

**Kingdom of Saudi Arabia**

**The National Commission for Academic Accreditation &  
Assessment**

**COURSE SPECIFICATION**

Electromagnetic theory (1)

326 Phys-2, 2<sup>nd</sup> semester

# Course Specification

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

Institution	King Khaled University
College/Department : faculty of science, Department of physics	

## A Course Identification and General Information

1. Course title and code: electromagnetic theory, 326 phys-2
2. Credit hours: 3
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)  <b>physics</b>
4. Name of faculty member responsible for the course <b>Ramadan Mohamad Salem</b>
5. Level/year at which this course is offered: 6 <sup>th</sup> level
6. Pre-requisites for this course (if any) 222 Phys
7. Co-requisites for this course (if any)
8. Location if not on main campus: Greiger

## B Objectives

<p>1. Summary of the main learning outcomes for students enrolled in the course.</p> <p>The main objective of this course is that the students understand the physical derivation and meaning of Maxwell equations and its applications in modern society.</p>
<p>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)</p> <p>1- Studying the course in English using Arabic concepts 2- Using English references</p>

## 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
Vector calculus and algebra (curl – divergence- curl – Green- Laplace- Stocks' theory)	2	4
Electric fields (Coulomb –Gauss – continuity equation – charge density – superposition principle- poisson –Laplace equation)	2	4
Dielectrics and electric dipoles	1	2
Magnetic fields (magnetic flux- bio-savart law)	2	4
Divergence of magnetic flux	1	2
Scalar and vector fields	2	4
Maxwell's equations	2	4
Gauss' s law in electricity and magnetism	2	4
Applications	1	2

2 Course components (total contact hours per semester):			
Lecture: 2	Tutorial: 0	Practical/Fieldwork/Internship: 0	Other: 0

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)

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**

(i) Description of the knowledge to be acquired

Know and understand the Maxwell equations

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

Discuss the physical meaning of mathematical equations

<p>(iii) Methods of assessment of knowledge acquired</p> <p>Periodic tests</p>
<b>b. Cognitive Skills</b>
<p>(i) Cognitive skills to be developed</p>
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p>
<p>(iii) Methods of assessment of students cognitive skills</p>
<b>c. Interpersonal Skills and Responsibility</b>
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p>

(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
<b>d. Communication, Information Technology and Numerical Skills</b>
(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
<b>e. Psychomotor Skills (if applicable)</b>
(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	Periodic tests	7	40%
2	Scientific articles	7	10%

### D. Student Support

<p>1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)</p> <p>10 hours</p>
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### E Learning Resources

1. Required Text(s)
<p>2. Essential References</p> <p>David J. Griffiths, 1999, introduction to electrodynamics, 3<sup>rd</sup> ed., Printice Hall, New Jersey.</p>
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)

<p>Jack Vanderlinde, 2005, classical electromagnetic theory, 2<sup>nd</sup> ed., Kluwer Academic Publishers.</p>
<p>4- Electronic Materials, Web Sites etc</p>
<p>5- Other learning material such as computer-based programs/CD, professional standards/regulations</p>

## F. Facilities Required

<p>Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)</p>
<p>1. Accommodation (Lecture rooms, laboratories, etc.)</p>
<p>2. Computing resources</p> <p>Computer and data show</p>
<p>3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)</p>

## G Course Evaluation and Improvement Processes

<p>1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching</p>
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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)
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.