

ADS thesis projects 2022-2023 – Information for supervisors

Contents

In brief (TL;DR)	3
Timeline.....	3
Project structure	3
Workplace agreements/NDAs	3
Thesis	3
Grade.....	3
Final presentation (the “defence”)	3
Useful links and contact info.....	4
Useful links.....	4
Useful contacts.....	4
The ADS thesis: Some general context	5
Phase 1 – Setup.....	6
Supervision.....	6
Supervisor vs. examiner	6
Expectations supervision	6
Project kick-off and Workplace Agreements	7
Osiris Zaak	7
Phase 2 – Thesis project.....	8
Project cycle	8
Computing power	8
Contents of the thesis	8
Example thesis structure.....	9
Phase 3- Wrap up.....	10
Thesis defence	10
Final submission.....	10
Assessment	10
Extension procedure	10
Appendix: Assessment form	12

In brief (TL;DR)

Timeline

- Thesis projects in ADS take place over the course of Period 4. Officially, they begin on 24 April and continue until 30 June. The official end date is 1 July.

Project structure

- Students are organised in teams, usually of two or three students. In some cases, projects can have more students.
- Projects often, but by no means always, involve external partners such as companies or Government agencies.
- The supervisory team consists of:
 - A first examiner, who is a UU faculty member;
 - A second examiner, a UU staff member;
 - Optionally, a daily supervisor who may be different from the first examiner, especially if daily supervision is provided by an external partner.

Workplace agreements/NDAs

- In case students are hosted by an external partner, a workplace agreement needs to be signed. UU provides a standard workplace agreement (link in the next section).
- Some partners have their own specific agreements or NDAs. This is perfectly fine, but such agreements need to first be approved by the faculty office responsible for internship contracts (see next section for contact info).

Thesis

- While students work in teams, each individual student is expected to submit a report which is independently written. Since students in a team collaborate, and often work on the same data, it is to be expected that some parts of the theses might overlap. Nevertheless, we encourage each individual thesis to consider an independent sub-topic or research question.
- There is no set length for a thesis. Given the duration of these projects, ADS theses are typically between 15 and 20 pages long. (See the next section for examples).

Grade

- A snapshot of the grading scheme is provided in the Appendix to this document.
- Grading is the responsibility of the first and second examiners.
- The thesis grade is awarded based on three criteria:
 - Process (30%)
 - Thesis report (60%)
 - Final presentation (10%)

Final presentation (the “defence”)

- While final presentations have hitherto been organised on an individual basis, this year we are re-thinking the process so as to highlight the interdisciplinary nature of our programme. ADS will organise a **student conference, to be held on 30 June, 2023**. Final presentations will be given by students during this conference.
- The conference is open to the public, and all supervisors and students are of course invited.
- It is not mandatory for students to submit their final thesis report by this date. Supervisors can agree with students for thesis submission to happen some time later. This gives students the opportunity to integrate comments received during their final presentation.
- Should it be impossible for students and/or supervisors to attend the conference, an individual defence can be organised.

Useful links and contact info

Useful links

- For examples of past ADS thesis reports, please see [this page](#).
- The standard UU workplace agreement [can be found here](#).
- [This page](#) gives information about the study advisors available for students to consult.

Useful contacts

Questions about...	Contact person	E-mail address
General questions	Thesis coordinator (Albert Gatt)	thesis.ads@uu.nl
Faculty-specific issues	Faculty representatives	ICS: thesis.ads@uu.nl GEO: p.d.a.kraaijenbrink@uu.nl s.scheider@uu.nl FSW: g.vink@uu.nl HUM: d.nguyen1@uu.nl UMCU: d.l.oberiski@uu.nl
Faculty – site-specific workplace agreements or NDAs	Faculty office for workplace agreements (Ineke Hulzebos)	science.internshipcontracts@uu.nl
Student difficulties and general study guidance	Study Advisor	studyadvisor-mcis@uu.nl

The ADS thesis: Some general context

The thesis project constitutes the final component of the master's program Applied Data Science. Students will start their project in block 4, after having completed the mandatory course *Data wrangling and data analysis* (INFOMDWR) and a selection of 4 out of the 8 domain-specific elective courses (for course descriptions, see [this page](#)).

The thesis project is credited with 14 EC (~400 hours of workload). The duration of the thesis project is ten weeks.

The thesis procedure can be largely divided into three phases: Phase 1 – Setup, Phase 2 – Thesis project and Phase 3 – Wrap up.

After being presented with the list of projects, students are asked to rank several projects in order of preference. Students are then matched based on these preferences, optimizing this as far as possible while respecting project constraints. In the setup phase, students are supposed to meet their supervisors and familiarize themselves with the project and complete the formal registration. In the ten-week period starting from 24 April, the students will carry out the thesis project. In the wrap-up phase, students will hand in their thesis, and present their results during the final student conference. Examiners can then finalize the grading. A graduation ceremony will take place later in the year.

Supervisors should take into account that ADS is a very diverse program, which is reflected in its student population. ADS has many international students, but its diversity also lies in the academic background of students. Many have a bachelor's degree in the field of the five focus domains (information and computing science, geo science, health science, social and behavioral science and media studies), but there are also students with a background in a different field. Because of this, it might be that within your group, there are some students who have stronger programming skills, whereas others for example have better writing skills.

Phase 1 – Setup

Supervision

Supervisor vs. examiner

For each project, multiple people are involved. It is important to be aware of the distinction between supervisors and examiners.

Each project must have two examiners, who are Utrecht University employees involved in the assessment of the thesis project. According to article 5.3 from the [Education and Examinations Regulations](#), someone can only be an examiner if they belong to one of the following categories: *a junior lecturer [junior docent], lecturer [docent], senior lecturer [hoofddocent] or full professor [hoogleraar]*. Sometimes, it is convenient to include someone in a different role as second examiner, for example, a PhD candidate. In such cases, please inform the thesis coordinator in advance, if possible.

For many projects, the first examiner is also the main supervisor and is responsible for the supervision tasks described below. However, for some projects, the daily supervision can also be delegated to an external partner or another UU-employee, such as a PhD student. Supervisors who belong to this group can be involved in guiding the student during the project, but they are not allowed to be an examiner. In this document, when referring to supervisors, we mostly refer to the UU-supervisors who are also the examiners.

Expectations supervision

Here are a few useful pointers to what is typically expected in the student-supervisor relationship:

The student	The supervisors
<ul style="list-style-type: none">• is responsible for their master's thesis• works independently and shows commitment• follows up on agreements and deadlines• includes feedback and advice from their supervisor into their master's thesis• hands in a draft version of the master's thesis that is to the best of their abilities (including feedback and• complete references, and paying attention to style and grammar)• follows university rules and guidelines, specifically the OER• Informs the supervisors of process and possible delays	<ul style="list-style-type: none">• will be in touch with the student on a regular basis• will read the student's research proposal as formulated in the thesis application form and will provide feedback on that proposal• will read one version of every thesis chapter and will provide feedback on that chapter• will read one version of the completed draft version of the master's thesis and will provide feedback on that version• will provide the student with constructive feedback on the thesis and the process• together bear responsibility for the grading of the final version of the master's thesis and presentation, and handing in the assessment form within ten working days to the student desk of the Graduate School of Natural Sciences.

If a truly irresolvable conflict arises between the student and the supervisor they should contact the thesis coordinator. For smaller problems, the student can contact the [study advisor](#), who may serve as a mediator or request another thesis advisor.

Project kick-off and Workplace Agreements

As soon as the matching is completed, supervisors and students are notified. Students are encouraged to contact their supervisors to set up a meeting. It is important to discuss expectations, the project, the dataset and establish how often you will meet with your students. If an NDA or workplace agreement is required for a project, it should be set up as soon as possible.

NDAs can either take the standard form of a Workplace Agreement, which is provided by the GSNS, or it can be specific to the project (e.g. because the external partner requires one). In the latter case, it is important that the agreement is checked by contacting science.internshipcontracts@uu.nl.

Please note that supervisors are not expected to sign workplace agreements. The agreement on the part of the University is signed by the person in charge of Internship Contracts.

Osiris Zaak

Students need to register their project in Osiris Case and fill out the necessary information. This usually includes:

- A brief description of the project;
- The names of the first and second examiners, as well as any supervisors involved from external partners;
- The start/end dates of the project;
- A Workplace Agreement or NDA, if applicable - see [Procedures and forms for research project and internship](#).

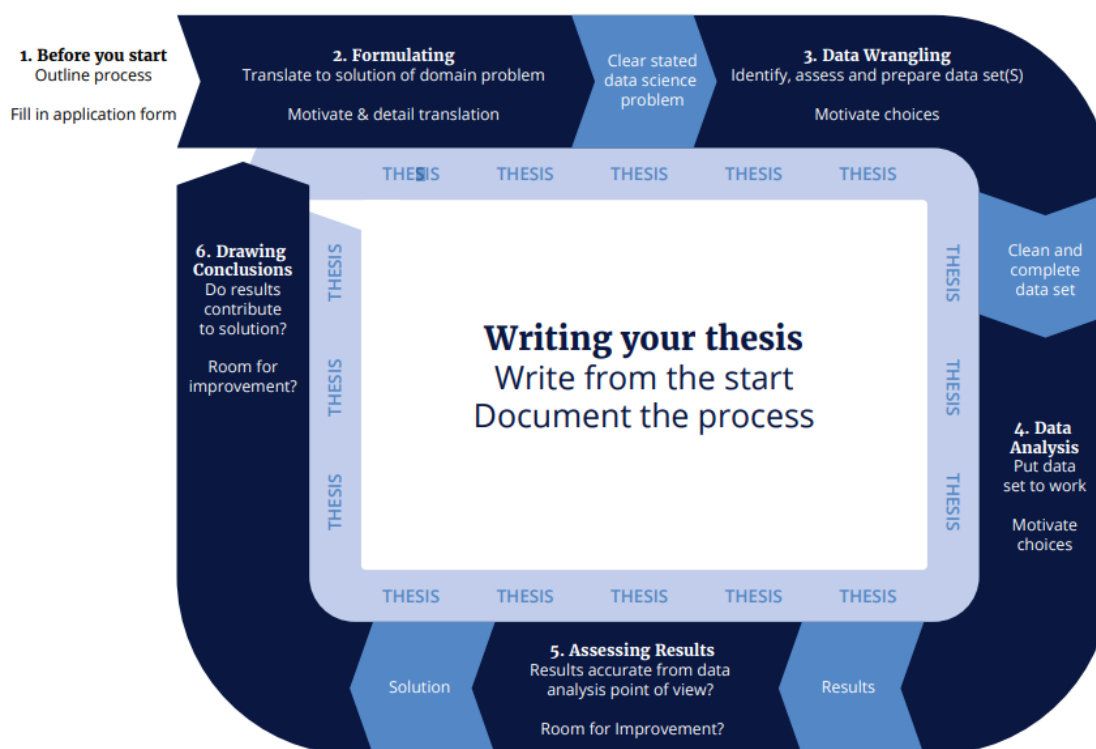
Please note that **once the student has submitted their case, it will have to be approved by the first and second examiner. Examiners should receive a notification via email when they need to provide this approval.**

Phase 2 – Thesis project

During the ten-week period, students should work on their projects, with regular meetings with their supervisors. Most UU-supervisors meet with their students at least once a week. For projects with an external partner, please establish in the kick-off meeting how often the student and the partner will be in contact.

Project cycle

A writing guide is provided to students to give more guidance on the thesis writing process. The figure below serves as a guideline. Since these are Data Science projects, they typically include problem formulation, data wrangling, data analysis, assessing results and drawing conclusions. However, how much time each of these aspects will take up is very much dependent on your project. Some projects are exploratory, while others are prediction-focused. In some cases, the challenge might be to integrate a variety of data sources; in others, the major challenge is the translation of the research question into a data science problem.



Computing power

For high-performance computing, if required, we recommend using cloud-based services (e.g. Google Collab, Kaggle). The ICS department does not provide access to HPC servers for masters students, though individual supervisors may be in a position to provide their students with this. External partners may in some cases be in a position to provide such access -- this should be checked in the kick-off meeting between student, supervisors and external partners.

Contents of the thesis

The thesis should be written as an academic paper. Because of the diversity in projects, the writing output can be different between projects. For instance, for some projects, a larger literature review is needed. Supervisors should also keep in mind that the ADS thesis forms a smaller component than a regular research thesis (which are usually 30 EC). Students should also discuss specific structure and

layout preferences (templates, reference style, presentation of code etc.) with their supervisors at the beginning of the project.

In addition to the written report, students should also provide their source code and datasets when handing in their final product. These can be linked via a repository such as github.

Example thesis structure

Here is an example of the structure of a typical ADS thesis (note that this can vary):

1. Title page, containing: name of the student, name of the supervisors, student number, date, name of the programme (master Applied Data Science, Utrecht University)
2. Abstract
3. Introduction
 - a. Motivation and context
 - b. Literature overview
 - c. Research question
4. Data
 - a. Selected data exploration results
 - b. Data preparation for analysis including motivation (integration, missing data analysis, etc.)
 - c. Ethical and legal considerations of the data
5. Methods
 - a. Translation of the research question to a data science question
 - b. Motivated selection of method(s) for analysis
 - c. Motivated settings for selected method(s)
6. Results and analysis
7. Conclusion and Discussion
 - a. Answering the data science question
 - b. Answering the research question
 - c. Describing implications for the proper domain setting
 - d. Discuss ethical implications and consideration
8. List of references
9. Appendix
 - a. Annotated scripts of analyses and method settings
 - b. Full data exploration results
 - c. Full analysis results

Phase 3- Wrap up

Thesis defence

On **30 June**, a student conference will be held, where students are invited to present their work, in the presence of their peers and supervisors.

The presentations given during this conference will account for the percentage of the grade awarded to the final presentation. The coordination team will ensure that there is space and time during the conference for the examiners to listen to the student presentations and ask questions.

In case students and/or supervisors cannot attend the student conference, an individual defence can be organised, whereby supervisors and students agree on a specific date for a presentation. Ideally, this should take place within the first two weeks of July, though of course this is subject to your availability. The length of individual defence presentations is usually around 15 minutes.

Final submission

Since this year we are organising the conference on 30 June, we do not necessarily expect final theses to be submitted by 1 July. Rather, with the consent of the supervisors, the final report can be submitted for grading after the conference, within a reasonable time.

If the supervisors do not think the thesis is good enough to receive a passing grade, the student will need to hand in a new version, and their defence (and therefore graduation) might be delayed. In such cases, the thesis coordinator should be contacted immediately, and will typically seek resolution with the Board of Examiners.

Assessment

The final grade for the thesis project is made up of the following components:

- Process (30%): Independence in execution of the project, independence in writing the report, planning and meeting deadlines, communication, integrity and responsibility, critical and reflective attitude
- Thesis (60%): Introduction, data and methods, results, discussion, English language usage, references
- Presentation (10%): Structure, context, content, quality of slides/media, presentation skills, suitability for audience, ability to cope with questions

Extension procedure

Regulations concerning potential delays are given in the [Education and Examination Regulations](#) (*Appendix: Protocol delay in graduation*).

The thesis projects should be designed such that they can be finished within the 10 allotted weeks. The Board of Examiners will strictly adhere to the ending date as specified (before starting the project) in Osiris Case.

If a potential delay is suspected, the student and supervisor should first see if they can find a way to still finish the project in time. If this is not the case, they should inform the thesis coordinator as soon as possible and apply for an extension from the [Board of Examiners](#) (7. *Delay of research or thesis project*). The Board of Examiners will judge whether an extension can be granted and inform the student of the length of the extension. **Note that applications for extension should be done via Osiris.**

Students should be aware that extensions may lead to a delay in their graduation, which means they might need to enroll for (part of) the new academic year. The availability of the involved parties (thesis and program coordinator, first and second supervisors, Board of Examiners) will be limited during the summer holidays.

Appendix: Assessment form

The following is a snapshot of the assessment form available in the Osiris system for grading student projects.

Assessment Form Thesis ADS

Volgende

1. Explanation2. Project3. Process4. Presentation5. Thesis6. Experts7. Grades

A Thesis is judged on 3 criteria: process, presentation and results/report. For each of these criteria there are several subcriteria, which are scored on the following scale:

Not Applicable
Insufficient
Sufficient
Good
Very Good
Excellent

Note: Students are expected to be able to do good work when they reach the phase of doing a master thesis, and the score "good" thus represents what can be expected from a normal student; it does not imply above-average results. Please fill out the form completely, and also write a brief explanation for each of the four criteria. This explanation should state the main strong points and/or the points that can be improved; it need not discuss all subcriteria. The scores and the overall performance with respect to each of the criteria together determine the final grade for the graduation project.

Volgende

Assessment Form Thesis ADS

Volgende

1. Explanation2. Project3. Process4. Presentation5. Thesis6. Experts7. Grades

Thesis Title
1

Course code
INFOMTADS

Vorige

Volgende

Assessment Form Thesis ADS

Volgende

1. Explanation2. Project3. Process4. Presentation5. Thesis6. Experts7. Grades

Process

Independence in execution of the project *

Independence in writing the report/proposal *

Planning and meeting deadlines *

Communication *

Integrity and responsibility *

Critical and reflective attitude *

Do not give a grade only on the basis of the above table. Explain also in more detail the various topics of this table. For instance, how did you conclude that the student was independent? Did he/she e.g. come with his/her own project proposal? Or, how did the student show his/her critical and reflective attitude?

Explanation *

5

Vorige

Volgende

Assessment Form Thesis ADS

Volgende

1. Explanation2. Project3. Process4. Presentation5. Thesis6. Experts7. Grades

Presentation

Structure *

Context *

Content *

Quality of the slides/media *

Presentation skills *

Suitability for audience *

Ability to cope with questions *

As before, do not give a grade only on the basis of the above table, but explain also (in words) in more detail the various topics of this table.

Explanation *

5

Vorige

Volgende

Assessment Form Thesis ADS

Volgende

1. Explanation 2. Project 3. Process 4. Presentation 5. Thesis 6. Experts 7. Grades

Report/Proposal

Structure and clarity of presentation * ☐ Not applicable ☐ Insufficient ☐ Sufficient ☐ Good ☐ Very Good ☐ Excellent

Discussion of related work and context * ☐ Not applicable ☐ Insufficient ☐ Sufficient ☐ Good ☐ Very Good ☐ Excellent

Completeness and correctness of arguments * ☐ Not applicable ☐ Insufficient ☐ Sufficient ☐ Good ☐ Very Good ☐ Excellent

English usage * ☐ Not applicable ☐ Insufficient ☐ Sufficient ☐ Good ☐ Very Good ☐ Excellent

General appearance (layout, figures and tables, etc) * ☐ Not applicable ☐ Insufficient ☐ Sufficient ☐ Good ☐ Very Good ☐ Excellent

As before, do not give a grade only on the basis of the above table, but explain also (in words) in more detail the various topics of this table.

Explanation *

%

Results

Quality of the results * ☐ Not applicable ☐ Insufficient ☐ Sufficient ☐ Good ☐ Very Good ☐ Excellent

Quantity of the results * ☐ Not applicable ☐ Insufficient ☐ Sufficient ☐ Good ☐ Very Good ☐ Excellent

Difficulty of the project * ☐ Not applicable ☐ Insufficient ☐ Sufficient ☐ Good ☐ Very Good ☐ Excellent

As before, do not give a grade only on the basis of the above table, but explain also (in words) in more detail the various topics of this table.

Explanation *

%

Assessment Form Thesis ADS

Volgende

1. Explanation 2. Project 3. Process 4. Presentation 5. Thesis 6. Experts 7. Grades

If internal or external experts have been consulted, please note them here.

Name and title

Affiliation

Email address

Vorige

Volgende

Assessment Form Thesis ADS

1. Explanation 2. Project 3. Process 4. Presentation 5. Thesis 6. Experts 7. Grades

Grade Project Process

Grade Project Presentation

Grade Project Thesis

Total grade = 30% * process + 10% * presentation + 60% * thesis

Total Grade *

7,6

Vorige