



Industrial Engineering and Management: Research Frontiers and Theoretical Foundations, 7.5 ECTS*

(SWE: "*Industriell ekonomi: forskningsfronter och teoretiska grunder*")

Doctoral course, spring 2027

The doctoral course provides an orientation of research going on within the broad field of Industrial Engineering and Management (IEM) and relates current research projects to their theoretical foundations and traditions.

The course is a cooperation between three departments within the field of IEM:

- *Industrial Economics and Management at KTH Royal Institute of Technology (KTH)*
- *Business and Mathematics at Mälardalen University (MDU)*
- *Industrial Engineering and Management at Uppsala University (UU)*

Purpose

The course is a joint introduction and orientation course to research in Industrial Engineering and Management (IEM) in the Nordic region. The course aims:

- To provide an orientation on the ongoing research in the subject area.
- To show important theoretical foundations and new perspectives on which the ongoing research is based.
- To create a common identity of industrial engineering and management as a postgraduate subject

Learning Objectives

After passing the course, the student shall have acquired skills and knowledge:

- To be able to describe the subject area of Industrial Engineering and Management (IEM) - in Swedish "*Industriell ekonomi*" - and its historical development.
- To be able to describe the ongoing research in IEM at the participating institutions.
- To understand which central theoretical foundations and new perspectives this research is based on.
- To reflect independently on IEM as an academic subject area and its relationship to other related fields
- To relate and connect own research with IEM as an academic subject area.

Structure

The course consists of three two-day workshops and one one-day seminar. Each workshop takes place on site at one of the three universities and deals with the ongoing research in Industrial Engineering and Management. Except for the introduction, each workshop covers two themes (see below). For

* PhD Students from KTH are awarded 6 ECTS for the course

each workshop, one of the universities functions as host, but researchers from at least one of the other organizing universities participate as well on each occasion.

Each theme begins with examples of ongoing research. Based on this, the background to the ongoing research is discussed, e.g. what is the previous research in the field? what are the theoretical starting points of the research? and what are possible future lines of development?

Schedule

Each workshop covers two days on site at one of the organizing departments, with a social program for the evening between the two days. The workshops start at 09.00 and end at 16.00. There is also a final seminar which will take place onsite at KTH from 09.00-16.00.

A detailed schedule will be provided before each workshop.

Workshop 1 @ Uppsala University, Ångström Laboratory: March 10-11

Theme 0: Introduction - IEM as an academic field

The course takes off with a general discussion about Industrial Engineering and Management (IEM) as an academic field revolving around managerial and organizational issues in the context of engineering. Setting the stage for the subsequent course modules, IEM's historical roots, development, and position at the interface between technology and management is addressed.

Theme 1 - Operations and supply chain management

The module provides an overview of the wide and deep range of topics related to operations and supply chain management. It addresses how concepts, theories, and tools developed in this area (such as simulation, optimization, and AI) are important in Industrial Engineering and Management.

Theme 2 - Industrial marketing and market systems

This module provides an interactive perspective on industrial marketing and market systems. The module discusses both classical studies and current research works penetrating specific facets of complex markets, networks, and value co-creation. By the end of the module, participants will be able to discuss critically the interactive nature of markets, including the ability to apply concept from this research area to their own research.

Workshop 2 @ Mälardalen University, Eskilstuna: April 14-15

Theme 3 – Entrepreneurship

The module explores the concept of entrepreneurship, delving into its theoretical foundations, previous research results, and the current perspectives in the field. By the end of this module, the participants will have a comprehensive understanding of the entrepreneurial landscape and be equipped with the knowledge to understand and use an entrepreneurship perspective in their research.

Theme 4 - Management and control

This module addresses the human side of industrial organization as well as technology in management and organization studies by exploring how the relation between people, management, organizing, and technology has been studied over the decades from different perspectives. By the end of this module, the participants will be able to critically discuss human aspects and technology in relation to management and control practices, as well as be able to use relevant concepts in their own research.

Workshop 3 @ KTH Royal institute of Technology: May 12-13

Theme 5 – Innovation management and industrial dynamics

The module provides an overview of research on technical and industrial transformations, covering research anchored in traditions from industrial dynamics and innovation studies, to the management

and organizing of innovation activities from an organizational perspective. It covers central theories behind contemporary concepts and ongoing research on product, service, and business model innovation as well as a critical perspective on some fundamental ideas behind innovation management.

Theme 6 – Sustainability and circular economy

This module addresses sustainability transitions and transformations, socio-technical change, and circular economy and circularity. It discusses if and how industrial organizations and industries can contribute to a more sustainability society. It addresses the meso-level of analysis, between the single organization and the society as whole.

Final seminar: June 15 @ KTH Royal institute of Technology

Seminar of the course papers and concluding discussions

Presentations and discussions of the course papers. Concluding discussions on IEM as an academic subject and research field.

Eligibility

The course is eligible for doctoral students within Industrial Engineering and Management (IEM) or equivalent doctoral programs/subject areas. If limited space, doctoral students from the organizing departments are given priority.

Literature

Readings and preparations will be specified in detail before each workshop.

Course paper

Before the final session, the doctoral students are expected to submit a five-page essay (double spaced, 12-point, not including references and exhibits) relating the course contents to his/her own research. More details will be provided during the course.

Examination

- SEM1 – Active participation in the seminar series, 3 ECTS, grading scale: P, F
- SEM2 – Oral presentation and opposition, 2 ECTS, grading scale: P, F
- INL1 – Presentation of course essay and opposition to another participant's essay, 2.5 ECTS, grading scale: P, F

Examiners

- *KTH Royal Institute of Technology*
Mats Engwall, Tech. Dr,
Professor in Industrial Management - *matseng@kth.se*
- *Mälardalen University:*
Magnus Frostenson, Econ Dr,
Professor in Industrial economy and organization - *magnus.frostenson@mdu.se*
- *Uppsala University*
Thomas Lennerfors, Tech. Dr,
Professor in Industrial Engineering and Management – *thomas.lennerfors@angstrom.uu*

Registration

By sending an email to one of the examiners (see above).

Deadline for registration: February 15, 2027.