Course: Research Skills — credits: 5

Course code	SEVM26RS
Name	Research Skills
Study year	2026-2027
ECTS credits	5
Language	English
Coordinator	P.M. Gomes Lourenco
Modes of delivery	Lecture Project-based learning
Assessments	Research Skills - Assignment

Learning outcomes

At the end of this module the student:

- independently gathers, selects and analyses relevant new information in a responsible way by using scientific databases, correct search terms, and evaluating the source of the information.
- formulates and critically verifies a research question with sub-questions through a logical line of reasoning from the practical problem to the specified research question.
- designs a research methodology that delivers relevant and reliable results and communicates this methodology in a way that is easy to replicate by others.
- communicates the knowledge, gained by critically judging insights originating from the forefront of smart system design, in a logical line of reasoning to a public of experts by writing a research paper, including a clear context and research goal, detailed methods, a structured presentation and discussion of the results, and sound conclusions that lead to answering the research question and giving advice to the client.
- presents their research in a presentation in the format of a scientific conference, in an effective and clear fashion, with high information density and leaving no gaps.
- optimizes the advice or design of an advanced smart sensor system application through critical reflection on the impact on society, environment, and end-user implications, based on ethical aspects, risk analysis and any other relevant information.
- considers the ethical implications when designing an advanced smart system by reflecting on the impacts on society, environment, and end-user implications, based on ethical aspects, risk analysis and any other relevant information.

Content

The course covers the following topics:
Research and innovation in engineering have a multitude of impacts on society and on the world. The study unit Sustainable Research Skills allows the student to improve (some of) their research skills, such as addressing a practical problem, investigating that problem in scientific literature, and finding possible solutions that lead to proposing a research question with sub questions. The student is expected to be critical of his/her research as well as that of others, while also being called to reflect on the relevance of ethics in the engineering field in general by taking part in a series of discussions on different ethical issues relevant for engineering and preparing themselves discussions on specific ethical problems.

Included in programme(s)

Smart Systems Engineering

School(s)

Engineering, Life Sciences & ICT

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