JÖNKÖPING UNIVERSITY
School of Engineering

COURSE SYLLABUS

Polymer and Composite Technology, 7.5 credits

Polymer och komposit teknologi, 7.5 högskolepoäng

Course Code:	TPKR25	Education Cycle:	Second-cycle level
Confirmed:	Feb 01, 2025	Disciplinary domain:	Technology
Valid From:	Sep 01, 2025	Subject group:	Materials Technology
		Specialised in:	A1N Second cycle, has only first-cycle course/s as entry requirements
		Main field of study:	Product Development

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

- show familiarity with the structure of polymers and their composite materials and their relationship with physical, chemical, and mechanical properties
- display knowledge in the processing of polymers and composite product design and quality control
- display knowledge in the sustainable development of polymer and composite materials
- display knowledge regarding applications of polymers and composite materials

Skills and abilities

- demonstrate the ability to formulate methodologies to deal with polymers and their composite product development challenges
- display ability in choosing materials to solve everyday engineering challenges

Judgment and approach

- demonstrate the ability to independently and critically analyze engineering problems related to polymers and composite materials selection, product design, manufacturing, and environmental concerns.
- demonstrate an understanding of trade-offs or compromises made during product design to meet the conflicting constraints that arise from the material, product geometry, and processing.

Content

This course has been designed to provide engineering students with a background in polymeric materials and their composites. The contents of the course are meticulously tailored to meet industrial challenges such as material selection, product design, sustainability, processing, and optimization of the products. The course includes the study of polymer and composite structures and their relationship with the physical, mechanical, chemical, and processing properties of polymers and composites.

The course includes the following elements:

- Different types of polymers, reinforcement additives such as fibers and particulates to produce composites and additives to modify their thermal, rheological, mechanical, and chemical properties. Moreover, their selection criteria in terms of cost processing, performance, and sustainability
- Different processing techniques and their merits concerning production rate, cost, and sustainability
- Product design to satisfy functionality, strength, processing, sustainability, cost, and aesthetics
- Mold design and its role in optimizing product performance

Type of instruction

Lectures, video lessons, quizzes, laboratory sessions, industrial visits, and assignments.

Language of instruction is in English.

Entry requirements

Passed courses of at least 150 credits in the program Industrial Product Realisation, or a bachelor's degree (i.e the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in Materials and Manufacturing, Materials Engineering, Mechanical Engineering, Chemical Engineering, Product Development, Engineering Physics or the equivalent. The bachelor's degree should comprise a minimum of 15 credits in Mathematics. Proof of English proficiency is required.

Examination and grades

The course is graded 5, 4, 3 or U.

Passing the written exam is necessary to get grades for the assignments and lab reports.

Registration of examination:

Name of the Test	Value	Grading
Examination	4 credits	5/4/3/U
Assignment	2 credits	G/U
Laboratory	1.5 credits	G/U

Course literature

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