

Course guide

250COD012 - 250COD012 - Ethics and Communication in Science and Engineering

Last modified: 16/06/2026

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.
Degree: MASTER'S DEGREE IN COMPUTATIONAL AND DATA-ASSISTED ENGINEERING (Syllabus 2026).
(Compulsory subject).

Academic year: 2026 **ECTS Credits:** 5.0 **Languages:** English

LECTURER

Coordinating lecturer: Sergio ZÁOTNIK
Others: Jose Manuel Gonzalez Lopez

PRIOR SKILLS

Oral and written English.

REQUIREMENTS

None

TEACHING METHODOLOGY

The course consists of 4 hours per week, combining theoretical and practical aspects of communication. All materials are distributed through the Atenea virtual campus.

LEARNING OBJECTIVES OF THE SUBJECT

The main objective of the course is to enable students to:

- help the students identify the important aspects for the preparation of oral, written and poster presentations, improving their communication skills in the scientific field,
- learn the use of large language models as aids for writing; their potentialities and ethical aspects,
- know methodologies for structuring scientific texts, and posters
- identify the key aspects of preparing research papers and articles,
- make rational and ethical use of computational and machine learning techniques for the preparation and presentation of scientific papers,
- know the intellectual properties dimension (copyright) of text, figures and code.

STUDY LOAD

Type	Hours	Percentage
Hours large group	45,0	36.00
Self study	80,0	64.00

Total learning time: 125 h

CONTENTS

Session 1: Introduction to the course

Description:

- Presentation of the course, main concepts and assessment mechanisms
- Writing part 1: titles
- Techniques: Rapid writing
- Practice 1

Full-or-part-time: 2h

Theory classes: 2h

Session 2: Writing of scientific texts

Description:

- Titles/summaries
- Use of Large Language Models (LLM) in text preparation. Ethical aspects, intellectual properties.
- Latex
- Practice 2

Full-or-part-time: 2h

Theory classes: 2h

Session 3: Writing

Description:

- Structure of manuscripts
- Techniques: Branching
- Constraints
- Practice 3

Full-or-part-time: 2h

Theory classes: 2h

Session 4: Figures

Description:

- History/Theory/Examples
- Ethics in showing the data
- Ethics in the creation of figures with LLM.
- Practice 4

Full-or-part-time: 2h

Theory classes: 2h

Session 5: Public speaking

Description:

- Speech/structure
- Audience
- Body language
- Anxiety
- Practice 5

Full-or-part-time: 2h

Theory classes: 2h

Session 6: Invited speaker

Description:

- Invited speaker
- Four minutes presentations
- Practice 6

Full-or-part-time: 2h

Theory classes: 2h

Session 7: Poster design

Description:

content english

Specific objectives:

- Posters/Design/Audience
- Structure/Organization
- Images/Blocks
- Colours palettes
- Examples
- Practice 7

Full-or-part-time: 2h

Theory classes: 2h

Session 8: Poster presentation

Description:

- Practice/evaluation

Full-or-part-time: 2h

Theory classes: 2h

Session 9: Preparation of proposals

Description:

- Preparations of written and oral proposals
- Specific kind of writing: solve a problem
- Competition/Format/Content/Audiences/Politics

Full-or-part-time: 2h

Theory classes: 2h

Session 10: Preparation of proposals

Description:

- Practice/evaluation

Full-or-part-time: 2h

Theory classes: 2h

Session 11: Accountability, Professionalism, and Communication

Description:

- Ethics
- Intellectual Property and Open Science
- Transparency, open data and open methods
- Copyright models

Full-or-part-time: 2h

Theory classes: 2h

Session 12: Ethics

Description:

- AI/responsibility/trackability
- Data Ethics & Representation
- AI and training bias

Full-or-part-time: 2h

Theory classes: 2h

Session 13: Public speaking

Description:

- Practice/evaluation

Full-or-part-time: 2h

Theory classes: 2h

GRADING SYSTEM

The course is assessed through practical assignments that must be submitted or presented in class. There are no written exams.

EXAMINATION RULES.

AI-generated material will not be accepted unless specifically requested.

All submitted material must be created for this course. Material created for other purposes (conferences/presentations) will not be accepted, even if the author is the same.

BIBLIOGRAPHY

Basic:

- Alley, Michael. The Craft of Scientific Writing. 4th ed. New York: Springer, 2018. ISBN 9781441982889.
- Higham, N.J. Handbook of writing for the mathematical sciences. 2nd ed. Philadelphia: SIAM, 1998. ISBN 9780898714203.
- Klauser, H.A. Writing on both sides of the brain [on line]. 30th. Santa Barbara, CA: Harper-Collins publisher, 1987 [Consultation: 26/06/2026]. Available on : <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=29435858>. ISBN 0063010259.
- Goldberg, Natalie. Writing down the bones. 2nd ed. Colorado: Shambhala, 2016. ISBN 9781611803082.
- Tufte, Edward R. The Visual Display of Quantitative Information. Cheshire, Connecticut: Graphics Press, 1983. ISBN 096139210X.
- Alley, Michael. The Craft of Scientific Presentations [on line]. 2nd ed. New York: Springer, 2013 [Consultation: 26/06/2026]. Available on: <https://link-springer-com.recursos.biblioteca.upc.edu/book/10.1007/978-1-4419-8279-7>. ISBN 1441982795.