Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

Phys 104

General Physics 2

September 2015 (DHU Al-AHIJAH 1436)

1st Semester 1436-37

Course Specification

For Guidance on the completion of this template, please refer to of Handbook 2 Internal Quality Assurance Arrangements

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

A Course Identification and General Information

1. Course title and code: **General Physics 2 – PHYS 104**
2. Credit hours **4 (3 Lecture +1 Lab)**
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **College of Engineering and College of Computer & Information Sciences**
4. Name of faculty member responsible for the course **Prof. Magdy Ghannam and Others**
5. Level/year at which this course is offered **Freshman /1st Year**
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.

The course enables the students to understand the principles of electricity and magnetism and AC Circuits

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)

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
Electric Charges and Coulomb Law	2	3
Electric Field of Point Charges		2
Motion of Charged Particles in a Uniform Electric Field		1
Electric Flux and Gauss Law and Its Applications	1	3
Potential Difference and Electric Potential	1.67	2
Electric Potential of a Uniform Electric Field		1
Total Potential (Reaction Energy)		2
Electric Capacitance and the Equivalent Capacitance	1.33	2
Energy Stored in a Charged Capacitor and Dielectrics		2
Electric Current, Conductivity, and Ohm's Law	2	3
Resistance and Temperature		1
Electrical Power and Energy		1
Electrical Energy Consumption Cost		1
The Direct Current Circuits and the Equivalent Resistance	1.33	2
Kirchhoff 's Rules		2
Magnetic Field and Magnetic Force	1.33	2
Motion of Charged Particles, Lorenz Force, the Speed Selector, and the Mass Spectrometer		2
Sources of the Magnetic Field (Thin Straight Conductor)	0.67	1
Ampere's Law and the Magnetic Field of a solenoid		1
Faraday's Law of Induction and Motional Electro-motive Force	1.33	2
Inductance and Self Inductance		1
Energy Stored in the Magnetic Field		1
Alternating Current Circuits and V_{rms} and I_{rms}, Inductors in an AC Circuit, Capacitors in an AC Circuit, and the Phase Angle	2.33	3
Impedance in an RCL (in Series)Circuit		2
Power and Resonance in an RCL Circuit		2
Total	**15**	**45**

2- Course components (total contact hours per semester):			
Lecture: **45**	Tutorial:	Practical/Fieldwork/Internship: **20 of 10 credit hours**	Other:

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)

The student is requested to study for about 4*hours* /w

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.

a. Knowledge

The course has been designed to explain the basic principles of electricity and magnetism. The student realizes, at the beginning, the meaning of the electric charges and their reaction with each others as well as their effect on the surrounding space throughout their electric field. After that, the electric potential, due to the electric field, and the electric stored energy in the capacitors are introduced to connect the topic of electricity with other topics in physics. Furthermore, the concept of the direct current and the electric energy consumption are introduced; accordingly, the student will be able to understand how to calculate the cost of the electricity bill. Therefore, the students connect the concepts with the reality. In the middle part of the course, the magnetic field and its effects on the electric charged are explained. Then, the students know how magnetism is created by electricity, and vice versa. As a result, this gives more understanding of how both electricity and magnetism are tightly related to each other. At the end of the course, the alternating current circuits (AC) are explained as well as the concept of the effective values of the voltage and the current (V_{rms} and I_{rms}), the phase angle (N), and the power factor. Consequently, the students should know the meaning of the alternating circuit impedance and the consumed energy as well as the state of resonance in the AC circuits.

(ii) Teaching strategies to be used to develop that knowledge Lectures in class, Home Work and discussions as well as lab experiments.
(iii) Methods of assessment of knowledge acquired Midterm Exams, Lab-experiment Reports and Exam, Attendance, Home Work and Participation, and Final Exam
b. Cognitive Skills
(i) Cognitive skills to be developed
(ii) Teaching strategies to be used to develop these cognitive skills
(iii) Methods of assessment of students cognitive skills
c. Interpersonal Skills and Responsibility
(i) Description of the interpersonal skills and capacity to carry responsibility to be developed
(ii) Teaching strategies to be used to develop these skills and abilities
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain.
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students numerical and communication skills

e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required
(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	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	**First Midterm Exam**	**6**	**15**
2	**Second Midterm Exam**	**12**	**15**
3	**Attendance and Participation**	**Continuous**	**5**
4	**Lab Reports**	**Weekly**	**10**
5	**Lab Exam**	**14**	**15**
6	**Final Exam**	**16**	**40**
	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)
10 Hours per Week

E. Learning Resources

1. Required Text(s) **Physics for Scientist and Engineers with Modern Physics, By R. A. Serway**
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4-.Electronic Materials, Web Sites etc
5- 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.) **Lecture rooms (Occupancy: 20 students) and labs (Occupancy: 20 students)**
2. Computing resources There is a need for a computer lab due to the recent improvement in the field of e-learning. Moreover, there is a need for applying an electronic system connected to the internet for the homework.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) This course requires completing about 10 -12 experiments in the LAB mainly in electricity and magnetism. Accordingly, the required instruments need to be provided with the proper spare parts.

G Course Evaluation and Improvement Processes

1- Strategies for Obtaining Student Feedback on Effectiveness of Teaching
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3 Processes for Improvement of Teaching

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)

The midterm exams are reviewed with the instructors in class. Moreover, the final exam papers are kept at the college deanship's office to be reviewed by an independent professor under the request of the student or any other official cases.

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

1- reconsidering the course syllabus periodically
2- reconsidering the examples given in class periodically
3- choosing the most recent edition of the assigned reference book
4- changing the main reference book once a better one is available