

Partners:



More informations:

RADMEP Coordinator:

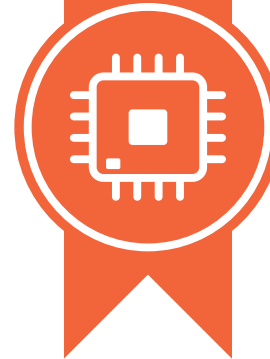
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*Faculté des Sciences Montpellier
Erasmus Mundus Master Degree*

Radiation and its Effects on MicroElectronics and Photonics Technologies (RADMEP)

Master

The Erasmus Mundus Joint Master Degree (EMJMD), is a prestigious, integrated, international study programme, jointly delivered by an international consortium of higher education institutions.

RADMEP will provide a multidisciplinary and innovative programme covering the interactions between Radiation and MicroElectronics and Photonics, two Key Enabling Technologies for the future of Europe. RADMEP objective is to educate students in those advanced technologies, providing methodologies and introducing practical applications for their implementation in a variety of natural or man-made radiation-rich environments.



With the support of the
Erasmus+ Programme
of the European Union



Master RADMEP

Goals:

RADMEP has two goals: first to improve their career prospects and second to respond to the needs of the industry, agencies and society. Thanks to this EMJMD, students will develop useful professional and soft skills in the rich European cultural context.

During the RADMEP masters programme students will obtain fundamental knowledge and experience in MicroElectronics and Photonics, and their behavior under irradiation. The first semester 1 will take place at Jyväskylän yliopisto (JYU, Finland) and the semester 2 at Katholieke Universiteit Leuven (KUL, Belgium). For the third semester, a choice between two different specializations will be offered to the RADMEP students. First one, taking place at Université Jean Monnet Saint-Etienne (UJM, France) will focus its programme on Radiation Effects on Photonics technologies while the second one will focus on Radiation Effects on Microelectronics and Advanced Electronic Technologies and will take place at Université de Montpellier (UM, France).

Preliminary Teaching programme:

Semester 1 - University of Jyväskylä

Major Units:

- Applies Semiconductor Physics
- Electron, Photon and Ion Beam Methods in Materials Science
- Measuring Techniques
- Efficient Numerical Programming

Workshop #1: Basics of Radiation Environments and Challenges related to radiation effects

Optional Courses:

Electronics workshop / Nuclear Physics / Fission and its Applications / Systematic Information Seeking / Creating Careers

Semester 2 - KU Leuven Campus Geel

Major Units:

- Analog and CMOS design essentials
- Digital Systems and Reconfigurable Devices
- Ethics and Scientific Integrity
- Digital Chip Design
- Analog and Mixed Signal Chip Design and Image Sensors

Workshop #2: Basics of Photonics Technologies and Their use in Harsh Environments

Optional Courses: Machine Learning / Big Data / Project: Radiation to Electronics / Advanced Electronics: RF and PLL design / Embedded Systems

Extra Credits: Survival Dutch / Two Months Internship

Semester 3 - Université de Saint-Etienne

Track 1 - Photonics

Major Units:

- Laser Physics
- Optical Engineering
- Advanced Photonics and Optoelectronic Technologies
- Radiation Effects on Photonic and Optoelectronic Technologies
- Photonics Labs

Workshop #3: CERN/ Simulation tools for Radiation-Matter Interaction and Radiation Effects on Materials, Components and Systems

Optional Courses: Digital Innovation and Entrepreneurship / Scientific Methodology and Project Management / Analytical Instrumentation for Detection / Project: Radiation to Photonics

Semester 4

During the last semester students will undertake a 6-months master thesis either in an industrial, an agency or in a research center, for example from the large RADMEP network of more than 35 associate partners.

Applications:

The courses that will be given will have direct applications for the industrial and research world.

For example: characterization of semiconductor chips for the so-called new space applications / Future free space optical communication links heavily rely on optoelectronics and photonics technologies / Development of sensors for the space, aviation and nuclear dismantling or automotive applications / Development of new generations of radiation dosimeters and beam monitoring tools for the accelerators devoted to medicine and high energy physics studies / Development of reliable robots for nuclear dismantling, reliable electronic and photonic for autonomous vehicles.

Semester 3 - Université de Montpellier

Track 2 - MicroElectronics

Major Units:

- Radiation and Reliability of Electronics for Transport, Space and Nuclear Applications
- Test and Reliability of Integrated Circuits and Systems
- Tools and Methodologies for Device Qualification for Space Missions
- Electronic Systems for Communications
- Microelectronics Labs

Workshop #3: CERN/ Simulation tools for Radiation-Matter Interaction and Radiation Effects on Materials, Components and Systems

Optional Courses: Digital Innovation and Entrepreneurship / Sensors associated Systems / Sensors / System on Chip and Embedded Systems

Extra Credits: French Language and Culture