



Revised: August 23, 2023

Course-PM autumn 2023: EI2525 Electric Power Engineering Project 9.0 credits

General course information

The Electric power engineering course both contains project management theory and application in the context of addressing a technical problem. The problems stem from researchers and the industry.

The course is implemented in project groups with around 3-6 students. After an introduction including modelling methods as well as project management the groups are assigned project works related to the development of new electric power technology components and systems. Course's main implementation happens through work with these. Since the different project assignments require different knowledge, the first task is to identify the specific knowledge need in each individual project group. Gathering of necessary knowledge comes partly through direct participation in the given courses, but it is in many cases necessary to by oneself find and absorb this knowledge that is available in the form of course material for the given courses.

Another task is that within the group distribute the work, to acquire the for the project necessary knowledge as well as to make a time planning for implementation of project. The project assignments consist of theoretically investigate whether a proposed technical solution of a problem related to an electric power technology component or a system is possible to implement practically. This study shall then be verified experimentally by means of a scaled down conceptual prototype, a physical arrangement, or computer simulation.

To limit the extent of the experimental part, the theoretical study is used to identify what is critical for the proposal solution to be implemented in a practical application. Since limited resources are available for the experimental work, it is necessary to use and interpret the results that come from the theoretical study.

Learning outcomes

After passing the course, the students should be able to:

- understand how an electric power system can be developed with the aim of contributing to a sustainable society
- organize a project group for implementation of a complex task
- plan a project group's work with respect to demarcations between project members' functions and assignments

- understand the importance of feedback for a group's development as well as have tools to give feedback to and take feedback from the co-workers
- plan so that work can be carried out within a given time frame and so that an even and just work distribution between project members is achieved
- in writing report status of a project at predetermined times
- write a project report, including background, working method, implementation, achieved results and conclusions
- evaluate the quality of a performed project work
- in oral form present a project for a client and a general public

in order to be able to define, plan, and implement a technical feasibility study with respect to proposed electric power technical components and systems.

Specific prerequisites

Knowledge equivalent to at least two completed courses of courses EG2100, EG2200, EH2741, EI2436, EJ2301, EJ2201 or the equivalent.

Examiner

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Teachers

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Supervisors for the individual projects (decided at the course start).

Course Assistant

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Lecture schedule (not including project work)

The schedule is available online from [TimeEdit Kungliga Tekniska högskolan](#). If any changes in the schedule must be made the version at TimeEdit would be the accurate version.

Date and place	Topic (lecturer)
Aug 28, 10-12, Sten Velander, TR 33	Course start, project grouping (LBT, all projects to be represented by a supervisor)
Sep 6 10-12 Sten Velander, TR 33	Project planning (JL)
Sep 11 15-17, Sten Velander, TR 33	Project risk analysis (JL)
Sep 21 13-15, Sten Velander, TR 33	Joint question and answer discussion (JL, LBT)
Nov 1, 10-12 , Ivar Herlitz, TR33	Group dynamics (JL)
Nov 6, 14-16, Sten Velander, TR 33	Group dynamics (JL)
Nov 13, 13-16, Sten Velander, TR 33	Project presentation preparation and draft results discussion (LBT)

Dec 11, 13-16, Sten Velander, TR 33	Oral presentation (LBT, all projects to be represented by a supervisor)
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Examination

The examination of this course is divided in two parts: project management (PROA) and project work (PROB).

Examination schedule (these dates might be revised)

Deadline	Task	Comment	Responsible
Sep 27 at 8:00	Project plan & risk analysis	Group submission in Canvas	JL
Nov 17 at 8:00	Feedback on group dynamics	Individual submission in Canvas	JL
Nov 20, 8:00	Draft Report	Group submission in Canvas	LBT
Nov 27 at 8:00	First Peer review	Individual submission in Canvas	LBT
Dec 4, at 8:00	First version Report	Group submission in Canvas	LBT
Dec 11, at 8:00	Second Peer review	Individual submission in Canvas	LBT
Jan 8 at 8:00	Final report	Group submission in Canvas	LBT

Project management, PROA (2 credits)

Project plan & risk analysis

The project groups are required to create a project plan and risk analysis at the start of the project. The deadline of the project plan and risk analysis can be negotiated if there is a valid reason why the group is not yet ready to formulate a meaningful plan. The project plan should be used by the students throughout the project to track use of resources, timing of events as well as to manage risks during execution of the project. Students can be awarded 0-3 grade points for the project plan and risk analysis. The score will depend on the following:

- Quality of the project plan in relation to template & instructions
- The soundness of the plan regarding timing and use of resources
- The use of the plan throughout the management of the project
- The assessment of risks and mitigation of risks during the project execution.

1 point, a correct and complete project plan following the template and covering all aspects of a plan accordingly

2 points, a plan that apart from the requirements for 1 points also have some well developed areas, such as goals, risks with proactive actions, a well developed WBS, a

project model that have a system for early warnings, how communication and cooperation in the project will be.

3 points, an excellent plan that apart from the requirements for 2 points is complete and where all areas above fits together, i.e. where it is clear how goals are addressed, risks that builds on the goals and the organization, milestones that are clearly connected to goals and risks and the webs, etc.

Feedback on group dynamics

Each student should submit a written feedback on the performance of the other members in the project group. Students will be awarded between 0 and 2 points for the feedback.

1 point for complete feedback

2 points, where the feedback is formulated in I-message form and the content typically is relevant and helpful for its receiver.

The grade of PROA is determined by the sum of grade points, as follows:

Sum	0	1	2	3	4	5
Grade	F	E	D	C	B	A

Project work, PROB (7 credits)

The project work is evaluated from the following five aspects, each awarded with 0, 1 or 2 grade points:

1. Project implementation – the process
2. Final report, presentation
3. Final report, scientific and technical content
4. Oral presentation
5. Peer review

The grade of PROB is determined by the *product* of the five grade points, as follows:

Product	0	1	2	4	8	16 or 32
Grade PROB	F	E	D	C	B	A

Project implementation – the process

- Very good (2 p): The group has shown a lot of initiative and a large ability to work independently. The group has been able to identify their need for

knowledge and data and have obtained the necessary knowledge and data without detailed guidance from the supervisor.

- Acceptable (1 p): The group has been able to carry out the project according to the guidance provided by the supervisor and within the given timeframe. The score 1 point can also be given to individual students even if the group has earned 2 points for the project performance, if the student has not contributed as much as the other members of the group.
- Insufficient (0 p): The group has not been able to carry out the project within time or has been unwilling to respond to instructions and criticism from the supervisor. The score 0 points can also be given to individual students even if the group has earned 1 or 2 points for the project performance, if the student has not made a sufficient contribution to the group.

Final report, presentation

- Very good (2 p): The presentation of the work and the results is easy to follow and the conclusions are supported by results from the report. The report is well structured and a reader can easily find information that he or she is looking for.
- Acceptable (1 p): The work and the results are mostly described with enough detail that it is possible follow the arguments and the conclusions.
- Insufficient (0 p): It is difficult for a reader who has not been directly involved in the project to understand what have been done, because important details and explanations are missing or incomprehensible.

Final report, scientific and technical content

- Very good (2 p): The group has thoroughly explored different methods and models that are relevant for the project. Data collection, assumptions and analysis also show that the group has made a considerable effort to solve the given problem.
- Acceptable (1 p): The group has used appropriate methods and models, project limitations and assumptions as well as analysis are reasonable, although there might be small errors or details that could have been improved.
- Insufficient (0 p): There are significant errors or misunderstandings in the report, or the group has not used an appropriate approach to solve the given problem.

Oral presentation

- Very good (2 p): The group has presented their work in a manner that is interesting to the audience and inspires confidence in the results. The presentation demonstrates good ability to discuss the results of the project including possible sources of error.
- Acceptable (1 p): It is possible for the audience to understand which problem the group has addressed and why this problem needed to be solved. It is outlined how the problem was solved and the results of the project are clearly summarized. The score 1 point can also be given to individual students even if the group has earned 2 points for the oral presentation, if the student is clearly

less active during the presentation compared to the other members of the group.

- Insufficient (0 p): It is difficult for the audience to understand what the group has done, because the presentation does not provide enough details about the background, solution method or results of the project. The score 0 points can also be given to individual students even if the group has earned 1 or 2 points for the project performance, if the student does not attend the oral presentation without a valid excuse.

Peer review

- Very good (2 p): The review is very constructive, i.e., it points out unclear parts of the presentation, possible errors in the model, methods, or analysis, and suggest solutions to detected problems. Moreover, the review provides new ideas or other tips that are useful to improve the reviewed report.
- Acceptable (1 p): The review is constructive, i.e., it points out at least some unclear parts of the presentation or possible errors in the model, methods, or analysis. Minor misunderstandings of the report or errors in the reviewer's suggestions are acceptable.
- Insufficient (0 p): The reviewer has not pointed out obvious shortcomings of the report or does not provide useful feedback on the technical contents of the report, for example by focusing on language or just summarizing the report without any additional comments.

Course grade, based on PROA and PROB

The grades awarded to PROA and PROB determine the final grade of the course, as follows:

PROA\PROB	F	E	D	C	B	A
F	F	F	F	F	F	F
E	F	E	D	C	C	B
D	F	E	D	C	B	B
C	F	E	D	C	B	A
B	F	D	D	C	B	A
A	F	D	C	B	B	A