Degree Projects at the Faculty of Computing

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Real time poll (Q0)

http://etc.ch/kj5e

About us

PA2534

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DV2572

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DV1478

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ET2606

- Course Responsible: **Kurt Tutschku (Professor)**
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Appointment hours:

Open door policy (You are always welcome! ☺)

Please send an email a bit before (1day) in order to make sure that we have time

Agenda

- Research Methodology I
  - Overview of the scientific method
- Research Methodology II
  - Research area and problem identification
  - Research method overview
- Course Introduction
  - Overview and process
  - Policies
  - Assessment
  - Tips and best practices

Real time poll (Q1)

http://etc.ch/kj5e

Degree Project

- 15 ECTS => 10 weeks (2.5 months) of full-time work = 400h

Prerequisites (30 ETCS MST)

- Admission to course requires a minimum of 130 credits
- At least 60 credits at the higher education advanced level
- Successfully completed course in Research Methodology (with Emphasis on Engineering Science for 7.5 credits)

→ Non-eligible students can't start thesis and will be deleted from Canvas

Learning Outcomes: Knowledge and Understanding

- be able to show in-depth insight in a selected sub-area within the main area of computer science.
- be able to formulate and delimit a relevant research question or problem within the chosen topic.
- be able to explain a number of current research questions in the main area of computer science.
- be able to describe applicable methods in the main field of computer science.

Learning Outcomes: Skills and Abilities

- be able to independently search, retrieve and evaluate available literature and other background information relevant to a problem in the main area of computer science.
- be able to independently identify, formulate and solve problems in the main area of computer science
- independently plan and execute tasks within given time frames.
- demonstrate the ability to orally and in writing give an account of the thesis's relevance, purpose and results in dialogue with different groups.
- independently dispose of and design a thesis that follows the structure of a scientific report in the main field of computer science.
- critically review, evaluate and constructively question the work of others regarding issues, implementation and results.

Learning Outcomes: Values and Attitudes

- demonstrate the ability to make judgments with regard to relevant scientific, social and ethical aspects from a computer science perspective.
- demonstrate the ability to identify their need for additional knowledge and to develop their skills.
- be able to independently review and critically evaluate the work of others.

- See Canvas course page for the specific learning outcomes of your particular course

Course Components

- Pre-study and planning (Project Plan)
- Execution (Academic Report)
  - Research and development
  - Supervision
  - Written presentation
- Oral presentation and defense
- Opposition
  - Written opposition
  - Oral opposition

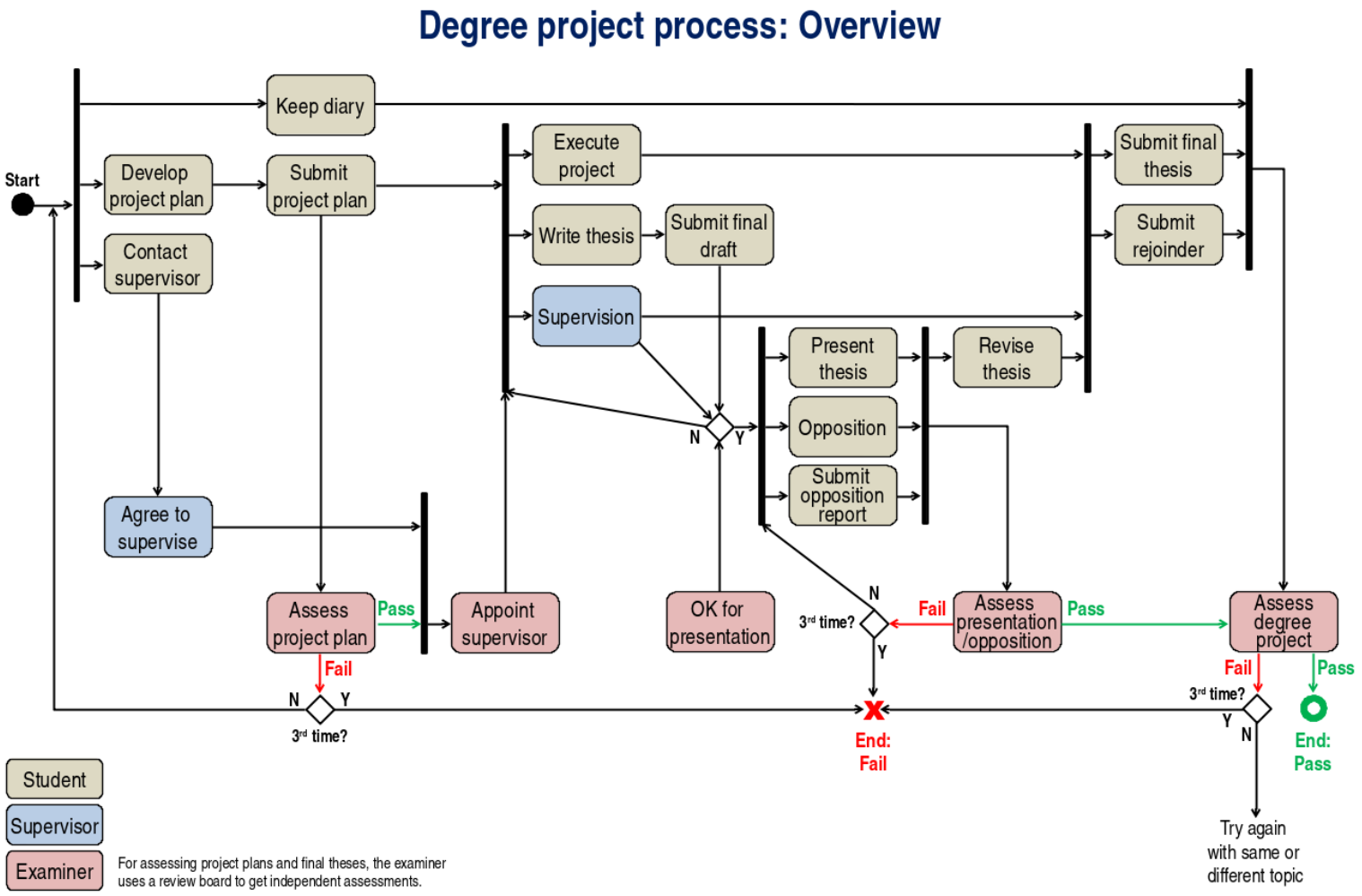
Required Coursework

- Student works individually and independently (working in pairs is allowed/encouraged)
- Student is responsible for completing a thesis with sufficiently high quality within the given timeframe and with given supervision resources (time may affect grade)
- Student regularly informs the supervisor about status and progress
  - Progress reports
  - Questions
  - Meeting minutes

Collaboration with External Partners

- You need a formal supervisor at BTH
- You need an external contact person
- The external partner needs to be aware that the main goal is your thesis and its scientific evaluation
  - I.e. do not be a “code monkey”
  - We assess the final thesis, not your performance as an employee

Process Overview



Real time poll (Q2)

http://etc.ch/kj5e

Course Timeline

(if you enrolled to the course the first time in LP3 2021)

Details:

https://studentportal.bth.se/en/page/degree-projects

Course canvas page

2021 LP3 and LP4:
timeline maintained / on-track

2021 LP1 and LP2:
No / limited Visa support

2022 LP3 onwards:
Only examination assured; limited / no support for supervision

	-- 2021 --
2021-01-10	DEADLINE: Submission of Thesis draft + "OK to present" from supervisor
2021-01-18	**Start of spring term (LP3)**
2021-01-18	**Introduction lectures for students starting VT (9-12pm CET, Zoom)**
2021-01-24	DEADLINE: Submission of opposition report
2021-01-25 - 2021-01-29	THESIS PRESENTATIONS AND DEFENSES* (TBD)
2021-02-07	DEADLINE: Submission of final thesis for grading DEADLINE: (Re-)Submission of project plan DEADLINE: 3-week-roll-call (for students starting or re-registering LP3
2021-03-21	DEADLINE: (Re-)Submission of project plan
2021-03-29	**Start of LP4**
2021-04-09	DEADLINE: (Re-)Submission of project plan (only DV1478/UD1449)
2021-05-09	DEADLINE: Submission of Thesis draft + "OK to present" from supervisor
2021-05-16	DEADLINE: Submission of Thesis draft + "OK to present" from supervisor (only DV1478/UD1449)
2021-05-23	DEADLINE: Submission of opposition report
2021-05-24 - 2021-05-28	THESIS PRESENTATION AND DEFENSES* (TBD)
2021-06-06	DEADLINE: Submission of final thesis for grading DEADLINE: (Re-) Submission of project plan
	SUMMER BREAK
2021-08-30	**Start of fall term (LP1)**
2021-08-30	**Introduction lectures for students starting HT**
2021-09-12	DEADLINE: Submission of Thesis draft + "OK to present" from supervisor
2021-09-19	DEADLINE: (Re-) Submission of project plan (Not ET2606) DEADLINE: 3-week-roll-call (for students re-registering LP1) DEADLINE: Submission of opposition report
2021-09-27 - 2021-09-30	THESIS PRESENTATIONS AND DEFENSES* (TBD)
2021-10-10	DEADLINE: Submission of final thesis for grading
2021-11-01	**Start of LP2**
2021-11-07	DEADLINE: (Re-)Submission of project plan (Not ET2606)

Course Policies I

- **BTH is expecting that students finish their thesis within one (1) semester**

- **Writing the thesis:**
  - Thesis can be done alone or in pairs
  - Regular status updates with the supervisor is a must
  - It is **strongly recommended** to use Overleaf for writing your thesis: https://www.overleaf.com/edu/bth

- **Conflict management in student groups :**
  - Not the business of the examiner nor the advisor
  - Has to be solved by the students group
  - Fall-back solution: individual submission of thesis documents → examination will be based on the quality of the content of the document
    - Beware of plagiarism due to common content, if splitting to work

- **Students are responsible for maintaining schedule (see course objective)**

Course Policies II

- **Deadlines and visa support:**
  - Multiple deadlines available → if deadline is missed then submission to next deadline (no exceptions!)
  - Limited support after one semester:
    - Visa support after one semester is limited / not available (i.e. student can not claim)
    - Supervision after one semester is limited / not available (i.e. student can not claim if supervision has been offered by an advisor)
    - Exceptions: only for persistent and severe reasons outside student's responsibility (e.g. illness over a longer time period; requires certified proof; death of relatives is generally not sufficient)

- **Course is completely online this year (on Zoom)**
  - **Course is an "on-campus" course → No Skype defense presentations**, i.e. you must be available to defend your at BTH premise

Course Policies III

Processing of personal information

- EU law (GDPR)
- Personal data must be protected and handled with care.
- Your thesis might collect personal data and use it for analysis. Hence, you, your supervisor and BTH are responsible for proper data management.
- Each project collecting personal information needs to compile a form and send to dataskyddsombud@bth.se
- Talk to your supervisor and raise awareness of the issue.

Examination I

Four parts:

Module	**Credit**	**Grade**	**Remark**
Report and implementation	9 ECTS	A-F	determines grade
Presentation/Defense	2 ECTS	G-U	
Project plan	2 ECTS	G-U	
Opposition	2 ECTS	G-U	
	15 ECTS		

Examination II

- Grading by examiner
- Additional independent assessments for project plan and thesis by
  - Supervisor
  - Reviewer
- Examiner/reviewers are not as familiar with your work as you and your supervisor(s)
  - Make sure it is easily understandable for others

Grading

- G–U (Project Plan, Presentation, Opposition)
- A–F (Thesis)
- Ux, Fx (time limited complementation possible)
  - Not for oral opposition or presentation
  - Fx can lead to E (on passing) or F (on not passing)
- Max 3 attempts

Real time poll (Q3)

http://etc.ch/kj5e

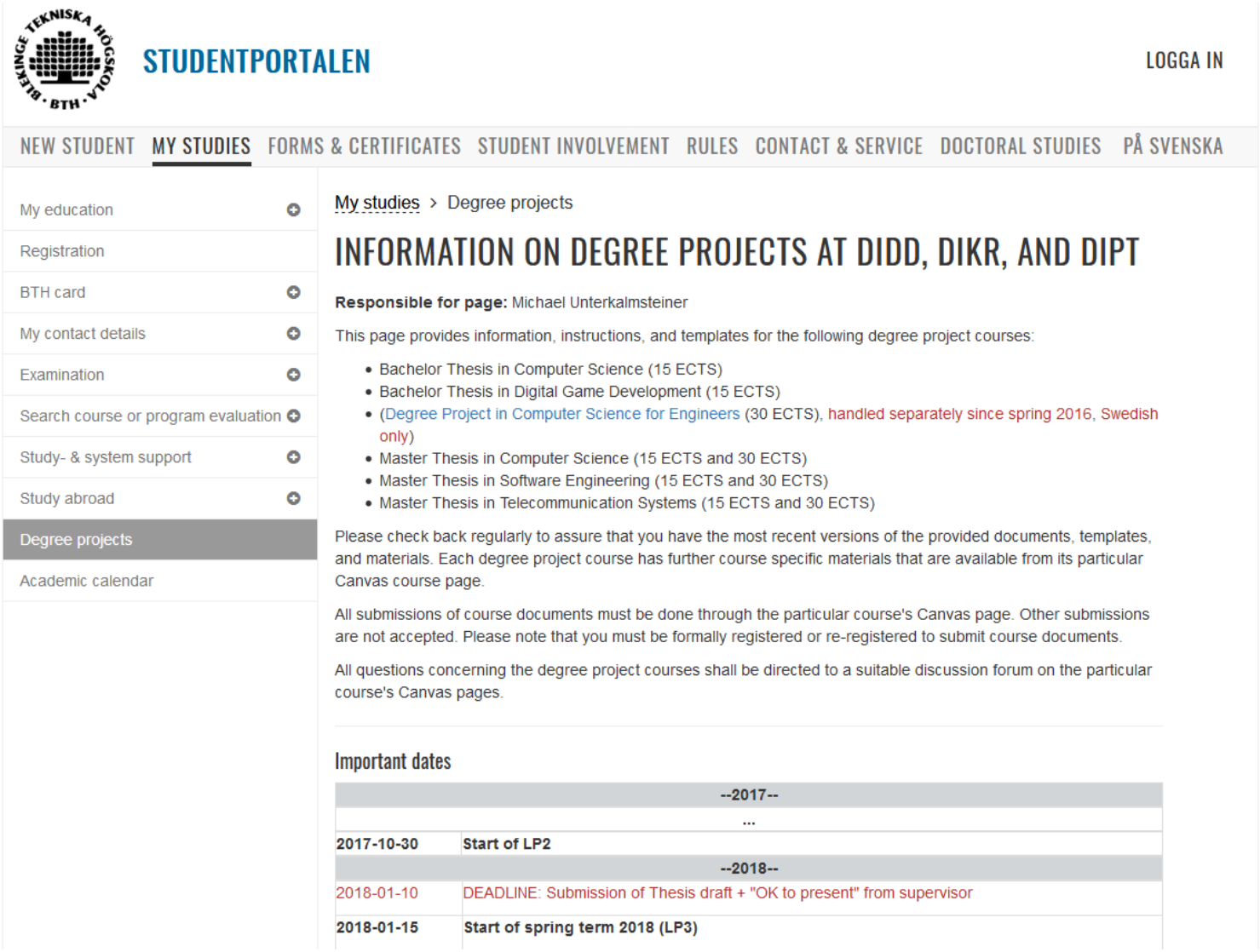
Resources / Recommended Reading

- Our “Guidelines for degree projects”: https://studentportal.bth.se/en/page/degree-projects
  - All templates (project plan, thesis, written opposition available here)

- See Canvas course pages for specific information (course syllabus and course memo)

- Specific supervisor recommendations

Common Info on Student Portal (1)



STUDENTPORTALEN

LOGGA IN

NEW STUDENT | MY STUDIES | FORMS & CERTIFICATES | STUDENT INVOLVEMENT | RULES | CONTACT & SERVICE | DOCTORAL STUDIES | PÅ SVENSKA

- My education
- Registration
- BTH card
- My contact details
- Examination
- Search course or program evaluation
- Study- & system support
- Study abroad
- Degree projects
- Academic calendar

My studies › Degree projects

INFORMATION ON DEGREE PROJECTS AT DIDD, DIKR, AND DIPT

Responsible for page: Michael Unterkalmsteiner

This page provides information, instructions, and templates for the following degree project courses:

- Bachelor Thesis in Computer Science (15 ECTS)
- Bachelor Thesis in Digital Game Development (15 ECTS)
- (Degree Project in Computer Science for Engineers (30 ECTS), handled separately since spring 2016, Swedish only)
- Master Thesis in Computer Science (15 ECTS and 30 ECTS)
- Master Thesis in Software Engineering (15 ECTS and 30 ECTS)
- Master Thesis in Telecommunication Systems (15 ECTS and 30 ECTS)

Please check back regularly to assure that you have the most recent versions of the provided documents, templates, and materials. Each degree project course has further course specific materials that are available from its particular Canvas course page.

All submissions of course documents must be done through the particular course's Canvas page. Other submissions are not accepted. Please note that you must be formally registered or re-registered to submit course documents.

All questions concerning the degree project courses shall be directed to a suitable discussion forum on the particular course's Canvas pages.

Important dates

--2017--	
...	
2017-10-30	**Start of LP2**
--2018--	
2018-01-10	DEADLINE: Submission of Thesis draft + "OK to present" from supervisor
2018-01-15	**Start of spring term 2018 (LP3)**

Common Info on Student Portal (2)

Instructions and templates

- Instructions/guidelines for degree projects (including rubrics for grading) (PDF)
  Please note that the rubrics have changed. Make sure to use the latest version (v3).
- Degree project process overview (PDF)
- Typical timeline (20 weeks) (PDF)
- Lectures
  - Lecture 1 (Introduction)
  - Lecture 2 (Research Methodology I)
  - Lecture 3 (Research Methodology II)
  - Information about further studies at BTH
- Project plan template
  - PDF
  - LaTeX
  - Word
- Opposition report template
  - PDF
  - LaTeX
  - Word
- Rejoinder template
  - PDF
  - LaTeX
- Thesis template
  - LaTeX (zip-file)
  - Word

Resources

This page contains links and references related to the different stages and perspectives of research projects. The aim is to focus on computer science and software engineering research but many items are generally applicable to scientific research. Please notify us about any broken links or other errors.

There's a nice set of tutorials from the publisher Springer about authoring and reviewing that will help you in writing your thesis and performing a good opposition: https://www.springer.com/us/authors-editors/authorandreviewertutorials

Books

- Berndtsson et al. (2008). *Thesis Projects: A Guide for Students in Computer Science and Information Systems*. 2nd Edition. Springer.
- Blomkvist, P.; Hallin (2015), A. *Method for engineering students, Degree projects using the 4-phase Model*. Studentlitteratur. (This text is available in Swedish and in English).
- Cunningham, D. and Wallraven, C. (2011), *Experimental Design: From User Studies to Psychophysics*. CRC

Course Assessment (see Instructions for degree projects for details)

Assessment Criterion	Project Plan	Thesis	Pres. & Defense	Written Oppos.	Oral Oppos.
Process	X	X			
Contents	X	X		X	
Contribution		X			
Presentation	X	X	X	X	X
Overall impression		X			

Table 2.2: Overview over grading criteria for all examination parts.

Assessment Criterion	Bachelor	1-year Master	2-year Master	MSE
Process	0.20	0.20	0.10	0.25
Contents	0.35	0.40	0.40	0.35
Contribution	0.20	0.10	0.25	0.20
Presentation	0.25	0.30	0.25	0.20

Table 2.3: Weighting of criteria for various types of theses.

Assessment of Project Plan

Criterion	Aspect
Contents	Background analysis
	Problem formulation
	Method selection and application
	Knowledge and understanding
	Critical thinking and scientific character
	Planning
Presentation	Disposition and layout
	Adherence to academic standards
	Cohesion and coherence
	Language

Assessment of Thesis

Criterion	Aspect
Process	Independence, initiative and creativity
	Openness to critique and supervision
	Planning and execution
Contents	Background analysis
	Problem formulation
	Method selection and application
	Knowledge and understanding
	Analysis and Discussion
Scientific quality	Overall contribution
	Scientific & engineering reasoning
	Traceability & validity
	Synthesis
Presentation	Disposition and layout
	Handling of references and citations
	Language
Overall impression	General impression of the thesis

Example Assessment Levels (Thesis->Contribution->Synthesis)

Synthesis	
Fail (–)	Lacks synthesis. Does not go beyond paraphrasing. Restates or summarises existing works and own materials in unsystematic/unorganized ways. Does not connect or combine the statements/summaries and does not describe their "meaning" with respect to the own work.
Insufficient (0)	*Close to level* Acceptable*; minor rework required to reach* Acceptable.
Acceptable (1)	Demonstrates some ability to go beyond paraphrasing. Indicates an ability to organize information from existing works and/or own materials in a systematic and logical way to describe their "meaning" in the context of the own work.
Satisfactory (2)	...
Good (3)	Demonstrates the ability to organize and summarise information from existing works and own materials and combine these in systematic and logical ways into explanations, discussions or conclusions that go beyond the analysis of individual works or results. Answers many "So What?" questions.
Very good (4)	...
Excellent (5)	Clearly demonstrates the ability for systematically and logically putting together thoughts based on analyses of existing works and own materials to derive new knowledge. Demonstrates a strong focus on answering "So What?" questions.

Presentation

- ~~In person at BTH~~ Online on Zoom
- 45 min in total (for 15 ECTS)
  - Presentation (20 min)
  - Defense
    - Student opposition (5–10min)
    - Questions/comments from examiner
    - Questions/comments from supervisor
    - Questions/comments from audience
- Feedback meeting with supervisor
  - Decide on report revisions => rejoinder

Make sure to take notes for improving your report

Presentation

- Deliver a clear message
  - You cannot cover everything; less is more
  - Skip boring details and things the audience can be expected to know (i.e., the process for an SLR)
  - What do you want the audience to remember?
- Clear and logical reasoning
  - Do not “show off”; a presentation that no one can follow will not earn you a good grade
- Talk clearly, loudly and reasonably fast
- Appealing visuals
  - Consistent look and feel
  - Not just text

Presentation

- Do:
  - Speak freely, do keep eye contact with the audience
  - Explain why the questions you are asking are important
  - Show examples if they help to explain a complex topic
  - Use figures
  - Spend some time discussing your results
    - Simplify complex figures/tables from the thesis and focus on main findings
    - Explain what the implications of your findings are
    - Explain what we know now what we did not know before your thesis
- Do NOT:
  - Read from a script, eyes on the screen, in a monotone voice: you will loose the attention of the audience within 30 seconds
  - Use text-only slides (from which you read)
  - Spend too much time on research methodology (how you conducted the research)
  - Show results (tables, figures) without discussing them
  - Try to fit all thesis content, unmodified, into a presentation: tailor it

Opposition

- Each student must be opponent once:
  - Always an individual task
  - Gets thesis one week before its presentation
  - Summarize key points and criticize objectively and constructively
  - Submit opposition report
- Too brief or too superficial an opposition will be failed
- Pose non-trivial questions during defense; you have 5–10 minutes and should use this time

Topics/Questions for Opposition

- Overall structure and content: What is the thesis about? Is the report well structured and easy to read? Is all content relevant? Are relevant topics/issues missing?
- Scientific character: Are all claims supported? (see more on scientific character later)
- Problems/aims/hypotheses/RQs: Is the work motivated well, i.e. is there a clear problem that needs to be solved? Do hypotheses/RQs match problems/aims?
- Background/theory: Is all background/theory relevant? Is all relevant research considered in an adequate way?
- Method: Is the method motivated and explained well? Does it fit the problem/aim?
- Analysis/synthesis: Is there a clear and trustworthy line of arguments? Is all relevant data/evidence described?
- Results: Are the results based on actual data/evidence? Is related work discussed and in sufficient depth?

Criteria for a Good Presentation & Defense

Content	**Structure**	The material is presented in a logical order with a clear thread of reasoning.
	Quality	The information presented is relevant, accurate and focused on the topic.
	Completeness	All relevant information has been presented/discussed.
Delivery	**Visuals**	Visuals are used effectively and go beyond plain text. Well-designed illustrations and examples are used were appropriate.
	Voice	The presenter speaks clearly, understandably and at a suitable speed.
	Appearance	The presenter shows enthusiasm and keeps good contact with the audience.
Message	**Problem**	The presenter clearly conveys the problem that was investigated.
	Contribution	The presenter clearly conveys the contribution of his/her work.
Knowledge	**Topic**	The presenter shows familiarity with the relevant body of knowledge.
	Methods	The presenter shows familiarity with relevant research methods.
	Q&A	The presenter answers questions correctly and thoroughly.

Criteria for a Good Oral Opposition

Opposition

Scale: 4: definitely, 3: to a large extent, 2: to some extent, 1: barely, 0: not at all

Opponent 1		**Start time**		**End time**		
Quantity (approx)	**Genuine questions**		**Comments/ suggestions**		**Irrelevant/generic quest/comm/sugg**	
Quality		The questions, comments and suggestions are relevant, objective and constructive.				
Summary		The opponent provides a good and concise summary of the reviewed work that points out the overall strengths and weaknesses.				
Understanding		The opponent conveys a thorough understanding of the reviewed work.				
Notes						

Real time poll (Q4)

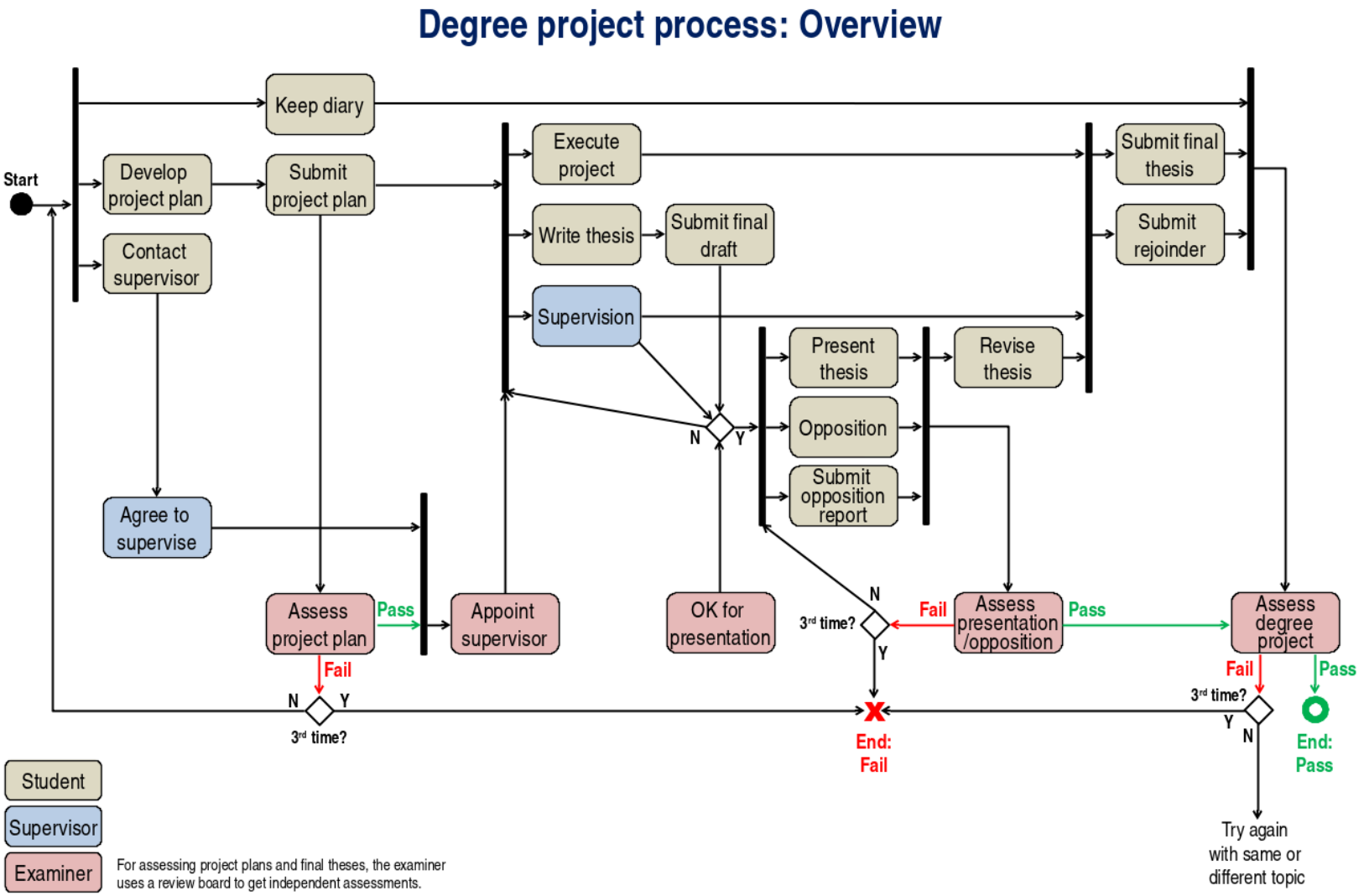
http://etc.ch/kj5e

After the Defense

- Revise your thesis according to the feedback
  - Opponent, examiner, supervisor, and audience
- Submit your final thesis for grading in Canvas
- When passed, register your thesis in DiVA
  - http://bth.diva-portal.org

- The last step is necessary to obtain your grade!
  - You'll receive detailed information in time

Process Overview



Next Steps

- Identify your area(s) of interest
  - Needs to show "substantially deeper knowledge in …", see course goals
- Draft an initial project plan
- Find a suitable supervisor
  - A supervisor has a limited number of students
  - Popular areas disappear quickly
- Refine your project plan
- Submit project plan for evaluation

Finding a Topic and a Supervisor

- Start sketching an idea yourself
- Potential supervisors can be found on Canvas
  - Final allotment made by the examiner
- If you book a meeting with a supervisor, give them feedback ASAP whether you continue with them/ their topic or not

- We have one supervisor per thesis; shopping around for feedback is not acceptable

Sources for Topics

- Staff homepages/canvas
- Past theses (check future work)
- Scientific projects/publications in your area
- …

- NOTE: Do not acquire topics from other universities. We do not supervise theses at other universities

What Makes a Topic Suitable?

- Focused
  - Specific enough to be answered with available resources.
- Sufficiently complex
  - Not trivial; finding an answer should require research.
- Arguable / interesting
  - The outcome should not be given.
- Involve getting substantially deeper knowledge in sub-area (course goal)
  - You should know something about the area already.
- Based on existing “body of knowledge”
  - You can place the topic within the field.
- Worthwhile investigating
  - Someone (besides you) is interested in the results.

- A vague idea is insufficient

- Without a clear focus, you cannot develop a clear project plan

- Just because it hasn’t been done, doesn’t mean it’s worth doing

Pre-study and Planning: Key Questions

- What is the problem?
- What has been done already to solve this problem?
- What hasn’t been done or what hasn’t been done well enough?
- What are you going to do about that?
- Why should we trust your results?
- What will be the result(s) of your work; how/why will it improve the situation?
- Who would be interested in your results?
- How does your time plan look like?
- What could possibly go wrong?

Developing a Project Plan

- Introduction – context, problem, related work, relevance, identification of gap
- Aim & objectives – the goals of the project
- Research questions / hypotheses – how the objectives will be operationalized
- Methods – how the RQs/hypotheses will be answered/tested
- Expected outcomes
- Time- and activity plan – a rough WBS
- Risk management – how risks are mitigated
- References

What is Good Research?

- Open minded
- Critical analysis
- Generalisations
- Considers alternatives
- Motivates choices
- Supported by evidence and/or clear thread of reasoning
- Has impact (someone would care)
- Makes a contribution to the body of knowledge

Bachelor thesis need not have a research theme but a clear problem at hand!

Supervision Guidelines

- You contact your supervisor
- Supervision is a scarce resource
  - Approx. one hour supervision / week
  - Right to supervision is not forever
- Use your time well and be prepared
  - If a supervisor needs to spend a lot of time reading, it means less meeting time for you
- Take feedback into account!

Road to Success

- Regular contact with the supervisor
- Start writing early and do so continuously
  - Project plan
  - Thesis
  - Status updates to supervisors (don’t disappear for months and ask 2 weeks before the Thesis deadline then for a Visa extension letter)
- Proper planning and risk assessment
- To get feedback, send work in good time
- Extrapolate from feedback

- Be pro-active
- Remember: You are responsible

Real time poll (Q5, Q6)

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Tips

- Keep a log
- When in doubt or stuck, ask
- Write with the reader in mind
- Write concise and coherent text
- Logical structure and clear line-of-thought
- Consider alternatives and motivate choices

Academic writing online course at Lund University:
https://www.lub.lu.se/en/open-online-courses

(includes 23 YouTube videos)

Plagiarism

- "... re-use in one paper of material that has appeared in another, without appropriate acknowledgement." [Zobel 2004, p 217]

- Source/target can be anything:
  - book, journal, web page, etc.
- Material can be anything:
  - ideas, phrases, illustrations, etc.

- More information on student portal:
  - https://studentportal.bth.se/en/page/plagiarism-andcheating

A Note on Thesis Length

- Writing well takes much more time than just accumulating a mass of text
- “More detailed” does not mean “adding more text”
- Adding to a bad text will only make things worse
- A long, verbose thesis will not earn you a higher grade (the contrary is more likely)
- A thesis shall be around 30-50 pages in length, excluding appendices

A Note on Related Work

- Background != related work
- Background describes the foundation and terminology (context) of your work and help you motivate your research
- Related work discusses how the work and results of others compare to your's
- You might need both!

- It is not enough to identify a research gap, you must also describe the "added value" of your work in comparison to existing works

A Note on Methods

- **Method refers to “research method”, not a sequence of tasks**
- You must make sure that the proposed method is a good choice
  - Because you can describe why it is a good choice
  - Because you can explain how it is better than potential alternatives
  - Because you show that you know what still can go wrong (→ threats to validity)

- Remember the learning goals:
  - Demonstrate methodological knowledge and understanding within <area>

Real time poll (Q7-Q9)

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Acknowledgements

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