RUHR-UNIVERSITÄT BOCHUM

RUB

CompEng
Computational Engineering

FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING

Chair of ...
Prof. Dr. ...

Master thesis

Title of the thesis in one or two lines

Student: First and last name

Matriculation number: 108 ...

Date 02. May 2017

Copy of the output sheet of the Master thesis

Table of contents

List of figures

1 Template for documents

This is a template for writing theses at the Chair of Steel, Lightweight and Composite Structures at RUB.

Please use this template with the formatting options presented here. For this purpose, the format templates labeled **A_Beispiel** are intended for whole paragraphs. The formats **Z_Beispiel** are to be used for single words. A maximum of 4 headings are to be used (**Überschrift 1 to 4**). Furthermore, there is **M_Beispiel** for inserting pictures, formulas and tables and **Liste_Beispiel** for enumerations and lists.

A_Text is the default text. Font Arial.

Start with page 1

Header with chapter number, chapter text and page number

$$f = \int \overline{M} \cdot \kappa dx = \frac{1}{3} \cdot (-h) \cdot \left(-\frac{Q_2 \cdot h}{EI} \right) \cdot h = \frac{h^3}{3 \cdot EI} \cdot Q_2 = \frac{h^2}{3 \cdot EI} \cdot M_1 \qquad (1.1)$$

1.1 Text - FORMATS

A_Text Normal text

A_Formate for the whole paragraph, Z_Formate only for single words. M_Formate for captions and co.

A_Text_Tabelle Text in tables smaller for tables

A_LeerzeichenNachTabelle for a space under tables

A_Überschrift 1 ohne Nummerierung and without page break for content listing and appendix

NOTE FOR NOTES DURING EDITING

M_Bilder line spacing variable

Z_Symbol A_Σψμβολ

Z_~~Durchgestrichen~~ / Hoch / capital / subscript

Z_Durchgestrichen / superscript / capital / subscript

Z_Durchgestrichen / superscript / CAPITAL / subscript

Z_Durchgestrichen / superscript / capital / subscript

Z_Durchgestrichen / **superscript** / capital / **subscript** / **bold**

1.2 List formats

a) Liste_a

b) Liste_a

A) Liste_A

B) 4225

- Liste_Bu
- Liste_Bu

1. Liste_Num
2. Liste_Num
3. asdfasdf

Format text after enumeration again with A_Text. For a new enumeration:

a) Liste_a (right click: start numbering again)

b) Liste_a

c) a

2 Structure of the template

Heading 1 (Überschrift 1) always starts on the new page.

2.1 Formulas

2.1.1 How to insert a formula?

Copy another table, then only exchange formula.

Get current numbering via "Update fields"

Insert cross-reference for formula under the label "(".

Formula; font size 11, Arial in Mathtype

$$f = \int \overline{M} \cdot \kappa \, dx = \frac{1}{3} \cdot (-h) \cdot \left(-\frac{Q_2 \cdot h}{EI} \right) \cdot h = \frac{h^3}{3 \cdot EI} \cdot Q_2 = \frac{h^2}{3 \cdot EI} \cdot M_1 \qquad (2.1)$$

With CTRL+A and then F9 all fields can be updated!

M_Gleichung for equations, so that a variable line spacing is available.

M_Formelnummerierung for numbering, so that it is right-justified.

2.2 M_Formate for figures and co.

Normal Text.

2.2.1 Tables

For tables, figure etc. the **labels must be defined first** (on each PC). To do this, mark the corresponding object - right click - insert label. If the desired label is not available: → new - select "Tab." as name, check the box for include chapter number (with dot or hyphen, as desired), above or below the object, as desired. Only then can a reference be created with "Insert cross-reference". In doing so, the name of the table must be designated as it is to appear later in the text. "see Tab. 2.1" requires the name "Tab.". After inserting the name, define it in the format M_Bildunterschrift.

If desired, insert a blank line below the table with A_Leerzeichen_nach_Tabelle corresponding to ½ line height. After inserting the name, define the table heading with the format M_Tabelle. Table heading is not separated from table at page change

Table 2.1

Table in font size 9. Line spacing left at 14.5	Table text in **A_Text_Tabelle**	
Insert caption		

Blank line after table

If desired, insert a blank line below the table with A_Leerzeichen_nach_Tabelle equaling ½ line height.

Table designation above the table in M_Tabelle

M_Bilder: centered, variable line spacing for images

M_Bildunterschrift caption for images

M_Gleichung for formulas with Mathtype, variable line height

M_Formelnummerierung formula numbering

M_Tabelle caption for tables

2.2.2 Images

Insert images as references

Use format "**M_Bilder**", because other formats have a fixed line height. Image and caption below are NOT separated on two pages.

Caption with: "Insert caption", format: **M_Bildunterschrift**. After inserting the caption still define the caption with the format M_Bildunterschrift.

Fig. 2.1 Text format M_Bildunterschrift, font size 9, line height 14.5

Normal text: member buckling failure stability theory of straight members that have at least one line of symmetry in the cross-section, are loaded in their cross-sectional plane, and also fail in this plane due to member buckling.

In Fig. 2.1, three penguins can be seen **Insert - cross-reference**

2.2.2.1 Heading 4

No other headings are expected.

3 Include literature

Insert references e.g. using Citavi...

Alphabetical and chronological order

Meier shows in [1, 2] ...

[3] shows....

Please leave section breaks before the list of references!

List of references

[1] DIN EN 1993-1-9:12/2010. Eurocode 3: Bemessung und Konstruktion von Stahlbauten – Teil 1-9: Ermüdung.

[2] Haibach, E. 2006. Betriebsfestigkeit. Verfahren und Daten zur Bauteilberechnung. VDI-Buch. Springer. Berlin

[2] Kindmann, R. 2008. Stahlbau. Teil 2: Stabilität und Theorie II Ordnung. Bauingenieur-Praxis, Bd. 2. Ernst und Sohn. Berlin.

[3] Kragerup, J. 1984. Buckling of rectangular, unstiffened steel plates in compression. Dissertation, Technical University of Denmark Lyngby. Denmark.

[5] Pedersen, M. M.; Andersen, J. G.; Olafsson, O. M. 2012. Investigation of the thickness effect for butt welded joints. IIW WG1-154-12.

[4] Rauch, M.; Knobloch, M. Challenges for tower structures of multi-megawatt class wind turbines. In: Zingoni, A. (Hrsg.): Insights and Innovations in Structural Engineering, Mechanics and Computation. Proceedings of the Sixth International Conference on Structural Engineering, Mechanics and Computation, Cape Town, South Africa, 5-7 September 2016. Boca Raton: CRC Press 2016, S. 335–336 (full paper on CD-ROM)

4 Declaration of independence

I hereby declare,

that I have written this thesis independently and have not used any sources or aids other than those stated (including, in particular, AI-based applications or tools). All literal or analogous references and quotations are labelled and verified. I confirm that I have not used any resources whose use was explicitly excluded in the assignment. If AI-based applications or tools were used, the AI tools used are documented in the appendix of the thesis and all AI-generated outputs used for the thesis are listed individually.

By submitting this work, I take responsibility for the overall product submitted. I am also responsible for any AI-generated content that I have included in my thesis. I have checked the accuracy of the (AI-generated) statements and content to the best of my knowledge and belief.

I have not submitted this thesis or parts of the thesis for the acquisition of another examination achievement in the same or a similar form.

I am aware that a violation of the above points has consequences under examination regulations and, in particular, will result in the coursework and examination being assessed as 'failed' (attempt to deceive).

Place, Date	(personal) signature