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**FINITE VOLUME RESOLUTION OF
THE MASS, MOMENTUM AND ENERGY
TRANSPORT EQUATIONS USING THE
FRACTIONAL-STEP METHOD**

Master Thesis: Budget
Master's Degree in Aerospace Engineering

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1 Budget itemization

The items of the budget of this study can be basically divided in:

- Human resources: the researcher conducting the study.
- Hardware amortization: the amortization of the machine used.
- Software licenses: the cost of the licenses of the software used.

1.1 Human resources

It can be considered that this study has been conducted by a senior engineer in a total of 300 h according to the university credits assigned to this study. A lower limit has been used considering the official annual minimum interprofessional wage in Spain [1] which currently is 31.66 €/day approximately, for 8 h/day.

Table 1.1: Human resources budget.

Working hours	Price	Cost
300 h	3.96 €/h	1 188 €

1.2 Hardware amortization

The employed hardware has been a laptop whose amortization has to be computed in the budget of the study. The cost of the laptop is approximately of 800 € and is expected to be amortized in 5 years. According to the latter, the partial amortization of the hardware throughout the study is computed.

Table 1.2: Hardware budget.

Duration of the study	Price	Cost
4 months	160 €/year	53.3 €

1.3 Software licenses

In this section the partial cost of the software licenses used in the study is computed in Table 1.3, for a 4 month duration of the study. The *Matlab R2020b* license price has been computed taking into account the student price of 35 €/year for the *Student license* [2] .

Table 1.3: Software budget.

Software	Price	Cost
Dev-C++	0 €/month	0 €
Matlab R2020b	2.92 €/month	11.68 €
Software total budget		11.68 €

1.4 Energy resources

In this section the energy resources are computed in Table 1.4. It basically consists in the electricity power. The data of the electricity price has been obtained from the *OMIE*, the *Nominated Electricity Market Operator* from Spain [3] . An estimated average power consumption of 40 W has been set for the laptop.

Table 1.4: Energy resources budget.

Units	Price	Cost
40W · 300 h	48.35 €/MWh	0.58 €

2 Total budget

The total budget is presented in Table 2.1: Final budget. Table 2.1.

Table 2.1: Final budget.

Concept	Cost
Human resources	1 188 €
Hardware	53.3 €
Software	11.68 €
Energy resources	0.58 €
TOTAL	1 253.56 €

Note that the minimum interprofessional wage has been used for the human resources budget computation as a minimum. Probably the study is expected to have a slightly higher budget.

3 References

- [1] *Salario mínimo interprofesional*. Retrieved on September 28, 2020.
<http://www.salariominimo.es/>
- [2] *Mathworks. Pricing and licensing*. Retrieved on September 28, 2020.
<https://es.mathworks.com/pricing-licensing.html>
- [3] *OMIE*. Retrieved on September 28, 2020.
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