

Course guide

2709993 - I2RM3 - Introduction to Research

Last modified: 16/07/2025

Unit in charge: Barcelona School of Informatics
Teaching unit: 270 - FIB - Barcelona School of Informatics.

Degree: MASTER'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2012). (Optional subject).
MASTER'S DEGREE IN INNOVATION AND RESEARCH IN INFORMATICS (Syllabus 2012). (Optional subject).
MASTER'S DEGREE IN ARTIFICIAL INTELLIGENCE (Syllabus 2017). (Optional subject).
MASTER'S DEGREE IN DATA SCIENCE (Syllabus 2021). (Optional subject).

Academic year: 2025 **ECTS Credits:** 3.0 **Languages:** English

LECTURER

Coordinating lecturer:

Others:

PRIOR SKILLS

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TEACHING METHODOLOGY

Methodologically, this course follows a research supervision format similar to that used with a PhD student. Practical research activities will need to be carried out, which will be defined when preparing the research plan in collaboration with the supervisor. The student is expected to go through a process guided by the supervisor that includes understanding the research objectives, planning research tasks, evaluating the state of the art, proposing original research, and developing and experimenting with the specific research tasks agreed upon with the supervisor.

LEARNING OBJECTIVES OF THE SUBJECT

1. Knowledge and practice of the scientific method
2. Knowledge and practice of research methods in Computer Science
3. Ability to reason and argue to discuss and validate research methods and results

STUDY LOAD

Type	Hours	Percentage
Self study	54,0	72.00
Hours small group	21,0	28.00

Total learning time: 75 h

CONTENTS

Research planning

Description:

Preparation of the research plan: objectives, review of the state of the art, selection of experimental method, design of experiments, validation criteria

Research: development of the research activity

Description:

Experimentation, development of algorithms and their testing, discussion of results with the tutor and review of hypotheses

Reporting

Description:

Preparation of the research report required for evaluation, which must follow a traditional paper-like structure: introduction, state of the art, formalization of the proposed solution (e.g., as hypotheses), experimentation, and conclusions.

ACTIVITIES

Research Plan

Description:

Information from the tutor on the context, objective and scope of their participation in the research project. Joint agreement on the milestones and time allocated, as well as the type of final result expected from the student's participation. Presentation and discussion of the research plan, method to be followed, data sources, bibliographic and software sources and, in general, everything you need to know and have at hand to start and follow the research project. Agreement on the frequency and form of review throughout the project. Agreement and definition of internal documentation formats, and publication format and possible participation in scientific conferences. Decision on the type of storage environments for the developed software. Sharing criteria and licenses for the developed software. Criteria for protection and exchange of other research results.

Specific objectives:

1, 2

Full-or-part-time: 13h

Laboratory classes: 5h

Self study: 8h

Research Development

Description:

Development of the research project

Specific objectives:

2, 3

Full-or-part-time: 45h

Laboratory classes: 15h

Self study: 30h



Reporting

Description:

Preparation of internal reports, software and hardware development documentation, information on all types of resources necessary to use and replicate the research results: repositories, specific computing systems, hardware and software configurations, specific hardware devices, datasets used and their storage location and sharing method; bibliographies, written articles, possible conference presentations, etc. Preparation of the final report of the research project.

Specific objectives:

2, 3

Full-or-part-time: 17h

Laboratory classes: 1h

Self study: 16h

Discussion of the activity report with the tutor

Specific objectives:

1, 2, 3

Full-or-part-time: 1h

Guided activities: 1h

GRADING SYSTEM

The evaluation of the students is carried out by the tutor of the activity.

The evaluation seeks to assess the quality of the work carried out by the student from the point of view of consistency and agreement with the research methods and the objectives and methodological particularities of the specific research carried out.

For this reason, the student must (a) prepare a short report (in the style of a scientific article or presentation at a scientific conference) and (b) make a presentation/discussion to the tutor who will evaluate it.

It is recommended to structure this report and its presentation and discussion as a presentation at a scientific conference. Therefore, it must have clear sections for a summary ("abstract"), introduction, development, conclusion and discussion of the results obtained and their relationship with the objectives of the research, in addition to a bibliography section. It is recommended to make the data used in the development of the research available (using an accessible repository such as Gitlab), so that the scientific community can check how any algorithms developed in the research work.

BIBLIOGRAPHY

Basic:

- Booth, Wayne C; Colomb, Gregory G; Williams, Joseph M; FitzGerald, William T. The Craft of research. Fifth edition. The University of Chicago Press, 2024. ISBN 0226826678.
- González García, Juana María; León Mejía, Ana; Peñalba, Mercedes. Cómo escribir y publicar un artículo científico. Editorial Síntesis, 2016. ISBN 9788490774502.
- Turabian, Kate L; Colomb, Gregory G; FitzGerald, William T; Bizup, Joseph; Williams, Joseph M; Booth, Wayne C. A Manual for writers of research papers, theses, and dissertations : Chicago Style for students and researchers. 9th edition. The University of Chicago Press, 2018. ISBN 022643057X.
- Alley, Michael. The craft of scientific presentations: critical steps to succeed and critical errors to avoid.. Springer, 2013. ISBN 1441982787.
- León, Orfelio G. Cómo redactar textos científicos y seguir las normas APA 7ª para los trabajos de fin de Grado (TFG), trabajos de fin de máster (TFM), tesis doctorales y artículos de investigación.. Quinta edición. Garceta Grupo Editorial, 2020. ISBN 978-84-1728-950-8.