Course: Research Skills — credits: 2

Course code	ELVH17ARESS
Name	Research Skills
Study year	2022-2023
ECTS credits	2
Language	English
Coordinator	P.M. Gomes Lourenco

Modes of delivery	Assignment Individual supervision Lecture Practical / Training
Assessments	Research Skills - Assignment

Learning outcomes

At the end of this study unit your are able to:

- Find scientific articles that are relevant to a given topic by using a search engine
- Explain the conclusion(s) and goal(s) of the research in a given scientific article by summarizing part of the article
- Enforce arguments, verify or falsify a statement by using references to scientific articles at the correct point in a text in a consistent format
- Pose a research question and sub research questions that makes clear what the main topic of the research is.
- Write experimentals in such a way that others that were not present and do not know about the experiment can repeat the following procedure and arrive at the same results:
  - Machine type and manufacturer
  - Pre-treatment of samples
  - Measurement details
  - Analysis of the results
- Keep a lab journal that includes details of all experiments that are performed so all people involved in the research understood what was done
- Present results and observations depending on the type and amount of result:
  - Graphs
  - Tables
  - Written sentences
- Compare found results with results found in literature to determine whether something is expected or not and come up with a reasonable explanation why things are different by using references and differences in experimental procedures
- Write a conclusion that answers the original research question and explains all (most) observations
- Write an abstract that includes the research question, experimental design and conclusions in 5-10 sentences
- Extract information about special sensors by reading selected scientific articles
- Understand some of the latest techniques applied in research on sensor technology by reading selected scientific articles
- Find and compare at least 3 scientific articles on a given topic to enhance critical thinking and draw conclusions
- Explain the principles and potential applications of modern research on sensor technology in a selected scientific article to an audience of semi-specialists

Content

In this study unit you will learn how to properly write a scientific article based on your research. We will use your project as input for this article. The following topics will be addressed:

- Reading articles
- Referencing
- Posing a research question
- Doing/writing experiments
- Getting/writing results
- Writing a discussion
- Writing conclusionsWriting an abstract

Next to how to write a scientific article we will also discuss state-of-the-art sensors. These sensors are often not on the market yet, but still in a proof of concept phase in various laboratories all over the world. You will receive a relevant and modern scientific article in which a special sensor is investigated and explained. It is your task to present the contents of this article (in groups of 2-3 students) to the rest of the class. For passing this course, you are going to receive a grade for the summary of your article (50%) and a grade for your presentation (50%). Delivery of all parts of the article, attendance and co-assesing are conditional.

Included in programme(s)

Exchange Technology to Innovate (autumn)
Electrical Engineering Major Sensor Technology
Minor Technology to Innovate

School(s)

Institute of Engineering

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