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

COURSE SPECIFICATIONS
(CS)

Electromagnetism lab

PHYS 394

June 2018

Course Specifications

Institution	King Saud University	Date
College/Department **College of Science /Physics and Astronomy**		

A. Course Identification and General Information

1. Course title and code: **Electromagnetism lab (PHYS 394)**
2. Credit hours: 2(0+0+4) hours per week
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **Undergraduate Program**
4. Name of faculty member responsible for the course
5. Level/year at which this course is offered: 5th Level
6. Pre-requisites for this course (if any) PHYS 221
7. Co-requisites for this course (if any) None
8. Location if not on main campus : Main campus for Male + Female
9. Mode of Instruction (mark all that apply)

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

Comments:

B Objectives

1. What is the main purpose for this course?

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

a- The student should be able to Provide a connection between theory and practice for the principles introduced in 221 phys lectures.

b- The student should Develop his technical skills by using specialized equipment, materials and tools. Technical, practical, observational, manipulative and measurement skills will also be developed.

c- The student should Promote teamwork skills necessary to perform effectively as a physics student and the sense of ethical and professional responsibility.

d- they will acquire the skills for measurement techniques. In addition, a strong emphasis on laboratory documentation, report writing, and oral presentation.

j- The student should be able to make careful experimental observations and how to think about and draw conclusions from such data. And use the computers to analyse the collecting data, and relate their result with numerical modelling to the relevant theory.

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

a- usage of computer simulation.

b-perform the experiment with the latest instrument developed.

g- Project including select and performing a different experiments related to main idea of the course.

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

Course Description:

Milikan experiment, Resonance in RCL services circuits, Full wave rectification, Determination of magnetic field intensity using the search coil, Determination of the charge to mass ratio for the electron (e/m), Determination of dielectric constant using RCL resonance circuit. Transformers.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
1-RLC series resonance circuit	1	4
2-Usage of RLC series resonance circuit to calculate the insulation constant for (wood, and plastic)	1	4
3-transformer a-step up b- step down c-transformer under load	1	4
4-motional emf	1	4
5-studing deflection of charged particle in (electric field-magnetic field, and calculating The ratio e/m) using Thomson tube	1	4
6-measuring the magnetic field intensity using the spot galvanometer	1	4
7-measuring the horizontal component of the earth magnetic field(classy lab)	1	4
8-Hall effect	1	4
9- Malican experiment	1	4
10- measuring the magnetic field due to circular conductor a-at the centre of the loop b- as afunction of x	1	4

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

			or Studio			
Contact Hours	40		30 hours			40
Credit	20					20

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	State the basic laws of the electromagnetic field through a broad range of interesting real applications. Recognize the e/m ratio of an Electron knowledge the voltage and current transformer. Tell about the concept of Faraday theory of induction and its applications in different fields.	- Lecture, - Preparing of laboratory experiments reports on their outcomes, completing tutorial prelab questions designed to give further practice in application of theory. - Lab demonstrations, memorization, individual presentation.	- going through the student notebook and discussing the results - written and experimental exams at the end of the semester. - exams, portfolios, long and short essays, log books, analytical reports, individual and group
1.2	The students have to know how to : register the name and purpose of the experiment, put appropriate words to explain the experiment, aim and set appropriate settings.		
1.3	use laboratory equipment conduct relevant experiments, to generate data, save and record results, re-experiment to obtain accuracy in readings and measurements.		
2.0	**Cognitive Skills**		
2.1	Prepare the experiment and install it.	- Through teaching by	- Written and verbal

	Demonstrates experience and how it works,	focusing on the above mentioned points - Define duties for each experiment - Advise students to search on some of the mentioned technologies either on websites or in library and make reports. individual presentation, brainstorming,	assessment. - Debates, - lab reports, - portfolios, - long and short essays, - exams.
2.2	Ability to calculates some numerical issues, interpret expected and unexpected results,		
2.3	Answers questions and raises questions if there is something unclear, Work collectively to achieve the best results, summarize the results and evaluate the experience. Criticizes and evaluates results.		
3.0	**Interpersonal Skills & Responsibility**		
	The student must have the ability to: explain, the importance of the experiment and the steps of work in it choose the right tools to do the experiment and the appropriate parameters.	- Work independently and as part of a team. - Manage resources, time and other members of the group. lecture, small group work, research activities, lab demonstrations,	- Discussion. interaction with the lectures and discussions, interviews, - presentation.
4.0	**Communication, Information Technology, Numerical**		
	- 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.	- Advise the students to: help each other in education, -communicate with the lecturer to discuss difficulties. - Ask students to: make search on the internet on some related interesting topics, writing reports on the computer - Asking for solving some problems and recalculating some examples.	- Discussing reports on the experimental results - internet search - Comments on some resulting numbers - Exams
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		2.1		3.2		4.1	
1.1									
2.1									

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	First midterm test	6	20%
2	written reports	Weekly	10%
3	Class activates (in class quizzes, and homework)	Weekly	10%
4	Second midterm test	12	20%
5	Final exam	15	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)

E Learning Resources

1. List Required Textbooks
Note lab for PHYS 394

2. List Essential References Materials (Journals, Reports, etc.)
Physics for scientist and engineering by Serway

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
Physics by Halliday , Resnic, and kane (V2)
الفيزياء المتقدمة أ.د توفيق قسام أ.د محمد قعقع د.توفيق ياسين
Principles of electrical circuits By Floyed

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
http://hyperphysics.phy-astr.gsu.edu/Hbase/electric/accircon.html
http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/alternatingcurrent.htm

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.) Data show
2. Computing resources (AV, data show, Smart Board, software, etc.) 15- PC+ printer Internet access
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 a-Through survey by the end of each semester b-Reports on their progress in the following lab course
2- Other Strategies for Evaluation of Teaching by the Instructor or by the Department Via annual course report.
3- Processes for Improvement of Teaching a-Implement the latest teaching technology b-Providing the latest soft ware program related to the subject c-Field trips
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)
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. a- consult with the faculty member responsible for the course(221 phys) ,for any experiment that should be eliminated or replaced frequently . b- update the lab equipment.

Name of Instructor: ____ Dr. Saad Algarni

Signature: _____ Date Report Completed: _____

Name of Field Experience Teaching Staff _____

Program Coordinator:_____

Signature: _____ Date Received: _____