

# MECHATRONIC PROJECT 478: ECSA EXIT LEVEL OUTCOME EVALUATION

ELO 1: Problem Solving	
Demonstrate competence to identify, assess, formulate and solve convergent and divergent engineering problems creatively and innovatively.	<ul style="list-style-type: none"> <li>• Chapters 1,2,3 and 4</li> <li>• Poster</li> </ul>

- Identify the need for an inexpensive smart trainer that will be able to interface with Zwift.
- Indicate the criteria needed to connect with Zwift, as well as have a usable trainer done in Introduction and Literature Review. (Chapter 1 and 2).
- Best solution for general problem presented, then split into separate sections to solve further into. Software and Hardware requirements (Chapter 3 and 4)

ELO 2: Application of Scientific and Engineering Knowledge	
Demonstrate competence to apply knowledge of mathematics, basic science and engineering sciences from first principles to solve engineering problems.	<ul style="list-style-type: none"> <li>• Section 4.1</li> </ul>

- Model of Forces involved in trainer for use in basic hardware design and component selection.
- Mathematical model and analysis of Eddy Current Brake. (Section 4.1)

ELO 3: Engineering Design	
Demonstrate competence to perform creative, procedural and non-procedural design and synthesis of components, systems, engineering works, products or processes.	<ul style="list-style-type: none"> <li>• Chapter 2 and 3</li> </ul>

- Design the software approach, communicating with Zwift through BLE protocol.
- Design a hardware approach for both the resistance brake and the general trainer.
- Design the electro-mechanical control of the braking unit and the controlling software. (Chapter 2 and 3)