Reg No: FYBX23/20262

Faculty of Health, Science and Technology
Physics

Syllabus

Physics Preparatory B

Course Code:	FYBX23
Course Title:	Physics Preparatory B *Fysik Bas B*
Credits:	7.5
Degree Level:	Preparatory
Progressive Specialisation:	()

Major Field of Study:

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2026-02-04, and is valid from the Autumn semester 2026 at Karlstad University.

Prerequisites
General entry requirements and upper secondary level Physics 1a and Mathematics 3, or Physics level 1b and Mathematics Further level 1, or registered in Physics Preparatory A (7.5 access credits) as well as Mathematics Preparatory A (7.5 access credits). An equivalence assessment can be made.

Learning Outcomes
Upon completion of the course, students should be able to:
- plan and conduct experimental investigations based on a given question and present and interpret the results orally and in writing,
- describe and analyse as well as mathematically process physical problems using adequate quantities, concepts, and models,
- give an account of the concepts power and momentum in two dimensions and use these concepts in calculations,
- give an account of the concepts voltage, current, energy, and effect, and use Ohm's law to perform calculations on series and parallel connections, and perform simple connection exercises,
- describe electric and magnetic fields,
- discuss the equivalence between mass and energy,
- give an account of ionising radiation, radioactive decay, fission and fusion, and be able to use massenergy equivalence to carry out calculations in nuclear physics, and
- discuss environmental and ethical issues, particularly those related to nuclear physics.

Content
The course includes the following:
- Mathematical processing of motion and forces in two dimensions.
- Electric charge, current, and voltage. Direct current and Kirchhoff's laws. Electric energy and effect.
- Basic understanding of the concept of field in relation to gravitation, electrostatics, and magnetism.
- Application of the relationship between electric strength of field, potential, and voltage in simple situations. Charged particles moving in electric and magnetic fields. Forces in electric and magnetic fields.
- Nuclear reactions, ionising radiation, and the calculation of radiation dose.
- Laboratory work related to the above.

Instruction is in the form of lectures, exercises, and laboratory sessions.

Reading List
See separate document.

Examination
Assessment is based on individual written exams and lab reports, both individually and in group. Laboratory sessions are mandatory.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades
One of the grades Fail (U) or Pass (G) is awarded in the examination of the course (see RB 17/26, Dnr C2026/102).

Quality Assurance
Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate
A course certificate will be provided upon request.

Additional information
The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.

The course corresponds in part to upper secondary level Physics 1a and 2 in accordance with Gy11, or Physics level 1b and 2 in accordance with Gy25 for natural science and technology programmes.