هيئة تقويم التعليم
Education Evaluation Commission
المركز الوطني للتقويم والاعتماد الأكاديمي
National Center for Academic Accreditation and Evaluation

COURSE SPECIFICATIONS
(CS)

Electromagnetism 2

PHYS 323

June 2018

Course Specifications

Institution King Saud University	Date 28/6/1438
College/Department Sciences / Physics and Astronomy	

A. Course Identification and General Information

1. Course title and code: Electromagnetism 2 – PHYS 323			
2. Credit hours 3 hours (3+0+0)			
3. Program(s) in which the course is offered. Bachelor in Physics (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: Fifth			
6. Pre-requisites for this course (if any) PHYS 221			
7. Co-requisites for this course (if any)			
8. Location if not on main campus			
9. Mode of Instruction (mark all that apply)			
a. traditional classroom	*	What percentage?	90%
b. blended (traditional and online)	*	What percentage?	10%
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 aims to enable the student to comprehend the theoretical principles of electromagnetism, to become familiar with Maxwell's equations of electromagnetism, and with the propagation of electromagnetic radiation in vacuum.
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) Utilizing BlackBoad in communicating with the students and enabling e-Learning.

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

Course Description: This course builds up on 221 phys in order to establish the theoretical grounds of electromagnetism. The course covers vector calculus, electrostatics in free space, conductors and dielectric materials. It also covers Ampere's law and the magnetic field, Maxwell equations in differential and integral forms, and in tensor form. It also covers solutions to Maxwell equations in vacuum and the propagation of electromagnetic radiation. The course covers the so-called 4-vector notation and the compatibility of Maxwell equations with special relativity. It also introduces gauge transformations.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Vector Calculus in different coordinate systems	1	3
Electrostatic in free space and in conductors	3	9
Electrostatic in dielectric materials	2	6
Ampere's law and the magnetic field	3	9

Maxwell's Equations and Electrodynamics	3	9
Electromagnetic waves	3	9

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	45					45
Credit	45					45

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

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

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

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

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	To outline the main concepts of electrodynamics	Lecture, Smart Board	Exams and homework
1.2	To recognize the importance of vector calculus in solving physical problems	Lecture, Smart Board	Exams and homework
2.0	**Cognitive Skills**		
2.1	Calculate the physical properties of electrodynamical systems using different methods	Lecture, Discussion	Discussion
2.2	Analyze electrodynamical systems using Maxwell's equations	Lecture, Discussion	Discussion
3.0	**Interpersonal Skills & Responsibility**		
3.1	Demonstrate mastery of the techniques used in electrodynamics	Group discussion, Inverted class	Presentation / discussion

3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Illustrate how to solve problems in electrodynamics	Presentation	Group presentations
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

6. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Midterm 1	5	15%
2	Midterm 2	11	15%
3	Quiz	Throughout	10%
4	Homework	Throughout	10%
5	In-class discussion	Throughout	10%
6	Final	End of term	40%
7			
8			

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)

2 hours per week of office hours

E Learning Resources

1. List Required Textbooks , Introduction to Electrodynamics 4th Edition by David Griffiths, Cambridge University Press, 2017 Electricity and Magnetism by Edward M. Purcell and David Morin, Third Edition, Cambridge University Press, 2013
2. List Essential References Materials (Journals, Reports, etc.) Electricity and magnetism by M. Al-Esa
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Electrodynamics by Jackson
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. MIT online courses, Coursera
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Lecture hall for 30 students
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 Feedback to be taken at the end of each class
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Peer consultation
3 Processes for Improvement of Teaching

Developing teaching based on regular feedback and peer consultation
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) Double-checking by independent peers
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. Creating a table for the course to ensure that the goals are achieved, and taking into account feedback and peer consultation

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Field Experience Teaching Staff _____

Program Coordinator:_____

Signature: _____ Date Received: _____