Course Specifications of
S132 – Physics (1)

University: Benha University **Faculty: Benha Faculty of engineering**

Course specifications

Programme(s) on which the course is given: All the three engineering technology programs

Major or minor element of programmes: Major

Department offering the programme: All the engineering technology departments

Department offering the course: Department of Basic Sciences

Academic year / Level: First Year, First Semester

Date of specification approval: 1/12/2009

A- Basic Information

Title: Physics (2) **Code:** S131

Credit Hours: N. A. **Lecture:** 2/week

Tutorial: 2/week **Practical:** 2/week **Total:** 6/week

B- Professional Information

1 - Overall aims of course

By the end of the course the students will be able to

- Knowing and understanding the concepts the electric field, the electric potential, capacitance, electric current and resistance, magnetic field, induced emf and inductance.
- Problem solving in electricity and magnetism
- Carrying out practical work on electrical and magnetic quantities.

2- Intended learning outcomes of course (ILOs)

a. Knowledge and understanding:

a.1 Define any physical quantity introduced.

a.2 List the sources of electric field and magnetic field.

a.3 Illustrate the electric field lines and magnetic field lines

a.4 Describe the motion of charge under electric field and under magnetic field.

a.5 Calculate the electric field, the electric flux, the electric potential, the electric potential energy, the capacitance, the electric current and electric power.

a.6 Evaluate the magnetic force, the magnetic field, the magnetic flux, the induced emf, the inductance.

a.7 Explain the different parameters that affect the electric field of charged bodies and the magnetic field of different current carrying wires of different shapes.

a.8 Discuss the electric conduction in solids.

b. Intellectual skills

b.1 Analyze the effect of electric force, electric fields and electric potential.

b.2 Analyze the capacitance, the electric current and resistance, the magnetic force, the magnetic field and its sources, induced emf and inductance, electrical conduction in solids.

b.3 Problem solving on electricity and magnetism.

b.4 Apply the physical concepts to solve engineering problems

b.5 Creative thinking for alternative views for electric fields and magnetic fields

c- Professional and practical skills

c.1 Measure the electric potential lines and then mapping of the electric field,

c.2 Determine the unknown resistance using the metric bridge,

c.3 Verify Ohm's Law experimentally and gain skills in connecting resistances.

c.4 Gain experience in charging and discharging of capacitors.

c.5 Ability to handle transformers with different cores.

c.6 Design an experiment to illustrate Faraday's law.

c.7 Use of scientific instruments and measuring tools.

d- General and transferable skills

d.1 Practice to work in a group.

d.2 Use computer to analyze the data.

d.3 Write scientific report and discuss the results and make conclusions.

d.4 Interact with e-learning course.

d.5 Skills in tackling engineering problems physically.

3- Contents

Topic	No. of Hours	Lecture	Tutorial and Practical
Units and Dimensions	3	1	2
Electric charge, electric force and electric field	12	4	8
Gauss law in electrostatics	12	4	8
Electric potential, Potential energy	11	3	8
Capacitance and dielectrics, electric energy density	9	3	6
Electric Current and resistance	9	3	6
Magnetic field and magnetic force	11	3	8
Sources of magnetic field, Ampere's Law, magnetic flux, Gauss law in magnetism	10	3	7
Faraday's law, motional emf, Lenz's law	7	3	4
Inductance and magnetic energy density	4	2	2
Electrical conduction in solids	2	1	1
Total	90	30	60

4– Teaching and learning methods

4.1- Lectures

4.2- Class tutorials

4.3- Laboratory work

4.4- E-learning on Web site

4.5- Internet search

4.6- Power point

5- Student assessment methods

5.1 Written examinations (Mid-Term and Final) to assess scientific knowledge and understanding

5.2 Assignments and quiz to assess ability to solve problems and analyze results independently.

5.3 Laboratory exam to assess ability to do practical work,

5.4 Oral exam to assess understanding of physical concepts.

Assessment schedule

Practical assessment 1	Week 1
Assessment 1	Week 1
Practical assessment 2 and Report	Week 2
Assessment 2	Week 2
Practical assessment 3	Week 3
Assessment 3	Week 3
Practical assessment 4 and Report	Week 4
Assessment 4	Week 4
Practical assessment 5	Week 5
Assessment 5	Week 5
Quiz1	Week 5
Practical assessment 6 and report	Week 6
Assessment 6	Week 6
Practical assessment 7	Week 7
Assessment 7	Week 7
Practical assessment 8 and report	Week 8
Assessment 8	Week 8
Practical assessment 9	Week 9
Assessment 9	Week 9
Mid-Term Exam	Week 9
Practical assessment 10 and report	Week 10
Assessment 10	Week 10
Practical assessment 11	Week 11
Assessment 11	Week 11
Quiz 2	Week 11
Practical assessment 12 and report	Week 12
Assessment 12	Week 12
Practical assessment 13	Week 13
Assessment 13	Week 13
Practical assessment 14 and Report	Week 14
Assessment 14	Week 14
Laboratory and Oral Exam	Week 15
Final Written Exam	Week 16

Weighting of assessments

Mid-term examination	12 %
Final-term examination	60 %
Oral examination	4 %
Practical examination	20 %
Semester work and quiz	4 %
Total	100 %

Any formative only assessments

6- List of references

6.1- Course notes

- Mahmoud Fathy Hassan, Tarek Abdol-Kader, Ahmed Auob," Engineering Physics I, Lecture notes onElectricity and Magnetism", Higher Institute of Technology, Cairo, 2008.

6.2- Essential books (text books)

- R. A. Serway and Jewett, "Physics for Scientists and Engineers",6th edition, Brooks cole, New York, 2003
- David Halliday and Robert Resnick, "Fundamentals of Physics", 7th edition, John Wiley, 2007.

6.3- Recommended books

- F.W,Sears, M.W.Zemansky and H.D. Young, "University Physics", Addison-Wesley Company, 2003.

6.4- Periodicals, Web sites, … etc

- Physics Review
- http://cms.nelc.edu.eg
- http://www.iitphysics.org
- http://library.thinkquest.org

7- Facilities required for teaching and learning

- Lecture rooms equipped with teaching board and data show.
- Class rooms for tutorial exercises with teaching board.
- Laboratory rooms with laboratory furniture and supplied with general instruments, measuring devices, supports, electrical components, magnetic devices, transformers and power supplies.
- Computers with the appropriate software.

Course coordinator: Dr. Mahmoud Fathy Hassan

Head of Department: Prof. Dr. Hassan Nasr Ahmed

Date: 1/12 /2009