- Newton's first and second laws. 20- Forces. 21- Newton's second law 22- Newton's third law. 23- Units of force 24- Weight and mass 25- Measuring forces 26- Applying Newton's laws.	**2**	**6**
❖ **Work and Energy** 16. Work done by constant force. 17. Work done by a variable force: one dimensional case. 18. Work done by a variable force: two dimensional case. 19. Kinetic energy and work-energy theory. 20. Power.	**1**	**3**

❖ **Fluids Statics** 27. Fluids and Solids 28. Density and pressure. 29. Variation of density in a fluid at rest. 30. Pascal Principle. 31. Archimedes' Principle. 32. Surface tension.	**1**	**3**
❖ **Fluid dynamics** 5. General concepts of fluid flow 6. Streamlines and the equation of continuity. 7. Bernoulli's Equation 8. Application of Bernoulli's Equation 9. Viscosity.	**1**	**3**
❖ **Temperature, Heat and the first law of Thermodynamics.** 13. Heat: Energy in transit 14. Heat capacity and specific heat. 15. Heat capacity of solids 16. Temperature. 17. The Celsius and Fahrenheit Scales. 18. Heat transfer.	**2**	**6**
❖ **Reflection and refraction of light at plane surface** 13. Reflection and Refraction 14. Deriving the law of refrlection 15. Image formation by plane mirrors. 16. Deriving the law of refraction. 17. Total internal reflection.	**1**	**3**
❖ **Reflection and refraction of light at plane surface** 6. Spherical mirrors 7. Spherical refracting surfaces. 8. Thin lenses 9. Compound optical systems 10. Optical instruments	**1**	**3**
❖ **Exercises and Solved problems**	**1**	**3**
	15 weeks	**45hrs**

Practical part:

15. Safety and Security at the lab.
7. Introduction to the Lab.
8. Precise measurements.
9. Vectors.
10. Verification of lens formula.
11. Determination of Viscosity
12. Determination of Sound speed.

Course Units/Credit Hours	Lecture: 4 credit hours		
Student workload		Contact hours	Private study
	Lecture	45	89
	Assignments	0	15
	Practical	42	22
	Exams & Quizzes	6	20
	Sum	93	146
	Total Sum	239	
Credits	8 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	45	0	0	42	8	93
Credit	3	0	0	1	0	4
3. Additional private study/learning hours expected of students per week.	9.73					

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.)

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

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 of physics (such as the fundamental quantities , the derivative quantities, the international system of units, The standard of time, the standard of length, the distance, the vector quantity and scalar quantity, displacement, velocity, speed, acceleration, Newton's law, work, energy, power, density, pressure, Pascal principle, Archimedes Principle, flow rate of fluid, viscosity, quantity of heat, specific heat, heat capacity, temperature scale, refractive index, Snell's law, law of reflection, and focal length) .	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 (such as the equations of motion of the particle, the motion of freely falling bodies, Newton's law of motion, work, energy, power, Bernoulli equation, viscosity, Pascal principle, quantity of sensible heat, latent heat, law of reflection, and law of refraction).		
1.3	**Record** the data and the results of the experiments at the lab (such as the length of an object, the time required for an event, etc.) .	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 2.2 2.3 2.4 2.5	**Calculate** some quantities (such as, converting units , calculate the velocity and acceleration of an object, calculate the flow rate of a fluid, calculate the specific heat of the material, calculate the refractive index of the material) . **Differentiate** between the physical quantities (such as speed and velocity, scalar and vectors, etc.) **Analyse** quantitative results (such as dimensional analysis of the physical quantities, and experimental results). **Explain** day life phenomena (such as heat transfer, fluid flow, floating of an object on a fluid, etc.). **Measure** some physical quantity (such as viscosity, focal length of a lens, etc.).	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.
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.	• Evaluate the efforts of each student in preparing the report. • Evaluate the scientific reports.

3.2	**Write** scientific report effectively.	• Develop their interest in Science through : • (lab work, visits to scientific and research institutes). • Write scientific reports.	• Evaluate the team work in lab and small groups. • Evaluation of students presentations.
4.0	**Communication, Information Technology, Numerical**		
4.1	**Demonstrate** the scientific report effectively.	• Incorporating the use and utilization of computer, network and websites. • preparing a report on some topics related to the course depending on web sites • writing scientific reposts .	• Evaluating the scientific reports. • Evaluating activities and homework
4.2	**Research** about the material related to the course.		
4.3	**Calculate** the slope of the graph and the physical quantities.		
4.4	**Operate** the tools and equipment at the lab effectively.		
5.0	**Psychomotor**		
5.1	**Perform** the experimental work 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	**Draw** the experimental results correctly.		

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	3.3	3.4	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

Halliday and Resnick and Jearal Walker, " Fundamental of Physics" 8 edition, Wiley, 2008.

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/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.

52- The following points may help to get the course effectiveness

- Student evaluation
- Course report
- Program report
- Program Self study

53- According to point 1 the plan of improvement should be given.

Name of Instructor: **Dr. Said Mohamed Attia**

Signature: *S. M. Attia* Date Report Completed: 2018

Name of Field Experience Teaching Staff Solid State Physics

Program Coordinator: **Dr. Fahad Alhashmi**

Signature: *Fahad Alhashmi* Date Received:2019

General Biology 4011101-4

Institution: UM AL – QURA UNIVERSITY	
College/Department : Faculty of Applied Science – Department of Biology	

A Course Identification and General Information

Course title General Biology **Course code:** 4011101-4
2. **Credit hours:** 4 hrs.
3. **Program(s) in which the course is offered. :** BSc Microbiology
Name of faculty member responsible for the course: Botany academic staff members / Zoology academic staff members.
5. **Level/year at which this course is offered:** 1st 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.

B Objectives

After completing this course student should be able to:

Define the principles and concepts of the living cells.
Differentiate between animal and plant cells
Aware of the protoplasmic and non-protoplasmic cell contents and its structure and function.
4. Study the different types of animal and plants tissues (structure and function).
5. Understand the biological activities of the living cells.

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

The course will cover the principle of eukaryotic cell structure and function. This course will provide a conceptual and experimental background in biology sufficient to enable students to take courses that are more advanced in related fields.

1 Topics to be Covered

Topic	No of Weeks	Contact hours
Introduction: - The living cells. - Basis of cytology and histology. -Major differences between Eukaryotic and Prokaryotic cells. -Major differences between plant and animal cells	1	6

Plant cell morphology and structure I **- Cell wall, middle lamella, types of pits.** **- Structure and function.** **- Cytoplasmic ultra structure and function: Endoplasmic reticulum; mitochondria; Golgi apparatus, ribosomes**	**1**	**6**
Plant cell morphology and structure II **- Plastids, chloroplasts, chromoplast, leucoplast types, morphology, ultra structure and function, distribution.** **-Non protoplasmic contents of plant cell (cell vacuole – carbohydrates – proteins – fats and oils – crystals glycosides – latex – alkaloids – tannins – organic acids).**	**1**	**6**
Animal cell morphology and structure I **-Fine structure of the Cell membrane and Cell junctions** **-Functions of cell membrane (cell transport)** **-Mitochondria, Peroxisomes,** **Lysosomes (phagocytosis, autocytosis and pinocytosis** **Centrioles, cytoskeleton, microtubules and microfilaments,**	**1**	**6**
Animal / Plant cell morphology and structure: The Nucleus **-Nucleus, nuclear envelope, nucleopores, nucleoplasm, chromatin and nucleolus. Mitochondria, Golgi apparatus and functions of each organelle.**	**1**	**6**
Plant morphology and anatomy **-Meristematic tissues in plants – classification of meristematic tissues – Apical and lateral meristems- Permanent tissues. Dermal system, ground system and vascular system. Ground system; parenchyma cell, collenchyma cell and sclerenchyma cell.** **Seed germination, conditions necessary for seed germination, dicotyledonous seeds and seedling 1) broad bean (*Vicia faba*), kidney bean (*Phaseolus vulgaris*), monocotyledonous seeds and seedling 1) maize (*Zea mays*)**	**2**	**12**
Plant morphology **Morphology of the root – functions of the root, zones of the root, types of the roots, Adventitious roots**	**1**	**6**
Plant morphology **Morphology of the stem- functions of the stem- origin, functions and types of the buds- Stem branching- habit of the stem- Metamorphosis of the stem.**	**1**	**6**

Plant morphology **Morphology of the leaf- functions of the leaf- parts of the leaf- Arrangement of the leaf- types of the leaf- leaf venation- leaf metamorphosis**	**1**	**6**
Animal Histology I **-Introduction to Animal tissues difference and distribution of the animal tissues in the human body** **-Epithelial tissues, simple and stratified epithelia, glandular epithelia**	**1**	**6**
Animal Histology II **-Connective tissues :** **Types of Cartilages** **Types of Bones** **Blood components**	**1**	**6**
Animal Histology III **-Muscular tissues:** **-Smooth – skeletal – cardiac muscles.** **-Nervous tissues:** **-Neuron and its types** **- Nerve fibres** **- Neuroglial cells.**	**2**	**12**
	14 weeks	**84hrs**

Course Units/Credit Hours	**4 credit hours**		
		Contact hours	**Private study**
Student workload	**Lecture**	**45**	**88**
	Assignments	**0**	**15**
	Practical	**42**	**20**
	Exams & Quizzes	**8**	**22**
	Sum	**95**	**145**
	Total Sum	**240**	
Credits	**8 ECTS C.Ps**		

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	**45**	**0**	**0**	**42**	**8**	**95**
Credit	**3**	**0**	**0**	**1**	**0**	**4**

3. Additional private study/learning hours expected of students per week. **9.67**

4. Development of Learning Outcomes in Domains of Learning
For each of the domains of learning shown below indicate: *A brief summary of the knowledge or skill the course is intended to develop;* *A description of the teaching strategies to be used in the course to develop that knowledge or skill;* *The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.*
Knowledge : Description of the knowledge to be acquired **Upon successful completion of this course The student will be able to:** **Student will be familiar with the general characters of plant cells.** **Student will be aware with the differences between plant and animal cells.** **Student will be familiar with protoplasmic and non protoplasmic contents of plant cell.** **Student will be familiar with the different types of plant tissues, their functions and distribution within plant body.** **1- Define the difference between prokaryotic and eukaryotic cells.** **2- Describe the fine structure and functions of all living organelles.** **3- Explain biological activities of the animal cells.** **4- Detect the difference between animal tissues.** **5- Explain the function of animal tissues.** **6- Discuss the distribution of all animal tissues in the body organs.**

(ii) Teaching strategies to be used to develop that knowledge

The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.

At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.

All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.

Using images and movies

Encouraging students to collect the new information about what the new in Microbiology

Enable the reference books and scientific sites concerning General biology in internet.

(iii) Methods of assessment of knowledge acquired:

Periodical exam and reports 10%

Mid- term theoretical exam 20%

Mid-term practical exam 5%

Final practical exam 15%

Final exam 50%

b. Cognitive Skills

(i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

xplain the structure and function of the plant and animal cells.

Understand the ultrastructure and function of living organelles.

Follow some of the biological activities of the cell.

List types of plant and animal tissues.

Differentiate between plant and animal tissues.

Explain specific characters of each tissues.

Classify the plants and animal tissues

The student will be able to detect the plant and animal tissues in the selected organs examined under the microscopic.

(ii) Teaching strategies to be used to develop these cognitive skills:

- Lectures
- Brain storming
- Discussion

(iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

c. Interpersonal Skills and Responsibility

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

Describe the structure of the cell

- **Explain most of the biological activities of the cell**
- **Make short presentation about the cell and the animal tissues.**
- **Defined the desirable sections.**

Teaching strategies to be used to develop these skills and abilities

- Lab work

- Case Study

- Active learning

- Small group discussion

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

Evaluate the efforts of each student in preparing the report.

Evaluate the scientific values of reports.

Evaluate the work in team

Evaluation of the role of each student in lab group assignment

Evaluation of students presentations

d. Communication, Information Technology and Numerical Skills

Description of the skills to be developed in this domain. At the end of the course, the student will be able to:

Enhancing the ability of students to use computers and internet.

Interpret biological data

Present biological data orally.

Know how to write a report.

Teaching strategies to be used to develop these skills

Homework (preparing a report on some topics related to the course depending on web sites).

Seminars presentation

Field visits to factories

(iii) Methods of assessment of students numerical and communication skills

Evaluation of presentations

Evaluation of reports

Practical exam

e. Psychomotor Skills (if applicable)

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

Practice the basic Lab. Skills.

Use light microscope in accuracy.

Prepare microscopic slides.

(ii) Teaching strategies to be used to develop these skills **- Follow up students the students in lab and during carryout all microbiological techniques**
Methods of assessment of students psychomotor skills **Giving additional marks for preparing correct media, bacterial slides , good seminar presentation** **Practical exam.**

5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

D. Student Support

Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)
Office hours: 10 hrs.

E. Learning Resources

Required Text(s):

Reece et. al (2013) Campbell Biology 10th edition. Benjamin Cunnings.
Mauseth, J. (2008) Plant Anatomy. Blackburn Press
Wojciech Paulina (2015) Histology: a text and atlas. LWW

Recommended Reading List

Electronic Materials, Web Sites

Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.) **Accommodation (Lecture rooms, laboratories, 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** **Providing class rooms with computers and labs with data show.** **3.Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)** **Availability of some reference bacterial strains** **Availability different specific media and chemicals used for isolation.**

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 (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in 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

Faculty member responsible for the course:

Prepared by faculty staff: **1.Botany / Zoology academic staff members.**	**Signature:**
Date Report Completed: 1.04.2018	
Revised by: **1. Dr. Khaled Elbanna.** **2. Dr. Hussein H. Abulreesh.** **3. Dr. Shady M. ElShehawy.**	**Signature:**
Date: 1.04.2018	
Program Chair **Dr. Hussein H. Abulreesh.**	**Signature:**
Dean	**Signature:**
Date:	

Course: English Language I **Code**:7004101-4

Course Units/Credit Hours	Lecture: **4** credit hours		
Student workload		**Contact hours**	**Private study**
	Lecture	60	130
	Assignments	2	18
	Practical	0	0
	Exams & Quizzes	5	19
	Sum	67	167
	Total Sum	**234**	
Credits	**8** ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	**60**	**0**	**0**	**0**	**7**	**67**
Credit	**4**	**0**	**0**	**0**	**0**	**4**
3. Additional private study/learning hours expected of students per week.					**11.13**	

Course: English Language II **Code**:7004102-4

Course Units/Credit Hours	Lecture: **4** credit hours		
Student workload		**Contact hours**	**Private study**
	Lecture	60	123
	Assignments	3	22
	Practical	0	0
	Exams & Quizzes	5	20
	Sum	68	165
	Total Sum	**233**	
Credits	**8** ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	**60**	**0**	**0**	**0**	**8**	**68**
Credit	**4**	**0**	**0**	**0**	**0**	**4**
3. Additional private study/learning hours expected of students per week. **6.67**						

(C) Department Requirements

Course Specifications

Course Specifications

Differentiation and Integration

4042501

COURSE SPECIFICATIONS

Institution	Umm Al-Qura University
College/Department	Faculty of Applied Science/ Department of Mathematical Science

Course Identification and General Information

Course title and code: **Differentiation and Integration** (4042501-4)
2. Credit hours 4 Hours
Program(s) in which the course is offered. **BSc. Mathematics** (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course ****
5. Level/year at which this course is offered Second year/first semester
6. Pre-requisites for this course (if any) **Calculus(1)** (4041011-4)
7. Co-requisites for this course (if any) N A
8. Location if not on main campus Al-Abdia Campus

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?	

B Objectives

What is the main purpose for this course?
By the end of the course, students will learn **the following main concepts:**
-Some properties and Aids in evaluating definite integrals and applications of the integrals..
Transcendental functions and their differentiation.
Inverse of a function and its differentiation.
Techniques of integration.
-Indeterminate forms and improper integrals.

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)
Encouraging students to collect problems from web based reference materials and supervise classroom discussions.
Update references used in teaching process.
Use e-learning facilities more efficiently.
Use computer packages for solving exercises

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
The first fundamental theorem of calculus, the second theorem of calculus, the mean value theorem for integrals and the use of symmetry, the area of a plane region, volume of solids, length of a plane curve.	3	12
The natural logarithm function, inverse functions and their derivatives, the natural exponential function and logarithm functions, The inverse trigonometric functions and their derivatives, the hyperbolic functions and their inverses.	4	16
Basic integration rules, integration by part, some trigonometric integrals, rationalizing substitution, integration of rational functions using partial fractions.	4	16
Indeterminate forms of type 0/0, other indeterminate forms, improper integrals: infinite limits of integration, improper integral: infinite integral.	3	12
Revision	1	4
Total	**15**	**60**

Course Unit/Credit hours	**4 credit hours**		
Students workload:		**Contact hours**	**Private study**
	Lecture	**60**	**120**
	Practical	**0**	**0**
	Assignments	**0**	**25**
	Exams & Quizzes	**8**	**25**
	Sum	**68**	**170**
	Total Sum:	**238**	
Credit	**8 ECTS C.Ps**		

2. Course components (total contact hours and credits per semester):						
	Lecture	**Tutorial**	**Laboratory or Studio**	**Practical**	**Other: (Exams Quizzes)**	**Total**
Contact Hours	**60**	**0**	**0**	**0**	**8**	**68**
Credit	**4**	**0**	**0**	**0**	**0**	**4**
3. Additional private study/learning hours expected of students per week.						**10.4**

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

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define the related basic scientific facts, concepts, principles and techniques in calculus	Lectures Tutorials Discussion Problem Solving	Exams Home work.
1.2	Recognize the relevant theories and their applications in basic mathematics.		
2.0	**Cognitive Skills**		
2.1	Represent problems mathematically.	Lectures Tutorials Solve Problem Brain Storming	Exams Quizzes. Homework. Discussion
2.2	distinguish different rules in calculus.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Develop connections of calculus with other disciplines	Cooperative education Competitive education	Home work. Reports. Quizzes. Discussion
	Solve problems using a range of formats and approaches in basic science		
3.2	show the ability to work independently and within groups.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Learn how to summarize lectures or to collect materials of the course.	Lectures tutorials brain storming	Home work. Reports. Discussion
4.2	Learn how to solve difficulties in learning: solving problems – enhance educational skills		
5.0	**Psychomotor**		
	Not applicable		

5. Schedule of Assessment Tasks for Students During the Semester			
No.	Assessment task	Week due	Proportion of Final Assessment
1	Midterm 1	7^{th} week	20 %
2	Midterm 2	12^{th} week	20%
3	Homework + reports + Quizzes	During semester	10%
4	Final exam	End of semester	50 %

D. Student Academic Counseling and Support

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) Office hours per week in the lecturer schedule (4 hours per week). 2- Contact with students by e-mail,SMS, and e-learning facilities.

E. Learning Resources

Required Text(s)
Calculus (Ninth Edition)by Dale Varberg, Edwin Purcell and Steven Rigdon, chapers 4-8
Essential References
Calculus (Ninth Edition)by Dale Varberg, Edwin Purcell and Steven Rigdon
Recommended Books and Reference Material (Journals, Reports, etc) (Attach List): ---
4.Electronic Materials, Web Sites etc http://en.wikipedia.org/wiki/Calculus
5. Other learning materials such as computer-based programs/CD, professional standards/regulations: Maple

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
Accommodation (Lecture rooms, laboratories, etc.) -Classroom with capacity of 25-students. - Library.
2. Computing resources: Not available
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list): None

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: Student feedback through electronic facilities organized by the deanship of registration and acceptance.
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Evaluation of the teachers by internal & external faculty members. Visiting to the classrooms. Mutual visits between colleagues and giving advices to each other after each lecture
3 Processes for Improvement of Teaching Analysis of student course evaluation and feedback Peer evaluation and feedback Review of course portfolios Workshops on pedagogical methods

Processes for Verifying Standards of Student Achievement (eg. 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) Analysis of course assessments by other reviewers on a periodic basis.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. Material and learning outcomes are periodically reviewed internally and externally. Comparing course content and teaching methodologies with similar courses offered at other departments and universities. Studying the outcomes of the students' evaluation of the course and use it to improve teaching strategies.

Faculty or Teaching Staff: ____
Signature: ______________________ Date Report Completed: ____________________
Received by: ___________________________ Dean/Department Head
Signature: ____________________________ Date_________

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

Course Specifications
(Linear Algebra (1) Math. 4042402-4)

Course Specifications

Institution:Umm Alqura University, Makkah
College/Department: College of Applied Science, Mathematical Science Department

Course Identification and General Information

Course title and code:**Linear Algebra (1) Math. 4042402-4**
2. Credit hours: **4 Credit hours.**
Program(s) in which the course is offered: (If general elective available in many programs indicate this rather than list programs) **Bachelor of Mathematical Science**
Name of faculty member responsible for the course **Prof. Dr. Ahmad Mohammed Ahmad Alghamdi**
5. Level/year at which this course is offered: **2th Year/ Level 3/ Semester 1**
Pre-requisites for this course (if any) **None**
Co-requisites for this course (if any) **(Discrete MathematicsMath. 404-354-3)+ (Introduction of Rings theory Math. 404-342-3)**
8. Locations: **Main campus+Girls Sections**

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:Mainly traditional classroom will dominant the mode on instruction. There is a need to apply some modes in some situations.

B. Objectives

What is the main purpose for this course?
The main purpose of this course are:
1-Linear equations in linear algebra: systems of linear equations, consistent and inconsistent systems of linear equations, examples
2-Elementary row operations, row reduction and echelon forms: examples
3-Matrix Algebra: Matrix operations, Properties of matrix multiplication,
the inverse of a matrix (invertible matrix theorem), elementary matrices, column space and null space of a matrix: examples

4-Determinants: Recursive definition of a determent, properties of determinants. Applications: Cramer's rule and volume. 5-Vector spaces: Definition, examples, substructures, and linear transformations of vector spaces examples 6-Linearly independence and basis of a vector space: examples 7-Eigen values and Eigenvectors of matrices , Orthogonality and least Squares.
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) Solving and proving basic facts using mathematical reasoning and proofs. Learning many problems in mathematical logic, set theory and binary operations. Encouraging students to collect and to use text books and tutorial to developand solve problems. -Encouraging students to collect and to use the web to develop and solve problems.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Linear equations in linear algebra: systems of linear equations, consistent and inconsistent systems of linear equations, examples	2.5	10
Elementary row operations, row reduction and echelon forms: examples	2	8
Matrix Algebra: Matrix operations, Properties of matrix multiplication, the inverse of a matrix (invertible matrix theorem), elementary matrices, column space and null space of a matrix: examples	2.5	10
Determinants: Recursive definition of a determent, properties of determinants. Applications:Cramer's rule and volume.	2	8
Vector spaces: Definition, examples, substructures, and linear transformations of vector spaces examples	2	8
Linearly independence and basis of a vector space: examples	2	8
Eigen values and Eigenvectors of matrices , Orthogonality and least Squares	2	8

Course Unit/Credit hours	4 credit hours		
Students workload:		Contact hours	Private study
	Lecture	60	120
	Practical	0	0
	Assignments	0	25
	Exams & Quizzes	8	25
	Sum	68	170
	Total Sum:	238	
Credit	8 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	60	0	0	0	8	68
Credit	4	0	0	0	0	4
3. Additional private study/learning hours expected of students per week.						10.4

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy			
	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	1-To name and label Linear equations in linear algebra: systems of linear equations, consistent and inconsistent systems of linear equations, examples To recognize Elementary row operations, row reduction and echelon forms: examples To list Matrix Algebra: Matrix operations, Properties of matrix multiplication, the inverse of a matrix (invertible matrix theorem), elementary matrices, column space and null space of a matrix: examples To define Determinants: Recursive definition of a determent, properties of determinants. Applications: Cramer's rule and volume. 5-To define Vector spaces: Definition, examples, substructures, and linear transformations of vector spaces examples 6-To recognize Linearly independence and basis of a vector space: examples 7-to describe Eigen values and Eigenvectors of matrices , Orthogonality and least Squares.	Lectures, tutorials and exams	Written Exams
1.2	To define Determinants: Recursive definition of a determent, properties of determinants. Applications: Cramer's rule and volume. 5-To define Vector spaces: Definition, examples, substructures, and linear transformations of vector spaces examples 6-To recognize Linearly independence and basis of a vector space: examples	Lectures, tutorials, and exams	Written exams

	7-to describe Eigen values and Eigenvectors of matrices , Orthogonality and least Squares.		
2.0	**Cognitive Skills**		
2.1	1-To solve and explain Linear equations in linear algebra: systems of linear equations, consistent and inconsistent systems of linear equations, examples To explain Elementary row operations, row reduction and echelon forms: examples To use Matrix Algebra: Matrix operations, Properties of matrix multiplication, the inverse of a matrix (invertible matrix theorem), elementary matrices, column space and null space of a matrix: examples	Lectures and Tutorials **<u>Brainstorming:</u>** A Method of solving problems in which all members of a group suggest ideas and then discuss them.	Mid-term exams
2.2	To explain and to use Determinants: Recursive definition of a determent, properties of determinants. Applications: Cramer's rule and volume. 5-To explain Vector spaces: Definition, examples, substructures, and linear transformations of vector spaces examples 6-To interpret Linearly independence and basis of a vector space: examples 7-to interpret and compute Eigen values and Eigenvectors of matrices , Orthogonality and least Squares.	Lectures, tutorials and exams **<u>Brainstorming:</u>** A Method of solving problems in which all members of a group suggest ideas and then discuss them.	Mid-term exams
3.0	**Interpersonal Skills & Responsibility**		
3.1	Demonstrate communication skills with the teacher and other students in the class.	Working together	Group study to do homework
3.2	Reading and solving basic facts of linear algebra structures.	Working together	Group study to do homework
4.0	**Communication, Information Technology, Numerical**		

4.1	Demonstrate communication skills with the teacher and other students in the class. Show ability to do mental mathematics	Working together **Brainstorming:** A Method of solving problems in which all members of a group suggest ideas and then discuss them.	Group study to do homework
4.2	Reading and solving basic facts of linear algebra structures.	Working together	Group study to do homework
5.0	**Psychomotor**		
5.1	Demonstrate an ability to build mathematical sense and establish linear algebra structures.	An interview assignments where a specific time limit is given to the student	Students will be evaluated for different assignments By and interview
5.2	Construct algebraic structures and evaluate matrix operations	**Brainstorming:** A Method of solving problems in which all members of a group suggest ideas and then discuss them.	

Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching

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	demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct

5. 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	Continuous Assessment Evaluation	Weekly	10%
2	First Periodic Exam	5	20 %
3	Second Periodic Exam	10	20%
4	Final Examination (written Exam)	16	50%

D. Student Academic Counseling and Support

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 group of students is assigned to a particular faculty where he or she will provide academic advising during specific academic hours. Each staff will provide at least one session/week.
-There will be an academic advisor how will be a responsible for helping the student by doing the general supervision .
The people in the library will support the students during the time of the course.

E. Learning Resources

List Required Textbooks
The book: Linear Algebra and Its Applications,(4th Edition)
Publisher: Pearson; 4 edition (December 26, 2011)
Language: English ISBN-10: 0321836146 ISBN-13: 978-0321836144
Linear Algebra (2nd Edition) by Kenneth M Hoffman, Ray Kunze;
Publisher: Pearson; 2 edition (April 25, 1971)
Language: English ISBN-10: 0135367972 ISBN-13: 978-0135367971

List Essential References Materials (Journals, Reports, etc.)
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List Recommended Textbooks and Reference Material (Journals, Reports, etc)
Schaum's Outline of Linear Algebra, 5th Edition: 612 Solved Problems + 25 Videos (Schaum's Outlines) :Publisher: McGraw-Hill Education; 5 edition (December 11, 2012)
Language: English ISBN-10: 0071794565 ISBN-13: 978-0071794565
-

List Electronic Materials(eg. Web Sites, Social Media, Blackboard, etc.) https://en.wikipedia.org/wiki/Linear_algebra http://mathworld.wolfram.com/topics/LinearAlgebra.html
Other learning material such as computer-based programs/CD, professional standards or regulations and software. -Mathematica -Magma -Gap -Matlab -Maple

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.)
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Lecture classroom which can accommodate 30 students for lectures and tutorials (normal and classical classroom)

Computing resources (AV, data show, Smart Board, software, etc.) Data Show (projector): sometimes shall be used.
Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) This course is a basic and fundamental course in mathematical reasoning and mathematical proofs ans well as basic course for building algebraic structures and the main source is thinking even we just use chalk and the board.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Following completion of the prescribed course study in Pediatrics module, an evaluation should be conducted through the following: A student questionnaire feedback should be carried out on the quality & effectiveness of teaching and evaluation
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor A staff questionnaire feedback about course
3 Processes for Improvement of Teaching Submission of a final evaluation report at the end of the course

A review of the recommended teaching strategies should be submitted after evaluation.
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) Compare the standards of students achievements' with standards archived elsewhere (inside KSA or students from outside the kingdom) by checking the marking of a sample of some student work : tests, course work Assignment by an independent member of teaching staff either from the UQU or other universities

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. Reviewing feedback on the quality of course report from staff members, other university' staffs. Looking for strengthen and weak points gathered at the end of the course and working on it. Plan to introduce updating material and technology that could improve the quality

Faculty or Teaching Staff: ___Dr. Ahmad Mohammed Ahmad Alghamdi____
Signature: ___Ahmad Alghamdi__________ Date Report Completed: 5 October 2018
Received by: ______________________________ Dean/Department Head
Signature: ________________________________ Date: _______________

(D) University Requirements

Course: The Holy Qu'aan I Code:605101-2

Course Units/Credit Hours	Lecture: 2 credit hours		
Student workload		**Contact hours**	**Private study**
	Lecture	30	51
	Assignments	1	15
	Practical	0	0
	Exams & Quizzes	4	14
	Sum	35	80
	Total Sum	**115**	
Credits	**4** ECTS C.Ps		

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	**30**	**0**	**0**	**0**	**5**	**35**
Credit	**2**	**0**	**0**	**0**	**0**	**2**

3. Additional private study/learning hours expected of students per week. **4.93**

Course: The Biography of Prophet Muhammad (pbuh) Code:102101-2

Course Units/Credit Hours	Lecture: 2 credit hours		
Student workload		**Contact hours**	**Private study**
	Lecture	30	38
	Assignments	2	13
	Practical	0	0
	Exams & Quizzes	3	12
	Sum	35	63
	Total Sum	**98**	
Credits	**3** ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	**30**	**0**	**0**	**0**	**5**	**35**
Credit	**2**	**0**	**0**	**0**	**0**	**2**
3. Additional private study/learning hours expected of students per week.					**4.20**	

Course: Arabic Language Code:501101-2

Course Units/Credit Hours	**Lecture: 2 credit hours**		
Student workload		**Contact hours**	**Private study**
	Lecture	30	32
	Assignments	2	14
	Practical	0	0
	Exams & Quizzes	4	13
	Sum	36	59
	Total Sum	**95**	
Credits	**3** ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	**30**	**0**	**0**	**0**	**6**	**36**
Credit	**2**	**0**	**0**	**0**	**0**	**2**
3. Additional private study/learning hours expected of students per week.					**3.93**	

Course: Islamic Culture I Code:601101-2

Course Units/Credit Hours	**Lecture: 2 credit hours**		
Student workload		**Contact hours**	**Private study**

	Lecture	30	32
	Assignments	1	11
	Practical	0	0
	Exams & Quizzes	4	12
	Sum	35	55
	Total Sum	**90**	
Credits	**3** ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams, Quizzes)	Total
Contact Hours	**30**	**0**	**0**	**0**	**5**	**35**
Credit	**2**	**0**	**0**	**0**	**0**	**2**
3. Additional private study/learning hours expected of students per week.	**4.27**					

Course: Islamic Culture II Code:601201-2

Course Units/Credit Hours	**Lecture: 2 credit hours**		
Student workload		**Contact hours**	**Private study**
	Lecture	30	32
	Assignments	2	10
	Practical	0	0
	Exams & Quizzes	3	11
	Sum	35	53
	Total Sum	**88**	
Credits	**3** ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total

Contact Hours	**30**	**0**	**0**	**0**	**5**	**35**
Credit	**2**	**0**	**0**	**0**	**0**	**2**

3. Additional private study/learning hours expected of students per week. **3.53**

Course: The Holy Qur'an II Code:605201-2

Course Units/Credit Hours	**Lecture: 2 credit hours**		
Student workload		**Contact hours**	**Private study**
	Lecture	30	32
	Assignments	2	13
	Practical	0	0
	Exams & Quizzes	3	15
	Sum	35	60
	Total Sum	**95**	
Credits	**3** ECTS C.Ps		

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	**30**	**0**	**0**	**0**	**5**	**35**
Credit	**2**	**0**	**0**	**0**	**0**	**2**

3. Additional private study/learning hours expected of students per week. **4.0**

Course: Islamic Culture III Code:601301-3

Course Units/Credit Hours	**Lecture: 3 credit hours**		
Student workload		**Contact hours**	**Private study**
	Lecture	45	50
	Assignments	0	10
	Practical	0	0
	Exams & Quizzes	4	15

	Sum	34	75
	Total Sum	**109**	
Credits	4 ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	**30**	**0**	**0**	**0**	**4**	**34**
Credit	**2**	**0**	**0**	**0**	**0**	**2**

3. Additional private study/learning hours expected of students per week. **4.4**

Course: The Holy Qur'an III Code:605301-2

Course Units/Credit Hours	**Lecture: 2 credit hours**		
Student workload		**Contact hours**	**Private study**
	Lecture	30	31
	Assignments	2	16
	Practical	0	0
	Exams & Quizzes	4	15
	Sum	36	62
	Total Sum	**98**	
Credits	**3** ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams&Quizzes)	Total
Contact Hours	**30**	**0**	**0**	**0**	**6**	**36**
Credit	**2**	**0**	**0**	**0**	**0**	**2**

3. Additional private study/learning hours expected of students per week. **4.13**

Course: Islamic Culture IIV   Code:601401-2

Course Units/Credit Hours	**Lecture: 2 credit hours**		
Student workload		**Contact hours**	**Private study**
	Lecture	30	42
	Assignments	2	16
	Practical	0	0
	Exams & Quizzes	4	19
	Sum	36	77
	Total Sum	**113**	
Credits	**5** ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	**30**	**0**	**0**	**0**	**6**	**36**
Credit	**2**	**0**	**0**	**0**	**0**	**2**
3. Additional private study/learning hours expected of students per week.					**6.27**	

Course: The Holy Qur'an IIV   Code:605401-2

Course Units/Credit Hours	**Lecture: 2 credit hours**		
Student workload		**Contact hours**	**Private study**
	Lecture	30	50
	Assignments	0	18
	Practical	0	0
	Exams & Quizzes	5	17
	Sum	35	85
	Total Sum	**120**	
Credits	**4** ECTS C.Ps		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams&Quizzes)	Total
Contact Hours	**30**	**0**	**0**	**0**	**5**	**35**
Credit	**2**	**0**	**0**	**0**	**0**	**2**

3. Additional private study/learning hours expected of students per week. **5.67**