ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Physiscs 2
(Phys 217)

Course Specifications

Institution :	**Majmaah University**	Date of Report:	**13/6/1435**
College/Department :	**Zulfi College of Science** // **Physics Department**		

A. Course Identification and General Information

1. Course title and code:	**Physics 2 // Phys 217**		
2. Credit hours:	3 Credit hours		
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)	**Physics Program (B.Sc.)**		
4. Name of faculty member responsible for the course	**Dr. Ibrahim Shaarany**		
5. Level/year at which this course is offered:	**3rd Level**		
6. Pre-requisites for this course (if any):	General Physics 2		
7. Co-requisites for this course (if any)	No		
8. Location if not on main campus :	**Zulfi College of Science Al-Zulfi**		
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	x	What percentage?	80
b. Blended (traditional and online)	x	What percentage?	20
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

The mode of instructor is distributed and used two items [Traditional classroom with 80% and Traditional online with 20%]

B Objectives

- What is the main purpose for this course?

On completion successful students will be able to:

- Understand Electric Charge, Insulators and conductors, Coulomb's law, Point charge, The electric field.
- Calculate the Electric field of multiple point charges, The electric field of continuous charge distribution, examples of various shapes (disks, rings, spheres, planes).
- Understand The parallel plate capacitor, Electric dipole, motion of point charge and electric dipole in electric field, Electric flux, Gauss's law,
- Apply Gauss's law.
- Understand Conductor in electrostatic equilibrium, The electric current, Batteries, current density, Conductivity and resistivity, Electric potential.
- Calculate the potential of point charges at a point.
- Understand the potential of dipole, The electric potential of many charges, Capacitance and capacitors, Energy stored in a capacitor,
- Understand fundamental circuits, Ohm's law, Series resistors, Parallel resistors, Kirchhoff's laws, RC circuits.
- Understand magnetism and magnetic force, source of magnetic fields, Magnetic field of current, Magnetic dipoles, Ampere's law and solenoids.
- Calculate the magnetic force on a moving charge, the magnetic force on a current-carrying wire, Forces and torques on current loops, Induced current, Motional emf, Magnetic flux.
- Apply Lenz's law, Faraday's law, Induced fields and EM waves.
- Understand inductors, LC circuits, LR circuits, AC circuits and phasor, Capacitors in AC circuits, RC filter circuits, Inductor circuits, The RLC circuits, Power in AC circuits.
- Understand Wave phenomena, Longitudinal and transverse waves, Sound, The nature of light and the laws of geometric optics, Image formation, Interference of light waves, Diffraction patterns and polarization.

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. **Update the content periodically.**
2. **Using new references.**
3. **Using web references.**
4. **increase use of IT**
5. **increase use of video material**
6. **exploring the possibility of introducing students to a specialized software**
7. **Increased use of power-point and projector in class**

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

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(The credit point is equal 25-30 hours)

A full academic year is equivalent to 36 Credit hour, which each semester is to be 18 Credit hour. Each course is credited with a number of credit hour (>=2) according to the student's workload (contact hours, laboratory work, homework, examination etc) and accumulation of credits hour is accomplished after successful completion of the course. In this case, one Credit hour is equal 25 – 30 student's workload hour.

Topic	Contact hours			Total of contact hours	Self- Study				Total hours
	Lecture	Tutorials	Lab		Internet	Library	Homework	Discussions	
Electric Charge, Insulators and conductors, Coulomb's law, Point charge, The electric field, Electric field of multiple point charges, The electric field of continuous charge distribution, examples of various shapes (disks, rings, spheres, planes), The parallel plate capacitor, Electric dipole, motion of point charge and electric dipole in electric field.	6	-	4	10	2	3	3	2	16
Electric flux, Gauss's law, Applications of Gauss's law, Conductor in electrostatic equilibrium, The electric current, Batteries, current density, Conductivity and resistivity, Electric potential, The potential of point charges, The potential of dipole, The electric potential of many charges, Capacitance and capacitors, Energy stored in a capacitor.	6	-	4	10	2	3	3	2	16
Fundamental circuits, Ohm's law, Series resistors, Parallel resistors, Kirchhoff's laws, RC circuits.	3	-	2	5	2	3	3	2	
Mid-term 1	-	-	-		-				
Magnetism and magnetic force, source of magnetic fields, Magnetic field of a current, Magnetic dipoles, Ampere's law and solenoids	6	-	2	10	2	3	3	2	16
Magnetic flux, Lenz's law, Faraday's law, Induced fields and EM waves, Inductors, LC circuits, LR circuits, AC circuits and phasor, Capacitors in AC circuits, RC filter circuits, Inductor circuits, The RLC circuits, Power in AC circuits	6		2	8	2	3	3	2	
The magnetic force on a moving charge, The magnetic force on a current-carrying wire, Forces and torques on current loops, Induced current, Motional emf	3	-	2	5	2	3	3	2	17
Mid-term 2	-	-	-						
Wave phenomena, Longitudinal and transverse waves, Sound	6	-	2	8	2	4	3	3	21
The nature of light and the laws of geometric optics, Image formation	3	-	2	5	2	3	3	3	14
Interference of light waves, Diffraction patterns and polarization.	6	-	-	6	3	3	3	4	19

Final Exam	-	-	2						
Total	45	-	-	24	18	25	32	25	170

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45		24		101	170
Credit	3		1			4

3. Additional private study/learning hours expected for students per week.	**1.5**

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

For each of the domains of learning shown below indicate:

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

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The ***National Qualification Framework*** provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

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. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Remember Coulomb's law, Continuous charge distributions ,linear, on surface and in volume.	• Developing basic communicative • Ability through short and varied situated discourse. • Lecturing • Team work • Exercises	• Homework. • Group Discussion • Presentation • Mid-term exam • Final test
1.2	Study and represent Field lines and flux, Gauss's law and its applications		
1.3			
1.4			
1.5	Understand. and know the magnetic properties of matter		
2.0	**Cognitive Skills**		
2.1	Apply Gauss law to calculate electric field and potential for charge distributions for high symmetry.	• Problem solving • Class discussion • presentation • Individual meeting with the instructor (encouraging students to discuss different topics outside the classroom)	• Class Participation • Presentation • Essay Question • Research
2.2	Calculate the magnetic force on a moving charge in a uniform magnetic field.		
2.3	Apply the gained mathematical and experimental knowledge in any physical related topic.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Work in a group and learn time management.	• Discussion with students • Making students aware about time management in completing their assignments and projects. • Counsel students how to make a good presentation in English. • Encourage students to help each other • Group presentation • Group assignments	• Respecting dead lines. • Showing active class participation. • Helping other students to understand tasks in the class. • Giving clear and logical arguments • Performing seriously on midterms and final exams
3.2	Learn how to search for information through library and internet.		
3.3	Present a short report in a written form and orally using appropriate scientific language		

4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate with teacher, ask questions, solve problems, and use computers.	• Exercises • Problem solving • oral quizzes • Essay questions • Encourage students to use program soft wear	• Write reports • Exercises related to specific topics
4.2	Illustrate deal with confidence with differential equations, integrations, and differentials.		
4.3	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended.		
	Students use information technology in the classroom		
5.0	**Psychomotor**		
5.1	Perform an experiment to verify the general law of lenses and mirrors.	1. Cooperative learning. 2. Exploring Learning 3. Laboratory Learning 4. Computer Aided Learning	1. Final practical exams. 2. Evaluation of lab reports.
5.2	Perform an experiment to estimate the capacitance of a capacitor	5. Cooperative learning. 6. Exploring Learning 7. Laboratory Learning 8. Computer Aided Learning	1. Final practical exams. 2. Evaluation of lab reports.

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

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

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

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

Suggested assessment methods and teaching strategies are:

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

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

5- Please fill in this table based on the following criteria:

1. Based on your course syllabus, provide 3 - 5 *major course objectives* in column 1 along with 2 - 3 *outcomes for each objective* in column 2.
2. In column 3, indicate how the objectives and outcomes in column 1 and 2 map into ME Program Learning Outcomes (PLO)
3. In column 3, indicate how the objectives and outcomes in columns 1 and 2 *map* into the NCAAA Outcomes
4. In column 4, indicate how the objectives and outcomes in columns 1 and 2 *map* into the Asiin criteria
5- Learning outcomes in step 2, 3, 4 are listed in (Physics Program Guidance)

Course Objectives:	Course Outcomes:	PLO	NCAAA	Asiin
The knowledge of the basics Electricity.	Remember Coulomb's law, and definite Continuous charge distributions, linear, on surface and in volume.	8,9,10	2,3	b,
	Apply Gauss law to calculate electric field and potential.	3,6,7	1,3,6	c,e, h
	Remember Coulomb s law	2,4	3	C, h

	Calculate potential energy of charge distributions.	7,8	6,7	H,f
The knowledge of the basics magnetism.	Derive Laws for magnetism			
	Understanding the magnetic properties of matter	8,9	6,8	g
	Applying Ampère law	6,7	9	h
	Differentiate between magnetic and electric field	10, 14	11	g,h
The development of students' mental and practical abilities.	Present a short report in a written form and orally using appropriate scientific language.	12,18	10,12	J,k
	Contributing to group discussion	j (4, 5)	11, 12	l, p
	Perform experiments independently with self-reliance.	j (1, 3, 4, 5)	12, 13	P
	Using of communications technology to communicate with instructors and peers	K (1 ,2, 3)	14	g
	Using of software programs in solving problems and view simulations.	K (1 ,2, 3)	14	i

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	First exam*	6	20%
2	Second exam*	11	20%
3	Lab. Exam	14	20%
4	Presentation	One/ semester	
5	Homework	Every week	
6	Quizzes	End topics	
7	Discussions	Every week	
8	Team group	Three or for time/ semester	

9	Tutorials	Every sub topic	
10	Computer tools used	Every report and presentation	
11	Project	-	
12	Peer project	-	
13	Final exam *	End of the semester	40%
	Total		100 %

* First exam, second exam and final exam are written exam

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)

Four office hour per week

E. Learning Resources

1. List Required Textbooks:

Physics for scientists and engineers; *Raymond A. Serway and John W. Jewett*; Cengage Learning; 9th edition; (2013).

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

- **College Physics**; *Raymond A. Serway and Chris Vuille*; Cengage Learning; 9th edition; (2011).

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

- **Physics**; *John D. Cutnell and Kenneth W. Johnson*; John Wiley & Sons; 9th edition; (2012).

4. List Electronic Materials (e.g. Web Sites, Social Media, Blackboard, etc.)

- http://demonstrations.wolfram.com
- http://faculty.mu.edu.sa/ishaarany
-

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

- **Excel software for drawing graphs in the lab.**
- **Word office for writing reports.**

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, a smart board to write on and computer, General Physics Lab.**

2. Computing resources (AV, data show, Smart Board, software, etc.) **Computer Lab. and internet lab.**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Library, and Seminar Room , Wi-Fi internet connections**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching **Student evaluation electronically organized by the University**
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor **There is a department committee**
3 Processes for Improvement of Teaching 1. **Course report.** 2. **Program report.** 3. **Training Courses**
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) **Efficiency of course will be reflected on the results of the class, which reviewed by members of the teaching staff in addition to other duties such as discussing ideas and ways of teaching and learning. The course should be developed periodically to ensure that it contains the latest developments in the field of study. Development could be put as an objective in the report of the course to be achieved each semester.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **1- Course Evaluation** **2- Exam Evaluation** **3- Improvement plan** **4- Program Outlearning with course outlearning** **5- Outlearning from the pre-requisite course**

Faculty or Teaching Staff: _____Dr Ibrahim Shaarany_____

Signature: _____ Date Report Completed: _____

Received by: _____Dr. Thamir Alharbi_____ Department Head

Signature: _____ Date: _____