# Course in Digitalisation and Policy

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| Course Code: | TEK600 |
| Credits | 7.5 |
| Department | Technology Management and Economics |
| Study Programme | Humans, Technology, Society (MTS) |
| Language: | English |
| Examiner | Erik Bohlin<br>erik.bohlin@chalmers.se |
| Course Administrator | Maria Massaro<br>massaro@chalmers.se |

## MTS requirement for all students

According to Decision 2002-12-11/C889-02 of the vice president for graduate studies, all students have to achieve 7.5 credits in the study programme Humans, Technology, Society (Människa, Teknik, Samhälle) in order to obtain the degree of graduate engineer (civilingenjör).

## TEK600 - Course Description

### AIM

The aim of this course is help students develop basic understanding of economic and governance principles, and analytical skills to conceptualise and critically assess the interplay between digitalisation and society.

### CONTENT

This course uses case studies from a wide range of sectors, such as telecommunications, manufacturing, , transport, to explain the ongoing fourth industrial revolution, also known as Industry 4.0. Digital innovations in products and services, processes and business models have radically changed the way industries work. Next generation industries are characterised by countless interconnected devices, automated processes, and storage, analysis and use of massive amount of data. Students will hear about real experiences of companies which have been changing their business models and strategies to embrace the opportunities brought about by digitalisation. The course also discusses the role of governments and policy makers play to unlock the benefits of digitalisation, and prevent threats and challenges. In addition, this course wants to raise awareness of the complexity of a digital society, by addressing ethical concerns related to privacy, security and sustainability.

### LEARNING OUTCOMES

After completion of this course, students should be able to:

- Describe and analyze the interplay between digitalisation on the one hand and societal change on the other;
- Identify factors that influence digitalisation;
- Describe and analyze the mechanisms of digitalisation;
- Explain and interpret historical processes of digitalisation, and also make forecasts of future effects of digitalisation, both short-term and long-term;
- Describe and analyze theoretical concepts and explanatory models for the interplay between digitalisation and societal change;
- Problematize the societal consequences of digitalisation, then, now and in the future;
- Observe the ethical problems that digitalisation may involve;
- Write argumentative text.

### COURSE MATERIAL

Course material is available on the course homepage at the start of the course. Lecture slides will be uploaded on the course homepage after each lecture.

## Examination

In order to pass this course, students are required to complete six assignments:

- Project outline;
- Project report;
- Three individual reflections connected to three study visits;
- Take-home exam.

All six assignments are compulsory, which means that only students that deliver all seven assignments can pass the course. Students are asked to complete the first five assignments while the course lectures are ongoing. Only the deadline for the take-home is usually placed after the last course lecture. Project outline and project report are group-based assignments, while the individual reflections and the take-home exam are individual assignments.

These assignments are described below. Furthermore, handouts with additional instructions regarding take-home exam will be distributed during the lectures and later uploaded on the course homepage.

Written assignments have to be uploaded on the course home page, using their specific assignment slots. Deadlines for uploading assignments on the course home page are mandatory. It is not possible to upload documents after deadlines are passed.

## Grading

Each assignment gives students a certain amount of points. Students have to earn a minimum amount of points per assignment in order to pass the course. Minimum and maximum points per assignment are illustrated in Table 1. There are no points associated with the project outline, which, however, needs to be approved by your examiner.

Table 1. Minimum and Maximum amount of points per assignment

| ASSIGNMENT | MIN AMOUNT OF POINTS | MAX AMOUNT OF POINTS |
|---|---|---|
| Project Outline | Approval | Approval |
| Project Report | 20 | 50 |
| Take-Home Exam | 8 | 20 |
| Individual Reflection 1 | 4 | 10 |
| Individual Reflection 2 | 4 | 10 |
| Individual Reflection 3 | 4 | 10 |
| Total | 40 | 100 |

The sum of all points earned gives the final grade. The final grade can be FAIL, 3, 4 or 5. The amounts of points which correspond to the various grades are illustrated in Table 2.

The sum of all points earned gives the final grade. Please have a look at the table below:

Table 2. Final Grade

| SUM OF POINTS | FINAL GRADE |
|---|---|
| Below 40 | FAIL |
| Between 40-59 | 3 |
| Between 60-79 | 4 |
| Between 80-100 | 5 |

## PROJECT OUTLINE

In the course *Digitalisation and Society*, students have to build groups of maximum 4 students. Each group has to write a project report. A good report is structured to support a main theme, which has to be related to the content of the course.

Before starting to write the project report, each group needs to get the project outline approved. The project outline is approximately 1-2 pages long and should consist of the following parts:

- project topic;
- purpose of the project;
- scope of the project;
- data sources;
- expected outcomes.

Students should use the materials presented during the course whenever this is possible. Moreover, students ought to use library web sites i.e. Chalmers library, IEEE Explore, SCOPUS, Science Direct and Springer LINK to find relevant literature to develop their project reports.

*Project Outline Presentation*

All members of each group are required to attend the Project Outline Presentation Day, and at least one student per group should be ready to present the project outline for about 5 minutes (no slide presentation needed). After the presentation, the supervisor/examiner and other students can ask questions.

*Deadlines*

Both the written project outline and attendance to the Project Outline Presentation Day are compulsory. The written project outline must be handed-in no later than 16 November. Please, upload your file on the course home page by using the "Project Outline" slot in the assignment menu and name your file TEK320_SP2_ProjectOutline_groupXY.doc or .pdf (XY is your group number). The oral presentation will be held on 18 November.

*Assessment*

Assessment of the project outline will be either *pass or fail*. If the project outline is positively assessed, the group can continue to work on the project report. If the project outline is negatively assessed, the group has to submit a new project outline. A new project outline must be uploaded on the course home page by using the "Project Outline Re-submission" slot in the assignment menu no later than 22 November.

*Practical Information*

Please indicate group number and group members' names on the first page of your project outline.

## Group-based Assignments

### PROJECT REPORT

In the course *Digitalisation and Society*, students have to build groups of maximum 4 students. Each group has to write a project report. The topic of the report is chosen by the group, together with the supervisor. A good report is structured to support a main theme, related to the content of the course. The report should be based on relevant literature (course literature or other sources). The length of the report cannot exceed 3000 words (figures, tables and list of references are excluded from the word counting). Furthermore, students will present their report during the last lecture.

The report should include the following parts:

1. Title page (title of the report, course code and course name, student group number, group member' names and personal numbers or date of birth)
2. Table of contents
3. Abstract
4. Introduction and aims (this part includes: background/context; a general description of the literature used, the approach adopted to investigate the topic and the rationale for writing the report)
5. Analysis (in this section you are asked to adopt a critical perspective on the knowledge you have gained about the topic. It is not sufficient to describe the situation: what are the implications of your findings?)
6. Conclusions and recommendations (you should draw conclusions out from the implications of your findings. You may want to suggest actions to be taken to change/improve a situation).
7. References (APA referencing system is preferable)

Students should use the materials presented during the course whenever this is possible. Moreover, students ought to use library web sites i.e. Chalmers library, IEEE Explore, SCOPUS, Science Direct and Springer LINK to find relevant literature to develop their project reports. Furthermore, it is recommended to include illustrations (pictures, diagrams, tables, etc.) to further explain the content of the report.

Before starting the project report, each group needs to get approval on their project outline (proposal). See the above description of the project outline assignment for further information.

*Project Report Presentation*

Each group has to present its project report in during the last lecture. The oral presentation has to be based on a PowerPoint presentation (any other slide show presentation programme can be used, for instance Prezi). Other supporting media (videos, pictures, sound files, writing on the whiteboard, using an overhead projector etc.) can be used as complementary. The oral presentation is mandatory: all group members have to participate in the preparation of the presentation and have to be present on the presentation day, although not all members of the group need to act as presenters. The group decides on who will be presenting the project report. Furthermore, all members of each group have to listen to the other groups' presentations and are encouraged to ask questions or make reflections. A laptop will be made available on the presentation day. In addition, it is recommended to save the presentation file(s) in an off-line device (e.g. memory stick or laptop). Each group usually has 10 minutes to present the project. A brief Q&A session will follow each presentation, during which the examiner and other students can ask questions.

*Deadline*

The written part of the project is compulsory and must be handed-in no later than 17 December. Please, upload your file on the course home page by using the "Project Report" slot in the assignment menu and name your file TEK320_SP2_ProjectReport_groupXY.doc or .pdf. (XY is your group number). The oral presentation is compulsory and will be held on 18 December.

*Assessment*

The project report counts for maximum 50 points (50%) of the total grade of this course. A minimum of 20 points on the project report is required to pass the course.

*Practical Information*

Please, indicate group number, group members' names and word count on the first page of your group discussion essay.

## TAKE-HOME EXAM

A handout describing the take-home exam will be distributed on 11 December. The handout contains two questions: question A and question B. Students are asked to choose a question and provide a written essay.

The assay should primarily be based on the course literature and relevant information from the lectures. Students are asked to provide a brief summary of the literature used. This summary should be one paragraph long (maximum 200 words) and it should be the first paragraph of your essay. Please, provide references of any source used outside the course readings.

*Practical Information*
The take-home exam essay should be between 1000-1200 words long (including the literature summary). Figures, tables and list of references are excluded from the word counting.

Please, indicate name and birthdate, question (A or B), and word count on each page of your essay.

*Assessment*
Assessment is based on students' capability to deal with the following aspects:

- Language, clarity and organisation of the answer;
- Capacity to apply concepts from the literature and lectures;
- Capacity of problem analysis and critical assessment.

The take-home exam counts for maximum 20 points (20%) of the course grade. A minimum of 8 points is required to pass the course.

The take-home exam must be handed-in no later than 10 January. Upload your file on the course home page by using the "Take-Home Exam" slot in the assignment menu. Please, name your file THA or THB_ID.doc or .pdf (ID is your personal number or your birthday if you don't have a personal number).

## INDIVIDUAL REFLECTIONS

In the course *Digitalisation and Society*, students are asked to write three individual reflections, one individual reflection for each study visit organised to SKF, Swedish Agency for Marine and Water Management and SAAB. The objective with the individual reflections is to reflect upon the changes that digitalisation has driven in the three different entities. It is not sufficient to provide a summary of the study visit. Students are required to adopt a critical view on what they have observed during the visits.

*Practical Information*
The length of the individual reflection should be between 800-1200 words (figures, tables and list of references are excluded from the word counting);

Please, indicate name, birthday and word count on the top right-hand corner of every page of the individual reflection.

*Deadline*
Deadline for the individual reflections are:

1. 26 November (SKF visit);
2. 4 December (Swedish Agency for Marine and Water Management):
3. 16 December (SAAB)

*Assessment*
The three individual reflection are compulsory. Each individual reflection counts for maximum 10 points (10%) of the total grade for this course. A minimum of 4 points is required in order to pass the course.

*Practical information*
Upload your individual reflections in the course home page. Please, upload your file on the course home page by using the slots “Individual Reflection 1”; “Individual Reflection 2” and “Individual Reflection 3” in the assignment menu.

Name your file IndividualReflection1_ID.doc/.pdf; IndividualReflection2_ID.doc/.pdf; IndividualReflection3_ID.doc/.pdf; (ID is your birthday).

## Mandatory Assignments, Deadlines and Max Points

| Group-based Assignments | Start Date | Hand-in written part | Oral Part | Max Points |
|---|---|---|---|---|
| Project Outline | 4 November | 16 November | 18 November | Approval |
| P. Outline Re-sub. | | 22 November | | |
| Project Report | 4 November | 17 December | 18 December | 50 |
| | | | | |
| Individual Assignments | Start Date | Hand-in written part | Oral Part | Max Points |
| Individual Reflection 1 | 20 November | 26 November | No oral presentation | 10 |
| Individual Reflection 2 | 27 November | 3 December | | 10 |
| Individual Reflection 3 | 9 December | 16 December | | 10 |
| Take-home exam | 12 December | 10 January | | 20 |

## Make-up Assignment

In order to pass this course, all six assignments have to be completed. For the individual assignments, written texts have to be submitted via the course home page. If one of the written texts is not delivered, students cannot pass the course.

For the group-based assignments, both the written and the oral parts are mandatory for all students. Written texts have to be submitted via the course home page. If one of the written texts is not delivered, students cannot pass the course. Students who cannot participate in the presentation of the project outline or project report, or in the group discussion are asked to deliver an additional assignment. Make-up assignments are available on the course home page, in the folder “Make-up assignments”. Deadline for uploading make-up assignments on the course home page is 10 January.

## Lecturers

Erik Bohlin (EB), Professor, Chalmers University of Technology, (examiner)
Teodosio Pérez Amaral, Professor, Universidad Complutense Madrid
Peter Altmann (PA), PhD, Senior researcher, RISE
Kari Finnskog (KF), BeBridge
Anwesha Chakraborty (AC), PhD, Bologna University
Simon Forge (SF), SCF Associates, London
Maude Hasbi (MH), PhD, Chalmers University of Technology
Maria Massaro (MM), Chalmers University of Technology
Harald Øverby (HÖ), Professor, NTNU Norwegian University of Science and Technology

## Guest Lectures

At least one guest lecture is usually included in the course programme. Students are kindly invited to participate in guest lectures, for two main reasons: firstly, for the sake of students’ own learning process, which can benefit from experiences and expertise of guest lecturers, and, secondly, as a form of respect towards time and effort of lecturers and administrators of this course. Furthermore, one or more of the six assignments of this course might be centred on the content of guest lectures. Extra guest lectures might be included in the course programme, in addition to the ones already indicated in the course schedule. In case of an additional guest lecture, the schedule will be modified accordingly and students will be informed using the course home page.

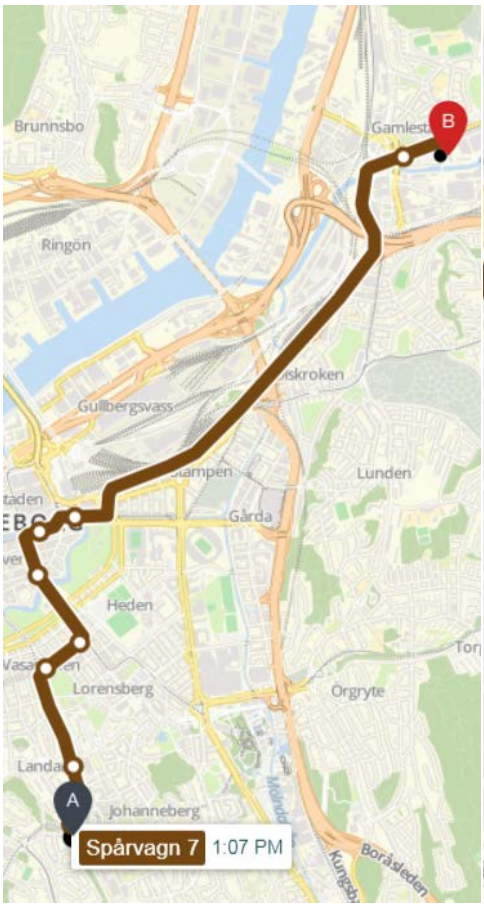
This year we have the pleasure to ask the students to join the public defense of Ph.D. dissertation by Maria Massaro, entitled “Radio Spectrum Management in the European Union”. Maria has been a very much appreciated teacher in

## Mandatory Assignments, Deadlines and Max Points

this course, and the public seminar is directly relevant to the course. You will learn a lot! This will be an opportunity to learn from science in action and also to deepen your knowledge in a specific field.

## Study visit

SKF AB (20 November, 14.00)
Hornsgatan 1
Västtrafik example from Chalmersplatsen (https://www.vasttrafik.se/en/travel-planning/travel-planner/)

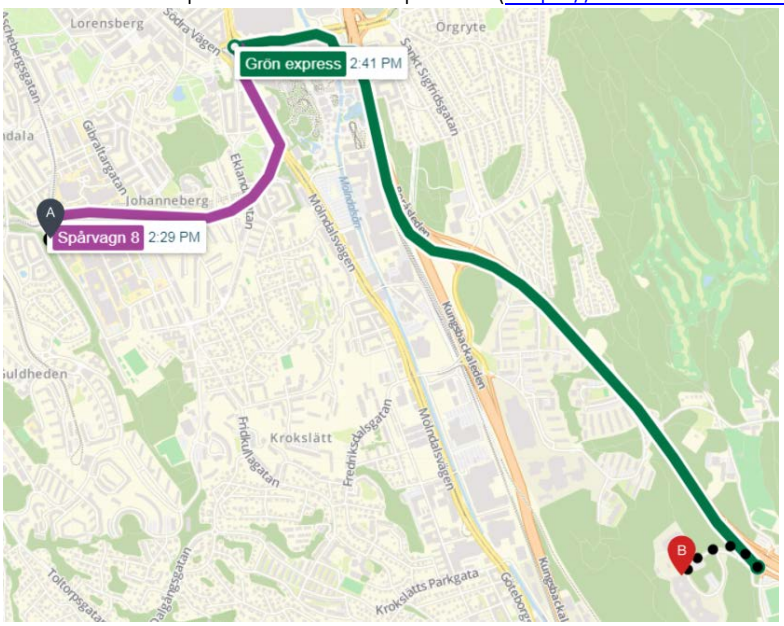



## Study visit

Agency for Marine and Water Management (27 November, 14.00)
Gullbergs Strandgata 15
Västtrafik example from Chalmersplatsen (https://www.vasttrafik.se/en/travel-planning/travel-planner/)



SAAB AB
Solhusgatan 10 (9 December, 0900)
Västtrafik example from Chalmersplatsen (https://www.vasttrafik.se/en/travel-planning/travel-planner/)




## Course Evaluation

At the end of the study period, the course will be evaluated by an evaluation group. The group evaluation is formed by the examiner and two or three students. Students can voluntarily propose themselves as potential evaluators. A course evaluation meeting is usually held at lunch time (12-13) at the Department of Technology Management and Economics. The aim of the course evaluation is to improve and further content and structure of the course.