JÖNKÖPING UNIVERSITY
School of Engineering

COURSE SYLLABUS

Applied Polymers and Composites: Manufacturing and Design, 7.5 credits

Tillämpade polymerer och kompositer: Tillverkning och design, 7.5 högskolepoäng

Course Code:	T2TPOK	Education Cycle:	Second-cycle level
Confirmed:	Sep 01, 2025	Disciplinary domain:	Technology
Valid From:	Jan 18, 2027	Subject group:	Materials Technology
		Specialised in:	A1F Second cycle, has second-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

Judgement 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 English.

Entry requirements

The applicant must hold the minimum of 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 or Engineering Physics or equivalent. The bachelor's degree should comprise a minimum of 15 credits in Mathematics. Taken course in Simulations for Integrated Product Realization, 7,5 credits, or equivalent. Proof of English proficiency is required.

Examination and grades

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

Passing all the parts mentioned below in the matrix is necessary to receive the final grade.

Registration of examination:

Name of the Test	Value	Grading
Examination	5 credits	5/4/3/U
Assignment	1.5 credits	G/U
Laboratory	1 credit	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.