

Department of Physics and Electronics



RHODES UNIVERSITY

Grahamstown • South Africa

Physics 3
Course Brochure
2024

Physics 3 consists of two one-semester courses Physics 301 and Physics 302. Physics 301 runs in the first half of the year and is examined in June. Physics 302 runs in the second half of the year and is examined in November.

The entrance requirement for Physics 301 is a credit in Physics 2 and a credit in Mathematics 2 (MAM 2). The entrance requirement for Physics 302 is at least 40 % in Physics 301.

1. TIME-TABLE

The provisional time-table for this year is as follows:

Physics 301 Lectures

Electromagnetism	(Medved)	12 Feb – 8 Mar (24 lectures)
Signals & Systems	(Kuja)	11 Mar – 12 April (20 lectures)
Classical Thermodynamics	(Nsengiyumva)	15 Apr – 16 May (28 lectures)

Practicals

Electronics	(Sullivan)	1st and 2nd terms
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Physics 302 Lectures

Nuclear	(Roux)	8 Jul – 26 Jul (18 lectures)
Quantum Mechanics	(Medved)	29 Jul – 16 Aug (16 lectures)
Solid State	(Chithambo)	26 Aug – Sept 18 (21 Lectures)
Statistical Mechanics	(Nsengiyumva)	Sept 19 – Oct 11 (20 Lectures)

Practicals

General	(Williams)	3rd and 4th terms
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Lectures, tutorials and practicals are held in the LLT, ULT or Lab (Rm 17) at the following times:

Day	Period	Time/Place
Monday	4	10:30/LLT
Tuesday	5, 6-10 (Prac)	11:25/LLT, 12:20/Lab
Wednesday	1	07:45/LLT
Thursday	2	08:40/LLT
Friday	3, 6 (Tut)	9:35/LLT & 12:20/LLT

2. TEXTBOOKS

Prescribed Textbooks:

These are available for hire from the department, not the bookshops in town. Books are to be returned in pristine condition to the department at the end of the semester. DO NOT MARK THE BOOKS.

Printed material: Various printed notes and handouts will be issued during the year, for which there is a charge of R180 per semester.

3. CLASS RECORD

Your class record depends on your work for each semester as follows:

Module mark: The mark C, for each module, is determined mainly by an end-of-module test, but also contains a component for class work such as assignments, tutorials etc. Clarify the make up of C for a particular module with the lecturer. C is expressed as a percentage.

The **Theory** class record, T, is the average C for a particular semester, weighted according to the number of lectures in the different modules. T is expressed as a percentage.

The **Practical** class record, P (expressed as a percentage), will derive from:

301	Tests and/or lab record books	100 %
302	Lab record books	25 %
	Oral presentations	25 %
	Report	50 %

The total **Class Record** (%) is then $(4T + P)/5$.

Class tests are provisionally scheduled for the following dates. These dates may be changed but not by more than three days beyond the scheduled end of a module. Other tests may be arranged by the lecturer involved.

First Semester		Second semester	
Signals & Systems	12 April	Solid State	18 September
Electromagnetism	8 March	Statistical Mechanics	11 October
Classical Thermodynamics	16 May	Quantum Mechanics	16 Aug
		Nuclear	26 Jul

4. DP REQUIREMENTS

In order for it to be considered that you have “duly performed” the work of the class you must attend at least 80 % of each of the practicals and tutorials, and obtain a class record of at least 40 %. This applies separately to each semester.

5. EXAMINATIONS

Theory: Two 3-hour papers are written at the end of the first semester and three 2-hour papers at the end of the second semester.

Practical: Examinations will be run in “Swot Week” and will be scheduled by the Registrars division like all other Exams

The final mark for each semester is obtained as follows :

Theory Exams	75%
Practical Exam	25%
=Total Exam Mark	
Total Exam Mark	60%
Class record	40%
=Final Mark	

The subminimum mark is 40 % in Physics 301, and 45 % in Physics 302.

If you obtain less than the subminimum for Physics 301 you will be excluded from doing Physics 302. If you get less than the subminimum for Physics 302 you fail Physics 302 and Physics 3, but you keep any credit acquired for Physics 301, and may combine it with Physics 302 in a subsequent year to earn a pass in Physics 3.

If you fail either Physics 301 or Physics 302, but obtain an aggregate of at least 50 % in the pair, you pass Physics 3 with 2 semester-credits, provided that you obtain at least the subminimum in the failed semester.

Note that, while the pass mark is 50 %, the faculty of science does not as a general rule accept students into an honours course in a subject for which they got less than 60 % in third year. In addition the NRF do not give postgraduate bursaries to candidates with a third year mark of less than 65 % (or who have taken more than 3 years to obtain their BSc).

6. OUTCOMES and ASSESSMENT

Learning outcomes for the Physics and Electronics third year are specified below. The means of assessment are described in terms of the quantities defined in the previous paragraphs.

1. **Basic knowledge**

Demonstrate a basic knowledge and understanding of physical laws, the principles and methods of physics and electronics, and the close interaction between the disciplines of physics, electronics, mathematics and computing. Assessment is by way of tutorials and tests quantified by C and thus T, and examinations.

2. **Solve problems**

Formulate and solve appropriate problems using the theory and methods of physics and electronics; in particular using mathematical reasoning, critical thinking, and mathematical and computational models. Assessment is by way of tutorials and tests quantified by C and thus T, and examinations.

3. **Experiment**

Conduct experimental investigations into appropriate physical systems. Analyse the data, estimate uncertainties and evaluate the results. This requires familiarity with basic laboratory equipment and some specialised equipment, particularly with electronic instrumentation and computers. Assessment is by way of practical tests and lab record books quantified by P and examinations.

4. **Communicate and document**

Communicate results and scientific ideas effectively, both orally and in written work. Be able to keep comprehensive records of procedures and results. Assessment is by way of lab record books and tests (301), and short oral presentations of lab experiments, a written report and lab record books (302), quantified by P and examinations.

7. COURSE SUPERVISOR

The member of staff specially in charge of the course is Mr A. Sullivan. If you have any questions or any problems, see him.