

# INDUSTRIAL PHD: THE BUSINESS OF IMPACT, INNOVATION, AND CO-CREATION

## Course coordinator

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## Course aim

The course aims to prepare the Industrial PhD students to understand and embrace the responsibility to create a business impact through their PhD research, to skillfully navigate between business and academia, and to ensure value creation.

## Course rationale

The Industrial PhD Program aims at increasing knowledge sharing between universities and private-sector companies or public sector/NGO, promoting research with commercial/value add perspectives, and taking advantage of competences and research facilities in private/public business to increase the number of PhDs. This course is a first step on this journey.

The course focuses on creating and strengthening a shared understanding of the Industrial PhD scheme as a unique example of collaborative research practice in both Danish and international contexts, which clearly addresses the need for and the benefit of research gaining momentum and impact in practice—in the hosting company, the academic world, and society. The vision for this course is, therefore, to consolidate and strengthen the brand value of the Industrial PhD scheme and applied research both nationally and internationally by combining a classical PhD education with competencies to create and demonstrate the impact of research in practice.

The overall aims of the course are to

- offer knowledge, competencies, and skills necessary to deliver the societal value and ensure business impact created by the Industrial PhD project,
- enhance networking among Industrial PhDs and ensure knowledge sharing, creation of innovative opportunities, and cracking the interdisciplinary challenges, and
- contribute to innovation and entrepreneurship in Denmark.

The course is compulsory for all Industrial PhD students, obtaining funds from the Innovation Fund.

## Course content

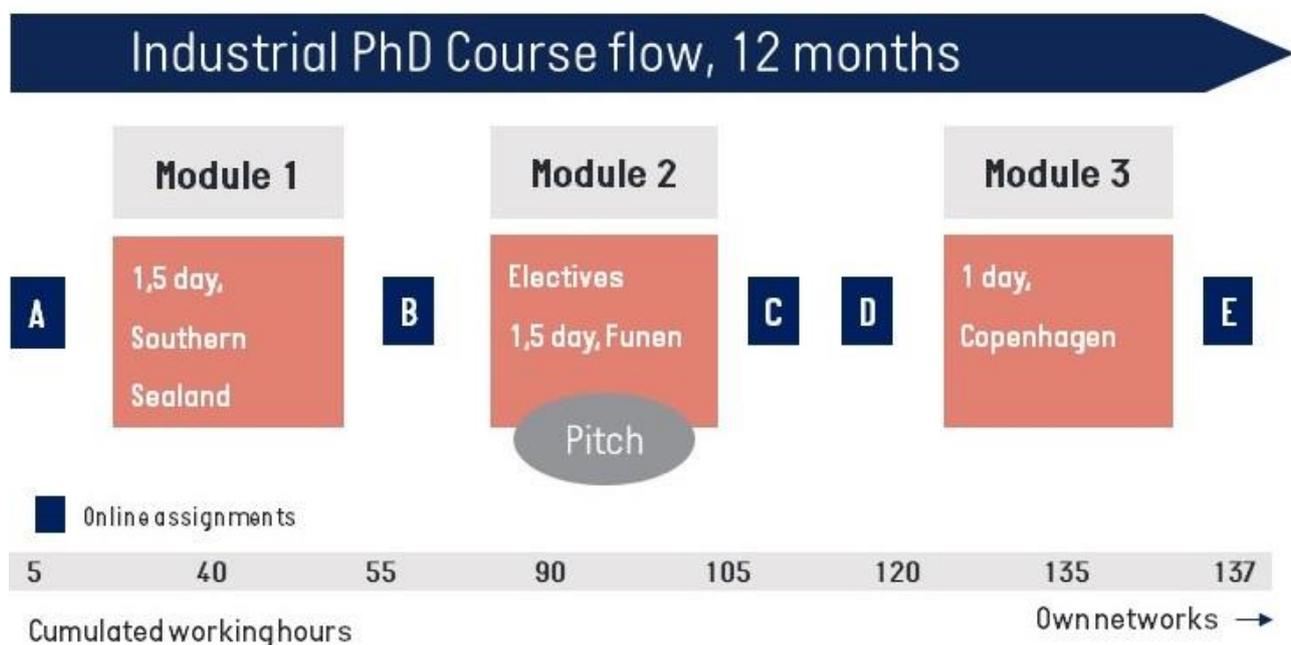
The course runs approx.. 12 months. With modules falling either April, October, April or October, April, October. It is highly recommended to take the course during the first year of PhD studies. The course consists of two compulsory modules and one elective. These are:

- **Module 1.** *The Best of Both Worlds—The Potentials and Pitfalls of Mutual Value Co-creation in-between Academia and Practice.*  
Required. 2 ECTS. (on-site).
- **Module 2 – elective in Project Management.** *Project Management and Organizational Dynamics.*  
Elective. 1.5 ECTS. (on-site)
- **Module 2 – elective in Innovation.** *Inspiring Entrepreneurial Behavior by Employees and Making Innovation Happening.*  
Elective. 1.5 ECTS. (on-site)
- **Module 2 – elective in Communication.** *Communication*  
Elective. 1.5 ECTS. (on-site).
- **Module 3.** *Empowerment on the Personal Level: Incorporate Career Goals, Manage the Supervisory Relationship and Keep up Energy.*  
Required. 1.5 ECTS. (on site).

When signing up for the course, each student should identify one elective module she or he would like to follow.

### Teaching methods

The course will be carried out using a blended learning teaching style, where teaching is delivered through traditional classroom teaching, online learning, reflection exercises, feedback, peer-grading, and networking activities. The figure below illustrates the overall course.



**The classroom teaching** includes 1.5-day introductory module, 1.5-day elective module, and 1-day closing module. The detailed descriptions of teaching for each module are included below. Typically, teaching is conducted as a flipped classroom, where class teaching focuses on activities with a specific learning point in being together, while individual preparation and infor-

mation sharing takes place online. The classes will be conducted in the workshop style with exercises, cases, and opportunities for students to work on concrete tools they could use later in their projects. Off-site modules offer additional opportunities for interaction, dialogue, and networking.

**Online assignments** are complementary to the classroom teaching and provide content for self-directed learning. That is, PhD students are expected to review the content provided online at any time within a given time frame (usually two to three weeks). There are five online assignments scheduled during the course:

- **Assignment A:** This is a pre-course activity.
- **Assignment B:** This activity is associated with the module 1.
- **Assignment C:** This activity is associated with the module 2 electives.
- **Assignment D:** This activity is associated with the module 3.
- **Assignment E:** This is a final course activity that is going to be handed out at the end of module 3.

### Peer grading

There is evidence that peer assessment enables students to learn from each other's successes and weaknesses. The ability to access one another's work objectively is clearly an important skill. Also, this will support group and collaborative learning so that students are given the opportunity to create professional and social relationships with other peers. The evaluation will be done online using tools available through the online platform. The Industrial PhD students will be organized in relevant thematic as well as interdisciplinary groups.

### Network events

The importance of building strong networks will be emphasized throughout the process. The key event will be three sessions around a "Pitch Your PhD" exercise. The students will also have many possibilities to socialize and build informal networks. In addition, the PhD students will be invited to an alumni network.

### Literature

The literature is divided into required and recommended readings. The required literature must be read in advance of each module and students must be prepared to discuss the literature in groups. The reading is included in the workload required for the 5 ECTS at PhD level. All literature will be available on the course portal.

### Examination

Course participation is assessed as passed/not passed. The evaluation is ongoing and assessed by the evaluation of students' participation in all course activities, that is, through 1) active participation in the activities carried out in and between classroom education, 2) submission of all the study products and online assignments defined for each module, and (3) completion of the feedback cycle.

Assessment is an integral part of the course progress and pedagogy. It is not only a necessary final formality but also focuses on value-creating learning activities that are directly transferable to the student's practice along the way.

In the next sections, we present a detailed description of each of the modules. We reserve the right to make changes in the time, venue, and faculty, as well as minor modifications to the content.

## MODULE 1

### THE BEST OF BOTH WORLDS—THE POTENTIALS AND PITFALLS OF MUTUAL VALUE CO-CREATION IN BETWEEN ACADEMIA AND PRACTICE

Type: Required, residency module

ECTS: 2 ECTS

#### Faculty

Rikke Kristine Nielsen, Associate Professor, Department of Communication & Psychology, Aalborg University Copenhagen (module coordinator).

#### Module aims

An industrial PhD is a PhD like all other PhDs. At the same time, an industrial PhD research is also a unique form of research and practice knowledge co-creation. The industrial PhD researcher's position between practice and research comes with special opportunities and challenges. Experience from the industrial PhD programme informs us that these opportunities and challenges transcend academic disciplines and scientific traditions, so this introductory module focuses on the *special role* of the industrial PhD researcher.

With this module we would like to enable you to proactively position yourself and navigate in a field characterized by a variety of stakeholders with different conceptions of quality and value. How do you simultaneously create value in the research project for your host organization, your field of research, society, and yourself.

#### Module content

The module consists of two sections:

##### Section 1: Constructive controversy—value creation in between academia and practice

Experience from decades of Industrial PhD research as well as extant research literature inform us that delivery of practical impact in research comes with a number of special opportunities and challenges that transcend academic disciplines and scientific traditions. This part of the course discusses ways of harvesting the benefits and avoiding the pitfalls by proactively positioning yourself in a field characterized by a variety of stakeholders with different conceptions of quality/value. Taking the research literature dealing with such a researcher role and position as our point of departure, this part of the course discusses your position as a researcher in-between academia and practice working with your stakeholder interview and your practical impact potential. In addition to discussing your position as a double-hurdle researcher from research literature point of view, we also engage in an "Industrial PhD collaboratorium". This takes the form of a panel debate where experienced Industrial PhD stakeholders is gathered to share ideas and advice for doing Industrial PhD research and debate Industrial PhD research with participants.

##### Section 2: Business/organizational strategy and your personal impact strategy

This second section of module 1 focuses on Industrial PhD research impact in the context of your host organization and strategic priorities with a view to building an "impact case" and stakeholder analysis of the individual Industrial PhD researcher's project, placing it in the value chain and wider stakeholder ecosystem.

### **Learning objectives:**

By participating in this module, the participant will acquire

- an understanding of and practical tools for optimization of the Industrial PhD researcher's role as a knowledge entrepreneur in-between research and practice,
- suggestions for strategies for impact optimization and multi-stakeholder cooperation,
- great and best practice: Inspiration for "dos and don'ts" in Industrial PhD research from Industrial PhD practitioners and extant literature, and
- membership in a community of practice through networking and knowledge sharing with peers.

### **Teaching methods**

This off-site module is conducted in an interactive workshop format, where participants work with stakeholder value creation and research impact in plenary, group work, and individual reflection. Highlights of the module literature are presented in videos made available to participants before the module so that we may spend our time together debating the take-aways from the literature and convert theoretical arguments to practical tools to be used in the participants' projects, seeking inspiration from each other, as well as guest lecturers/panelists.

### **Preparation and Online Assignment B**

To pass this module, the Industrial PhD student must actively participate in the module's teaching activities by engaging in the following "learning by doing" actions before, during, and after the module.

1. Prior to participating in the module, the Industrial PhD student must
  - a. complete a survey on his/her research project and background and
  - b. conduct a 45-minute interview with a central Industrial PhD research project stakeholder about the practical value and impact of the research project.
2. During the module, the Industrial PhD student is required to
  - a. participate in the teaching activities, including group work, collective wisdom, etc.
3. After module 1—and before module 2—the Industrial PhD produces
  - a. a 5-7-page stakeholder analysis of central Industrial PhD project stakeholders for which the participant receives written feedback through peer grading from co-students.

## MODULE 2

Type: Required, residency module

This module is divided into three electives that will run simultaneously. Read more about each elective below.

At the end of day one on this residency module all three electives will join for a Pitch Your PhD-exercise.

Day two of the module will begin with pitch feedback in groups and we will wrap up the module with a joint keynote.

## MODULE 2, ELECTIVE IN PROJECT MANAGEMENT **PROJECT MANAGEMENT AND ORGANIZATIONAL DYNAMICS**

Type: Elective, residency module

ECTS: 1,5 ECTS

### Faculty

John K. Christiansen, Professor at Copenhagen Business School

Joana Geraldi, Associate Professor at Copenhagen Business School

### Module aims

Projects are part of the daily life of firms, as they act as a vehicle for e.g. boosting innovation, generating new knowledge, bringing about change, and creating new products and services. This module aims at enhancing participants' knowledge about project management, while fostering a reflexive approach to the subject and its practice.

### Module content

It will introduce two different theoretical perspectives on project management: one represents the traditional view on project management, clearly portrayed in international standards and most textbooks. The other perspective represents the so called 'Scandinavian school' of project management, which on the one hand acknowledges the need for classic planning tools and methods, but also reflects on the need for flexibility and co-creation to cope with the high uncertainty, complexity and ambiguity of projects. We will call them tightly coupled and loosely coupled perspectives, respectively.

We then bring the two theoretical perspectives into three core project practices, that is, three levers/pillars that every project practitioner will *do*:

1. **Aiming:** Apply tools and concepts to define project vision, purpose, scope, success and benefit, and connect these with a project plan. As we discuss aspects of planning, and timing, we will discuss behavioral aspects of scheduling, e.g. procrastination, overly cautious scheduling, and identify pragmatic coping strategies to mitigate them in your own projects;
2. **Adapting:** Explain impact of uncertainty and change in projects and identify risks, opportunities and mitigation strategies for own projects;
3. **Collaborating:** Being able to recognize the importance of different requirements from different stakeholders, e.g. need for progress reporting versus dialogue.

The two perspectives and three project practices form a 2x3 matrix that will guide the course.

*Our intention is to illustrate all subjects in the curriculum through practical exercises, relating the theory and the analytical tools to the individual PhD project and other projects.*

### **Learning objectives**

After this module, the participants will have gained knowledge, tools, and methods to

- understand two distinctly different theoretical perspectives on project management, and their implications for the selection and application of management tools and concepts,
- apply tools and concepts to develop and manage projects, including developing purpose and plans for the project,
- being able to identify sources of uncertainty and changes and to manage their project in a world enriched with uncertainty and ambiguity,
- explain and apply approaches for managing stakeholders and building relationships for their projects, including strategies for communication of progress and research results to and interaction with stakeholders in a dynamic setting,
- recognize the behavioral challenges of scheduling, such as procrastination, and identify pragmatic approaches to mitigate them in projects.

### **Teaching methods**

The module combines two half-day workshops with online assignments. The teaching will be a mix of delivery methods encouraging active participation of the participants through discussions and exercises. The class is inspired by the flipped classroom pedagogy where participants are expected to have executed guided reading prior and conducted some preparation activities before we meet and also to conduct one ex-post reflection activity after the workshop to be submitted online.

### **Before the course**

Participants will engage with a number of guiding presentations and course literature on the on-line platform. The readings cover various parts of the 2 x 3 course matrix and participants are asked to reflect on how the readings relate to their PhD experiences (and if they would like to, other project experiences). We have developed a reading template to guide your reflections and help you prepare a few reflection notes for each of the cells of the 2x3. The reflections will be used in the workshop and will provide the basis for your 'online assignment C' (examination).

### **Preparation and Online Assignment C**

During the module, the Industrial PhD student is required to participate in the teaching activities, including group work, by being present for all sessions offered as part of the module. After the module, the participants will need to submit a short reflection that will be graded as pass/failed. The reflection of max 2000 words should build on the students' preparations and classroom debates and treat a topic of importance for the participant and with implications for project management of her/his own PhD project or another business project.

## **MODULE 2, ELECTIVE IN INNOVATION**

### ***INSPIRING ENTREPRENEURIAL BEHAVIOUR AND MAKING INNOVATION HAPPEN***

Type: Elective

ECTS: 1,5 ECTS

#### **Faculty**

Jacob Lyngsie, Associate Professor, University of Southern Denmark

#### **Module aims**

The course explores entrepreneurial behaviour by employees that lead to the discovery of new business opportunities and how such opportunities may be exploited by established firms.

Entrepreneurship has become a key focus area in today's dynamic competition. The classical type of entrepreneurship, self-employment, has become a means to fuel growth. However, the view that the study of entrepreneurship means the study of people whom start-up companies is unnecessarily constraining. Entrepreneurship also involves complex processes of assembling bundles of complementary resources and coordinating actions and investments over time in the pursuit of profit under uncertainty – all activities associated with the established firm. Thus, recruitment and support of employees engaging in entrepreneurial behaviour is a key factor in firms' competitive strategy. However, most managerial advice about entrepreneurship within established firms has been based on anecdotal evidence or single case studies.

This course breaks with the focus on start-ups and instead emphasises that established firms may be uniquely positioned to use organizational mechanisms that exacerbate entrepreneurial behaviour by employees. In relation to the Industrial PhD program this may involve exploring questions such as: who should be entrusted with engaging in entrepreneurial activities, what is the role of senior management in the entrepreneurial process, and how do firms organise to emphasise the entrepreneurial motivation of their employees. In addition to a research driven curriculum, students are prompted to apply course material to practical business circumstances.

#### **Module content**

The course centres on entrepreneurial behaviour by employees. This entails exploring human capital antecedents in terms of their proclivity to engage in entrepreneurial activities. However, as the course is based on entrepreneurial activities within established firms, an integral part of the course deals with how firms may organize such behaviour. Unlike a new venture undertaken by an individual, entrepreneurial activities within established firms may broadly be separated into three different activities:

- The discovery
- Evaluation
- Exploitation activities

Thus, organizing entrepreneurial activities not only requires that entrepreneurial behaviour is encouraged by the firm's organizational setup but also that different phases are coordinated. Specifically, the course focuses on:

- Conceptualisation and analysis of entrepreneurial behaviour within established firms.
- Understanding key drivers of entrepreneurial behaviour and how these may differ between different entrepreneurial activities.
- Delineation and consideration of the role played by managers in establishing "pro-entrepreneurial firms"
- Practically orientated application of research findings and appreciation of the complexity of balancing different entrepreneurial activities.

### **Learning objectives**

After this module, the participant will be able to:

- Reflect on an informed basis on the nature and antecedents of entrepreneurial behaviour.
- Be familiar with the analytical tools needed to manage constituent factors relating to entrepreneurial behaviour within established firms.
- Understand the differences between various aspects of entrepreneurial behaviour and how these may be separated within the firm.
- Identify organizational misalignment with entrepreneurial activities and apply practical tools to enhance entrepreneurial activities.

### **Teaching methods**

The module combines a one-day workshop with on-line activities. At the workshop, the pedagogical approach varies between lectures; dialogue-based discussion; and student presentations based on group work. Throughout the course on-line methods will be utilized to enrich the learning experience. This may encompass videos, information search, on-line group meetings and student feedback on group work.

### **Preparation and Online Assignment C**

In order to pass this module, the Industrial PhD student must actively participate in the module's teaching activities by engaging in the following "learning by doing"-action before and during the module:

1. Prior to participating in the module, the Industrial PhD student must:
  - a. Prepare a 2-minute video presentation on her/his research topic and how this relates to innovative/entrepreneurial behavior.
2. During the module the Industrial PhD student is required to:
  - a. Participate in the teaching activities including group work by being present for all sessions offered as part of the module.
3. After the module the student is required to hand in a 1-page reflecting on his/her organizational context.

## MODULE 2, ELECTIVE IN COMMUNICATION

Type: Elective, residency module

ECTS: 1.5 ECTS

### Faculty

Rikke Kristine Nielsen, Associate Professor, Department of Communication & Psychology, Aalborg University Copenhagen (module coordinator)

Frederikke Winther, PhD, M.Sc. in rhetorics, communication consultant, Copenhagen Coaching Center

### Module aims

This module aims at establishing a solid foundation for the development of the Industrial PhDs' communication competence with a view to enhancing the ability and motivation for effectively communicating the value of their research in a multi-stakeholder research setup.

### The module takes as its point of departure that

- Research communication is an active, productive and personally driven element of the collaborative research process which can stimulate dialogue, mutuality, and value creation, and
- Industrial PhDs stand to gain from being able to address many different interests and values in their communication. Not only after project completion, but also during the research process as pathways for fostering productive interactions with stakeholders, trust, and room for maneuvering.

This module emphasizes the development of communicational strategies and practices from within the everyday life as a researcher. It is important to note that this is not a course on presentation techniques or research dissemination in general, but rather a course on communication as an integral part of research practice throughout the project period.

The focus is put on the ongoing "micro-impacts" through communication – particularly, but not exclusively, internally in the host organization and in the "in-between" of host organization and host university. Micro-impacts are the smaller, incremental - positive as well as negative – insights, results and news that is relevant for central stakeholders to be informed about. Such an effort will support and stimulate the vital connection between the project and its variety of stakeholders (internal and external) *during* the research process, rather than *after* completion of research and results. Information and communication is key to interaction and collaboration between stakeholders.

In effect, this module aims at making participants capable of delivering on their knowledge dissemination obligation (cf. the regulations of the Innovation Fund Denmark) in an active, strategic, fruitful and meaningful way.

### Module content

This module introduces theoretical perspectives of and practical tools for communicating Industrial PhD research in speech and writing both internally in the host organization as well as externally to the broader public. In effect, this module will invite participants to reflect upon the role of communication and their role as communicators with respect to securing research

impact through productive interactions with stakeholders and as a platform for social capital buildup.

The module will enable participants to handle communication in their project as well as positioning and planning of research communication. *Before* (pre-module assignments), *during* and *after* (after-module assignments) the module, participants will work with their own project communication through production exercises (online and in-class). Themes, we touch upon during this module:

- Rhetorical situation analysis
- Intention and expectations
- The narrative approach
- Strategies of argumentation

### **Learning objectives**

By participating in this module, the participant will obtain

- training in planning and execution of research communication activities,
- the ability to formulate central story lines tailored to different groups of stakeholders,
- training in handling communication activities in established news media as well as social media,
- practical research communication tools,
- the ability to formulate and disseminate the value and impact of the individual research project, and
- an understanding of the way in which research communication is an integral part of research impact in both practice and academia.

### **Teaching methods**

The module combines a one-day workshop with online assignments. It is conducted in an interactive workshop format in which participants work with stakeholder research communication in plenary, group work, and individual reflection. Highlights of the module literature are presented in videos made available to participants before the module so that we may spend our time together building theoretically informed research communication tools to be used when communicating the individual participant's research project.

### **Preparation and Online Assignment C**

To pass this module, the Industrial PhD student must actively participate in the module's teaching activities by engaging in the following "learning by doing" actions during and after the module. During the module, the Industrial PhD students are required to

- participate in the teaching activities including group work by being present for all sessions offered as part of module 2,
- produce a podcast tailored to their own project.

## MODULE 3

### EMPOWERMENT ON THE PERSONAL LEVEL: INCORPORATE CAREER GOALS, MANAGE THE SUPERVISORY RELATIONSHIP AND KEEP UP ENERGY

Type: Required

ECTS: 1,5 ECTS

#### Faculty

Mirjam Godskesen, Independent Consultant in UNWIND, Part-time lecturer, AAU

#### Module aims

This module aims to empower the participants by giving them personal tools that target the specific challenge to navigate in the Industrial PhD setting.

When the participants take module 3, they are at the middle stage of the PhD study, which is often characterized by challenges such as increasing time-pressure and the feeling that there is still far to go. The module addresses three topics that are specifically challenging for Industrial PhD students:

- Possible career paths
- Managing supervisory relationships
- Balancing inspiration and exhaustion

It also rounds up the course; while module 1 *explores* the in-between position of an Industrial PhD student as a particular platform of inquiry and knowledge creation that comes with a range of possibilities and challenges, module 3 further explores this position, zooming in on the ability to *handle* these special challenges and opportunities on the more personal level.

#### Module content

Each of the three challenges refers to a separate teaching element in the module.

##### *Possible career paths - explored from an activity and strengths perspective*

Input to this teaching element comes to a large extent from module 1 where former Industrial PhD students have participated and shared their stories. This is supplemented by a flipped-classroom element, where participants watch a video made specifically for the module where former Industrial PhDs are interviewed about their career choices and significant moments on their journey to their current position.

Inspired by these examples, participants explore their dreams from an activity and strength perspective. They prepare by 1) finding three examples of positions they would like to hold after the PhD and 2) by mapping activities in their work as an Industrial PhD according to a method focused on strengths and activities. At the workshop, participants will share their work, challenge and inspire each other on alignment between career goals and strengths, and 3) write a one-page reflection on their career plans and possibilities.

##### *Managing supervisory relationships*

This teaching element takes its starting point in a presentation in which the PhD student is characterized as a “boundary subject,” and it will be exemplified how and why the special supervisory relationships in the Industrial PhD study are both challenging and potentially very rewarding. Participants will reflect on how their own PhD is “orchestrated” and share their experiences in groups. A one-page reflection is written and will be shared and commented on in peer groups. This reflection is included in the final portfolio.

### *Balancing inspiration and exhaustion*

The third teaching element explores inspiration and exhaustion as two sides of the same thing. Cross-pressure, realistic planning, and taking on the optimal amount of challenges will be addressed. Participants will make a game plan before the module and discuss realistic planning and priorities at the workshop in small groups.

### **Learning objectives**

After this module, the participant will be able to

- reflect on an informed basis concerning possible career paths after the PhD study,
- connect one’s career goals to specific competence development during the PhD study,
- navigate more safely in the field between academia and industry and in handling relations in the supervisory group,
- manage and prioritize ones’ work in the cross field between diverging expectations in different organizational settings, and
- keep a healthy work-life balance and a proactive approach to stress.

### **Teaching methods**

The module combines a one-day workshop with several online assignments. At the workshop, pedagogical methods alternate between short presentations, dialogue, and group work in groups of different sizes. The online methods encompass videos, activity mapping based on tools, investigations of possibilities, online group meetings, and a reflection paper.

### **Preparation and Online Assignment D**

To pass this module, the Industrial PhD student must actively participate in the module’s teaching activities by engaging in the following activities before, during, and after the module:

1. Before the course, participants are required to
  - a) watch a video (flipped classroom method),
  - b) find one to three examples of situations,
  - c) map their activities for two weeks according to the strengths perspective, and
  - d) prepare a “game-plan” for a 14-day period.
2. During the course, participants are required to
  - a) participate in the teaching activities including group work by being present for all sessions offered as part of module 3,
  - b) challenge each other on career goals in small groups,
  - c) discuss the realistic planning based on the “game-plan” in small groups, and
  - d) share in groups their experience of how their PhD is “orchestrated.”.