

THT311

OBLIGATORY PROJECT REPORT (course work)

Guideline 2019

General

THT 311 “Water Resources Management and Treatment Technologies” is a 10 ECTS course, requiring of minimum 300 hours of input from students. The lectures, lab and field works will count for about 80 hours. The rest 220 hours of the work should be provide through preparations, presentation and reporting of an obligatory project report (term paper or course work).

Deadline

Absolutely final deadline for report submission is **31 October 2019 23:55**

After this time, submission in Canvas will be automatically closed. All reports must be submitted via Canvas only. Submission by email is not possible.

If you submit before the deadline, you may get preliminary response from one of the three reviewers. This will allow you to make improvements to the report and resubmit before the deadline.

You can choose between two case studies for your project report:

- Upgrade of drinking water treatment plant in the city of [choose a city], in country [choose a country]
- OR**
- Upgrade of wastewater treatment plant in the city of [choose a city], in country [choose a country].

Please choose a treatment plant from your home city or any other city in your country. Please make sure that no one else is doing the same case study.

Table of content

1. Introduction (geographical location, population, population increase, urbanisation and industrialisation trends.
2. Legal background and quality control practice (which laws and regulations are used, who decides the water quality or discharge permits, who is monitoring and reporting etc.)
3. Water supply (*or wastewater treatment*) in the city (the need, population & industrial needs, how many treatment plants are there, and which plant you will use for further work)
4. Description of the study object (size or capacity, when constructed, treatment processes used – flow sheet, incoming water quality, outgoing water quality, any existing problems)
5. The need for upgrade and options available
 - Increase capacity by [...]%
 - Improve treatment efficiencies related to parameter [choose your parameters]
 - Increase process surveillance and automation
6. Two alternative solutions / flowsheets / treatment schemes
7. Justification of the best selected solution / flowsheet / treatment scheme

8. Selected unit processes
9. Instrumentation and automation of the selected flowsheet
10. Economical and environmental considerations
11. Conclusions and recommendations
12. Literature references

The report normally has 20-30 A4-pages. Use the recommended template.

Evaluation Criteria

- Understanding of the problem: demonstrate why it is necessary to upgrade and what could be the possible reasons for the needs or existing problems
- Demonstration of knowledge on possible solutions: several alternatives, flow sheets, advantages and disadvantages of each system
- Demonstration of detailed designing for at least 2 solutions and selection of one with justification. Show basic calculations or dimensioning; cost comparisons; flow sheets and any other details; list of monitoring instruments and with indications of where to place them

Note: if you do not provide answer / response to any of the issues noted in the assignment, you will loose marks for that. For example, if the odour was noted as an issue and if you do not write anything about odour problems, you will not get marks for that.

Marking structure

Reasons for problems & solutions/understanding of the problem	10%
Which unit processes or treatment concepts can solve the existing problems?	10%
Comparison of unit processes/treatment concepts with adv & disadv of unit processes - (why you will include them in the 2 choices)	15%
Flowsheets of complete processes of two alternatives	10%
Disadv & adv of the two flowsheets and justification for the priority/selection	15%
Economy/size comparison/justification	10%
Monitoring: Instrumentation & flow sheet	10%
Special issues (odour, taste)	10%
Report format: Design, format, references, etc	10%

Content of the report – an example

Understanding the problem

What is the problem as defined in the assignment text? Describe how you understand the problem. Discuss and describe the possible reasons for the problem.

The need for a solution

Discuss why it is necessary/important to solve this for the client. What consequences could be expected if the problem is not solved within a short or medium term time period.

What can be done to solve the problem?

Based on your understanding of the causes for problem, present and discuss methods for solutions. What technological and technical solutions could be suitable? Here you can show what you learned from the course about solving these problems using both conventional and innovative technologies.

Methodology

Choose at least two technological schemes (include flow diagrams) to solve the main problems from the previous chapter. Present and describe solutions – as two technologically feasible solutions

Selection of the solution

Compare the two solutions described above according to their technological performances, investment and operational costs, area needs, accessibility to resource persons, suppliers, etc. use the check-list given in the lectures (see page 18-19 in the 1JULYB- Combined processes) to compare the two processes (where relevant). Justify and conclude your selection.

Addressing special issues

Here you need to discuss all remaining aspects that were not addressed/solved in the previous chapter. For example odour and taste issues, etc. Present how you are going to solve them.

Design of the plant

Please provide design calculations for your final selections. It is necessary to carry out detailed calculations of reactors and related systems as required for a typical project work at your home university. For NMBU evaluations, it is sufficient to give overall conceptual dimensions.

Monitoring and control of the treatment process

Please discuss what parameters are important to each of unit processes of your final solutions. What are the benefits and what critical problems could be avoided with a good surveillance of these parameters. Discuss what can be measured online and draw the final flow sheet of your process with online monitoring sensors placed accurately. Please also indicate where to take manual water samples for the analysis of which parameters.