



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

UNIVERSITAT POLITÈCNICA DE CATALUNYA

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# Autonomous aerial vehicle: flight control and energy management

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## Budget

**Degree:** Bachelor's Degree in Aerospace Vehicle Engineering

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# Contents

List of Tables	3
1 Introduction	4
2 Manpower	5
3 Prototype	6
4 Total cost	7

# List of Tables

2.0.1	Fees budget . . . . .	5
3.0.1	Prototype budget . . . . .	6

# 1 | Introduction

The aim of the budget is to provide information about the cost of elaboration of this project. This include engineering fees and manufacturing cost of the prototype.

## 2 | Manpower

In this chapter the value of the engineering fees will be specified.

Work package	Cost per hour (€/h)	Duration (h)	Cost (€)
<b>Definition and planning</b>	15	25	375
<b>Vehicle parts</b>	15	255	3825
Selection of the UAV	15	80	1200
Battery	15	100	1500
System of renewable energy	15	75	1125
<b>Energy management</b>	15	190	2850
Measurement and control electronics	15	80	1200
Algorithm	15	110	1650
<b>Prototype</b>	15	110	1650
Integration and checking	15	20	300
Experimental validation	15	60	900
Results analysis	15	30	450
<b>Presentation</b>	15	30	450
Documentation	15	20	300
Planning of the defence	15	10	150
<b>Total cost</b>			9150

Table 2.0.1: Fees budget

## 3 | Prototype

In this chapter the cost of elaboration of the prototype is specified. Numbers have been rounded to the highest unit, except in the case of the cost per credit, where what is rounded is the total cost.

<b>Work package</b>	<b>Cost per unit (€)</b>	<b>Units</b>	<b>Cost (€)</b>
<b>Structure</b>			33
Frame	21	1	21
Battery support	10	1	10
Communication system case	2	1	2
<b>Engines</b>	19	4	76
<b>Propeller</b>	1	4	4
<b>Battery</b>	40	1	40
<b>Control electronics</b>			157
ESC	9	4	36
Flight controller	121	1	121
<b>Measurement electronics</b>			124
GPS/Compass	66	1	66
Sonar	38	1	38
Power module	20	1	20
<b>Communications</b>			307
RockBLOCK Mk2	230	1	230
Arduino MEGA	35	1	35
Line rental (1 month)	12	1	12
Credit	0.15	200	30
<b>Software licenses</b>		0	
MATLAB	0 (Academic license)	1	0

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SolidWorks	0 (Academic license)	1	0
Arduino	0 (Open source)	1	0
Python	0 (Open source)	1	0
Mission Planner	0 (Open source)	1	0
<b>Total cost</b>			<b>741</b>

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Table 3.0.1: Prototype budget

## 4 | Total cost

Taking into account the exposed in the previous sections, the total cost of the project has been of **9891 €**.