

The EFOMP Erasmus+ Traineeship Scheme

This exciting trainee scheme for undergraduate students is described in this article, which was contributed by:

Carmel J. Caruana, Medical Physics, Faculty of Health Sciences, University of Malta, Malta

Christoph Bert, Medical Physics, University Clinic Erlangen, Germany,

Kiki Theodorou, Medical Physics, Faculty of Medicine, School of Health Sciences, University of Thessaly, Greece,

Niall Colgan, Medical Physics, Faculty of Health Sciences, National University of Ireland, Galway, Ireland.

Introduction

The Erasmus+ scheme has been a game changer for education and training in Europe. The great majority of healthcare professions have schemes for their students and the prospect of having an experience at a foreign academic and/or healthcare organisation is considered one of the highlights of university undergraduate student life. Students simply love it and such an opportunity makes any programme and profession more attractive to students, hence increasing student numbers in the respective profession. Yet the Medical Physics profession has not done this in a systematic manner and on a European scale. This does not reflect well on the profession and the EFOMP Education and Training Committee decided to take up the challenge. There are several Erasmus+ schemes that one can adopt. For reasons explained later, we chose the Erasmus+ traineeship scheme. More information on the **Erasmus+ training scheme** can be found here <https://erasmus-plus.ec.europa.eu/opportunities/individuals/students/traineeship-student>. This year we have schemes from Malta, Germany, Greece and Ireland. For the following year, organizations from the Netherlands and France have already shown interest.

We look forward to more organizations welcoming students next year. Those who are interested should contact Carmel on carmel.j.caruana@gmail.com Let's turn this into a grand Europe-wide programme for our students! We guarantee that paperwork is at a minimum (just write to Carmel and he will explain). This will be a nice opportunity for you and your students!

Why did we choose traineeships?

We wanted to create a scheme that would attract undergraduate physics/engineering students to our profession. A traineeship would make it possible for physics/engineering undergraduate students to see what we do

in our academic and/or clinical departments as opposed to listening to theoretical lectures. We wanted participants to see real world medical physics in action, meet medical physicists, network with young medical physicist from other countries and show them what life is like in the European Medical Physics family.

Principles guiding the EFOMP Erasmus+ traineeship scheme

Since we are all very busy, we wanted to design a scheme that follows a "KEEP IT SIMPLE" approach that:

- (a) Leads to a MINIMUM DISRUPTION to the academic studies/examinations of students and MINIMUM DISRUPTION to busy academic / clinical departments. Unfortunately, students who travel abroad during the academic year tend to fall behind in their studies. We wanted to avoid this. We also wanted it to be relaxed for the students so that they could enjoy the cultural and other delights of the country where they would be visiting. Therefore, summer was the best time. There is usually a lull in activities both at universities and hospital clinical services in the summer (as many patients are on holidays) and people are more relaxed and would have some more time for the students.
- (b) LEARNING OUTCOMES WILL BE VERY FLEXIBLE so that the trainees will simply join in and help out with whatever is happening in the academic department and/or hospital at the time of their visit. Hence, in the traineeship agreement, we just simply used: "Fundamental knowledge, skills and competences in academic and/or clinical medical physics and/or associated radiation protection for undergraduate physicists depending on the academic and/or clinical activities happening at the receiving department during the period of the mobility. Specific summary learning outcomes will be included in the text of the Traineeship Certificate awarded at the end of the mobility".

- (c) THERE WILL BE NO COST FOR THE WELCOMING DEPARTMENTS. In fact, students apply for travel funds through the Erasmus+ scheme. There is no cost for the organisers at all.
- (d) DOES NOT INVOLVE TRAINING PERIODS THAT ARE TOO LONG – we chose 60 days which is the minimum accepted by the Erasmus+ scheme. This makes the whole thing manageable. We wanted to avoid the whole semester exchanges (4 months) that are common and known to cause disruption.
- (e) IS VOLUNTARY FOR THE STUDENTS WITH NO ATTACHED ECTS CREDITS as this would be more relaxed and would require minimum paperwork from students and medical physics staff. We decided not to attach ECTS credits to the scheme, as this would require again formal agreements between different

universities and hospitals – which would, of course, mean tonnes of paperwork for busy medical physicists. We wanted that both organizers and participants to have an interesting yet calm and enjoyable experience.

- (f) All insurances (travel, sickness, indemnity) are taken care of by the student and home institution.

HARMONISED structure of the traineeship programme

Again, we adopted a simple approach that would require minimum administration for both centres and students. The structure is given in the table below. Specific examples from Malta, Greece, Germany and Ireland are also given.

TIME	PROGRAMME
Week 1 Introductory Week (same for all traineeship centers)	Readings and tutorials on Medical Physics topics and the Medical Physics profession, the structure of the traineeship programme, programme requirements (e.g., attendance record, keeping of a diary of daily activities) and legal requirements (e.g., local safety rules, issuing of personal radiation safety monitor). Introduction to the department(s) and familiarization of the working environment(s).
Week 2 - 3 Placement 1	Academic department: Students will be required to carry out experimental work or prepare a research-oriented presentation or research paper or literature review under the supervision of an academic member of staff in MRI
Week 4 - 5 Placement 2	Academic department: Students will be required to carry out experimental work or preparation of a research-oriented presentation, research paper, or literature review under the supervision of an academic member of staff in electrical physiology measurement / Ultrasound imaging
Week 6 - 7 Placement 3	Clinical Department: Diagnostic and Interventional Radiology Physics Presentations/readings and tutorials on Diagnostic and Interventional Radiology Physics. Follow the everyday clinical work on different diagnostic medical devices (CT, MRI etc). Keep track of scientific meetings and any other scientific work in the department.
Week 8 - end (11 days) Wrap-up Period (same for all traineeship centers)	Report writing and career guidance. Participants will be required to write a formal report about their experiences based on a diary of activities they kept during the entire traineeship. Participants will be advised of the variety of work and career opportunities in Europe.

Exemplars of programme from the early adopting welcoming institutions

1. University of Malta
 - Department of host institution organizing the traineeship: Medical Physics, Faculty of Health Sciences
 - Name of main contact at the host institution: Professor Carmel J. Caruana
 - Email address of main contact at the host institution: carmel.j.caruana@um.edu.mt
 - Maximum number of trainees that can be accepted: 6
 - Hosting period (60 days in July - September): starting Monday 18th July 2022

TIME	PROGRAMME
Week 1 Introductory Week (same for all traineeship centers):	Readings and tutorials on Medical Physics topics and the Medical Physics profession, the structure of the traineeship programme, programme requirements (e.g., attendance record, keeping of a diary of daily activities) and legal requirements (e.g., local safety rules, issuing of personal radiation safety monitors). Introduction to the department(s) and familiarization of the working environment(s).
Week 2 – 3 Placement 1	Academic department: Students will be required to carry out experimental work or prepare a research-oriented presentation or research paper or literature review under the supervision of an academic member of staff in MRI
Week 4 – 5 Placement 2	Academic department: Students will be required to carry out experimental work or preparation of a research-oriented presentation, research paper, or literature review under the supervision of an academic member of staff in electrical physiology measurement / Ultrasound imaging.
Week 6 -7 Placement 3	Clinical Department: Diagnostic and Interventional Radiology Physics
	Presentations/readings and tutorials on Diagnostic and Interventional Radiology Physics. Follow the everyday clinical work on different diagnostic medical devices (CT, MRI etc.). Follow scientific meetings and any other scientific work in the department.
Week 8 – end (11 days) Wrap-up Period (same for all traineeship centers)	Report writing and career guidance. Participants will be required to write a formal report of their experiences based on a diary of activities they kept during the entire traineeship. Participants will be advised of the variety of work and career opportunities in Europe.

2. University Clinic Erlangen

- Department of host institution organizing the traineeship: Radiation Oncology, Audiology, Radiology
- Name of main contact at the host institution: Professors Christoph Bert, Ulrich Hoppe, Frederik Laun
- Email address of main contact at the host institution: christoph.bert@uk-erlangen.de, frederik.laun@uk-erlangen.de, ulrich.hoppe@uk-erlangen.de
- Maximum number of trainees that can be accepted: 1
- Hosting period (60 days July – September summer 2022 as mutually agreed)

TIME	PROGRAMME
Week 1 Introductory Week (same for all traineeship centers):	Readings and tutorials on Medical Physics topics and the Medical Physics profession, the structure of the traineeship program, programme requirements (e.g., attendance record, keeping of a diary of daily activities) and legal requirements (e.g., local safety rules, issuing of personal radiation safety monitors). Introduction to the department(s) and familiarization of the working environment(s).
Week 2 – 3 Placements 1, 2, 3	Three placements in Radiation Oncology, Radiology, and Audiology each with a duration of ~2 weeks.
	Clinical Departments: Diagnostic and Interventional Radiology Physics, Audiology, Radiation Oncology Presentations/readings and tutorials. Keep track of the everyday clinical work on different diagnostic medical devices. Follow scientific meetings and any other scientific work in the department. All three departments also focus on academic work, i.e. students can also get the opportunity to carry out experimental work or prepare a research oriented presentation if mutually agreed.
Week 8 – end (11 days) Wrap-up Peri- od (same for all traineeship centers)	Report write-up and career advice. Participants will be required to write a formal report of their experiences based on a diary of activities kept during the entire traineeship. Participants will be advised of the variety of work and career opportunities in Europe.

3. National University of Ireland, Galway

- Department of host institution organizing the traineeship: Medical Physics, Faculty of Health Sciences
- Name of main contact at the host institution: Dr Niall Colgan
- Email address of main contact at the host institution: Niall.Colgan@nuigalway.ie
- Maximum number of trainees that can be accepted: 2
- Hosting period (60 days June - July): starting Monday 16th June 2022

TIME	PROGRAMME
Week 1 Introductory Week (same for all traineeship centers):	Readings and tutorials on Medical Physics topics and the Medical Physics profession, structure of the traineeship program, programme requirements (e.g., attendance record, keeping of a diary of daily activities) and legal requirements (e.g., local safety rules, issuing of personal radiation safety monitors). Introduction to the department(s) and familiarization of the working environment(s).
Week 2 – 3 Placement 1	Academic department: Students will be required to carry out experimental work or prepare a research-oriented presentation, research paper, or literature review under the supervision of an academic member of staff in MRI
Week 4 – 5 Placement 2	Academic department: Students will be required to carry out experimental work or prepare a research-oriented presentation, research paper, or literature review under the supervision of an academic member of staff in electrical physiology measurement / Ultrasound imaging
Week 6 -7 Placement 3	Clinical Department: Diagnostic and Interventional Radiology Physics Presentations/readings and tutorials on Diagnostic and Interventional Radiology Physics. Follow the everyday clinical work on different diagnostic medical devices (CT, MRI etc.). Follow scientific meetings and any other scientific work in the department.
Week 8 – end (11 days) Wrap-up Period (same for all traineeship centers)	Report writing and career guidance. Participants will be required to write a formal report of their experiences based on a diary of activities they kept during the entire traineeship. Participants will be advised of the variety of work and career opportunities in Europe.

4. University of Thessaly, Greece

- Department of host institution organizing the traineeship: Medical Physics, Faculty of Medicine, School of Health Sciences.
- Name of main contact at the host institution: Professor Kiki Theodorou
- Email address of main contact at the host institution: ktheodor@med.uth.gr
- Maximum number of trainees that can be accepted: 6
- Hosting period (60 days July - September): starting Monday 18th July 2022

TIME	PROGRAMME
Week 1 Introductory Week (same for all traineeship centers):	Readings and tutorials on Medical Physics topics and the Medical Physics profession, structure of the traineeship program, programme requirements (e.g., attendance record, keeping of a diary of daily activities) and legal requirements (e.g., local safety rules, issuing of personal radiation safety monitors). Introduction to the department(s) and familiarization of the working environment(s).
Week 2 – 3 Placement 1	Academic department: Students will be required to carry out experimental work or prepare a research-oriented presentation, research paper, or literature review under the supervision of an academic member of staff.
Week 4 – 5 Placement 2	Clinical Department: Diagnostic and Interventional Radiology Physics Presentations/readings and tutorials on Diagnostic and Interventional Radiology Physics. Follow the everyday clinical work on different diagnostic medical devices (CT, MRI etc.). Follow scientific meetings and any other scientific work in the department.
Week 6 -7 Placement 3	Clinical Department: Nuclear Medicine Physics Presentations/readings and tutorials on Nuclear Medicine Physics. Follow the everyday clinical work on different diagnostic or therapeutic medical devices (e.g., SPECT, PET, thyroid therapy). Keep track of scientific meetings and any other scientific work in the department.
Week 8 – end (11 days) Wrap-up Period (same for all traineeship centers)	Report writing and career guidance. Participants will be required to write a formal report of their experiences based on a diary of activities they kept during the entire traineeship. Participants will be advised of the variety of work and career opportunities in Europe.