Courses/Seminars for PhD students (Electronic Engineering –open to others) – June and July 2023 (Academic Year 2022/2023)

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)

4. Examples of New Frontiers in R&D (Quantum computation, Epidermal electronics)

REMARK - The official language is English and all activities are held in the <u>Lecture Room B16</u>, "Nuovo Edificio Didattica di Ingegneria", via del Politecnico, Roma

1. Scientific Writing (32 hours)

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

Schedule: 19, 21, 26, 28 of June from 9:30 to 13:00

5, 7, 10, 12 of July from 9:30 to 13:00

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 - <u>vito.introna@uniroma2.it</u> Schedule: 20, 27 of June from 14:00 to 18:00 4, 11, 13 of July from 14:00 to 18:00

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.

3. Exploitation and Protection of Research and Development Introduction to Patents and related procedures; the role of the IPR consultant (2 hours) Ing. Antonio Celona - <u>a.celona@ngpatent.it</u>

Schedule: 20 of June, from 11:00 to 12:45

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).

4. Examples of New Frontiers in R&D

4.1 *Radio Frequency Identification and Sensing with applications ranging from Factory to Prosthetics & Skin Intelligence (8 hours)*

Prof. Gaetano Marrocco - <u>gaetano.marrocco@uniroma2.it</u>

Schedule: 3 of July, from 09:30 to 13:30 and 6 of July, from 09:00 to 13:00

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 bioengineering 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.

4.2. Introduction to Quantum Computation for Engineers (16 hours) Prof. Aldo Di Carlo - <u>aldo.dicarlo@uniroma2.it</u> Schedule: 10, 12 of July, from 14:00 to 17:00

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

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>Week</u>	<u>Monday</u>	<u>Tuesday</u>	<u>Wednesday</u>	<u>Thursday</u>	<u>Friday</u>	<u>Room</u>
	19 June 2023	20 June 2023	21 June 2023	22 June 2023	23 June 2023	
June 19 - 23	T.Brown Scientific Writing (9:30 – 13:00)	A. Celona Introduction to Patents and related procedures; the role of the IPR consultant (11:00 – 12:45) V.Introna Project Management (14:00 – 18:00)	T.Brown Scientific Writing (9:30 – 13:00)			B16
	26 June 2023	27 June 2023	28 June 2023	29 June 2023	30 June 2023	
June 26 – 30	T.Brown Scientific Writing (9:30 – 13:00)	V.Introna Project Management (14:00 – 18:00)	T.Brown Scientific Writing (9:30 – 13:00)	SS Pietro e Paolo	Chiusura Ateneo	B16
	3 July 2023	4 July 2023	5 July 2023	6 July 2023	7 July 2023	
July 3 - 7	G. Marrocco Radio Frequency Identification and Sensing with applications ranging from Factory to Prosthetics & Skin Intelligence (9:30 – 13:30)	V.Introna Project Management (14:00 – 18:00)	T.Brown Scientific Writing (9:30 – 13:00)	G. Marrocco Radio Frequency Identification and Sensing with applications ranging from Factory to Prosthetics & Skin Intelligence (9:00 – 13:00)	T.Brown Scientific Writing (9:30 – 13:00)	B16
July 10 -	10 July 2023	11 July 2023	12 July 2023	13 July 2023	14 July 2023	
	T.Brown Scientific Writing (9:30 – 13:00) A. Di Carlo Introduction to Quantum Computation for Engineers (14:00 – 17:00)	A. Di Carlo Introduction to Quantum Computation for Engineers (9:30 – 12:30) V.Introna Project Management (14:00 – 18:00)	T.Brown Scientific Writing (9:30 – 13:00) A. Di Carlo Introduction to Quantum Computation for Engineers (14:00 – 17:00)	A. Di Carlo Introduction to Quantum Computation for Engineers (9:30 – 12:30) V.Introna Project Management (14:00 – 18:00)		B16