

# 12998-144(16) Introductory Physics B (3l, 3p)

2016

## Course summary:

An introductory physics module with a mathematical approach and emphasis on the fundamental concepts, with contents: Electrostatics, electrodynamics and magnetism. Special relativity.

*P Physics 114*

*P Mathematics 114*

*C Mathematics 144*

## Outcomes of course:

This calculus-based course exposes the student to a first systematic treatment of electricity and magnetism. It also lays the foundation for more advanced physics courses which may lead to eventual specialization in physics.

## Lecturer:

### Dr GW Bosman

Telephone number: (021) 808 2525

E-mail address: [gwb@sun.ac.za](mailto:gwb@sun.ac.za)

Office: Room number 1028 in the Merensky Physics Building

Dr H Kriel

Telephone number: (021) 808 3658

E-mail address: [hkriel@sun.ac.za](mailto:hkriel@sun.ac.za)

Office: Room number 1014 in the Merensky Physics Building

## Mentor:

The Department of Physics has appointed a staff member as mentor for each year of its physics programme to be available to students for consultation. Students should feel free to discuss general issues related to the physics programme or specific modules in the programme with the relevant mentor, in addition to usual consultations with their individual lecturers of modules.

The mentor for first year programme and its modules is Dr GW Bosman [gwb@sun.ac.za](mailto:gwb@sun.ac.za)

## Course content:

### **Formal lectures**

The following topics are covered during formal lectures: Electricity and magnetism: Electrostatics, electric fields and Gauss' law, potential, capacitance, currents and resistance, electrical circuits. Magnetic fields, force on moving charges in magnetic field, sources of magnetic fields. Brief introduction to electromagnetic induction and special relativity.

### **Practicals**

The practical component of the course consists of experiments related to the course material. Students work in pairs. Each student, however, has to record his/her results in a report on each experiment. This mark counts towards the class mark.

### **Practical (Tutorials):**

Tutorials will occur each week. On days where practical laboratory work is also scheduled, the session will commence with a tutorial of one hour to be followed by the practical until 17:00. During tutorial sessions in which there is no scheduled practical the tutorial shall end at 17:00. There will be 6 practical sessions for laboratory work. During the tutorial sessions students have the opportunity to solve problems related to the course work and to participate in other activities to enhance their understanding of the content covered during the lectures. During each tutorial session students should expect to produce work that will contribute to their class mark. The nature of assignments and assessments will be varied.

### **Study material:**

Prescribed textbook: "**Sears and Zemansky's University Physics**" (Addison-Wesley, 14th edition) by Young and Freedman.

### **Learning opportunities:**

Tutorials (once a week).  
Selected Lecture material will be made available on SUNLearn.  
Solutions to selected problems will be made available on SUNLearn.  
Practicals.

### **Assessment:**

#### ***Methods of Assessments***

Tutorial problems, tutorial tests, homework assignments, group work, in-class quizzes  
Class test  
Practical laboratory reports  
Examination

#### ***Venue and time of assessment opportunities***

Tutorial tests: during the tutorial session.  
Class test: See timetable.  
Exam: See timetable.  
Supplementary exam: See timetable.

***Availability of marks:*** Most marks will be available within two weeks after submission. The moderation processes for tests and exams may require more time.

#### ***Calculation of class mark:***

Tutorials, homework, other assignments and practical report mark: 50% (laboratory work and the other assessments will be weighted roughly evenly) Class test: 50%

#### ***Calculation of final mark:***

Examination: 60%  
Class mark: 40%

#### ***Admission to examination:***

Class mark greater than or equal to 40%