



UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

Escola Superior d'Enginyeries Industrial,
Aeroespacial i Audiovisual de Terrassa

MSc. in Space and Aeronautical Engineering

Study of the performance of the propulsion units with nitrogen-jet thrusters for astronaut Extravehicular Activities (EVAs)

Master Thesis - Budget

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1. Budget

This project achieved the implementation two main codes and two functions: the first code created was regarding the performance analysis of the SAFER nitrogen-jet thrusters, utilizing a function for the calculation of the Mach number at the exit of the nozzle, while the second code was regarding the orbital dynamics applied on the EVA crew member, utilizing a function for the numerical resolution of the Clohessy-Wiltshire equations. Thus, since the whole project consisted of the presented theory and the programming regarding the thrusters and the dynamics of the astronaut, no budget for its implementation can be calculated. Therefore, the budget presented in this section will consist on the expenses that would generate the design of the theory and the corresponding algorithm.

Human resources	12,732.50 €
Junior Propulsion Engineer [1]	27.50 €/h
Work hours (14 ECTS)	463 h
Software resources	0 €
Matlab R2018a (Academic)	0 €
Energy resources	3.89 €
Laptop power consumption [2]	60 W
Electricity expense (Spain)	0.14€/kWh
Work hours (14 ECTS)	463 h
Total expenses	12,736.39 €

(Fig. 1.1.: Thesis budget)

[1] Institute, E. (2021). Salary Expert - Aeronautical Engineer Salary Spain. Salary Expert. Retrieved 18 June 2021, from: <https://www.salaryexpert.com/salary/job/aeronautical-engineer/spain>.

[2] Electricity usage of a Laptop or Notebook - Energy Use Calculator. Energyusecalculator.com. (2021). Retrieved 18 June 2021, from:

https://energyusecalculator.com/electricity_laptop.htm#:~:text=Electricity%20usage%20of%20a%20Laptop%2C%20Notebook%20or%20Netbook&text=When%20charging%20the%20laptop%20battery,inch%20laptop%20when%20plugged%20in.