# Template for Bachelor and Master Theses at the department Biobased Resources in the Bioeconomy (340b), University of Hohenheim

## General information and text formatting

* Paper size: A4
* Page margins: top (2.5 cm), bottom (2 cm), left (2.5 cm), right (2.5 cm)
* Page numbering: no number of the first (title) page; for the following pages, the numbering is different depending on the chapter (see example below)
* Font: Times New Roman (12) or Arial (11)
* Logo (e.g. for title page): See <https://www.uni-hohenheim.de/logo>
* Headings: Keep to the same font (Times New Romans or Arial), the font size can be varied if necessary
* Line spacing: 1.5
* Labelling of tables and figures: Tables and figures must have a caption. Captions are placed **above tables** and **below figures** (see next page). Each table and figure must be referenced in brackets (Table 1, Figure 1 etc.) the first time it is mentioned in the main text.
* **Referencing within main text: format must stay consistent**. For example:

Von Cossel et al. (2019a) reported a marginal area affected by natural constraints across European land surface of 646,833 km2, while Gerwin et al. (2018) quantified 380,000 km2 of marginal lands for biomass production in Europe using soil-quality indicators. Furthermore, it has been estimated that 137,000 km2 of EU agricultural land is contaminated by at least one heavy metal and/or metalloid (HM&M) in concentrations above the guideline value set for agricultural soils (Tóth et al., 2016). This land has to be remediated before re-using for food production to protect human health and the environment. Previous works have demonstrated that several non-food industrial crops have the ability to accumulate HM&M in their aerial biomass contributing to the removal of the toxic elements from the soil (Barbosa et al., 2016; Fernando et al., 2016; Galić et al., 2019; Guo et al., 2019, Witters et al., 2009).





**Figure 4.** Relative light intensity at ground level (%) before

first cut and dry matter yield (DMY) of first cut for 2017 and 2018

together at (a) Foothills and (b) Swabian Jura

**List of References:** see end of document

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# Title

by

**first name, family name**

Matriculation No.: XXX

A Bachelor's/Master's Thesis

submitted to the department "Biobased Resources in the Bioeconomy"

University of Hohenheim

in fulfilment of the requirements

for a Bachelor's / Master's Degree

date of submission

First supervisor (normally Prof. Dr. Iris Lewandowski): **Title, first name, surname**

Second supervisor (only for Master’s thesis, must be an authorised examiner, i.e. not a PhD student etc. Must be agreed upon with the first supervisor): **Title, first name, surname**

# Summary

* The summary should be no longer than 2 pages (preferably only 1 page).
* The purpose of the summary is to entice the reader to read the entire thesis.
* The summary is a miniature edition of your complete thesis. It should answer the following questions:
	+ Why is your thesis of scientific interest?
	+ What exactly did you examine, what was the goal?
	+ Which methods did you employ to achieve this goal?
	+ What are the most important results?
	+ Did your work lead to new scientific findings?
* The content of the summary must correspond exactly with the content of your work. For this reason, it is best not to write the summary until you have finished all other parts of the thesis.

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| --- | --- |
| **Contents (Example only. You can also create a table of contents automatically via “References”-“Table of Contents”, but remember to update before submission!)** | **Page** |
| **Table of Contents** | **II** |
| **List of Abbreviations** | **III** |
| **List of Figures** | **IV** |
| **List of Tables** | **IV** |
| **1. Introduction** | **1** |
| **1.1** | **1** |
| 1.1.1 | 1 |
| 1.1.2 | 1 |
| 1.1.3 | 1 |
| **1.2. Purpose of the Research** | **1** |
| **2. Material and Methods** | **2** |
| **3. Results** | **3** |
| **3.1** | **3** |
| 3.1.1. | 3 |
| 3.1.2. | **3** |
| 3.1.3. | 3 |
| **3.2.** | **3** |
| **4. Discussion** | **4** |
| **5. Conclusions** | **5** |
| **References** | **6** |
| **Appendix** | **7** |

# List of abbreviations (Example only)

°C degree centigrade / Celsius

ADF acid detergent fiber

ADL acid detergent lignin

C carbon

CH4  methane

cm centimetre

C:N ratio of carbon to nitrogen

CO2 carbon dioxide

d day

DOC dissolved organic carbon

FM fresh matter

FoDM fermentable organic dry matter

FOS volatile organic acids

g gram

GWh gigawatt hour

h hour

ha hectare

HPLC high performance liquid chromatography

J joule

K Kelvin

kg kilogram

kW kilowatt

kWh kilowatt hour

l litre

m meter

mg milligram

ml millilitre

MW megawatt

N nitrogen

NDF neutral detergent fiber

NFC non-fiber carbohydrates

NfE nitrogen-free extract

oDM organic dry matter

ppm parts per million

rpm rounds per minute

# List of Figures (Example only)

Figure 1: Number of biogas plants and their installed electric capacity in Germany 11

Figure 2: Proportion of energy crops used as biogas substrate according to mass 12

Figure 3: Scheme of the processes in a biogas fermenter 24

Figure 4: Measured parameters of laboratory fermenter 1 30

Figure 5: Measured parameters of laboratory fermenter 2 32

# List of Tables (Example only)

Table 1: Substrate-specific biogas and methane yields derived from the literature 10

Table 2: Origin and parameters of the roadside grass silage spring samples 22

Table 3: Origin and parameters of the roadside grass silage autumn samples 23

Table 4: Theoretical biogas yield and methane content 30

Table 5: Classification of biogas batch methods described in the VDI guideline 4630 32

# 1. Introduction

* Background information and motivation for your thesis.
* Briefly describe objective of the thesis.
* Are there results from other studies which need to be clarified or further developed?
* State the approach you use (not a detailed description - that should follow in the 'Material and Methods' section).
* Pay attention to smooth transitions between the sections – think about the flow of the text. A good flow helps the reader to follow the central ideas in your thesis.

## 1.1. Lorem ipsum dolor sit amet

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## 1.2. Problemstellung Zielsetzung

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# 2. Material and Methods

* + Communication of the information necessary to be able to understand all measurements, tests, calculations, assumptions etc. made.
	+ For field trials, also describe site conditions (climate, weather, soil etc.) and experimental design.
	+ Possibly refer to other studies in which the same methods were applied. In this case, the core elements of the methodical procedure should however still be described.

# 3. Results

* Keep it brief: In this section, only report those results that are necessary to answer your research questions.
* Diagrams and photos can help keep the reader's interest, represent complex relationships schematically or illustrate observations that are difficult to express in words. For this reason, it's a good idea to show part of your results, where possible, in the form of diagrams and photos. But remember to always refer to the figures in the main text and to limit the number to essential information or a few examples in order not to overload your thesis with graphical elements.
* In this section, the results and particular details or trends should only be **shown or described**. The **interpretation** of the results should be done in the **Discussion**. Phrases such as "this suggests that..." or "this can presumably be attributed to..." therefore belong to the Discussion and not the Results section.
* It is best to show complex data in table form rather than graphical representation.
* Specific result values can also be included in the main text, e.g. where there are only a few numerical values in a category or if there are a few particularly important values. Avoid using tables or figures which display only two or three values.
* If you show results from the literature in a table or figure, any references from the original literature should also be included in your table/figure.

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# 4. Discussion

* + The results of your work should be interpreted here. Were there deviations from the planned methodology, inaccuracies, etc. that should be taken into account in the interpretation? Justify any deviations from the planned methodology.
	+ How can the results be related to the original research objectives?
	+ Which relationships can be derived from the results?
	+ Can you substantiate your results using those of similar studies (literature sources)? If not, what are the reasons for this? Comment on “typical” and “unexpected” results.

# 5. Conclusions

* + Which conclusions can you draw?
	+ Was the objective of the study achieved?
	+ What are the central messages of your study?
	+ Can the results of your work be used for future scientific studies?

# References

* **Standardize** your reference list - be consistent.
* The reference list should be **in alphabetical order**. Don't make separate lists for the different document types i.e. internet sources, scientific publications, book chapters etc.
* It is best to choose a **scientific journal** (e.g. Global Change Biology <https://onlinelibrary.wiley.com/journal/13652486>) and use their referencing style as a guideline.
* To make creating the reference list easier - and also for your own literature database management -, we recommend you use appropriate **software**, e.g. Zotero (free of charge, <https://www.zotero.org/>) or Citavi (charges apply, <https://www.citavi.com/de> ).

## Here are some examples of referencing styles according to document type.

### Internet source:

European Union (2009) Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC. [www.eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0088:0113:EN:PD](http://www.eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ%3AL%3A2009%3A140%3A0088%3A0113%3AEN%3APD)F. Accessed: 22.08.2011.

### Scientific paper:

Lewandowski I, Schmidt U (2006) Nitrogen, energy and land use efficiencies of miscanthus, reed canary grass and triticale as determined by the boundary line approach. *Agriculture, Ecosystems & Environment,* **112**, 335-346.

### Book chapter:

Mosier AR, Syers JK, Freney JR (2004) Nitrogen fertilizer: An essential component of increased food, feed, and fiber production. In: A*griculture and the nitrogen cycle: Assessing the impacts of fertilizer use on food production and the environment* (Eds.: Mosier AR, Syers JK, Freney JR). SCOPE, Island Press, Washington DC 65. pp. 3-15.

# Appendix (optional)

* + Here you can include supplementary information which does not belong in the main body of the thesis, for example, additional tables of raw data (e.g. botanical assessments), field trials photos, data sheets for the devices and measuring instruments used, programming codes you developed yourself etc.

**Eigenständigkeitserklärung (mandatory)**

* On the last page, you must include and sign the 'Declaration of Originality' (Eidesstattliche Erklärung). The template for this can be found at [https://www.uni-hohenheim.de/fileadmin/uni\_hohenheim/PA/formulare/
allgemein/Eigenstaendigkeitserklaerung.pdf](https://www.uni-hohenheim.de/fileadmin/uni_hohenheim/PA/formulare/allgemein/Eigenstaendigkeitserklaerung.pdf). If you are submitting your thesis in digital form, you must print the declaration of originality, sign it by hand, scan it and add it at the end of the digital document.