IC.2302 – Introduction to research

GENERAL INFORMATION

Module: Introduction to Research
Module leader: Lionel TROJMAN
Module ID: IX.2308 / IX.2408
ECTS: 3
Average amount of work per student: 125 hours, including 40 hours supervised
Teamwork: yes
Keywords:

Presentation

Research is the key to human society's development. On the academy side, it continuously builds new knowledge and proposes new skills for the teaching-learning to students of each new generation. The researchers play hence a primordial role in the Higher Education Institutions (Universities, Engineering schools among others). On the industry side, it consolidates the leadership on the market and prepares the introduction of new products and techniques.

Research activities are based on high-level brain skills development. And these ones rely on many cognitive skills that only graduate students may acquire. It is the reason why in this module we introduce cognitive and communication skills, methodology for information organization and critic thinking; in other terms, some important keys to understand the amazing world of the Research. Interestingly, the student will also have to apply these knowledges and skills in-situ thanks to the participation of researchers of the Isep who are working in Sciences and Technologies based projects in the Laboratory of Informatic, System, Image, Telecom and Electronics (LISITE). Then we expect that the participants will have a full picture of the research, and this way may reveal hidden talent for this amazing discipline, real pillar of the human society.

Educational objectives

The student will be able to:

- (SO_1) auto-evaluate my research potentials
- (SO_2) demonstrate the acquisition of selected research skills according to the context
- (SO_3) report a research activity in the form of a presentation and/or poster

Prerequisite

- None

Content/Program

Concepts

The course is organized in the following four modules.

1. Being a researcher
    - The scientific context
    - The researcher's role, progress, and skills
    - How fit am I as a researcher?
2. The basics of the scientific research method
    - Observing the world: The idea
    - The steps of the scientific method

- Ethical issues
- The step of the scientific method
- Introduction to publication process

3. The research in Engineering Sciences

    - Literature review
    - Main research methods
    - Getting involved in research activity
    - Writing a report

4. Communicating research

    - My public profile
    - Designing my presentation
    - Designing my poster
    - Getting prepared to present and relate to your public

Tools used

The instructors will be applying the following learning tools:

- Free web interactive educational tools (Mindmeister, Genially, Kahoot, Padlet and/or others)
- Web videos
- Video presentations (Prezi or Adobe Spark)

The students will apply :

- Free web interactive educational tools (Trello, Kahoot, Canva, Prezi or Powerpoint)
- Web videos (YouTube, Vimeo, others)
- Electronic research resources

Pedagogical methods

Learning methods

The main learning methods promote active learning within an inverse methodology instructional design. Students are expected to learn and/or apply pedagogical strategies such as self-reflection and evaluation, questioning, discussion, role play, to name a few. Other implicit methodologies include critical, constructive, meaningful, collaborative, and creative learning. Finally, the course provides an initial, experiential project-based learning.

Evaluation methods

The courses' assessments include:

- Formative self-evaluations
- Formative co-evaluations
- Summative project-based evaluation

Language of work

The support, the course and the deliverable are in English. However, the communication teacher/students and some specific part of the course could be in French if this improves the understanding.

Bibliography, Webography, Other sources

- Clark, S. (2017). How did I become a researcher [YouTube]. https://www.youtube.com/watch?v=vOhyZ8FYCmw
- Doumont, J. L. Effective research posters. https://www.principiae.be/X0800.php

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- Evans, J. St. B. T. (2016). *How to Be a Researcher: A Strategic Guide for Academic Success*. Routledge.
- Ganesan, R. (2021). *Research Methodology for Engineers*. MJP Publisher.
- Thiel, D. V. (2014). *Research methods for Engineers*. Cambridge University Press.