

12998 – 176 (32) Preparatory Physics (3L, 3P)

2020

Course summary:

Students follow this module in the BSc Extended Degree Programmes in AgriSciences and Science and for the BEng. The module focus on the nature of physics with the following themes as content: Mechanics, electromagnetism, modern physics.

Flexible assessment

Outcomes of course:

This module focuses on facilitating a process where students need to make connections between the study material, events during contact sessions and tasks to give the students the opportunity to prove that they have the potential to continue with further studies and to teach the students something about the importance of such a process. The process involves a selection of certain physical concepts, their application to solve problems and the relevance of certain mathematical concepts for physics.

Lecturer:

Mr GL Andrews

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Course content:

Formal lectures

Topics covered during the lectures include the following:

Unit conversions, Significant figures

Vectors: Cartesian coordinate system, resultant; component vectors; force, displacement, velocity, acceleration.

Linear motion, graphs for motion along a straight line: position versus time; velocity versus time; acceleration versus time.

Two dimensional projectile motion

Four fundamental forces, Macroscopic forces: forces exerted by ropes; gravitational force; normal force; friction.

Newton's laws

Impulse and Momentum.

Energy, Work-energy theorem.

Fluid Mechanics, Archimedes' principle.

Temperature, heat and thermodynamics, heat transfer and phase changes

Electric force

Atomic nucleus, radioactivity: alpha and beta decay; decay curve; half-life;

Laboratory work

The laboratory work consists of 4 experiments on topics related to the course material. Students work in groups dependent on equipment availability. Each student, however, has to record his/her results and written reports on the experiments are assessed individually.

Practical (Tutorials):

There are 20 tutorial sessions of 3 hours each. The tutorial sessions alternate with laboratory work. The problems for a tutorial will be available to the students on the Tuesday prior to the tutorial session. During the first two hours of the tutorial students will have the opportunity to ask questions. During the last hour a tutorial test will be written. These tests will include a problem similar to one of the problems in the present tutorial as well as a questions in which relevant concepts of the present tutorial need to be applied in a different way than in any of the tutorial problems. The marks for these tests will contribute to the final mark for the course. Final solutions to the tutorial test will be given during the subsequent lecture period. No written solutions will be provided.

Study material: Prescribed textbook: There is no prescribed textbook for this module. Students will receive references to open source textbooks.

Learning opportunities:

1. Tutorials (20 tutorials of 3 hours each).
2. Feedback of tests and tutorial problems will be given during tutorials or lectures.
3. The lecturer will be available for students during certain scheduled periods to answer questions.

Assessment:

Methods of Assessments

Tutorial tests
Class tests
Practical laboratory reports

Venue and time of assessment opportunities

Tutorial tests: during the last hour of a tutorial session
Class tests: on dates as scheduled according to timetables, in venues which will be announced.

Calculation of class mark:

Not applicable

Calculation of final mark for the module:

Tutorial tests:	20%
Practical mark:	15%
Class tests:	65%