

TIØ5225 Project Management, Specialization course

TIØ5230 Project Management, Specialization Project, Fall 2025

Project Management - specialization

Position and function of the specialization:

The course is an obligatory course in the 3rd semester for students in MSPROMAN who take IØT as their main profile and in the 9th semester for students at MTIØT who takes project management as their main profile.

The learning outcomes for the specialization project are as follows:

Knowledge learnt in this course:

- Detailed knowledge about models and concepts within their chosen theme of project management
- Detailed knowledge about possible applications and solutions to theme-specific challenges within their chosen theme of project management

Competences learnt in this course:

- Dealing with integrated problems in project management on a high level

Other competences learnt in this course:

- The student should learn how to write a scientific report
- The student should learn about, and practice, how to search for relevant literature when dealing with a problem within their field of knowledge
- The student should practice gathering empirical data and analysing such data with a method suitable to the theme chosen

Possible supervisors:

Professor Vedran Zerjav

Professor II Wenche Aarseth

Associate professor Tim Torvatn (co-ordinator)

Other supervisors may be available depending upon project chosen and the total number of supervised projects in adjoining scientific areas.

If you wish to know more about the specialization, please contact the coordinator, Tim Torvatn (tim.torvatn@ntnu.no)

Requirements for being able to chose project management as a main profile:

Students from MTIØT who wish to take project management as their main profile need to have taken at least three of the four obligatory courses of the project management program.

The obligatory courses are:

- TIØ5200 Project Organizations
- TIØ5210 Programme and Portfolio Management
- TBA5200 Project Planning and Analysis
- TPK5100 Project Planning and Control

Students who have spent time abroad need to have taken courses with a similar content, or have at least 30sp of other courses relevant to project management, and accepted as such by the coordinator.

Taking the Specialization means to take both TIØ5230 Project Management Specialization Project and TIØ5225 Project Management Specialization Course. The Specialization course is described below, and is followed by a FAQ regarding the specialization, and then a list of the possible projects offered in TIØ5230 Project Management Specialization Project.

Description of TIØ5225 Project Management Specialization Course

Course contents:

The course is a further specialization within relevant subjects of Project Management and builds on subjects presented in the obligatory courses in the 1st year of the Master Programme in Project Management. The choice of subjects for the seminar may vary from one year to another. Included is also a seminar series on research methods, tailored to what is relevant for the students in their projects and master thesis work.

Learning activities:

The student need to participate in a minimum number of methodology and research seminars, but attendance to all is expected. If there is a re-sit examination, the examination form may be changed from written to oral. Re-scheduled examinations will be given in December or January, depending on the teaching schedule.

Learning outcomes for the course:

The position of the course: The course is restricted to students who have an IØT specialization in their 3rd semester of the international master of project management, and students in their 9th semester of the MTIØT program who have chosen project management as their main profile.

Knowledge learnt in this course:

- The student should acquire specific and detailed knowledge about a small set of advanced themes within project management. Preferably, at least one of these themes should be relevant for the theme chosen for the project work that the student is doing in parallel with this course
- The student should acquire general knowledge about the most important methodological challenges when doing research, as well as a set of ways to handle these challenges.

Competences learnt in this course:

- The student should be proficient in handling methodological questions and applying methodological theory to his or her own research work.

Other competences learnt in this course:

- The student should develop his or her ability to discuss advanced theories within project management with colleagues
- The student should develop his or her ability to present scientific work done by others.

FREQUENTLY ASKED QUESTIONS:

What specialisation do I choose?

Students who take Project Management as their main profile within a 5-year integrated study program **must** take the Specialisation Project which corresponds to their study program.

What about the specialisation Course?

For each Specialisation project there is a corresponding Specialisation Course. You **must** take the Specialisation Course at the same department as your Specialization Project. Evaluations are handled by the department giving the Specialization Project and you may thus have a different way of being evaluated than your classmates.

How do I choose projects?

Below is a list of the projects offered by the IØT department. Students from the MTIØT program should use the web solution which will be sent to you by the administration, and **choose 5 projects before 5/5-2025**. If there are more people on a project than the capacity of the supervisor, we will discuss solutions at that point in time. This is in order to give everyone a fair chance if some projects become very popular. To ensure flexibility, the students are asked to choose projects from more than one supervisor.

What if I have my own suggestions for a suitable project?

In such cases, the challenge is to find a suitable supervisor. Contact the co-ordinator and present your project to him. He should be able to help you with suggesting a supervisor. In the web choice, please indicate a “self-defined” project and the suggested supervisor at the appropriate place on your list.

Please observe that self-defined projects are a possibility, but not a prerogative. The best possible use of the supervisors is the paramount factor when deciding upon distribution of projects, and this may lead to you not being given your self-defined project.

What about the Master project?

The normal situation is that the Master project is on the same area of expertise as the specialisation project. Thus, we will expect that you have the same supervisor for your Master project as for your specialisation project (or at least one from the same department). If, for some reason, you would like to change supervisor from project to master thesis, be sure to contact co-ordinator as soon as possible.

PROJECT PROPOSALS:

FOR TIØ5230 Project Management Specialization at IØT

PRO 01: Self-Defined project

In this project, you must describe a problem yourself. Send the description along to Tim Torvatn (tim.torvatn@ntnu.no), who will decide if a suitable supervisor is available.

Please observe that Self-Defined projects will be acted upon if a suitable situation can be found with respect to supervision. Thus, you may experience that your suggestion will not be followed. You can only use one self-defined project among your 5 chosen projects.

PRO 02: Involvement of external organizations into product development projects

Any product development project may need to include other organizations into the project. Organizations included could be suppliers, customers, competitors, universities/research institutions, consultants and/or other types of organizations. In this project you look at why, how and/or with what results such organizations are involved, and how their involvement affects the product development project in itself.

Supervisor: Tim Torvatn

Linked to strategic initiative: Could be linked to sustainability, green value creation or health and public sector depending on case chosen.

PRO 03: Cooperation and coordination across organizational boundaries in construction projects

Most construction projects involves multiple organizations, such as architects, consulting engineers, main contractor(s) and different types of sub-contractors. This project looks at how construction project managers handle the involvement of other organizations into their construction project.

Supervisor: Tim Torvatn

Linked to strategic initiative: Leading transitions

PRO 04: Project Management in Non-profit organizations

Many Non-profit organizations are Project-oriented or run large Projects as part of their operations. However, they may not be as proficient in using organizations as for example Professional "For-profit" organizations. If you are interested in looking at non-profit organizations this may be of interest to you. I suggest three areas that you may look at, but other areas can also be handled:

- a) Using Portfolio models to choose the right mix of Projects to run in large non-profit organizations.
- b) Handling non-profit goals when choosing Projects and/or partners for Projects.
- c) How can we do Project management that focuses on the longer-term effects and goals of the Project, rather than "just" doing the Project as efficiently as possible?

Supervisor: Tim Torvatn

Linked to strategic initiative: Could be linked to sustainability or green value creation depending on case chosen.

PRO 05: Project management in volunteer technical student organizations

Problem statement:

Trondheim is well-known for having extraordinary many well-functioning volunteer student organizations. This is the background for the establishment of the course IØ1003 Managing Voluntary Organisations and IØ1004 Top Management Positions in Voluntary Organisations. Among students it is often said that you need to engage in one of these to improve your CV and your later work career. Why is this a saying? Is it because you learn relevant thing being active in organizations, is it because you develop a better network, or is it because you develop project management skills? These are a few of several interesting topics than can be studied further. Among the different organizations, UKA and most technical organizations are

among the more goal- and project-oriented organization. Further understanding of how project management skills and competences are developed, is highly relevant, and it is possible to both study members, middle- and top-mangers in this setting.

Supervisor: Ola Edvin Vie

Linked to strategic initiatives: Leading transitions: Co-create a sustainable future

Contacts: Various volunteer student organizations, including technical organizations

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PRO 06: Responsible innovation

Problem statement: How to include responsible innovation in sustainable projects?

Responsible innovation (RI) is a framework that allows for the governance and evaluation of innovations with regard to their potential harmful consequences and positive contributions to grand societal challenges (GSC). Moreover, it stipulates that this evaluation process should be facilitated by appropriate governance structures at various levels (Voegtlin et.al, 2022). One of the most promising avenues for addressing GSCs is through responsible innovation (RI) (Khavul and Bruton, 2013; Owen et al., 2012; Stilgoe et al., 2013; Voegtlin and Scherer, 2017). RI is a framework that evaluates innovations for their potential harmful consequences, on one hand, and their potential positive contribution to societal challenges, on the other. It suggests that this evaluation process should be facilitated by appropriate governance structures at various levels (Voegtlin et al, 2022). To gain sustainable projects, innovation is a requirement (Aarseth et al, 2017). The problem statement of this project assignment is then “how to include responsible innovation in sustainable projects?”

Supervisor: Professor Wenche Aarseth

Linked to strategic initiative: Sustainability, Green value creation and health and public sector.

PRO 07: Innovative smart road projects

Problem statement: What are the challenges when concept planning for future smart road projects?

Road transport is one of the challenges in achieving the national net zero emissions target as agreed in the Paris Agreement. In Norway, road traffic generates 18% of the total greenhouse gas emissions (Grinerud et al, 2024). This makes road traffic a serious threat against climate challenges. Technological development is stated to be the most promising solution to the challenges. There are especially four overarching trends that will influence road transport systems in the years to come: Electrification, automated transport, intelligent transport systems and shared transport. These are all based on technologies that will radically change the transport system as we know it and make road transport more climate friendly. However, to achieve the aim, existing roads must also be calculated into the equation and a different perspective is now arising when dealing with road infrastructures. Instead of building new

roads only for bearing loads, new roads will be built with communication and information exchange with possibility to be a source of energy. This new approach introduces the term “Smart Roads”. Sustainable smart road projects include technology and innovation, and it is widely accepted that project owners have not included technology and innovation in the concept and planning phase of the projects. We are interested in research on the following topic/ problem statement: What are the challenges when concept planning for future smart road projects? Case: National road authorities in Norway.

Supervisor: Professor Wenche Aarseth

Linked to strategic initiative: Sustainability, Green value creation and health and public sector.

PRO 08: Achieving excellence in global projects

Problem statement: How to reduce some of the main challenges in global projects to achieve project excellence?

Excellence in projects is no longer achieved through project management methodologies. Through the culture of the companies and by determining how to get people to work together internally and externally to solve problems and make decisions, global excellence in projects can be achieved (Kerzner, 2018). When it comes to global projects, this is even more about the external surroundings and how companies strategically position their project managers (Aarseth et al, 2017; Aarseth et al, 2013, Aarseth et al, 2011). Global projects can be defined as temporary collaboration between organizations across nations and cultures with the goal to deliver a unique product or service in a complex external environment which requires relationship management (Aarseth et al, 2013). Some of the challenges found in global projects research are cultural challenges, external stakeholder challenges, the lack of support from the basis organization and sustainability challenges (Aaltonen et al, 2022; Aarseth et al, 2017). In this project assignment you will study a project in your own country or globally, with the following problem statement “how to reduce some of the main challenges in global projects to achieve project excellence?”.

Case: students own projects from their country or conceptual master thesis (literature review).

Supervisor: Professor Wenche Aarseth

Linked to strategic initiative: Sustainability, Green value creation and health and public sector.

PRO 09: Tensions and controversies in the implementation of sustainability programmes

Problem statement: Achieving the transition to sustainability is a major long-term challenge for governments and industries of most industrialised nations. While sustainability initiatives are often presented as interventions of implementing optimal technological solutions, in reality they contain complex interests and conflict embedded in their structures. Some

examples include mass electrification of private transport that relies on technologies, supply chains and manufacturing methods with extremely detrimental effects on the remote communities which source materials. Another example are renewable energy infrastructure, which implement net-zero policy targets, yet they are consuming vast amounts of natural habitat and infringe on the rights of local communities and wildlife. This master thesis project focuses on sustainability programmes with an emphasis on their political and social and economic tensions, analysing the different issues that make their implementation challenging. Research would mainly be based on in-depth qualitative case studies of sustainability programmes. Some examples include Norway's Action Plan for Sustainable Development, deep sea mining, onshore and offshore renewables, and hydropower programmes, which are all prominent in the Norwegian national media and can be analysed through publicly available data sources.

Supervisor: Professor Vedran Zerjav

Research design: Qualitative, mixed methods, exploratory analysis

Linked to strategic initiative : Leading Transitions

PRO 10: Programme management in Trondheim Kommune area initiatives

Problem statement: Trondheim Kommune runs a portfolio of projects in its key areas of delivery. An important ongoing area of project delivery are the Area Initiatives ([Områdesatsingene i Trondheim](#)). This master thesis project would work in collaboration with Trondheim Kommune team elaborating on the complementarities and dependencies across projects in the areas of focus and developing a programme model for coordinating the area initiative strategically.

Supervisor: Professor Vedran Zerjav

Research design: Qualitative, mixed methods, exploratory analysis

Linked to strategic initiative: Leading Transitions

PRO 11: International case studies of project delivery failures

Problem statement: Public and private clients around world are developing, planning and delivering IT, infrastructure and systems transformation with different purposes. The main features of such initiatives is that they are typically of very large scales and comprise a number of interdependent projects which together lead to a strategic or policy goal. They very often fail to achieve their time and cost objectives and for that reason they end up in the public coverage, making them a good unit of analysis. This topic is based on the student selecting a programme of their choice (in their home country or elsewhere) that faced delivery issues and then developing a study based on publicly available material (or empirical work) on the programme. Topics can include leadership, stakeholder issues, performance issues, financing and involvement with local communities. Some example programmes would include Follobanen, Rosebank oil and gas field and others in Norway, the UK High Speed 2, Crossrail (now known as The Elizabeth Line), Berlin Brandenburg Airport and Stuttgart 21, Olympics Projects around the world, in Norway and many others.

Supervisor: Professor Vedran Zerjav

Research design: Qualitative, mixed methods, exploratory analysis

Linked to Strategic initiative: Leading Transitions, Health and Public Sector

PRO 12: Norway portfolio of public investment projects

Problem statement: Governments are implementing programmes and projects of different types, scales and costs to implement their policy goals and deliver on their policy mandates. The portfolio of government projects and programmes is typically large and involves very complex and large investments of different levels of risk and interdependency. In the implementation of such investments, it is their governance that is a key factor of success or failure. This MSc project topic involves working in particular with the Norwegian datasets of major government projects across different segments such as infrastructure, defence, ICT and transformation. Data will be secondary and will be sourced from the [NTNU Concept Research Programme](#). A variety of topics are possible within the governance and management of the front-end of projects and the same is the case for the methodological approach, although it is expected that there will be a focus on quantitative (mixed methods) analysis given the size of the sample of projects.

Supervisor: Professor Vedran Zerjav

Linked to Strategic initiative: Leading Transitions and Health and Public Sector

PRO 13: Project-based orchestration of supplier networks and development

This project is within the field of orchestration of supplier networks and development. It will challenge you to develop an understanding of factors that can promote or hinder orchestration of supplier networks and development in project-based organizations. You can choose between two different contexts for such an analysis. One is related to large construction projects such as the campus development project at NTNU or the Powerhouse project at Brattørkaia in Trondheim. The other is the context of a large event, such as the student cultural festival UKA or the upcoming World Championship in Nordic Disciplines in Trondheim 2025.

Project-based organizations are prevalent within several key sectors in Norway, and their handling of upstream activities is often key to their ability to operate. In typical large projects, up to 60-80% of the value creation is done through the acquisition of goods and services, and often several key purchases are new to the project and also to the mother organizations in charge of the project. Thus, the orchestration of supplier networks and development is often central to both the economic and technical success of the project.

Orchestration of supplier networks is often related to the complicated communication and organization of large projects, and the project's ability to engage suppliers in a development process is central to the ability to appropriate new technical solutions.

Although we have suggested two specific contexts for this work (large construction projects or large events), the knowledge acquired through working on this challenge is not context-specific, but instead useful for all kinds of project-based activities.

Practical information

We would like to invite student groups of 2-3 persons to this project, and are likely able to handle 2-3 such groups. Since the project work in the Fall semester will normally be a literature study, possibly with some exploratory case work, we would also invite the students to proceed in the Spring semester with a master thesis within the field, were an important task would be to test the framework developed in the project up against one or more relevant cases.

Supervisors: Elsebeth Holmen (elsebeth.holmen@ntnu.no), Ann-Charlott Pedersen (ann.pedersen@ntnu.no), Tim Torvatn (tim.torvatn@ntnu.no)

Linked to strategic initiatives: Leading transitions, Technology-based organizational design and Health and Public Sector.

PRO 14: Public procurement from a project management perspective: AI enabled mapping of national practices

Much of all public procurement related activity in Norway (and most, if not all, other countries) is essentially organized and carried out as a complex set of smaller and larger projects. Due its highly regulated nature, expressed through a system of directives at EU level (and implemented in each member and affiliated country in national laws), public purchasers can choose among a limited set of procedures for public procurement that specify how the activities in the procurement process should be carried out, prior to the tender phase, during the tender process and post-tender. This includes a description of how and when information should be published, how communication with suppliers should take place and strict time windows for processing the information from suppliers and reaching decisions. In other words, in a way, following the EU directives, a public procurement process automatically becomes a project with a given start and end point. Different procedures may imply different ways of managing it as a project (different degrees of interaction with suppliers, shorter or longer processes, different degrees of uncertainty). Furthermore, procurement projects are carried out at different system levels, for example within a single municipality, across a group of municipalities as a joint procurement project, or even at national or international level. Thus, the management of the entire system of public procurement projects in a country quickly becomes very complex and will enforce a balance between overall top-down coordination and lower level autonomy.

Public procurement is a much-researched topic in general, but we lack a holistic model of public procurement through a project management lens. In this project the students will carry out a literature study of public procurement as projects and in addition, start analyzing publicly available (and detailed) information about the larger public procurement projects in Norway available in the national Doffin database and the Tenders Electronic Daily (TED) database on the European level. This analysis should lead to better insight into which public procurement procedures are being used in different situations in Norway and provide a basis for hypothesizing about the project management approaches being used. These hypotheses can be combined into a conceptual model of public procurement as a system of projects to be validated and tested in the master thesis. The students are encouraged to explore the use of AI (based) technologies for analyzing the databases (but no specific AI knowledge is required).

The project thesis is aligned with IØTs strategic research area Health and Public Sector.

Supervisors: Luitzen de Boer (luitzen.de.boer@ntnu.no) and Vedran Zerjav (vedran.zerjav@ntnu.no)

PRO 15: Circular procurement and projects

Several major public contracting authorities have begun to initiate and test strategies for more reuse of materials and components in their construction projects through their procurements (circular procurement). Examples of this may be to stipulate specific requirements for whether/reuse in the requirement specification or in the award phase. More extensive initiatives may involve establishing dedicated warehouses or marketplaces for storing and sharing materials among several users in the organization (or possibly even outside). This quickly requires coordination across projects and their stakeholders.

Research in this area and experience so far is that a lot is going on, but that there are also some challenges, such as a lack of overview of (possibly) reusable materials, lack of knowledge to be able to determine what the materials can be used for, uncertainty about quality, legal questions regarding who is responsible for the materials "along the way" and after they have been reused. In addition, the question is how profitability and achieved sustainability benefits can be estimated and documented.

For a buyer, it is therefore not obvious how to work with circular procurement. The literature (Kristensen et al., 2021) suggests that buyers can focus on the procurement process for the materials themselves (the specification), work more closely with suppliers or make changes to contract type and elevate efforts to a larger ecosystem level (e.g. establishment of a shared warehouse). However, what do these strategies imply from a project management perspective?

In the project, the student (s) will conduct a literature study and at the same time begin to identify concrete examples of circular procurement projects through desk research and focus group interview. The purpose will be to develop a framework for further validation and testing in the master's thesis.

With a view to the master's course, it is relevant to seek cooperation with companies and other relevant external actors. The supervisor will assist in this process.

Supervisor: Luitzen de Boer (luitzen.de.boer@ntnu.no)

Linked to strategic initiative: Green Value Creation/CE as well as Health and Public Sector.