

JBP000 Bachelor final project Data Science (BEP Data Science)

The Bachelor End Project is an individual project, which is executed during one semester (in principle, this is semester B). Each student writes an individual thesis and is assessed individually. Students are supervised during their research by a lecturer who is actively involved in the curriculum of the Bachelor Data Science. Each thesis is also assessed by a second reader. The aim of the BEP is that a student shows that, for a perceived data science problem, (s)he is able to develop and formulate a research question, and analyze the problem making a justified choice for methods and techniques from the data science domain, with great level of independence. Generally, the BEP takes place in a circle group consisting of several students that writing individually, but on a similar topic, supervised by a supervisor.

The assessment consists of a report, a presentation, and a reflection on the whole bachelor program. Moreover, students write a BEP project description, a plan of work, and are assessed on professional skills (writing, communication, planning and organization, information, and reflection). All the assessment criteria are available in the Assessment Form for BEP Data Science.

Prerequisites:

The BEP is a level-3 course, and requires prior knowledge from all three years. A student can only enroll in the course if he/she:

- has obtained at least 120 credits,
- has passed the compulsory study components of the first year of the Bachelor's program.

Enrollment takes place in the quarter preceding the BEP by registration in Osiris.

The education office performs an admission check and informs students about acceptance into the course.

Finding a project:

Predefined projects

Successfully registered students will receive an invitation for the BEP Marketplace. This is a digital platform where all available projects can be found. Each student should submit five preferences for projects. Students are then allocated automatically to projects and supervisors. The aim is to assign each student to their project of first or second preference, however, this cannot be guaranteed.

Own project

It is possible to perform a BEP in industry or some other external organization. This requires substantial effort from the student: arrange the external contacts, find a supervisor from the scientific staff (with expertise in the topic), and compose an initial proposal together with the intended supervisor.

We encourage students/ companies to come up with proposals for at least 2 students.

Based on an initial proposal, the course coordinator of the BEP Data Science decide whether or not the assignment proposed by the student is suitable for the BEP. For this initial proposal, the student needs to submit the following information in about 500 words to the course coordinator :

- Introduction to the BEP topic;
- Preliminary research question, including sub-questions if available;
- Outline of the methodology including data science techniques that will be used;
- The fit with data science;
- Description of the external party involved (if applicable);
- The name of the supervisor from the scientific staff who has agreed to supervise the project.

Note that this initial proposal has to be submitted in the quarter preceding the BEP, so that the student can start the BEP trajectory in time.

Project requirements

The BEP comprises 10 credits, which corresponds to 280 working hours. In a semester planning, this is about 2 days of workload per week.

The assignment needs to be such that:

- a student can investigate a data science (research) problem individually and with great level of independence;
- there is a clear research question and scope;
- the size and depth are such that an average student is able to finish the project successfully (grade 6.0 or higher) within the study load of 280 hours;
- the learning goals can be assessed.

Learning goals:

At the end of the final Bachelor final project the student is able to:

1. integrate and apply theoretical knowledge and practical skills acquired during the bachelor program Data Science on a research assignment;
2. develop and formulate a research question, including a well-defined description of the scope of the research question;
3. make a research plan under supervision taking into account the required study load and fixed period, and can organize the activities to execute the research according to plan;
4. explore and make use of scientific literature (for this type of research question and business problem);
5. make a justified choice for methods and techniques for data collection and data analysis;
6. work (with limited supervision) independently on a project;
7. reflect on decisions made during the execution of the research assignment
8. present the results of the project both orally and in writing

Timeline

The BEP is organized as a course, and it is pre-structured with deliverables and milestones. Students are expected to hand in all deliverables in time. The general timeline of the BEP is shown in Figure 1, below. The exact timing of the circle meetings can be defined by the supervisor, in consultation with the students.

Project supervision is done in so-called **circles**. A thesis circle typically consists of three to five students who work on related topics from the same supervisor. Supervision in circles aims to encourage students to learn from each other and simultaneously diminishes the supervisor's workload. Within a circle, students review each other's work and provide feedback to each other.

Below you can find a guideline for planning these circle meetings. Depending on the agenda of the supervisor, in consultation with the students, and the nature of the project, supervisors can deviate from this planning. Note that the final deadline and the intermediate deliverables, however, are fixed.

These deadlines are available on Canvas (see: Assignments).

Week	Activity	Milestones	Circle meetings
1	Orientation, project definition, and work plan		
2			1
3			
4		Work plan	
5	Project work		
6			
7			
8			
9			
10		Mid-term presentation	2
11			
12			
13			
14			
15			
16			3
17			
18			
19		Final report	
20	Assessment meeting	Final presentation	4
21			
22			

Figure 1: General timeline of the BEP.

Note: Week 1 in Figure 1 is the first week of Quarter 1 (Sem A), see the [academic calendar](#)

Circle meeting 1:

The first circle meeting takes place in week 2 or 3. Prior to the meeting, students submit a draft version of their project plan (in figure 1, called 'work plan'). The project plan (to be delivered in week 4) should

contain detailed planning of your project, the research question, proposed methodology, and a concise literature search. During the meeting, students provide each other with feedback on their proposals. The supervisor adds his / her feedback to the observations made by the students and provides the students with information about his or her expectations with regard to the thesis project (e.g., deadlines for submission, availability for consultation, criteria with regard to expected quality, etc.). Based on the feedback, the students draft a detailed planning of their work and submit this by the end of week 4 in Canvas.

Circle meeting 2:

The second meeting takes place in week 10 to 12. Prior to the meeting, students prepare and submit the introduction and methods/approach chapters and outline of the remainder of their thesis. For the meeting, they prepare a presentation about the current state of their work. During the meeting, students provide each other with feedback and the supervisor adds his / her feedback.

Circle meeting 3:

The third meeting takes place in week 16 or 17. The students prepare a full draft of their thesis. Students prepare for the meeting by reading the other students' work and preparing feedback. During the meeting, students provide each other with feedback. The supervisor provides the students with feedback and offers suggestions for final revisions. In week 19, students submit the final version of their report to Canvas.

Circle meeting 4:

The final circle meeting takes place in week 20 or 21. Students prepare a presentation of their research. The presentation is assessed by the supervisor.

Assessment:

The assessment form is available on Canvas and in the [study guide](#).

Resit rule:

In case a student fails the final report (grade is < 6), will the student be given the opportunity to revise the report, thereby taking into account the feedback they received from the supervisor. If possible, the same first and second assessor will assess the re-exam of the report. However, as the re-exam sometimes falls in the middle of the summer holidays, it is possible that the re-exam will be assessed by different assessors. Note that only in exceptional circumstances, it is possible to score a grade higher than 6.5 for the resit. The Examination Committee decides whether there are exceptional circumstances on a case-by-case basis. Students need to deliver their revised report within 30 days after their first grade became available.

If a student misses the deadline for delivering the final BEP data science, the supervisor registers a 'no show'. However, we encourage students to always hand in a concept version of the BEP, so that feedback can be received before the resit.

Note that improvement of the BEP grade when the student received a passing grade is not allowed, as students need to show they are able to do the BEP within the fixed time frame. This is also reflected in the learning goals and assessment form of the BEP Data Science.

Second assessor rule:

To ensure independence of the assessments, in principle the assessors cannot have supervisor-supervisee relationship in a PhD project.