Reg No: FYGB06/20252

Faculty of Health, Science and Technology
Physics

Syllabus

Modern experimental physics

Course Code:	FYGB06
Course Title:	Modern experimental physics *Modern experimentell fysik*
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has at least 60 credits in first-cycle course/s as entry requirements (G2F)

Major Field of Study:
FYA (Physics)
TKA (Engineering Physics)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2025-03-03, and is valid from the Autumn semester 2025 at Karlstad University.

Prerequisites
45 ECTS credits in Physics, including Quantum physics I, 7.5 ECTS credits, and 30 ECTS credits in Mathematics, plus registered for Solid state physics, 7.5 ECTS credits, or equivalent

Learning Outcomes
The aim of the course is for students to acquire basic knowledge and skills required to plan and conduct scientific experiments in modern physics and to present the research problems and the results of these experiments orally and in writing. The course also aims to deepen the students' knowledge of quantum physics, solid state physics, and nanoscience, as well as introduce them to current research.

Upon completion of the course, students should be able to:

- demonstrate in-depth knowledge of experimental methods in parts of quantum physics, solid state physics, and nanoscience, as well as their use in current research, development, and applications,
- independently design, plan, and carry out a experiment based on a given problem in one of the fields mentioned above,
- perform literature searches on a given problem and assess the results yielded in relation to scientific literature, and
- compile the result of the experiment in a scientific report and present and discuss the result orally in a scientific manner.

Content
The course is offered in the form of laboratory sessions where research issues and problems are explored experimentally. The course comprises a number of pre-planned and supervised laboratory experiments and on a supervised and independently conducted experimental project. The experiments deal with problems in the fields of quantum physics, solid state physics, and nanoscience.

Reading List
See separate document.

Examination
Assessment is based on mandatory laboratory experiments and lab reports, and the individual oral and written presentation of an experimental project.

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 Distinction (VG), Pass (G), or Fail (U) is awarded in the examination of the course. For students in Engineering, one of the grades 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass), or U (Fail) is awarded in the examination of the course.

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.