

## Course PM

# Management of Innovation and R&D (7.5 credits)

Autumn 2020, reading period 1

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### Course module responsible (from the division of Innovation and R&D Management)

- **Organizational theory:**  
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This document contains information about the course, its conduct, content and examination. It is structured into three major parts; first ‘Overall course information’, and then ‘Course content and themes’ and finally ‘Additional important information’. More detailed information will be found on the course web page ([www.canvas.chalmers.se](http://www.canvas.chalmers.se)). This web page will be updated throughout the course so make sure to **visit the course web page on a regular basis!**

### Course revisions since last year

This is a new course, run for the first time this year. The course is replacing the previous course IPR011-Managing development projects.

## Part 1 - Overall course information

### Course aim and goal

This course aims at developing an understanding of the prerequisites for R&D and innovation work in large established organizations.

More specifically the course will address key elements within the areas of:

- Organizational theory
- Project management
- Product development
- Innovation management

Having completed the course the student should hopefully be able to (the learning outcomes):

- Describe fundamental mechanisms related to organizations' existence, design and scope
- Explain the basic project management terms and tools
- Describe different types of product development processes
- Apply different methods and tools for efficient product development work
- Describe the prerequisites for innovation work and their implications on the strategic and operative levels

### Pedagogical Philosophy

The basic pedagogical philosophy is to foster understanding of the subjects taught. This means that formal lecturing will be kept to a minimum. The course includes a number of sessions. The purpose of these sessions is to present and discuss the central issues in the literature and to support students in developing an understanding of these issues. The sessions will not cover all details in the literature. Instead, the sessions build on the premise that the student has read and reflected upon the relevant articles/book chapters before the session. For some of the sessions the students are also expected to watch some preparatory videos. These preparations aim towards having fruitful discussions in the Zoom sessions, and by that increase the students' learning.

### Literature

The literature for this course will be textbooks (for the Project Management course module) and a number of articles. The articles will be possible to find through Chalmers Library, other places on the Internet or distributed separately.

#### Textbooks:

The textbooks are listed in the description of Module 2 – Project Management (see below).

## **Examination**

The examination is based on two different parts. There will be two individual partial exams, one for the ‘Organizational theory’ part of the course, and one for the ‘Textbook project management’ part of the course. In the end of the course there will also be a home exam covering the whole course; all four modules. For the two individual exams the grading will be Passed or Not passed, for the home exam the grading will be Fail, 3, 4 and 5.

Having passed both individual partial exams and having 50% of the maximum number of points on the home exam a grade of “3” will be awarded. A result of 65% of the maximum number of points will result in the grade “4”. The highest grade “5” will be awarded for 85% and over.

### **‘Organizational theory’ exam**

This individual partial exam will be introduced in the first session (Session 11) in the Organizational theory course module. The deadline for the handing-in the exam will be **the 14<sup>th</sup> of September, at 17.00.**

### **‘Textbook project management’ exam**

This individual partial exam will be done by means of an online test. This test will take place **the 25<sup>th</sup> of September at 13.15.** There will be a re-exam possibility the 16<sup>th</sup> of October at 13.15.

### **Home exam**

The aim of the home exam is to create a state of reflective learning and not to test by rote. Knowledge from the whole course should be integrated, by working with the questions and themes of the course. Theory and practical knowledge should be integrated and various theories reflected against each other. Proven understanding of concepts and ability to build syntheses are encouraged as well as a structured reasoning.

The home exam will be published the 20<sup>th</sup> of October, and deadline for hand-in will be **the 30<sup>th</sup> of October at 13.00.**

## Part 2 – Course content and themes (subjects)

Below is the content in the four course modules described, as well as the literature to prepare before each session. The course will start with an introduction in week 1. For schedule, see TimeEdit and Canvas. **Please note that this course will be run online, which means that all of the sessions in the course will be run on Zoom. Links to the Zoom-sessions will be found in Canvas!**

### Course introduction

- **Session 0: Course introduction (MP and SB)**

In this session the course will be introduced, including both course aim and goal, examination and structure, but also an introduction to the course team.

### Module 1 – Organizational theory

The first course module will focus on fundamental mechanisms to reasons for organizations' existence, design and scope. It will also discuss relationships between the organization design and firms' abilities regarding product development and innovation.

- **Session 11: Introduction and overview (AP)**

The reading for this session introduces the course module and provides a broad overview of the field of organisational theory.

**Literature to prepare for the session:**

- Montana, 1993. Organizational structures: concepts and formats. In: Management: A Streamlined Course for Students and Business People. (Hauppauge, New York: Barron's Business Review Series, 1993), pp. 155-169.
- Fligstein, 2001. Organizations: Theoretical Debates and the Scope of Organizational Theory. In B. S. Turner, C. Rojek, & C. Calhoun (Eds.), Handbook of sociology. London: Sage.

- **Session 12: Organisations' structure and context (AP)**

The reading for this session discusses different key dimensions of firms, and how firms can be organised in different ways to cope with different external circumstances.

**Literature to prepare for the session:**

- Lunenburg, 2012. Organizational Structure: Mintzberg's Framework. International Journal of Scholarly, Academic, Intellectual Diversity 14.
- Schweizer, 2005. Concept and evolution of business models. Journal of General Management 31, 37-56.
- Young et al., 2014. Strategy in emerging economies and the theory of the firm. Asia Pac. J. Manag. 31, 331-354.

- **Session 13: Organisation and innovation (AP)**

The reading for this session covers the relationships between organisational theory and innovation.

**Literature to prepare for the session:**

- Lorsch, J.W., Lawrence, P.R., 1965. Organizing for Product Innovation. Harvard Business Review.
- Teece, 1996. Firm organization, industrial structure, and technological innovation. Journal of Economic Behavior & Organization 31, 193-224.
- Chandy & Tellis, 1998. Organizing for Radical Product Innovation: The Overlooked Role of Willingness to Cannibalize. Journal of Marketing Research 35, 474-487.

## **Module 2 – Project management**

The second course module will focus on the history and advancement of project management, and on the basic project management terms and tools.

The first session *Textbook Project Management* deals with a brief summary, presented as two video recordings, of the well-known project management textbooks Maylor (2010) and Pinto (2012):

- Maylor, H. (2010). *Project Management* (4th ed.). Harlow, England: Pearson Prentice Hall.
- Pinto, J. K. (2012). *Project Management: Achieving Competitive Advantage* (3rd Global ed.). Boston: Pearson Education.

The above editions are available as e-books from the Chalmers Library. However, at the time of writing, the Chalmers Library search engine cannot provide useful links to these e-books. Instead, use the following procedure:

1. Go to <https://www.vlebooks.com>
2. Under *Sign in below*, click *OpenAthens*
3. Find *Chalmers University of Technology*
4. Provide your username and password

- **Session 21: Textbook Project Management (LH)**

Session 21 is managed by Lars Hallin. The major work effort consists of your preparatory work (see below) where you watch videos prerecorded by Lars. The scheduled Session 21 is a live Q&A session via Zoom, chaired by Lars.

**Preparation for the session:**

Watch the two lecture videos (each with a length of about three hours); they will be available in Canvas under Course Material -> Module 2 Project Management before Sept 6.

Session 21 *Textbook Project Management* will be examined by means of a scheduled pass-or-fail online test.

Session 22-24 will focus on *Challenges when Managing Innovative Projects*,

## **Session 22: The balance between leeway and rigour in managing projects (JW)**

### **Literature to prepare for the session:**

- Engwall, M. (2002). The futile dream of the perfect goal. In K. Sahlin-Andersson & A. Söderholm (Eds.), *Beyond project management - New Perspectives on the Temporary-Permanent Dilemma* (pp. 261-277). Malmö: Liber Ekonomi.
- Olin, T., & Wickenberg, J. (2001). Rule Breaking in New Product Development - Crime or Necessity? *Creativity & Innovation Management*, 10(1), 15-25.

### **Suggested reading:**

- Hällgren, M., Jacobsson, M., & Söderholm, A. (2012). Embracing the drifting environment: The legacy and impact of a Scandinavian project literature classic. *International Journal of Managing Projects in Business*, 5(4), 695-713.

### **• Session 23: Shadow System of Project Management (JW)**

This session will focus on what is not talked about in project-based organizations, either because it is not in the self-interest of individuals or groups or because individuals or groups are unaware of it going on. The session covers power in organizations, organizational politics, and introduces organizational learning.

### **Literature to prepare for the session:**

- Argyris, C. (1991). Teaching Smart People How to Learn. *Harvard Business Review*, 69(3), 99-109.
- Buchanan, D., & Badham, R. (1999). Politics and Organizational Change: The Lived Experience. *Human Relations*, 52(5), 609-629.

### **Suggested reading:**

- Raven, B. (1965). Social influence and power. In I. D. Steiner & M. Fishbein (Eds.), *Current studies in social psychology* (pp. 371-382). New York: Holt, Rinehart, Winston.

### **• Session 24: How to deal with the Shadow System in practice (JW)**

In this session we will discuss how to deal with the Shadow System in practice. As we will cover the Challenger accident in 1986, you might want to start your pre-reading by briefly study its Wikipedia entry to understand the context.

### **Literature to prepare for the session:**

- Feynman, R. P. (1986). *Report of the PRESIDENTIAL COMMISSION on the Space Shuttle Challenger Accident, Volume 2 Appendix F; Personal Observations on Reliability of Shuttle*. Washington D.C.: NASA.

### **Suggested reading:**

- Feynman, R. P. (1974). Cargo Cult Science. *Engineering and Science*, 37(7), 10-13.
- Wickenberg, J. (2013). *Trade-offs between efficiency and legitimacy when implementing a large change program at the middle management level*. Paper presented at the 8th Colloquium On Organisational Change & Development, September 12 and 13, Gent, Belgium.

Session 22-24 that focus *Challenges when Managing Innovative Projects* are not part of the module exam, its content will be included in the course overall home exam.

### Module 3 – Product development

The third course module will focus on product development processes, such as Stage-gate and Agile, for the development of products and services. Also some methods and tools for efficient product development work will be introduced, such as portfolio management, product platforms and modularization.

- **Session 31 – What is product development, and how can it be managed? (MP)**

This session introduces the course module and some of the main challenges to manage in product development, such as for example uncertainty, the balance between market pull and technology push, and the importance of time to market. The session will also discuss product development processes, and portfolio management.

**Literature to prepare for the session:**

- Schilling, M.A. and Hill, C.W.L. (1998), Managing the New Product Development Process: Strategic imperatives, *Academy of Management Executive*, Vol. 12, No. 3, p. 67.
- Cooper, R.G. and Kleinschmidt, E.J. (1991), New product processes at leading industrial firms, *Industrial Marketing Management*, Vol. 20, pp. 137-147.
- Cooper, R., Edgett, S. and Kleinsmith, E. (2001), Portfolio management for New Product Development: Results of an industry practices study, *R&D Management*, Vol. 31, No. 4, pp. 361-380.

**Suggested reading:**

- Stockstrom, C. and Herstatt, C. (2008), Planning and uncertainty in new product development, *R&D Management*, Vol. 38, No. 5, pp. 480-490.
- Sommer, A.F., Hedegaard, C., Dukovska-Popovska, I. and Steger-Jensen, K. (2015), Improved product development performance through agile/stage-gate hybrids, *Research-Technology Management*, January-February, pp. 34-44.

- **Session 32 – Platform development and modularization management (MP)**

This session focuses on how product platforms and modularization can be used in order to develop a variety of customized products in an efficient, as well as effective, way.

**Literature to prepare for the session:**

- Robertson, D., and Ulrich, K. (1998), Planning for Product Platforms, *Sloan Management Review*, Vol. 39, No. 4, pp. 19-31.
- Persson, M. and Åhlström, P. (2006), Managerial issues in modularizing complex products, *Technovation*, Vol. 26, No. 11, pp. 1201-1209.

**Suggested reading:**

- Muffatto, M. and Roveda, M. (2000), Developing Product Platforms: Analysis of the development process, *Technovation*, Vol. 20, pp. 617-630.
- Magnusson, T. and Lakemond, N. (2017), Evolving schemes of interpretation: Investigating the dual role of architectures in new product development, *R&D Management*, Vol. 47, No. 1, pp. 36-46.

- **Session 33 – Servitization and service development (SJ and MP)**

This session will discuss why, and how, many traditionally manufacturing and product-focused companies change into developing combined product-service offerings. We will also discuss some of the challenges that these companies face in this transformation.

**Literature to prepare for the session:**

- Martinez, V., Bastl, M., Kingston, J. and Evans, S. (2010), Challenges in transforming manufacturing organisations into product-service providers, *Journal of Manufacturing Technology Management*, Vol. 21, No. 4, pp. 449-469
- Ulaga, W. and Reinartz, W.J. (2011), Hybrid offerings – how manufacturing firms combine goods and services successfully, *Journal of Marketing*, Vol. 75, pp. 5-23.

**Suggested reading:**

- Storbacka, K. (2011), A solution business model: Capabilities and management practices for integrated solutions, *Industrial Marketing Management*, Vol. 40, No. 5, pp. 699–711.

## **Module 4 – Innovation management**

The fourth course module will focus on innovation work in established organizations. It will discuss prerequisites for innovation (barriers and enablers) and their implications on the strategic and operative levels.

- **Session 41 – Innovation and Innovation capabilities in large firms (SB)**

This session will introduce the notion of innovation in large firm and discuss the prerequisites for innovation from a capability perspective.

**Literature to prepare for the session:**

- Assink, M. (2006) The inhibitors of disruptive innovation capability: a conceptual model. *European Journal of Innovation Management*, 9(2), 215-233.
- Colarelli O'Connor, G. (2008) Major innovation as a Dynamic Capability: A systems approach. *Journal of Product Innovation Management*, 25(3), 313-330.

**Suggested reading:**

- Helfat, C.E., Finkelstein, S., Mitchell, W., Peteraf, M.A., Singh H., Teece, D.J. and Winter, S. (2007) *Dynamic Capabilities, Understanding strategic change in organizations*, Blackwell Publishing, Singapore.
- Danneels, E., (2011). Trying to become a different type of company: dynamic capability at Smith Corona. *Strategic Management Journal* 32 (1) 1–31.
- Börjesson S, Elmquist M. 2011. Developing innovation capabilities: A longitudinal study of a project at Volvo cars. *Creativity and Innovation Management* 20(3): 171-184.



- **Session 42 – The ‘Fuzzy Front end’ of innovation (GP)**

This session will focus on ideation and the fuzzy front end (FFE) of Innovation. The three perspectives (environment, individual and organization) of innovation and how they relate to FFE will be introduced. The session will also discuss the networked and systematic nature of innovation, and how it influences the front end of innovation.

**Literature to prepare for the session:**

- Reid SE, De Brentani U. 2004. The Fuzzy Front End of New Product Development for Discontinuous Innovations: A Theoretical Model. *Journal of Product Innovation Management* **21**(3): 170-184.
- Nobelius D, Trygg L. 2002. Stop chasing the Front End process — management of the early phases in product development projects. *International Journal of Project Management* **20**(5): 331-340.

**Suggested reading:**

- Backman M, Börjesson S, Setterberg S. 2007. Working with concepts in the fuzzy front end: exploring the context for innovation for different types of concepts at Volvo Cars. *R&D Management* **37**(1): 17-28.
- Gawer A, Cusumano MA. 2014. Industry Platforms and Ecosystem Innovation. *Journal of Product Innovation Management* **31**(3): 417-433.
- Furr N, Shipilov A. 2018. Building the right ecosystem for innovation. *MIT Sloan Management Review* **59**(4): 59-64.

- **Session 43 – Design thinking (LC)**

This session will focus on Design Thinking.

**Literature to prepare for the session:**

- Brown, T. 2008. Design thinking. *Harvard Business Review*, 86(6): 84-92

**Suggested reading:**

- Carlgren, L., Rauth, I., & Elmquist, M. (2016). Framing design thinking: The concept in idea and enactment. *Creativity and Innovation Management*, 25(1), 38-57.

Teachers:

MP – Magnus Persson, Associate Professor, Division of Innovation and R&D Management, Chalmers

SB – Sofia Börjesson, Professor, Division of Innovation and R&D Management, Chalmers

GP – Gouthanan Pushpanathan, PhD student, Division of Innovation and R&D Management, Chalmers

AP – Alvar Palm, PhD, Division of Innovation and R&D Management, Chalmers

JW – Jan Wickenberg, Senior lecturer, Division of Innovation and R&D Management, Chalmers

LH – Lars Hallin, Project Management consultant

SJ – Siri Jagstedt, Senior researcher, RISE

LC – Lisa Carlgren, Senior researcher, RISE

## Part 3 – Additional important information

### Course evaluation

A course evaluation committee will be organized, consisting of the examiner and four to five students, during the course introduction session. The committee will meet at two to three times (one of these meetings is during the next Reading period). Tokens of appreciation will be rewarded to those students who participate (see further description of the Course Evaluation Process, available in the Student Portal).

### Referencing, copying and academic honesty

In this course you are required to use a **Harvard referencing** style ('author/date'), either the one stated in the Chalmers Library Reference Guide or the APA style (by the American Psychological Association).

You are encouraged to use a reference managing system, as it is important to get your references right. There is a built-in referencing system in recent versions of Microsoft Word, which can produce APA-compliant referencing. Many academics prefer the free Zotero software, which stores your references in a database separated from your documents.

Aiming to become a future Master, you are encouraged to make use of the works of others. However, you **must avoid plagiarism** – if your writing is inspired by someone else's text, you refer to it, and if you copy it, you quote it. Please download and study [Academic Honesty and Integrity at Chalmers – What Are the Rules of the Game?](#)

**Do not discuss an on-going Home Exam** with anyone (other than your peer-writing partner, if you have agreed to co-write the exam with another student).

Please note that **lectures are copyrighted** by the lecturers. Thus, you cannot record a lecture (even for your own use), unless you have received authorization by the lecturer.