AGH UNIVERSITY OF KRAKOW

Faculty of Space Technologies

Master's Thesis Requirements and Guidelines

Kraków, 2026

Requirements for the structure and contents of the Master's thesis

The Master's thesis should include the following sections:

1. Title page (available from the Faculty's website)
2. Acknowledgements (if applicable)
3. Table of contents – the thesis is submitted as PDF file, make sure your table of contents is **interactive** and each entry links to the corresponding page in the document.
4. Abstract – provide a brief introduction to the problem addressed in your work. Summarize the state of art, present the aim and goals of your research and what was achieved in this project. *It is a **formal requirement** that you prepare the abstract both in **Polish** and **English**.*
5. Introduction – clearly state the **aim** and **goals** of your project in details. Briefly summarize contents of each following chapter.
6. Literature review – **critical analysis** of the scientific articles and other relevant sources. Introduce similar projects which were previously tested in the field, focus on their **advantages, disadvantages** and **limitations**, especially in the context of your project. This section should clearly explain the **motivation** behind the selection of your approach, tools, and methods.
7. Methodology – describe in detail the methods, tools, and procedures used in your research. Clearly explain your **approach** and justify why it was chosen in the context of your project.

   This section should include (depending on your project):

   - description of the **experimental setup**, models or simulations,
   - the **materials, software** and **equipment** used,
   - the **data collection process**,
   - the **analysis methods** applied.

   Ensure that the description is sufficiently detailed to allow the work to be **reproduced** by others. Clearly state and motivate any **assumptions**, **constraints**, and **limitations** of your methodology.
8. Results and implementation – present the results obtained in your study in a clear and structured manner. Use appropriate **figures, tables and charts** to support your findings. Describe the **final implementation** of your solution, model, or system.

   This section should include:

   - a presentation of the **key results (figures, tables, charts, etc.)**,

- a description of the system or model **performance**,
- **validation** or **verification** of the results (if applicable).

Ensure that all results are **clearly explained and properly referenced** in the text.

9. Discussion- critically analyse the results obtained in your study. Explain what the results **mean** and how they relate to your research objectives. Compare your findings with the **state of the art** and results reported in the literature. Discuss the **outcomes** and provide possible explanations. Also, address the **strengths and weaknesses** of your approach, and the **significance** of your results in the broader context of the field. Avoid simply repeating the results but focus on their **interpretation** and **implications**.
10. Conclusions and future work – summarize the main findings of your work. Clearly state if the **aim** and **objectives** were achieved. Discuss possible directions for **future work**, including any improvements, extensions, or new research questions that arise from your study. Avoid repeating from Results and Discussion, focus on **overall outcomes** and main takeaways.
11. Bibliography – ensure that all references are **consistent** and **formatted according to the required citation style**. Use Mendeley, Zotero or similar tool to manage your citations efficiently. This will help you handle large numbers of references and update them automatically throughout the document.
12. List of Figures
13. List of Tables
14. Appendix – attach any documentation relevant to your research, i.e. technical drawings, software you developed, documentation of experimental setups, detailed calculations and derivations. If your software project is large, store it on GitLab or GitHub and provide reference in the text. Here you can attach only most important code snippets relevant for the discussion in the thesis.

Editorial guidelines

1. Page setup:

Page size A4, margins: left- 3.5cm, right, top and bottom- 2.5cm. All pages numbered (except the title page).

Interline 1.5 (1.0 in the titles of the chapters).

Chapter titles and subtitles should be aligned to the left. Main text justified.

2. Fonts and sizes:

Main text: Times New Roman 12pt

Main chapters: 1. – **16pt bolded**

Sub chapters: 1.1. – **14 pt bolded**

Sub chapters: 1.1.1. **– 12 pt bolded**

Tables titles and figures captions – 10pt

3. Tables

The title of a table should be placed directly above it, aligned to the left-hand side. In case of large tables with multiple columns, the page orientation can be changed to landscape. All tables must be referenced in the text. The tables must be numbered according to the chapter number and their order of appearance in that chapter (e.g. tables in chapter 3 will be 3.1, 3.2, etc.). The headers of the columns may include additional information about the unit or any scaling factors applied to improve the table clarity. For example, Table 3.1. shows average costs of space flights.

Table 3.1 Costs of space flights

Provider	**Cost per launch [mln USD]**	**Payload mass [10^3 kg]**	**Cost per kg [10^3 USD/kg]**
SpaceX Falcon 9	69–134	17.0–22.8	~3.0–7.0
Space Shuttle (historical)	1,500	24.0	~60
Ariane 5	165	20.0	~8.0
Starship (planned)	10–20	100–150	~0.1–0.2

4. Figures

Figures should be placed close the main text sections where they are mentioned and centred. The title of a figure should be placed directly below it and aligned to the left-hand side. All figures must be referenced in the text. Figures must be numbered according to the chapter number and their order of appearance within that chapter (e.g., Figures in Chapter 4 are numbered 4.1, 4.2, etc.) In case of figures with multiple panels, the panels should be referred with capital letters, for example panel A in Figure 4.1 as Fig.4.1.A. Each figure must include a source reference, placed in the figure caption. The source may indicate original work by the author (‘*own work’*) or an external reference included in the bibliography. Figures should be clear, self-explanatory, and have sufficient resolution to ensure readability in both digital and printed formats. Figure 4.1. shows the International Space Station.

Figure 4.1 International Space Station [2]

5. Plots and charts

Plots and charts should be labelled as figures. All plots and charts must be referenced in the text. They must be numbered according to the chapter number and their order of appearance within that chapter (e.g., Plots and charts in Chapter 5 are numbered 5.1, 5.2, etc.). They must include appropriate title describing what they represent. Axis labels must include both the **variable name** and its **unit** (if applicable). Where relevant, scaling factors should be clearly indicated either in axis labels or in the caption. Legends must be included when multiple datasets are presented to ensure clarity and interpretability. Plots and charts should be high resolution, legible in grayscale (markers or different line types for multiple plots in a single chart), and designed to remain clear when printed. The plots can be prepared with MS Excel, Python, MatLab or similar tools. Where possible present different charts in one Figure for easier comparisons.

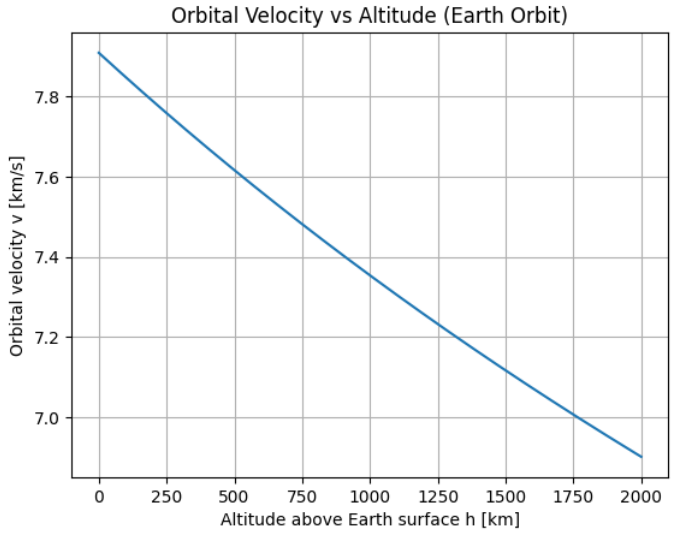

Figure 5.1. Orbital velocity vs altitude.

6. Equations

For equations, use the **final form whenever possible**. If detailed derivations are required, include them in the **Appendix**. All equations should be referenced in the main text. All symbols used in equations must be clearly explained. Equations should be centred and numbered according to the chapter number and their order of appearance in that chapter (e.g. equations for chapter 6 will be 6.1, 6.2, etc.). Equation numbers should be placed on the right-hand side and aligned with the right margin. Remember about appropriate **units** if applicable.

For example, Equation 6.1 defines the orbital velocity of a satellite in a circular orbit around a central body of mass.

$$v = \sqrt{\frac{GM}{r}} \left[\frac{m}{s}\right] \tag{6.1}$$

where:

v is the orbital velocity of the satellite $\left[\frac{m}{s}\right]$,
G is the universal gravitational constant $\left[\frac{m^3}{kg \cdot s}\right]$,
M is the mass of the central body $[kg]$,
r is the distance from the center of mass of the central body to the satellite $[m]$.

Alternatively, the symbols used in the equation can be explained in the text.

For example, Equation 6.1 defines the orbital velocity *v* of a satellite in a circular orbit around a central body of mass *M*, where *G* is the gravitational constant and *r* is the orbital radius measured from the centre of mass of the body.

$$v = \sqrt{\frac{GM}{r}} \left[\frac{m}{s}\right] \tag{6.1}$$

The same rules apply for any numerical calculations you show in the thesis.

7. References and citations

References should be cited consistently throughout the text using the IEEE (numerical) citation style (e.g. [1]). Multiple references after a section of the text should be cited in numerical order (e.g., [1], [3], [5] or [2]–[4]). Every source included in the reference list must be cited in the text, and all in-text citations must correspond to an entry in the bibliography. The reference should be added right after the paraphrased part. If a direct quotation is required, it should be enclosed in quotation marks and followed by the appropriate reference ("for example like this"[6]). All figures, tables, charts, and data must also include appropriate source references. When referencing online sources, the bibliography entry must include the access date. You can use Zotero, Mendeley or other citation management tools to keep track of your bibliography.

8. Use of AI and automated tools

The use of artificial intelligence (AI) tools is permitted as a standard aid in the preparation of academic work, particularly for purposes such as proofreading, formatting, translation, and information retrieval. If AI tools are used to generate substantial content including text, data analysis, code, graphics or other elements of the work, the author must clearly disclose how and to what extent the AI was used. This should include the tool used, the purpose of its use, and the nature of the generated material. The author remains fully responsible for the accuracy, integrity, and academic compliance of all content presented in the work. Undisclosed use of AI-generated materials may be considered a violation of academic integrity policies and handled in accordance with applicable institutional regulations.