

# Preparation of the TFG manuscript using L<sup>A</sup>T<sub>E</sub>X

Author: Treball de Fi de Grau Advisory Committee.  
*Facultat de Física, Universitat de Barcelona, Diagonal 645, 08028 Barcelona, Spain.\**

Advisor: Baruch Spinoza

**Abstract:** Some examples of the use of L<sup>A</sup>T<sub>E</sub>X are given. Hope this will prove helpful in preparing the manuscripts for the *Treball Fi de Grau* (TFG).

## I. INTRODUCTION

In this document you will find the structure as well as the length of what the *Treball Fi de Grau* (TFG) report is required to have. It uses L<sup>A</sup>T<sub>E</sub>X in a two-column format and provides an example of what the essay ought to look like, including lists, tables and figures.

The text has to be written in (good) English (compulsory). The length of the report should by no means exceed **five** pages in the present format, all figures, tables, etc..., included. It is important that the two requirements are precisely met. Otherwise the essay will not be considered for evaluation, and will automatically fail with a mark of *Suspès*.

The report must consist of the following parts:

1. Abstract.
2. Introduction.
3. Development sections.
4. Conclusions.
5. Appendix (Optional)
6. Bibliography.

The final score will combine both the advisor and the jury marks. The defense will consist of a 15 minute public presentation before a jury composed by two members. The deadlines as well as the dates for the presentations will be announced in due time. The students are encouraged to stick to the allowed allotted time (15 minutes), since no extra time will, in general, be conceded by the jury members. At any rate, it should be clear that a list of conclusions needs to be read before the presentation is over.

The evaluation will follow the *Rúbriques* (or *Taules d'avaluació*) provided by the TFG Advisory Committee, which will be available to the students prior to the presentation date, well ahead of time. It is highly advisable for the students to read them thorough and carefully, in order to become aware of all the competences that need be assessed to comply with the guidelines of Bologna.

Make sure that the presentation will include:

1. Introduction.
2. Development sections.
3. Conclusions.

You can find all the information concerning the TFG process in,

[http://www.ub.edu/fisica/guia\\_grau\\_fisica/fidegrau.html](http://www.ub.edu/fisica/guia_grau_fisica/fidegrau.html)

## II. EQUATIONS: A FEW EXAMPLES

Let us write a few equations,

$$\Delta = \sum_{i=1}^N w_i (x_i - \bar{x})^2, \quad (1)$$

with a label so that we can refer to it later. For instance you can refer to it as Eq. (1). All equations must be numbered. If needed, you can also produce unnumbered equations.

$$T = 2\pi \sqrt{\frac{l}{g}}.$$

You can insert equations in the text, like  $e^{i\pi} + 1 = 0$ ;  $\frac{df(x)}{dx}$  or you may prefer  $\frac{df(x)}{dx}$ . You can also write aligned equations,

$$\begin{aligned} \frac{du(x)}{dx} + Vu(x) + Wv(x) &= (\lambda + \alpha) u(x) \\ \frac{dv(x)}{dx} + Vv(x) + Wu(x) &= (\lambda - \alpha) v(x). \end{aligned} \quad (2)$$

Further examples are,

$$\begin{aligned} \nabla \cdot \vec{E} &= 4\pi\rho \\ \nabla \times \vec{B} - \frac{1}{c} \frac{\partial \vec{E}}{\partial t} &= \frac{4\pi}{c} \vec{J} \\ \nabla \times \vec{E} + \frac{1}{c} \frac{\partial \vec{B}}{\partial t} &= 0 \\ \nabla \cdot \vec{E} &= 0, \end{aligned} \quad (3)$$

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\*Electronic address: [tfyac@ub.edu](mailto:tfyac@ub.edu)



Another table,

<b>M1</b>	Teoria:	Galileo	A11G
(11:45)	Problemes:	Galileo	A11G
	Problemes	Planck (M1A)	A11G
(12:45)	tutoritzats:	Fermi (M1B)	A23M
<b>M2</b>	Teoria:	Clausius	A12G
(8:30)	Problemes:	Huygens	A12G
	Problemes	Boltzmann (M2A)	A12G
(9:30)	tutoritzats:	Maxwell (M2B)	A24M
<b>T1</b>	Teoria:	Gibbs	A12G
(18:00)	Problemes:	Helmholtz	A12G
	Problemes	Böhr (T1A)	A12G
(19:00)	tutoritzats:	A. Einstein (T1B)	A24M

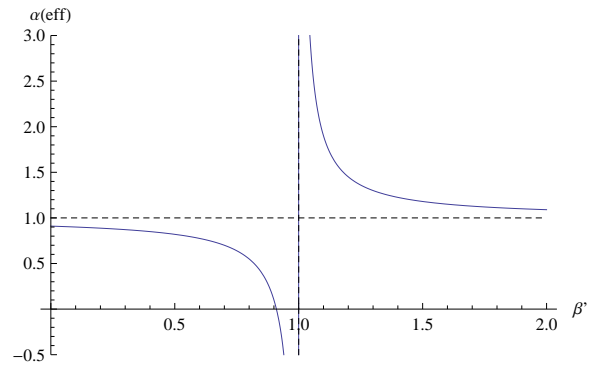


FIG. 2: A sample figure made smaller by changing the width parameter.

#### A. Subsection 1

This is the first subsection.

## IV. CONCLUSIONS

[illegible]

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- The image contains two identical blank dot grids stacked vertically. Each grid consists of a 10x10 array of small black dots on a white background, intended for handwriting practice. A solid black dot is positioned at the top-left corner of each grid.

You can add your appendix if needed, or you should like to do so. The following equation,

$$\vec{F} = m\vec{a}, \quad (11)$$

is important in Physics.

Be sure to thank your advisor, your colleagues, and granting agencies (e.g. parents, etc...) as well.

- [1] Helmut Kopka and Patrick W. Daly, *A Guide to L<sup>A</sup>T<sub>E</sub>X: Document Preparation for Beginners and Advanced Users*, 3rd. ed. (Addison-Wesley, Reading, MA, 1999).
- [2] It is necessary to process a file twice to get the counters correct.
- [3] J.D Jackson, *Classical Electrodynamics*, (John-Wiley & Sons, New York 1975, 2nd. ed.).
- [4] Hinshaw, G. et al. (WMAP Collaboration). "Five-Year Wilkinson Microwave Anisotropy Probe Observations: Data Processing, Sky Maps, and Basic Results". The Astrophysical Journal Supplement **180**: 225245 (2009).
- [5] Weinberg, S.. "High-Energy Behavior in Quantum Field Theory". Phys. Rev. **118**: 838849 (1960).
- [6] This is a footnote.