

From data to divulgation: the scientific path

Dr. Lorenzo Bartolucci

Ricercatore

SSD: ING-IND/08 – Macchine a fluido

Università di Roma Tor Vergata



22, 25, 29 Marzo e 1, 4, 7, 12, 14, 19 Aprile 2022

Ore 11.00-13.30

Online su piattaforma MS Teams

Per aderire al corso occorre inviare una mail al docente (lorenzo.bartolucci@uniroma2.it) richiedendo di poter partecipare al corso per essere aggiunti alla classe MS Teams che sarà utilizzata per comunicazioni, caricare il materiale delle lezioni e organizzare i meeting delle varie classi.

Il Corso sarà tenuto in inglese, e consta di 3 moduli da 1CFU ciascuno (3 lezioni da 3 ore accademiche). Di seguito viene riportato il programma indicativo.

Module 1 – Scientific Writing

Objectives

The module 1 aims to provide the key components of the scientific writing structure. The fundamental elements of a scientific paper will be presented and the creation of a document about a generic laboratory or numerical study will be asked in order to verify the concepts covered by the lectures.

Program

Lesson 1 – Theoretical lesson on writing and structure of a paper / thesis.

The fundamental elements of the structure of a paper / thesis will be presented and analysed deeply.

In particular, the first lesson will cover the following elements:

- a. Abstract - structure and essential elements, definition of context, objective and method, presentation of different types of abstracts based on some published examples, importance of keywords and summary of main results
- b. Introduction - structure and analysis of the state of art, presentation of tools for literature study and organization of the work summary aimed at defining a clear introduction that allows for a clear statement of the specific contribution of the presented study
- c. Bibliography - examples of bibliography and tools for a fast and dynamic realization

Lesson 2 – Theoretical lesson on writing and structure of a paper / thesis

The fundamental elements of the structure of a paper / thesis will be presented and analysed deeply.

In particular, the second lesson will cover the following elements:

- a. Methodology - structure and analysis of examples from literature, analysis of the essential elements and possible tools for effective communication (flowcharts, concept maps)
- b. Results - structure and analysis of literature examples, importance of graphic elements, possible tools and quality standards
- c. Discussion / Conclusions - structure and analysis of literature examples

Lesson 3 – Critical analysis of scientific literature.

- a. Analysis of the structure of different papers (Scientific reports, Review papers, PhD Thesis)
- b. Analysis of the framework of the personal document proposed by the students
- c. Q&A session

Expected outcomes

At the end of the class basics of scientific writing will be properly managed by the student. A short report (in the form of an article – 4 pages) about a laboratory activity, which will be reviewed and discussed during the last class.

Module 2 – How to present your research

Objectives

The module 2 aims to develop the fundamental skills toward effective presentation. The structure of oral presentation will be analyzed, basics of the communication theory will be provided. Theoretical knowledge will be tested through practical experiences.

Program

Lesson 1 – Basics of presentation structure. Presentation file rouge and key elements. Description of the most used tools for making a presentation (PPT, CANVA, PRIZI). Tricks and point of attentions while making a presentation. Short practice.

Lesson 2 – Basics of communication theory. Practical experience.

Lesson 3 – Presentation contest. The best oral presentation will be awarded with the “best oral presentation certificate”.

Expected outcomes

At the end of the class the skills about communication for an effective presentation will be gained by the student. Lesson learned will be strengthened through practical experiences.

Module 3 – Post processing scientific data

Objectives

The module 3 aims to provide fundamental knowledge about post processing of scientific data. Through simple examples major functionalities and approaches for analysing data will be presented and practically tested by small exercises. All the modules will be developed in Matlab environment.

Program

Lesson 1 –Array, structure, cell data types. Dealing with big data. Conversion and manipulation of data types. Practical exercises in class.

Lesson 2 – Post processing data, different types of graphs, characteristics and best uses. Dealing with big data in postprocessing – synthetic indexes, statistical graphs.

Lesson 3 – Live scripting functionality and practical experience: starting from raw data, live scripting practice and plot realization. Comments and Q&A.

Expected outcomes

At the end of the class detail knowledge of the major functionalities and approaches for postprocessing data will be acquired by the student. A “live” practical experience will be developed in class during the last lesson.

Breve Curriculum Vitae

Dr. Lorenzo Bartolucci is currently a Researcher at the University of Rome Tor Vergata where he is co-lecturer of the Internal Combustion Engine course. He got his PhD in Industrial Engineering in 2017 with a project on the partially stratified combustion in natural gas fueled internal combustion engines. His main research focus is on the sustainable conversion and use of energy, starting from numerical analysis for advanced combustion strategies in high efficiency ICEs, to the development of smart control strategies for hybrid renewable energy systems. He has been collaborating with several national and international institutions such as the STEMS institute, the University of Alabama and the Argonne National Laboratory, where he spent one year as a visiting scholar during his PhD. He has co-authored more than 40 papers published both in conference proceedings and international journals. He is the co-PI of the PON project AIRE and PI of two industrial projects with IVECO group on the development of electric and fuel cell hydrogen vehicles. Since 2018 he has been co-organizing the Advanced Combustion Session of the ICEF conference and since 2022 he has been part of the scientific board of the SDEWES conference.