School of Technology and Management
Course Unit Syllabus

Level of qualification:
Second Cycle (EQF level 7) - Master
Study cycle:
Internet of Things

Course Unit: – **Introduction to Research in Engineering**

Year 1 **Semester 1** **ISCED Code: 0613** **ECTS: 2**

Type of Course Unit: Compulsory **Delivery Mode:** Face-to-face **Language of Instruction:** Portuguese

COURSE COORDINATOR: João Paulo Barros

HOURS OF WORK

TOTAL HOURS	Contact Hours								Hours in autonomous work
	Theory	Theory and practice	Practical and laboratory work	Field work	Seminar	Internship	Tutorial guidance	Other	
50		**8**							**42**

Prerequisites (if applicable):

LEARNING OUTCOMES (knowledge, skills and competence)

On successful completion of this course unit, the student should be able to:

1. Classify the relevance and quality of scientific literature for a given problem;
2. Debate viewpoints concerning a research problem;
3. Describe a scientific writing process and its phases;
4. Discuss the possible ethical problems related to a research project or publication;
5. Review technical and scientific literature;
6. Find literature using the available resources;
7. Select relevant scientific literature for a given problem;
8. Write an article about a state-of-the-art;
9. Present an article.

CONTENTS

1. What is Research.
2. Ethics and Research.
3. Research methods.
4. Linkage between Research and thesis projects.
5. Purposes of Thesis Projects.
6. Choosing a Subject Area.
7. Choose Problem to Focus on Within the Subject Area.
8. Finding resources.
9. References and citations.
10. Methods.
11. Presenting data.

12. Drawing conclusions and identifying future work.

13. Oral presentations.

DEMONSTRATION OF THE CONTENTS COHERENCE WITH THE COURSE UNIT'S LEARNING OUTCOMES

We present the relevant contents for each learning outcome:

1. Classify the relevance and quality of scientific literature for a given problem (1, 2);

2. Debate viewpoints concerning a research problem (1, 2, 3, 10, 11, 12, 13);

3. Describe a scientific writing process and its phases (1, 2, 3);

4. Discuss the possible ethical problems related to a research project or publication (1, 2),

5. Review technical and scientific literature (1, 2, 3);

6. Find literature using the available resources (1, 3, 8, 9);

7. Select relevant scientific literature for a given problem (1, 3, 4, 5, 6, 7);

8. Write a state-of-the-art article (1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12);

9. Present an article orally (10, 11, 12, 13).

TEACHING METHODOLOGIES

For each theme, specific resources are recommended for students to study before class. Each theme is summarized using expositive methods based on several available resources, namely articles and videos. The presentation is followed by in-class discussion.

At the end of the class, new resources are recommended.

After the first classes, each student starts to write a state-of-the-art article, which is delivered and presented in the end of the semestre.

DEMONSTRATION OF THE COHERENCE BETWEEN THE TEACHING METHODOLOGIES AND THE LEARNING OUTCOMES

Before each class and for each topic, the students study several resources, namely articles and videos. These foster a follow-up discussion in class where all students participate. This discussions promote further and deeper learning. After the first initial topics, the students start to write a review paper about the state of the art of a chosen theme. In the end, the student has to present the article and answer questions about it.

EVALUATION METHODS

The evaluation will have two components:

- State of the art article;

- Oral presentation of the article.

MAIN BIBLIOGRAPHY

Berndtsson, M, Hansson, J., Olsson, B, Lundell, B. (2008) "Thesis Projects A Guide for Students in Computer Science and Information Systems", second edition, Springer-Verlag. Available at em https://link.springer.com/book/10.1007/978-1-84800-009-4.

Leedy, P, Ormrod, J. (2016), "Practical Research: Planning and Design" 11th Edition, Pearson Education Limited.

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