H2020-MSCA-ITN-2019
EID

MyWave
860023

Detailed Planning of all Training Events
Deliverable D6.2

V2.0

Document history – List of changes

Version	Date	Author name	Scope
V1.0	22/03/2020	Christian Fager	
V2.0	26/01/2021	Christian Fager	Training program updated.

Contents

1   Introduction

The main objective of MyWave is to train early-stage researchers (ESRs) by means of the research projects in which the ESRs will work together to form a large multi-disciplinary and collaborative research team. In this way, the ESRs will learn to work across disciplines and sectors. On top of the training by doing research, the training programme includes specific training of scientific and technical skills, soft-skills and an industrial orientation. Next to the training programme, specific workshops will be organized that complement the training and research activities and will stimulate the interaction between the fellow ESRs. Upon successful completion of the training programme, the ESRs will receive a PhD degree.

In this deliverable, we briefly summarize the MyWave training programme and present the planning. The COVID-19 pandemic has made it necessary to revise the planning of the training activities compared to the initial plan. Since the duration of the pandemic is still not known, the planning of the training events, particularly summer schools and joint workshops, may therefore still change. All such changes are made in discussions with the MyWave Management Team and done with the intention to maximize the quality of the ESR training.

2   Training Programme Summary

Figure 1 provides an overview of the overall training programme, with a total study load of 40 ECTS (1 ECTS = 28 hours of work). It is organised in the form of a **Graduate School**, which will be continued after completion of MyWave. The **introduction courses (5 ECTS)** provide the ESRs with a first introduction into the cross-disciplinary technical background required in this programme. It consists of four workshops organised by the industrial partners in this project. In this way, the ESRs will get a solid introduction into the expertise and capabilities of the industrial partners and state-of-the-art at leading European industries in the area of wireless infrastructure. As part of the introduction programme, the ESRs also have to write a **white paper** for the general public about their research project. The post-master level **core courses (20 ECTS)** are mandatory for all ESRs and will provide them with a cross-disciplinary overview of the relevant technical disciplines. The **specialisation courses (15 ECTS)** consist of three very specialized technical elective courses and three mandatory professional skill training sessions, including hands-on training in teaching in higher education. The ESRs have to choose at least 2-out-of-3 of the specialisation elective courses in order to have in-depth knowledge of adjacent disciplines. All technical courses will include a significant hands-on experience. Several theoretical modules will also be provided as on-line modules using web-lectures, screen-casts and electronic exercises using an On-course learning platform[1].

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[1] https://oncourse.tue.nl/2017/

It is the responsibility of the ESR and his/her supervisor to define in the PCDP an individually tailored course combination that map to the intended learning outcomes of the MyWave programme. The ESRs have to pass all courses which are included in their PCDP.
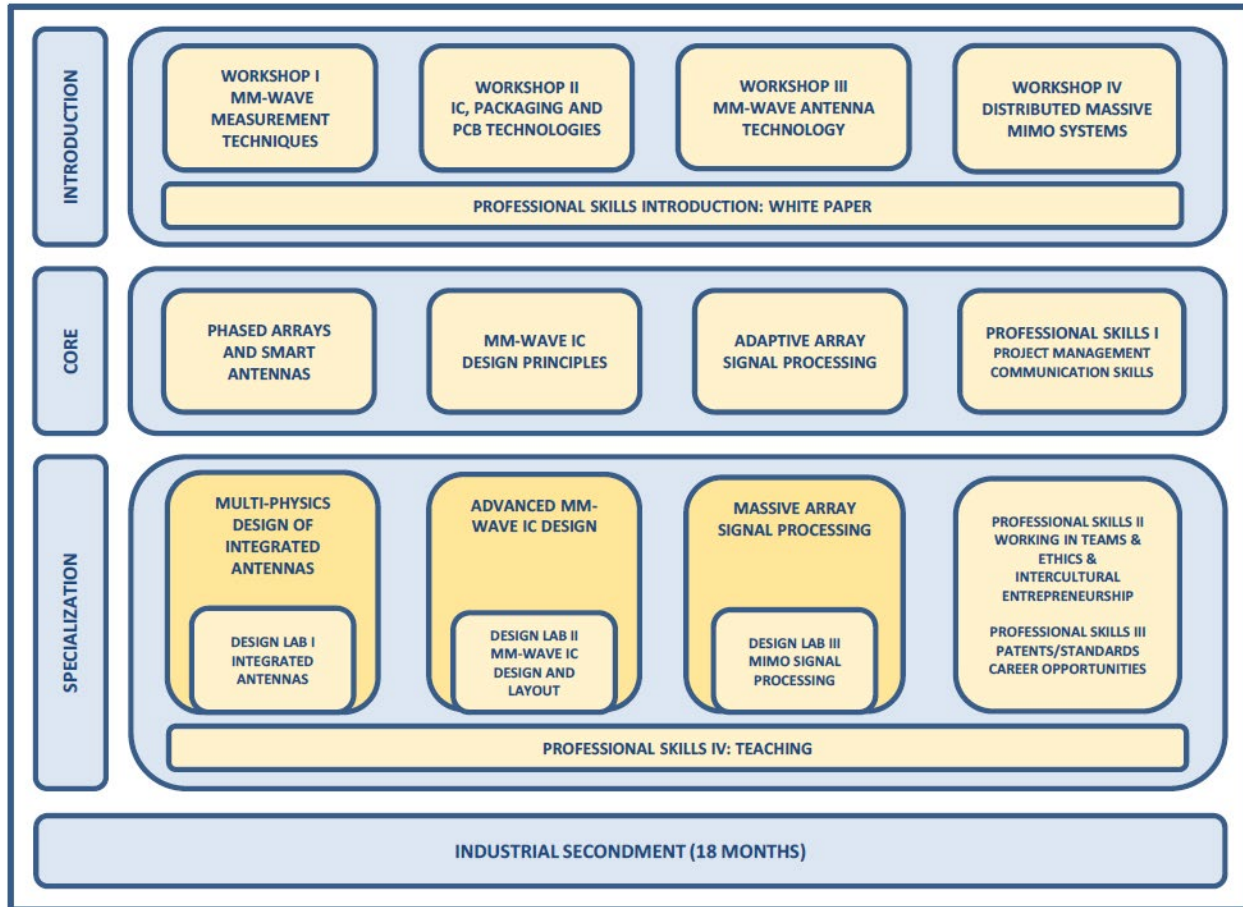

Figure 1. Overview of the MyWave Graduate School training programme. The total training programme has a study load of 40 ETCS. All courses are mandatory, except for the technical specialisation courses (orange colour) of which ESRs have to choose 2-out-of-3 electives.

3 Introduction Courses

The MyWave programme defines a series of introductory training events, including four technical workshops and one Professional Skill introduction. The table below summarizes the revised planning of these events.

	Introduction Courses / Training Activities	Project Month
1	Workshop I: mm-wave measurement techniques (completed).	M8 June 2020
2	Workshop II: IC, packaging and PCB technologies.	M18 March 2021

3	Workshop III: mm-wave antenna technologies (completed)	M14 Nov 2020
4	Workshop IV: Distributed massive MIMO (completed).	M14 Nov 2020
5	Professional Skills Introduction: Write a White Paper.	M16-M19 Jan-Apr 2021

4   Core Courses

The core courses are given at Chalmers, TU/e, and KIT, respectively. These courses are part of their regular university curriculum, and hence offered yearly to the students. The ESRs can therefore choose to take them either at their home university, or during their secondments. The ESRs will plan core training of at least 20 ECTS in their PCDPs.

The core courses consist of technical- and professional skills courses as described below.

4.1   Technical courses

The following table describes the specific core technical courses defined at Chalmers, TU/e and KIT:

	Schedule
Phased arrays and smart antennas	
Chalmers: SSY100 - Antenna engineering *KIT: Electromagnetics and Numerical Calculation of Fields & Antennas and multi antenna systems (2nd part)* *TU/e: 5LPB0 Phased array and smart antennas (5 ECTS)*	Apr. – June. Nov. – Feb. Apr. – July
mm-wave IC design principles	
Chalmers: EME110 - Design of monolithic microwave integrated circuits *KIT: Radio Frequency Integrated Circuits and Systems* *TU/e: 5SFE0 - RF transceivers 2: Design*	Sept – Oct Sept. – Dec. Feb. – Apr.
Adaptive array signal processing	
Chalmers: FSSY065 Model-based Signal Processing *KIT: Digital beamforming for radar and communication systems* *TU/e: 5SSC0 - Adaptive array signal processsing*	Sept Oct Sept. – Dec. Feb. – Apr.

4.2   Professional skills courses

All the universities offer a wide portfolio of professional skills courses to choose from, see examples for Chalmers (mandatory and optional) and KIT (professional skills courses). This includes courses in *Project Management and Communication Skills (Professional Skills 1)*. For KIT, the courses are given in German, so language training will also be an important part of the professional skills training for the ESRs situated there.

5   Specialization Courses

The specialization courses will be organised in the form of technical summer/winter schools at a single location of one of the beneficiaries. This is complemented with Professional Skills training such that the total specialization training adds up to 15 ECTS.

5.1   Technical courses

During one week, summer/winter schools will offer specialised technical training with experts from industry and academia. The aim of these schools is mainly training, but they will also provide networking and team-building activities. The schools will include several key-note lectures and panel discussion sessions between the ESRs and the experts of the consortium. As part of the examination, each student will also perform hand-in exercises. The table below summarizes the planning of the MyWave specialization training courses. Each ESR needs to select at least two specialization courses.

	Specialization courses	Project Month
1	Summer school on Multi-physics design of integrated antennas.	M24 Sept 2021
2	Summer school on Advanced mm-wave IC design.	M27 Dec 2021
3	Summer school on Massive array signal processing.	M33 May 2022

5.2   Professional skills courses

The specialization training include courses in the areas of *Working in Teams, Ethics and Intercultural Entrepreneurship* (Professional Skills 2) and *Patents/Standards and Career Opportunities* (Professional Skills 3). As described in Section 4.2, all involved universities offer a wide range of suitable courses to choose from. In addition, the ESR will be trained in teaching in higher education, including hands-on activities such as lecturing and tutoring in Bachelor and Master courses.

6   Industrial secondment

The industrial secondments play a crucial role in the training and personal development of the ESRs. In this way, they will be exposed to an academic environment (with focus on fundamental research, training and teaching) and an industrial environment to gain application-specific skills and insight in economic and market-related aspects. To get most profit from the secondment, it is typically planned to start one year after the start of the PhD studies.