

Courses/Seminars for PhD students (Electronic Engineering –open to others) – June and July 2024 (Academic Year 2023/2024)

General frame

The Courses and Seminars are organized in five tracks:

1. Communication aspects of R&D (Scientific writing)
 2. Organization of R&D (Project Management),
 3. Exploitation and Protection of R&D (Patents, spin-off/start-up Companies)
 4. Critical Tools (Data Analysis)
 5. Examples of New Frontiers in R&D (Quantum computation, Epidermal electronics)
-

REMARK - The official language is English and all activities are held in the Lecture Room B16, “Nuovo Edificio Didattica di Ingegneria”, via del Politecnico, Roma

1. Scientific Writing (32 hours)

Prof. Thomas M. Brown - thomas.brown@uniroma2.it

Schedule: 17, 19, 21, 24, 25 of June from 9:30 to 13:00

8, 9 of July from 9:30 to 13:00

10 of July from 14:30 to 18:00

Main Topics : Expectations for PhD students, Careers for PhD students in and outside Academia in Engineering and Sciences, Understanding the publication process for peer-reviewed scientific articles: metrics, impact and impact factors, open access, selecting a journal, submission, cover letter, manuscript, peer review, response to reviewers, revisions, editorial processes. Understanding what makes research and your results publishable. Scientific communication: writing, presentations, finding information. Writing of a scientific article (with class exercises): structure of an article (title, abstract, introduction, results, discussion, conclusions etc.), graphing and images, writing a PhD thesis, writing a proceeding, preparing a poster, preparing an abstract for conferences.

*Curriculum Vitae: **Thomas M. Brown** investigated polymer OLEDs for his PhD at the Cavendish Laboratory, University of Cambridge. From 2001– 2005 he developed OTFTs and E-Paper as Senior Engineer with Plastic Logic Ltd. In 2005 he was recipient of a “Re-entry” Fellowship awarded by the Italian Ministry of University and Research and is Associate Professor at the University of Rome-Tor Vergata. Cofounder of the Centre for Hybrid and Organic Solar Energy, his current research is in solution-processed solar cells including perovskites, especially on flexible substrates, and bio-hybrid devices. He is author of over 150 publications and 15 patents and is Associate Editor of Solar Energy.*

2. Project Management (20 hours)

Prof. Vito Introna - vito.introna@uniroma2.it

Dott.ssa Annalisa Santolamazza - annalisa.santolamazza@uniroma2.it

Schedule: 20, 27 of June from 14:00 to 18:00

4, 12, 18 of July from 14:00 to 18:00

Content: The Project Management course aims at providing students with the basic competencies for managing a project. The course starts with an introduction to Project Management. Then the course focuses on project management processes: initiating processes, planning processes, executing and controlling processes and closing processes. The course focus on processes belonging to different knowledge areas: Scope, Time, Cost, Quality, Resource, Risk, Purchasing, Communication, Stakeholder and Integration. The standard steps and tools needed to implement each processes are described. Finally the course focuses on general management basic competencies and behavioural competencies needed for project manager.

*Curriculum Vitae: **Vito Introna** is Associate Professor at the University of Rome “Tor Vergata” where he teaches “Innovation and Project Management”. He received his PhD in Industrial Product and Process Engineering at the University of Naples “Federico II” in 2003. Since 2000 he has carried out research project for National and International Research Centers and international companies and he has held project management course within Master program and certification program. He is a certified project manager according to the standard UNI 11648:2016*

Curriculum Vitae: Annalisa Santolamazza is a Researcher at the University of Rome "Tor Vergata," where she teaches the course "Smart Factories." In 2020 she received her PhD in Design, Manufacturing and Operations Engineering and since then she has been involved in research and teaching at "Tor Vergata", the University of Tuscia and "Guglielmo Marconi" University in "Innovation and Project Management", "Industrial Plants" and "Energy Consumption Management". On the research front, she has primarily focused on themes related to maintenance and energy management and Smart Manufacturing.

3. Exploitation and Protection of Research and Development

3.1 Introduction to Patents and related procedures; the role of the IPR consultant (2 hours)

Ing. Antonio Celona - a.celona@ngpatent.it

Schedule: 27 of June, from 10:30 to 12:15

Curriculum Vitae - Antonio Celona - After graduating in 2001 at the University of Messina in Materials Engineering, he received a Master's Degree in Innovation and Development of Intellectual Property at the Istituto Guglielmo Tagliacarne in Rome in 2003. In 2008 he obtained the qualification as Italian Patent Consultant and he is qualified at the European Union Intellectual Property Office (EUIPO) in the field of designs. In 2012 he obtained the qualification as European Patent Attorney and he is enrolled in the European Patent Institute (EPI).

3.2 Design Your Start-Up (8 hours)

Dr. Roberto Giuliani – robertogiuliani10@alice.it

Schedule: 21 of June, from 14:00 to 18:00

5 of July, from 14:00 to 18:00

Main Topics

Introduction: key topics for a start-up

Design your Business Model Canvas: your company in one slide

The Business Plan structure and basic instructions about the economic and financial aspects of budgeting for your start-up.

The start-up fund raising activities addressed to private investors

Curriculum Vitae: Roberto Giuliani has over ten years of international experience in marketing and in strategic planning of business. His career started in an American multinational company and he was responsible for a regional-based incubator aimed to support the creation of new companies and spin-off in the high-tech area, with over thirty start-up companies created to date. Today he is in charge as Innovation Manager in a big industrial player in the mobility infrastructure sector.

4. Critical Tools (Data Analysis)

Artificial Intelligence and Machine Learning for Electronics Engineering

Dott. Sergio Spanò - spano@ing.uniroma2.it

Schedule: 3, 4, 10 of July, from 9:30 to 13:30

11 of July, from 14:30 to 18:30

Content: The course offers a comprehensive introduction to the foundational concepts of Artificial Intelligence (AI) and Machine Learning (ML). It covers key theories and equips students with the essential tools for developing practical Machine Learning applications. Throughout the course, students will explore various AI and ML methodologies, gaining hands-on experience with industry-standard software and frameworks. The curriculum is further enriched with the examination of real-world case studies, providing insights into how AI and ML are applied in practical scenarios, particularly in the context of Electronics Engineering. Overall, the course aims to build a solid understanding of AI and ML principles, while also fostering the skills necessary to apply this knowledge to address complex engineering challenges.

Curriculum Vitae: Sergio SPANO' received the Ph.D. degree (summa cum laude) in electronic engineering from the Tor Vergata University of Rome in 2022. Since then, he has been an Adjunct Professor at Tor Vergata University of Rome, where he is currently a Postdoctoral Research Fellow. In addition, he is an Adjunct Professor at "Guglielmo Marconi" University of Rome. He has several industrial work experiences in the fields of space and telecommunications. His research interests include digital signal processing, machine learning, the IoT, the development of telecommunication systems, and the implementation of machine learning accelerators for embedded and low-power systems.

5. Examples of New Frontiers in R&D

5.1 Radio Frequency Identification and Sensing for the Digital Transition in Industry and Medicine (8 hours)

Prof. Gaetano Marrocco - gaetano.marrocco@uniroma2.it

Schedule: 11,12 of July, from 9:30 to 13:30

Content: This course introduces the basics of Radiofrequency Identification technology (RFID) from its assessed application in the logistic of goods and, above all, to the most advanced research trends in bio-engineering and in predictive maintenance. Indeed, an RFID system is one of the best scalable infrastructures that can handle a single device, like an implanted sensor and a fruit, but it can, however, be indefinitely replicated to control a multitude of entities in farms and even in process of huge complexity thus becoming an unprecedented source of big-data.

Curriculum Vitae: **Gaetano MARROCCO** is currently Full Professor of Electromagnetics at the University of Roma Tor Vergata, director of the Medical Engineering Degree and Chair of the Pervasive Electromagnetics Lab. His research is currently focused to the development of the wireless physical layer of the Medical and Industrial Internet of Things. He pioneered the extension of RFID technology to the batteryless sensing of deformation, temperature, humidity, volatile compounds, implanted bio prosthesis, skin parameters, human motion recognition and restoration of epidermal senses.

Associate Editor of IEEE RFID Journal and of IEEE Journal of Flexible Electronics, chair of the Commission D - Electronics and Photonics, Union RadioScience International (URSI) - Italy, Co-founder and President of the University spin-off RADIO6ENSE, active in Industry 4.0.

5.2. Introduction to Quantum Computation for Engineers (16 hours)

Prof. Aldo Di Carlo - aldo.dicarlo@uniroma2.it

Schedule: 15, 16, 17, 18 of July, from 9:00 to 12:00

Content: In this course I will review the basic concept of quantum computing and the new paradigm for computation introduced by the quantum mechanical concepts. The concept of qbit is introduced and a short discussion about the quantum algorithm is presented. An overview of present implementation of quantum computers will be given including quantum programming software.

Curriculum Vitae - **Aldo Di Carlo** is the director of the Institute for Structure of the Matter of the Italian National Research Council (CNR-ISM) and full professor at the University of Rome "Tor Vergata" (Italy). His research activity focusses on the design, fabrication and characterization of electronic and optoelectronics devices. He was developing a quantum simulation tool based on non-equilibrium transport theory for nanodevices which has been extended to the multiscale simulation software TiberCAD. Recently he was focusing his research investigation on novel nanomaterials including nanotubes, graphene and related 2D materials and halide perovskites. Di Carlo is author/coauthor of more than 450 scientific publications on international journals, 13 patents and several book chapters.

	<u>Monday</u>	<u>Tuesday</u>	<u>Wednesday</u>	<u>Thursday</u>	<u>Friday</u>	<u>Room</u>
	17 June 2024	18 June 2024	19 June 2024	20 June 2024	21 June 2024	
June 17 -21	T.Brown <i>Scientific Writing</i> (9:30 – 13:00)		T.Brown <i>Scientific Writing</i> (9:30 – 13:00)	V.Introna A. Santolamazza <i>Project Management</i> (14:00 – 18:00)	T.Brown <i>Scientific Writing</i> (9:30 – 13:00) R. Giuliani <i>Design Your Start-Up – Part 1</i> (14:00 – 18:00)	B16
	24 June 2024	25 June 2024	26 June 2024	27 June 2024	28 June 2024	
June 24 – 28	T.Brown <i>Scientific Writing</i> (9:30 – 13:00)	T.Brown <i>Scientific Writing</i> (9:30 – 13:00)		A. Celona <i>Introduction to Patents and related procedures; the role of the IPR consultant</i> (10:30 – 12:15) V.Introna A. Santolamazza <i>Project Management</i> (14:00 – 18:00)		B16
	1 July 2024	2 July 2024	3 July 2024	4 July 2024	5 July 2024	
July 1 - 5			S. Spanò <i>Artificial Intelligence and Machine Learning for Electronics Engineering</i> (9:30 – 13:30)	S. Spanò <i>Artificial Intelligence and Machine Learning for Electronics Engineering</i> (9:30 – 13:30) V.Introna A. Santolamazza <i>Project Management</i> (14:00 – 18:00)	R. Giuliani <i>Design Your Start-Up – Part 2</i> (14:00 – 18:00)	B16
	8 July 2024	9 July 2024	10 July 2024	11 July 2024	12 July 2024	
July 8 - 12	T.Brown <i>Scientific Writing</i> (9:30 – 13:00)	T.Brown <i>Scientific Writing</i> (9:30 – 13:00)	S. Spanò <i>Artificial Intelligence and Machine Learning for Electronics Engineering</i> (9:30 – 13:30) T.Brown <i>Scientific Writing</i> (14:30 – 18:00)	G. Marrocco <i>Radio Frequency Identification and Sensing for the Digital Transition in Industry and Medicine</i> (9:30 – 13:30) S. Spanò <i>Artificial Intelligence and Machine Learning for Electronics Engineering</i> (14:30 – 18:30)	G. Marrocco <i>Radio Frequency Identification and Sensing for the Digital Transition in Industry and Medicine</i> (9:30 – 13:30) V.Introna A. Santolamazza <i>Project Management</i> (14:00 – 18:00)	B16
	15 July 2024	16 July 2024	17 July 2024	18 July 2024	19 July 2024	
July 15 - 19	A. Di Carlo <i>Introduction to Quantum Computation for Engineers</i> (9:00 – 12:00)	A. Di Carlo <i>Introduction to Quantum Computation for Engineers</i> (9:00 – 12:00)	A. Di Carlo <i>Introduction to Quantum Computation for Engineers</i> (9:00 – 12:00)	A. Di Carlo <i>Introduction to Quantum Computation for Engineers</i> (9:00 – 12:00) V.Introna A. Santolamazza <i>Project Management</i> (14:00 – 18:00)		B16