JÖNKÖPING UNIVERSITY
Jönköping University Enterprise

COURSE SYLLABUS
Preliminary, not confirmed

Pathway Physics 2, 7.5 credits

Pathway Physics 2, 7.5 högskolepoäng

Course Code:	P1PP2D	Education Cycle:	First-cycle level
Confirmed:		Disciplinary domain:	Natural sciences
Valid From:	Jan 19, 2026	Subject group:	Physics
		Specialised in:	GXX First cycle, in-depth level of the course cannot be classified

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

1. Demonstrate extended understanding of two-dimensional and circular motion in gravitational and electric fields.

2.Explain the principles of oscillatory motion, mechanical waves, and resonance phenomena.

3. Describe and compare electric and magnetic fields, electromagnetic induction, and AC circuit behaviour.

4. Demonstrate understanding of the interaction between light and matter, including photoelectric and emission effects.

5. Explain the basic physical models of the universe and atomic structure based on modern theories.

Skills and abilities

6. Apply concepts of circular motion, torque, and static equilibrium to solve physical problems.

7. Perform calculations involving harmonic oscillations, wave interference, and sound properties.

8. Analyse and solve problems involving capacitors, inductors, transformers, and AC circuits.

9. Use electromagnetic theory to explain induction and wave phenomena.

10. Perform basic calculations involving the energy levels of electrons, photon energies, and emission spectra.

11. Interpret and evaluate models of atomic structure and cosmic evolution using data from spectra.

Judgement and approach

12. Use self and peer reflection on the development of skills and abilities.

13. Critically evaluate relevant information related to the different parts of the course.

14. Apply critical thinking to scientific questions and interpret findings in broader societal and ethical contexts

Content

The course includes the following elements:

The course covers topics in the field of physics, including two-dimensional motion in gravitational and electric fields, torque, waves, electromagnetism and signals, orientation to current models and theories that explain the development and structure of the universe, models and theories as simplifications of reality, the nature of physics and mathematical methods of physics. It also contains scientific modelling, simulation, and numerical analysis. The course content includes and corresponds to, but is not limited to, the Swedish upper secondary school course Fysik 2. The horizontal aim is to develop and strengthen student skills for participating in higher education, life-long learning and global citizenship through group work, social engagement, peer learning, reflective learning and autonomous learning whilst developing agency, ability to reconcile tensions and dilemmas, intercultural communication skills, metacognitive skills, information and digital literacy and critical thinking.

The course includes the following topics:

- Torque with application to static balance
- Motion in two dimensions; projectile motion, circular motion and the centripetal force
- Mechanical oscillations and waves; springs, pendulums, resonance
- Sound and properties of sound waves, sound level
- Electric and magnetic fields; capacitance and the capacitor, magnetic flux and magnetic field strength, charged particles in magnetic fields, the Biot- Savart law, electromagnetic induction, Lenz' law, coils, electromotive force, Faraday's law of induction
- Alternating currents; the generator, the transformer, AC circuits with capacitor and coil, self inductance
- Light as electromagnetic waves; the electromagnetic spectrum, reflection,

refraction and Snell's law, diffraction, interference

- Atomic physics; photons, propertied of atomic electron structure, absorption and emission, emission spectra, the photoelectric effect

Type of instruction

Lectures and tutorials, lab work and tutorial sessions.

Language of instruction is in English.

Entry requirements

General entry requirements and High School Diploma and English Language skills corresponding to: English IELTS 5.5 or the equivalent and Physics 1, Pathway Physics 1 or the equivalent

Examination and grades

The course is graded Pass (G) or Fail (U).

The examination consists of one paper and one written exam. The course is graded pass or fail. The ILOs are assessed by the following means:

Written exam

Laboratory report

Registration of examination:

Name of the Test	Value	Grading
Written Exam	6.5 credits	G/U
Laboratory report	1 credit	G/U

Other information

Qualification Requirements

To obtain the Course Certificate the student shall complete the course requirements of 7.5 credits.

Title of qualification

The course gives you skills equivalent to the Swedish upper secondary school course Kemi 1 for eligibility to programmes at Jönköping University.

Course literature

Please note that changes may be made to the reading list up until eight weeks before the start of the course.