

Course PM and general information

The objective of the course is that students, through their own active work on a company-based authentic change project, will synthesize and develop their knowledge as well as their skills in the area of Industrial management. The students' work with a real-world problem within an established organization, concerning a considerable transformation, creates the prerequisites in order to implement theories and models in a rich context. By pinning-down the problem formulation, collecting data, analyzing, drawing conclusions, and presenting a thoroughly elaborated plan for the implementation of a change project, the students will exploit their current and (in the course given) new knowledge at the same time as they train their skills in central areas, such as leadership and project management. Furthermore, the objective is to increase the students' ability to handle challenges within the subject area of Industrial management based on a systems perspective – that is, the final implementation plan should cover how the proposed changes affect the organization as a system (e.g., taking into account effects on the individual-, functional-, and industrial levels). Finally, by the use of an authentic organization as the target for the change project, the course also aims to increase the students' knowledge and skills concerning research-based approaches and data collection techniques.

Intended learning objectives (ILOs)

After the course students will be able to:

- Creatively identify and formulate a concrete researchable problem based on an industrial and authentic issue.
- Critically evaluate and apply knowledge, current research, theoretical concepts and research methods in order to analyze complex issues in industrial and technology-intensive businesses
- Analyze, discuss and generate sustainable solutions to complex and reality-based challenges in industrial and technology-intensive businesses based on a systems perspective
- Evaluate own results and recommendations in the area of industrial management with regard to sustainable development and ethical aspects
- Lead, collaborate and provide feedback in project groups and reflect on group dynamics, academic work process, and outcomes
- Critically discuss other students' scientific work and judgments with regard to problem formulation, theory, and method selection
- Communicate your own positions, judgments and results - orally and in writing - towards companies and course management

Main course content

The course content is structured around the implementation of a major change project. In parallel and integrated with the students' own work with the change projects are lectures and seminars where theory is presented and discussed. Particular emphasis is placed on leadership

theory/change management, organizational and business development, interactions between fields in Industrial management (systems perspective), sustainable development, and scientific and methodological approaches.

In short, the course includes:

- A course project to structure the implementation of a major change project in industrial and technology-intensive organizations
- Presenting findings and recommendations in the form of a comprehensive academic report
- Lectures and seminars aimed at deepening the knowledge of change management, the systems perspective, sustainable development, and the scientific approach
- Seminars, presentations, interim and final reporting associated with one's own change project, given in front of the course management and company representatives
- Seminars for evaluating other students' scientific work
- Continuous interactions with representatives of the companies, who are the subjects of the change project (through study visits, data collection and guest lectures)
- Personal reflection and feedback through the work on the individual examination portfolio (including the task to individually discuss and exemplify the fulfilment of the course's specified learning objectives)

The CPIM course has a large part dedicated to skills in academic writing and oral presentation techniques. The course represents an integrated course in the Industrial management master's program curriculum and as such the demands on writing, oral presentations, and practice of scientific methods throughout the course are high. Therefore, the methods textbook *Method for engineering students: Degree projects using the 4-phase Model* is used in the CPIM course (see also course literature). In addition, the central theme of change/change management will be supported through the use of the book *Change in the mind of the strategist*. The textbook is linked to the specific lectures and activities on change management in the first period of the course and act as a support for students in using models and theory related to change in their change projects.

Examination

In line with the objectives of engineering education in general and with educational systems adopting the CDIO concept (www.kth.se – CDIO) in particular, students' skills and abilities related to their subject area should be set in focus. Hence, skills and abilities should be central aspects of learning and examination in such education. The overall aim of this course is, therefore, based on the students' direct experiences of a "real" industrial project, to improve their professional competence.

In the areas of Industrial management, such skills are represented by e.g., the ability to discuss models and theories taking a systems perspective, leading and managing communication of workgroups, handling expectations, and delivering value for clients (or other stakeholders).

This course is designed in order to put forth learning activities that bring managerial decisions and problem formulation into the hands of the students throughout the learning process. The main tools for learning and examination of these skills and abilities are the major change project in itself, the delivery of the results to an authentic industrial client, the project report, and the examination portfolio. Hence, students will be individually examined by an integrated set of activities including their own work and activities in the project (SEM1; INL1,2; PRO1,2), the contribution to the group's final report (and the final presentation) (PRO2), and their final examination portfolio (INL2).

The learning objectives are particularly important to the students in this course due to the practice of the examination portfolio. The portfolio includes an increased responsibility of the individual student to provide evidence for how they have reached particular learning objectives (e.g., Biggs and Tang, 2007, p 222). Thus, revisit the learning objectives continuously (see section 1).

The examination portfolio is a well-established tool for examination in higher education, especially in relation to skills training, Problem Based Learning PBL (Biggs and Tang, 2007), and CDIO. However, a well-developed portfolio should also be seen as an instrument for promotion and exemplifications of one's own knowledge, skills, and capabilities e.g., F in students' future recruitment processes.

1. Pass on active participation in seminars, 1,0 hp (SEM1), grading scale P/Fx/F
2. Pass on mid-term seminar group report, 1,0 hp (INL1), grading scale P/Fx/F
3. Pass on mid-term examination portfolio, 1,0 hp (PRO1), grading scale P/Fx/F
4. Final group report, 4,5 hp, grading scale: A, B, C, D, E, Fx, F (PRO2)
5. Final individual examination portfolio, 4,5 hp, grading scale: A, B, C, D, E, Fx, F (INL2)

ILO#	ILO (2019)	INL1	INL2	PRO1	PRO2	SEM1
1	Creatively identify and formulate a concrete researchable problem based on an industrial and authentic issue.	P/F	A-F	P/F	A-F	
2	Critically evaluate and apply knowledge, current research, theoretical concepts and research methods in order to analyze complex issues in industrial and technology-intensive businesses	P/F	A-F	P/F	A-F	
3	Analyze, discuss and generate sustainable solutions to complex and reality-based challenges in industrial and technology-intensive businesses based on a systems perspective	P/F	A-F		A-F	
4	Evaluate own results and recommendations in the area of industrial management with regard to sustainable development and ethical aspects	P/F	A-F		A-F	
5	Lead, collaborate and provide feedback in project groups and reflect on group dynamics, academic work process and outcomes	P/F	A-F			
6	Critically discuss other students' scientific work and judgements with regard to problem formulation, theory and method selection					P/F
7	Communicate your own positions, judgements and results - orally and in writing - towards companies and course management					P/F

Comments to Table 1, above:

- Colours
 - Light yellow – ILOs fulfilled by reflections (INL1, 2) and/or progressively (INL1, PRO1)
 - Dark yellow – ILOs fulfilled by final examination
- INL1 and PRO1 – ILOs fulfilled according to mid-term progression, according to criteria under INL1, PRO1, below; therefore, INL1 and PRO1 must be met before assessment of INL2 and PRO2
- INL2 and PRO2 – ILOs completely fulfilled and graded according to criteria given in tables INL2, PRO2, below
- In order to fulfil the requirements of the course, students need to meet all criteria given below and pass the examination for INL1, INL2, PRO1, PRO2, and SEM1

Grades

Final grading in this course will be based on a combination of the group report of the project (PRO2) and the final individual examination portfolio (INL2) (see also under heading 5.3 Combining final grade, below). The individual grading of the final examination portfolio will be founded on the evidence that the student presents and how well these items meet the learning objectives of the course (see learning objectives and criteria for grading).

An important notice concerning the implementation of an examination portfolio and the assessment in this course is to acknowledge that this is a qualitative and divergent type of assessment, which means that there are several possible strategies and types of final evidence that could meet each level of the grading scale (thus, the work process of the group will also be assessed). Moreover, this also implies that in order to achieve higher grades students might have to take some risks in line with their project works and learning strategies (e.g., in order to show evidence of creativity and depart from established ways of doing things and presenting solutions). Such efforts could be discussed in the individual learning portfolio of each student, e.g., in the individual reflection on the group's final report.

Combining grades

The following matrix is used for the weighting of the final individual grade (based on P for SME 1, INL 1, PRO 1, and the grades for INL 2 and PRO 2).

		PRO2				
		A	B	C	D	E
INL2	A	A	B	B	C	D
	B	A	B	C	C	D
	C	B	B	C	D	D
	D	B	C	C	D	E
	E	C	C	D	D	E

Plagiarism

The course builds on individual and group work with questions, seminars, and homework assignments. Plagiarism is not allowed. Information about plagiarism can be found at: <https://www.kth.se/en/student/stod/studier/fusk-1.997287>

Information about what plagiarism is and how control of plagiarism is executed will be presented during the course. Amongst the measures taken, automatic control of plagiarism will be done on all assignments (group and individual).

Use of AI

The course contains activities where AI can be used i.e. for idea generation and improvement of language etc. However, AI cannot be used for generating outcomes of calculations made in assignments, generation of overall structures, or generation of text as an author. In particular, AI cannot be an author of any text related to examination. Hence, content, references, meaning, logics, and arguments needs to be based on the work and writing of the students. For more details see course [Canvas \(https://canvas.kth.se/courses/64671/pages/generative-ai-tools-allowed-according-to-given-guidelines\)](https://canvas.kth.se/courses/64671/pages/generative-ai-tools-allowed-according-to-given-guidelines).

Literature

Course literature

Blomkvist & Hallin (2014/2015). *Method for engineering students: Degree projects using the 4-phase Model*, Studentlitteratur.

or (same book in Swedish):

Blomkvist & Hallin (2015). *Metod för teknologer. Examensarbete enligt 4-fasmodellen*, Studentlitteratur. (in Swedish)

N.B. This book is also used as course literature in the PIM course (ME2501).

Additional readings

Wadström (2023). *Change in the mind of the strategist*, Book on Demand, Norderstedt, Germany.

Lennerfors (2019). *Ethics in Engineering*, Studentlitteratur, Sweden