



**USES** of novel **U**ltraSonic and **S**eismic **E**Embedded **S**ensors  
for the non-destructive evaluation and structural health monitoring  
of infrastructure and human-built objects

## D4.2 – USES<sup>2</sup> network training catalogue available to all researchers

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## Amendments

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# Notation

USES	Uses of novel Ultrasonic and Seismic Embedded Sensors for the non-destructive evaluation and structural health monitoring of infrastructure and human-built objects
WP	Work Package
DN	Doctoral Network
DC	Doctoral Candidate
EU	European Union
AP	Associated Partner
MSCA	Marie Skłodowska Curie action
PhD	Doctor of Philosophy
SHM	Structural Health Monitoring
NDE	Non-Destructive Evaluation
EOC	Environmental and Operational Conditions
CDP	Career Development Plan
UPM	Universidad Politecnica de Madrid
UEiffel	Université Gustave Eiffel
CEA	Commissariat à l'Énergie Atomique et aux énergies alternatives
IZFP	Fraunhofer Gesellschaft zur Förderung der angewandten Forschung eV
BAM	Bundesanstalt für Materialforschung und -prüfung
ULB	Université Libre de Bruxelles
UBRI	University of Bristol
TUIL	Technische Universität Ilmenau
UNIPD	Università degli studi di Padova
ENI	ENI SPA
ENSAM	École Nationale Supérieure d'Arts et Métiers
RWTH AACHEN	RHEINISCH-WESTFÄLISCHE TECHNISCHE HOCHSCHULE AACHEN
SMI	École Doctorale Sciences des Métiers de l'Ingénieur
ECTS	European Credit Transfer and Accumulation System
TS	Transferrable skills
TW	On-site Training weeks
OW	Online Workshop
ID	On-site Industry days
EU	European Union
ARS	Advanced Research Skills
Prof	Professor
Dr	Doctor

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# 1. Executive Summary

This deliverable is a comprehensive report that outlines the training programme designed for the Doctoral Candidates (DCs) within the scope of the USES<sup>2</sup> project. The primary objective of this report is to provide an inventory and description of the various training opportunities that will be made available for all researchers throughout the USES<sup>2</sup> project. The training sessions will encompass both local programs hosted within the hosting institution and external opportunities that will enrich the DCs academic and professional development.

## 2. Institutional summary

An abstract of USES<sup>2</sup> project is available and can be used by beneficiaries and partners when they present the project:

Detecting degradation that endangers the safety and impairs availability of infrastructure and components is currently the task of schedule-driven Non-Destructive Evaluation (NDE), this process is however costly and disruptive. The attractive alternative is to use condition based Structural Health Monitoring (SHM). Current, SHM typically uses sensors that provide local information only, which may be insufficient for detecting interior degradation or require very dense networks. Furthermore, the performance of both in-situ sensing systems and algorithms to process and interpret the sensor data is reduced when subject to Environmental and Operational Conditions (EOC). This limits their large-scale deployment.

USES<sup>2</sup> will develop and combine novel emerging sensing technologies (optical fibre and wireless piezoelectric sensors), advanced processing (compressed sensing, artificial intelligence) and full-mechanical-waveformbased imaging to tackle these issues. Key to this cross-disciplinary work is a new generation of researchers with skills across sensing and signal processing. They will be trained with a unique combination of “hands-on” multidisciplinary research demonstrators, industrial placements, and courses /workshops on scientific and transferable skills. All of which is facilitated by the broad intersectoral composition of the consortium.

USES<sup>2</sup> will produce world class researchers expert in innovative sensing solutions, advanced mechanical wave processing and robust EOC compensation methods. Their skills will be embodied in a series of laboratory demonstrators and in situ industrially relevant experiments spanning three key sectors of European industry: energy [power plants (nuclear, wind), hydrogen storage, pipeline networks for fuel exploration and transport], mobility for citizens (aircraft, automotive industry) and construction (urban subsurface soil, infrastructures).

Keywords: Civil engineering, diagnostic and implantable devices, environmental monitoring, electronics, photonics, embedded systems, signal processing, mechanical waves, ultrasonics, seismic.

## 3. Introduction

The USES<sup>2</sup> project embarks in a dual-fold mission characterized by ambition and innovation. It seeks to foster a unique and fertile environment, one that is truly interdisciplinary, inter-sectoral, international, and marked by innovation. These objectives are classified into 2 distinct categories, each of them playing a key role in the project’s overall vision:

- **Research and innovation objectives:** the USES<sup>2</sup> project aspires to cultivate and fortify enduring partnerships between European academia and industrial stakeholders. This collaborative effort aims to accomplish key goals:

- **Enhanced Connectivity and Energy Efficiency:** by harnessing novel mechanical wave sensing solutions, the project endeavors to revolutionize the connectivity and energy efficiency of embedded sensors. This innovation promises to propel the capabilities of embedded sensors to new heights.
- **Advanced Damage Detection and Visualization:** Through the application of cutting-edge imagery techniques, USES<sup>2</sup> aims to vastly improve the detection, localization, and quantification of damage that was previously undetectable. This breakthrough will render invisible damages visible, thereby transforming the field of structural health monitoring.
- **Elevated Reliability in Sensing Solutions:** USES<sup>2</sup> seeks to elevate the reliability of embedded sensing solutions across a wide spectrum of in-situ materials and structures. This will be accomplished through the development and implementation of groundbreaking data processing and monitoring methodologies that ensure these solutions remain viable and dependable.

By achieving these goals, USES<sup>2</sup> aspires to make profound contributions to the realms of academia, industry, and technological advancement, ultimately shaping a more connected, efficient, and resilient future.

## 4. Training objective

Inspired by the MSCA DN programme, USES<sup>2</sup> will train a new generation of researchers capable of accounting for the constraints and opportunities inherent in SHM and beyond. USES<sup>2</sup> will educate open-minded, critical experiences to aid cohort building and fully develop collaboration and communication skills both within and outside the USES<sup>2</sup> Doctoral Network.

### 4.1. Overview and content structure of the doctoral training programme

The training objectives of the USES<sup>2</sup> project encompass a multifaceted approach aimed at nurturing the development of the DCs. These objectives are meticulously designed to meet the evolving demands of the Structural Health Monitoring (SHM) industry and foster a dynamic, cross-disciplinary learning experience. They can be summarized as follows:

- **Cutting-Edge Training:** the main objective is to provide DCs with top-tier training that aligns with the state-of-the-art scientific and cross-disciplinary requirements of the SHM industry. This ensures that the researchers are well-equipped with the latest knowledge and skills.
- **Mobility and Exposure:** to enrich the DCs' learning journey, regular mobility opportunities are facilitated, enabling them to engage with prominent industrial and academic players across the European Union (EU). This exposure spans key sectors such as energy, mobility for citizens, and construction, enhancing their practical understanding of real-world challenges.
- **Problem-Centric Learning:** the programme aims to seamlessly integrate DCs with the prevailing and forthcoming engineering challenges faced by the SHM industry. This approach fosters a direct and impactful connection between their research pursuits and industry demands.
- **Multidisciplinary Collaboration:** USES<sup>2</sup> strives to create a collaborative ecosystem where academia and industries converge to share insights and work collectively towards innovative solutions. This environment accelerates the development and market adoption of new solutions utilizing embedded mechanical wave sensors in the SHM industry.
- **Diverse Career Opportunities:** beyond academic pursuits, the training programme equips the DCs with a set of transferable skills, emphasizing effective communication across diverse audiences and organizations. This versatility opens doors to varied career prospects, spanning academia, private enterprise, and government sectors.

- **Enhancing European Competitiveness:** by nurturing highly qualified experts and advancing technological capabilities in embedded mechanical wave sensors and associated monitoring methods, USES<sup>2</sup> contributes to enhancing the competitiveness of European actors in the SHM industry. This, in turn, strengthens the region's position on the global stage.

The training program is structured into 4 distinct levels to cater to the diverse needs of the DCs:

- **Local Training:** foundation-building sessions held within the home institution.
- **Network-Wide Training:** cross-institutional training events that facilitate collaboration and knowledge exchange.
- **Training Through Secondments:** opportunities for the DCs to work in different institutions and industrial settings.
- **Training Through Practice:** hands-on experience and practical application of knowledge and skills gained throughout the programme.

### 4.1.1. Local training

Local training within the USES<sup>2</sup> project will be intricately customized to cater to the unique requirements of each recruited DC, aligning with their individual Career Development Plan (CDP). The USES<sup>2</sup> consortium of academic beneficiaries comprises renowned universities equipped with graduate schools and well-established PhD programs that offer a diverse array of annual courses spanning the spectrum of scientific and technical skills. Table 1 delineates the discipline-specific training themes provided by each partner institution.

In parallel with their doctoral journeys, all academic partners extend comprehensive training in transferable skills (TS). This encompasses a broad spectrum of proficiencies, including laboratory safety protocols, honing writing skills, language proficiency courses, software proficiency, as well as pedagogical and presentation techniques. These holistic programs are designed to equip the DCs with a well-rounded skill set, ensuring their readiness for multifaceted challenges.

It is worth noting that the USES<sup>2</sup> collaborative network includes prominent research institutions such as CEA, IZFP, and BAM, alongside industry leaders like Isamgeo, Airbus Defence and Space and Zensor. These entities have actively engaged with local universities, formalizing agreements that enable the DCs to seamlessly participate in their respective PhD programmes.

Figures 1-10 offer a comprehensive visual representation of the distinct training sessions scheduled for the DCs throughout the duration of the project. These figures serve as invaluable tools for conveying the structured and methodical approach adopted to cultivate the academic and research competencies of the candidates. The visual aids encapsulate the breadth and depth of the training curriculum, offering stakeholders a clear and succinct overview of the pedagogical components designed to support the DCs professional development. It is noteworthy to mention that these are only some examples of the training sessions. DCs will be able to choose among a wide variety of trainings in their hosting institutions.

#### 4.1.1.1. Training of DC01 and DC09

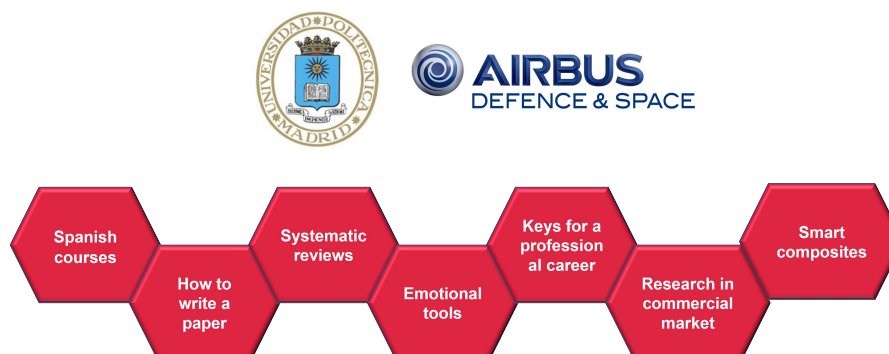


Figure 1: Training sessions of DC01 and DC09



### 4.1.1.2. Training of DC02



Figure 2: Training sessions of DC02

### 4.1.1.3. Training of DC03

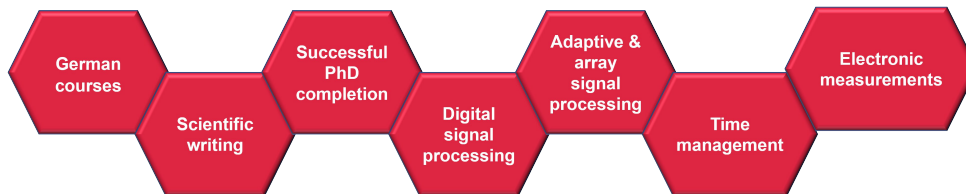


Figure 3: Training sessions of DC03

### 4.1.1.4. Training of DC04

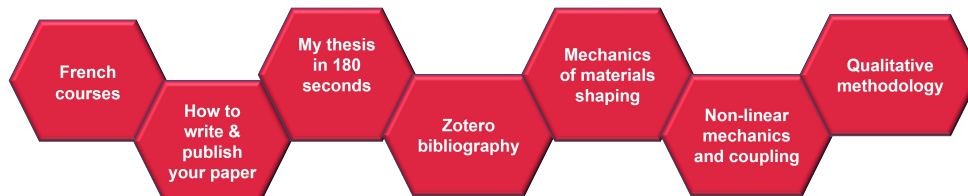


Figure 4: Training sessions of DC04

#### 4.1.1.5. Training of DC05

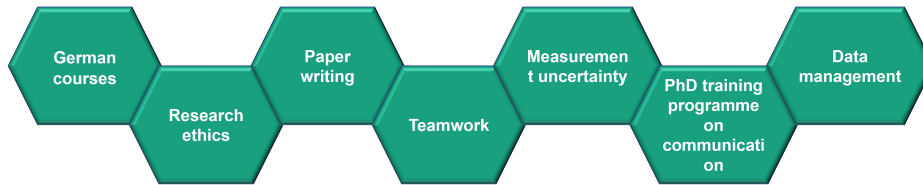


Figure 5: Training sessions of DC05

#### 4.1.1.6. Training of DC06

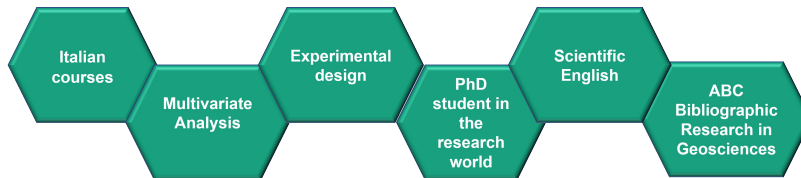


Figure 6: Training sessions of DC06

#### 4.1.1.7. Training of DC07

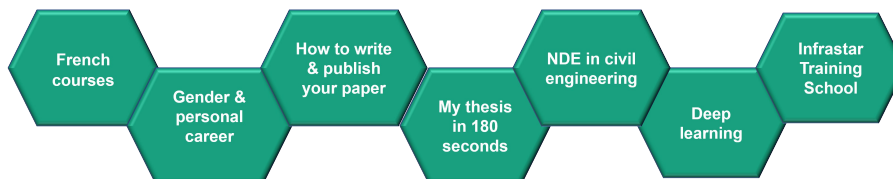


Figure 7: Training sessions of DC07

#### 4.1.1.8. Training of DC08

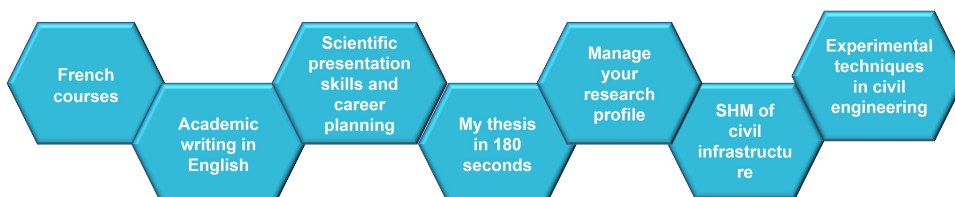


Figure 8: Training sessions of DC08

#### 4.1.1.9. Training of DC10

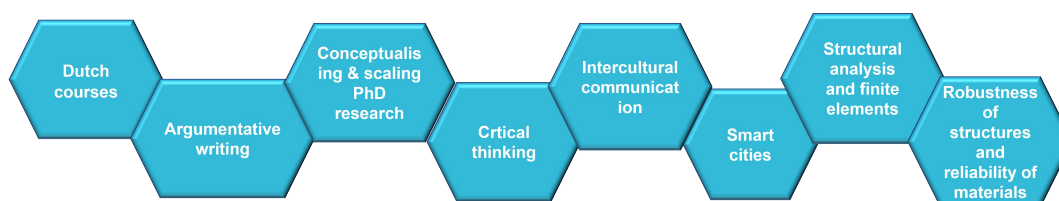


Figure 9: Training sessions of DC10

#### 4.1.1.10. Training of DC11

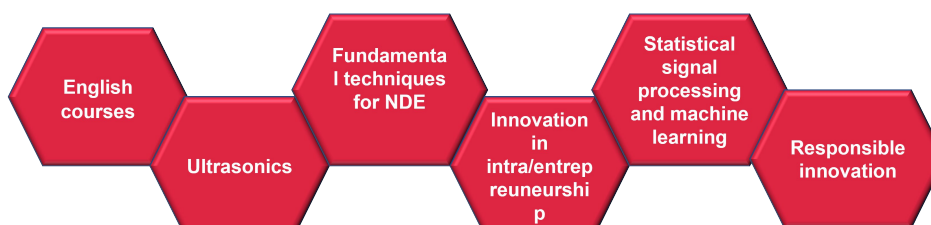


Figure 10: Training sessions of DC11

Doctoral School	Type of training (TS: transferrable skills or ARS: advanced research skills)	Training title	Beneficiaries involved	Online availability to all DCs
<b>UPM</b> <a href="https://www.etsiae.upm.es/index.php?id=78&amp;L=1">https://www.etsiae.upm.es/index.php?id=78&amp;L=1</a>	TS	Spanish courses	<b>UPM, Airbus</b>	Yes
	TS	How to write a paper		Yes
	TS	Systematic reviews with meta-analysis		Yes
	TS	Emotional tools for dealing with a PhD		Yes
	TS	Keys for the professional career of a young researcher		Yes
	TS	How to implement the research in a commercial market		Yes
	ARS	Smart composites		No
<b>ENSAM SMI</b> <a href="https://adum.fr/script/formations.pl?site=eds_mi">https://adum.fr/script/formations.pl?site=eds_mi</a>	TS	French courses	<b>CEA</b>	No
	TS	Scientific and technical search in databases (Zotero)		No
	TS	Scientific writing		No
	ARS	Laser shock and laser ultrasonics for composite structures test		No
<b>TUIL</b> <a href="https://www.tu-ilmnau.de/en/university/departments/department-of-electrical-engineering-and-information-technology">https://www.tu-ilmnau.de/en/university/departments/department-of-electrical-engineering-and-information-technology</a>	TS	German courses	<b>IZFP</b>	No
	TS	Scientific writing		No
	TS	Time management		No
	TS	Successful PhD completion		No
	ARS	Digital signal processing		Yes
	ARS	Adaptive and array signal processing		Yes
	ARS	Electronic measurements		Yes
ARS	Training schools ITN-5VC, EMERALD and INFANS	No		
<b>UBRI</b> <a href="https://www.bristol.ac">https://www.bristol.ac</a>	TS	English courses		No
	TS	Responsible innovation		Yes
	TS	Innovation in intra/entrepreneurship		Yes

.uk/engineering/phd-study/cdts/	ARS	Fundamental techniques for NDE	UBRI	Yes
	ARS	Ultrasonics		Yes
	ARS	Statistical signal processing and machine learning		Yes
<b>BAM and RWTH AACHEN</b> <a href="https://www.bam.de/Navigation/EN/About-us/Organisation/Organisation-Chart/President/Department-8/Division-82/division82.html">https://www.bam.de/Navigation/EN/About-us/Organisation/Organisation-Chart/President/Department-8/Division-82/division82.html</a> <a href="https://www.gge.eone.rc.rwth-aachen.de/cms/E-ON-ERC-GGE/~dngs/Das-Institut/lidx/1/">https://www.gge.eone.rc.rwth-aachen.de/cms/E-ON-ERC-GGE/~dngs/Das-Institut/lidx/1/</a>	TS	German courses	BAM	No
	TS	BAM PhD training programme on communication		No
	TS	Research ethics		No
	TS	Paper writing		No
	TS	Teamwork		No
	ARS	Measurement uncertainty		No
	ARS	Data management		No
	ARS	Workshop on NDT in civil engineering		No
<b>UNIPD</b> <a href="https://www.geoscienze.unipd.it/corsi/phd-course/coursework">https://www.geoscienze.unipd.it/corsi/phd-course/coursework</a>	TS	Italian courses ( <a href="https://cla.unipd.it/en/language-courses/italian-courses/">https://cla.unipd.it/en/language-courses/italian-courses/</a> )	Isamgeo	No
	ARS	Chemometrics: Multivariate Analysis		No
	ARS	Chemometrics: Experimental Design		No
	ARS	The PhD student in the research world		No
	ARS	Scientific English		No
	ARS	ABC Bibliographic Research in Geosciences		No
<b>ED-SIS</b> <a href="https://ed-sis.doctorat-paysdelaloire.fr/format ion">https://ed-sis.doctorat-paysdelaloire.fr/format ion</a>	TS	French courses	UEiffel	No
	TS	Gender and personal carrier		No
	TS	How to write and publish your paper		No
	TS	My thesis in 180 seconds		No
	ARS	NDE in civil engineering		No
	ARS	Deep learning		No
	ARS	InfraStar training school <a href="https://trainingschool.infrastar.eu/">https://trainingschool.infrastar.eu/</a>		Yes
<b>ED Mathstic</b> <a href="https://ed-mastic.doctorat-paysdelaloire.fr/">https://ed-mastic.doctorat-paysdelaloire.fr/</a>	TS	French courses	UEiffel	No
	TS	How to write and publish your paper		No
	TS	My thesis in 180 seconds		No
	TS	Zotero bibliography		No
	ARS	Mechanics of materials shaping		No
	ARS	Non-linear mechanics and coupling		No
	ARS	Qualitative methodology		No
<b>ULB</b> <a href="https://polytech.ulb.be/">https://polytech.ulb.be/</a>	TS	French courses	ULB	No
	TS	Academic writing in English		No
	TS	Scientific presentation skills and career planning		No
	TS	My thesis in 180 seconds		No
	TS	Manage your research profile		No
	ARS	SHM of civil infrastructure		No
	ARS	Experimental techniques in civil engineering		No
<b>VUB</b> <a href="https://wearephd.vub.be/c/7793?title=Doctoral_Training_Offer">https://wearephd.vub.be/c/7793?title=Doctoral_Training_Offer</a>	TS	Dutch courses	Zensor	Yes
	TS	Argumentative writing		Yes
	TS	Critical thinking		Yes
	TS	Conceptualising & scaling PhD research		No
	TS	Intercultural communication		Yes
	ARS	Smart cities		No
	ARS	Structural analysis and finite elements		No
	ARS	Robustness of structures and reliability of materials		No

Table 1: Planned local training for the DCs of USES<sup>2</sup>

### 4.1.2. Network-wide training

Network-wide training in the USES<sup>2</sup> project will embrace a flexible and hybrid approach, seamlessly blending physical and virtual learning environments. This multifaceted training strategy will encompass several key components, including (Figure 11; Table 2):

- **On-Site Training Weeks (TW):** five-day intensive sessions will bring together DCs alongside a core group of USES<sup>2</sup> supervisors and external instructors, totaling approximately 20 participants. TWs will comprehensively cover all project work packages, incorporating elements such as transferable skills training, scientific lectures, practical implementation, DCs presentations, technical site visits, consortium meetings, and social bonding activities. Each TW will entail approximately 25 hours of training, from 9 am to 5 pm, with pre- and post-work to supplement the learning experience. Successful completion of this training will earn participants 2 ECTS credits, considering the requisite pre- and post-training workload.
- **Online Workshops (OW):** five-day virtual workshops will be open to external trainees, including both academic and non-academic participants. DCs will actively engage in OWs alongside the core group of USES<sup>2</sup> supervisors and external instructors, totaling approximately 20 participants. The workshops will provide an interactive platform for skill development and knowledge exchange.
- **Industry Days (ID):** comprising two-day events, these gatherings are designed to engage a broad audience, with the first day targeting an estimated 60 participants, including researchers, engineers, professionals from diverse companies, academic experts, and stakeholders in the SHM field. The goal is to solicit feedback on USES<sup>2</sup> progress and foster networking opportunities. The second day will focus on networking and training in transferable skills tailored to industrial requirements.
- **USES<sup>2</sup> Training School (School):** a five-day event, open to a wide audience, will occur in month 33 of the project. DCs will take on an active role in teaching and shaping subsequent editions of the event post-USES<sup>2</sup>. Presentations delivered during the school will be recorded and made accessible through the USES<sup>2</sup> website.
- **Final Conference and Job Fair:** spanning two days, this concluding event will be open to a wider audience, with an anticipated attendance of approximately 60 participants. It will transpire in month 42, serving as a platform to disseminate the final results achieved by the DCs to academia, industry stakeholders, policy-makers, and prospective employers. This occasion aims to foster direct connections between DCs and potential employers.

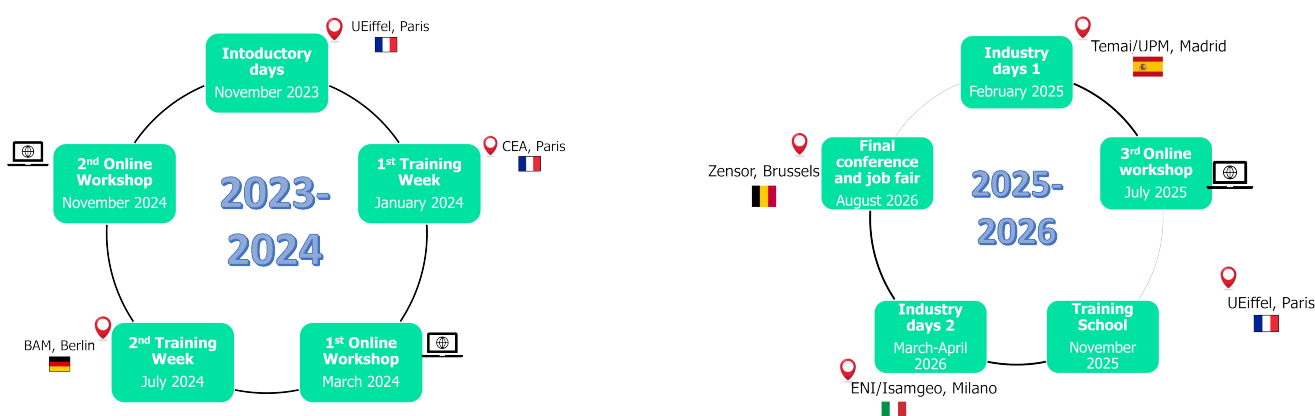


Figure 11: Mandatory training events in the USES<sup>2</sup> project

#### 4.1.2.1. Mandatory training events, draft content

Main training	Event	Training	Type of training (TS or ARS)	Given by	Lead Institution	Date
Introductory days	Introductory days	Research project management	TS	Dr Vincent Le Cam, U Eiffel	UEiffel	November 2023

<b>Training Week #1</b>	Sound foundations: human & scientific	Bibliography tools	TS	Mrs Audrey Lilin, CEA/IST	<b>CEA</b>	January 2024
		Intellectual Property Rights	TS	Mrs Dolores Martinez, UPM		
		Environmental assessment of SHM	TS	Dr Olivier Mesnil, CEA LIST		
		WP1: Insight on sensing and instrumentation	ARS	Dr Sylvain magne, CEA LIST		
		WP1: GERIM and SACHEMS platforms	ARS	Dr Bastien Chapuis, CEA		
		WP2: Wave propagation theory	ARS	Prof Anthony Croxford, UBRI		
		WP3: industrial monitoring needs – nuclear sector	ARS	Dr Jean-Marie Hénault, EDF		
		WP3: industrial monitoring needs – aerospace	ARS	Dr Jaime Garcia-Alonso, Airbus		
		WP3: industrial monitoring needs – oil and gas	ARS	Dr Guiseppa Giunta, ENI		
		WP3: conception rules of hydrogen reservoirs for automotive applications	ARS	Dr Stéphane Villalonga, CEA-DAM/DMAT		
<b>Online Workshop#1</b>	Wide vision: from sensors to decision part 1 - modelling	Data management	TS	Jessica Rex, IZFP	<b>UBRI</b>	March 2024
		Responsible innovation	TS	Vivienne Kuh, UBRI		
		Psychology of new Technologies: acceptance and usability	TS	Prof Nicola Doring, TUIL		
		WP1: Wireless communication for IoT	ARS	Dr Sylvia Krug, IMMS		
		WP1: Ultrasonic arrays	ARS	Prof Anthony Croxford, UBRI		
		WP2: Forward numerical wave propagation modelling	ARS	Simone Re, Isamgeo		
		WP3: Materials/structures damage mechanism and growth, site effects (concrete)	ARS	Dr Jean-Marie Hénault, EDF		
		WP3: Materials/structures damage mechanism and growth, site effects (composite)	ARS	Manolo Iglesias, Airbus		
WP3: Materials/structures damage mechanism and growth, site effects (soil)	ARS	Prof Giorgio Cassiano, UNIPD				
<b>Training Week#2</b>	Measurements and Signal Processing	Gender and diversity dimension in research	TS	Dr Anja Waske, BAM	<b>BAM</b>	July 2024
		Science communication	TS	Prof Arnaud Deraemaeker, ULB		
		Human factors in NDE and SHM	TS	Dr Marija Bertovic, BAM		
		WP1: Signal processing	ARS	Dr Florian Roemer, IZFP		
		WP1: Machine learning	ARS	Prof Ahmad Osman, IZFP		
		WP1: FPGA-based sensor signal processing	ARS	M.Sc Georg Glaser, IMMS		
		WP2: Measurement uncertainty	ARS	Dr Stefan Küttenbaum, BAM		
WP3: Lab and field exercises	ARS	Dr Ernst Niederleithinger, BAM, Horst Trattng, Vallen				
<b>Online Workshop#2</b>	Wide vision: from sensors to decision part 2 - noise	Communication tools	TS	Prof Santiago Pindado-Carrion, UPM	<b>ULB</b>	November 2024
		European citizen values	TS	EU representative to be contacted		
		WP1: Electromagnetic compatibility	ARS	Ing Heiko Stolpe, BAM		
		WP2: Passive methods: ambient noise	ARS	Ing Antonio Fuggi, Isamgeo		
		WP2: Acoustic emission	ARS	Dr Franziska Baensch, BAM		
		WP3: Probability of detection	ARS	Dr Stefan Maack, BAM		
		WP3: Environmental mitigation	ARS	Prof Arnaud Deraemaeker, ULB		
WP3: Operational mitigation	ARS	Dr Jaime Garcia-Alonso, Airbus				

<b>On-site Industry Days#1</b>	From the laboratory to the market: encapsulation of electronic products for commercial applications	Acceptability of technology	TS	Dr Jaime Garcia-Alonso, Airbus	<b>Teami/UPM</b>	February 2025
		Senocosme making of an art piece	TS	Senocosme		
<b>Online Workshop#3</b>	Wide vision: from sensors to decision part 3 - decision	Innovation and entrepreneurship	TS	Prof Gustavo Alonso-Rodrigo, UPM/IDR	<b>UPM</b>	July 2025
		WP1: Energy balancing for smart sensor nodes	ARS	Dr Silvia Krug, IMMS		
		WP2: Inverse problem and imaging	ARS	Dr Vera Lay, BAM, Dr Florian Römer, IZFP		
		WP3: Case studies (subsurface soil)	ARS	Dr Alessandro Brovelli, Isamgeo		
		WP3: Case studies (pipes)	ARS	Ing Simone Cesari, ENI		
		WP3: Case studies (wind turbine)	ARS	Luis Buisson, Temai		
<b>Training School</b>	Uses of Ultrasonic and Seismic Embedded Sensors (USES2)	Learning by teaching	TS	All DCs	<b>UEiffel</b>	November 2025
		WP1: Innovative sensors (optical fibre sensors and electronics)	ARS	Dr Sylvain Magne, CEA and Prof Antonio Fernandez Lopez, UPM		
		WP1: Innovative sensors (wireless sensors)	ARS	Prof Anthony Crawford, UBRI		
		WP1: Innovative sensors (compressed sensing)	ARS	Dr Florian Roemer, IZFP		
		WP2: Advanced mechanical waves (diffuse waves)	ARS	Dr Odile Abraham, UEiffel		
		WP2: Advanced mechanical waves (non-linear acoustics)	ARS	Prof K. Van Den Abeele		
		WP3: Smart structures and materials (in-service SHM)	ARS	Dr Jaime Garcia Alonso, Airbus		
		WP3: Smart structures and materials (multi data source, multi sensor monitoring)	ARS	Dr Yves Van Ingelgem, Zensor		
		WP3: Automated SHM of concrete infrastructures using embedded piezo electric transducers	ARS	Prof Arnaud Deraemaeker, ULB		
		<b>On-site Industry Days#2</b>	From USES2 outcomes to the market	Finalisation of the Scenocosme art piece		
The added value of information	TS			Prof Sebastian Thons, Lund University		
<b>On-site Industry Days#2+</b>	Personal step for the future	Funding opportunities and grant writing	TS	Prof Giorgio Cassiani, UNIPD	<b>Isamgeo/ENI</b>	April 2026
		Curriculum Vitae writing	TS	Paolo Cavassi, ENI		
		Career development screening	TS	Marco Guarnone, ENI		
		Entrepreneurship and establishing a start-up company	TS	Dr Alessandro Brovelli, Isamgeo and Dr Yves Van Ingelgem, Zensor		
<b>Conference</b>	USES2 final conference and job fair				<b>Zensor/ULB</b>	August 2026

Table 2: Main network-wide training events

### 4.1.3. Training through secondments

A structured programme of three two-month secondments has been meticulously mapped out for all DCs, as shown in Figures 12-14, then more detailed in Tables 3-5. These secondments are designed to immerse the DCs in a highly intersectoral, interdisciplinary, and international milieu, thereby enriching their academic

journey. Importantly, each DC will partake in secondments that are distinct from their primary host institution, encompassing diverse sectors, countries, and work packages (WP).

The timeline for these secondments spans from Month 11 (M11) to Month 30 (M30), strategically aligned to coincide with the developmental stages of the DCs' research projects. Where feasible, secondments have been synchronized to facilitate joint hosting of multiple DCs at the same location, fostering collaborative synergy and a conducive working environment. This collaborative ethos contributes significantly to the overall objectives of the programme.

Additionally, the programme's scheduling ensures that the third year of the PhD programme remains free from secondments. This intentional arrangement allows DCs to dedicate their third year exclusively to thesis finalization, culminating in a coherent and comprehensive research output.

## Secondment#1

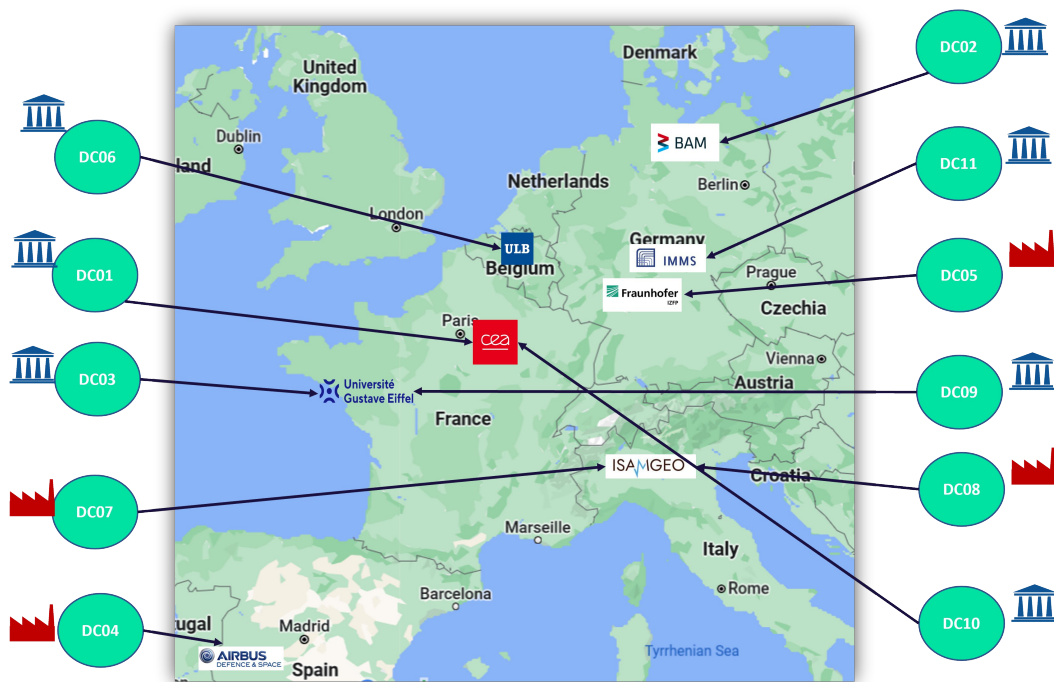


Figure 12: Map of the first set of secondments



## Secondment#2

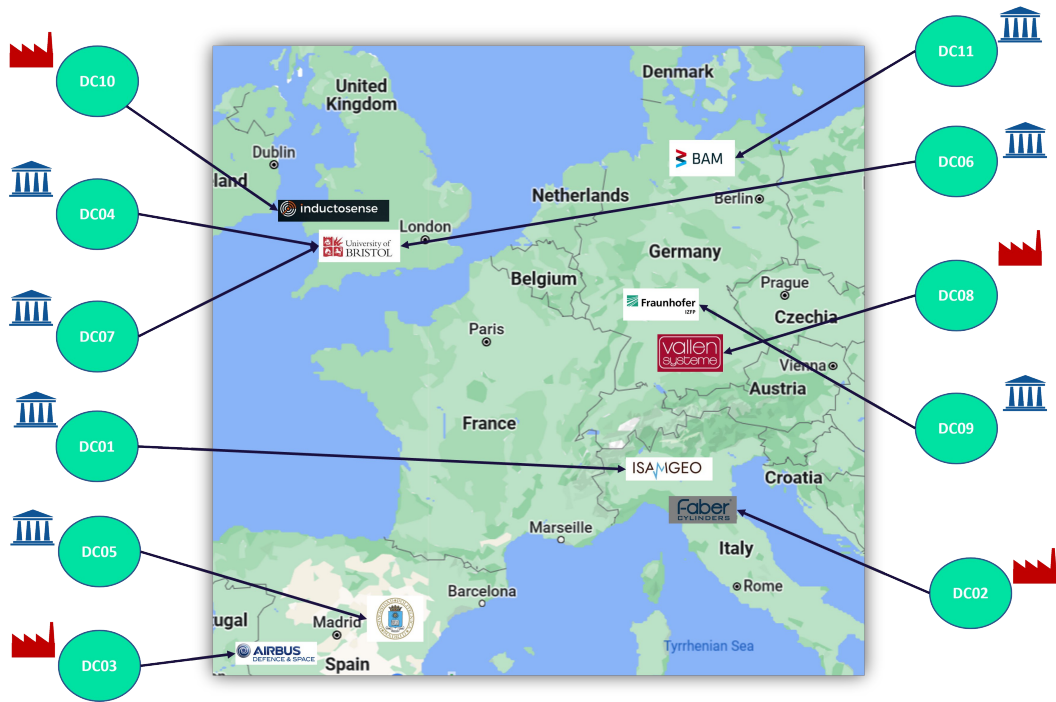


Figure 13: Map of the second set of secondments

## Secondment#3

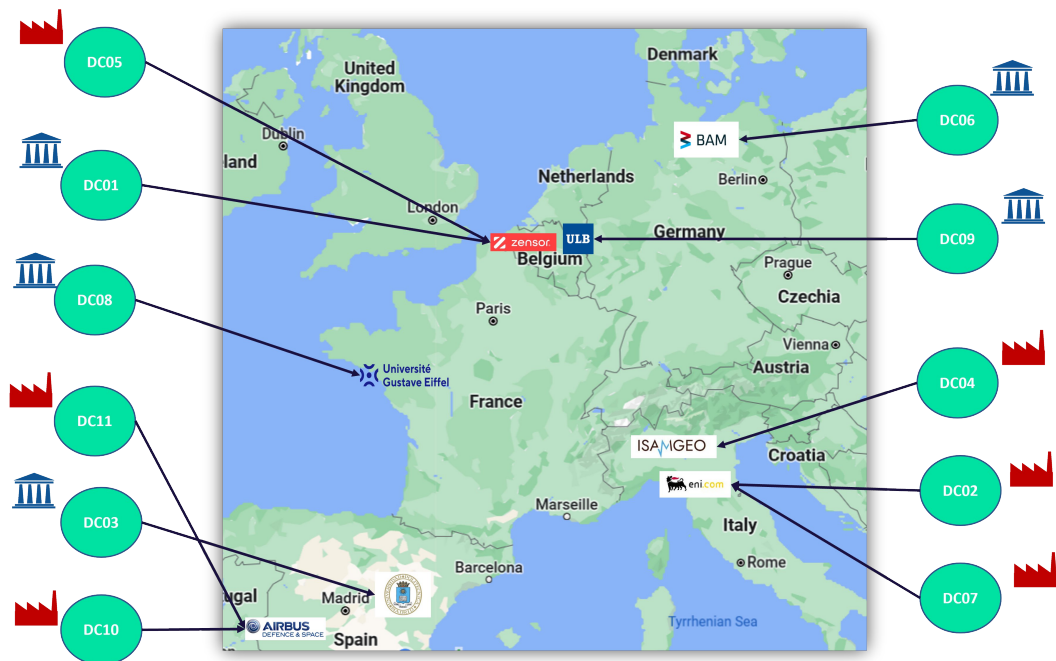


Figure 14: Map of the third set of secondments

Tables 3-5 show a more detailed view of the secondments pre-scheduled planning.

## Secondment#1

WP	DC	Beneficiary	Host	Sector	WP	Country	Start Month	End Month
	1	UPM	CEA	Academic	1	France	M11	M12

WP1	2	CEA	BAM	Academic	2	Germany	M13	M14
	3	IZFP	UEiffel	Academic	2	France	M13	M14
	4	UEiffel	Airbus	Non-academic	3	Spain	M11	M12
	11	UBRI	IMMS	Non-academic	1	Germany	M11	M12
WP2	5	BAM	IZFP	Academic	1	Germany	M11	M12
	6	Isamgeo	ULB	Academic	3	Belgium	M13	M14
	7	UEiffel	Isamgeo	Non-academic	2	Italy	M11	M12
WP3	8	ULB	Isamgeo	Non-academic	2	Italy	M11	M12
	9	Airbus	UEiffel	Academic	2	France	M13	M14
	10	Zensor	CEA	Academic	1	France	M11	M12

Table 3: List of the first set of secondments

## Secondment#2

WP	DC	Beneficiary	Host	Sector	WP	Country	Start Month	End Month
WP1	1	UPM	Isamgeo	Non-academic	2	Italy	M20	M21
	2	CEA	Faber	Non-academic	3	Italy	M20	M21
	3	IZFP	Airbus	Non-academic	3	Spain	M20	M21
	4	UEiffel	UBRI	Academic	1	United Kingdom	M20	M21
	11	UBRI	BAM	Academic	2	Germany	M25	M26
WP2	5	BAM	UPM	Academic	1	Spain	M18	M19
	6	Isamgeo	UBRI	Academic	1	United Kingdom	M18	M19
	7	UEiffel	UBRI	Academic	1	United Kingdom	M18	M19
WP3	8	ULB	Vallen	Non-academic	3	Germany	M18	M19
	9	Airbus	IZFP	Academic	1	Germany	M20	M21
	10	Zensor	Inductosense	Non-academic	1	United Kingdom	M20	M21

Table 4: List of the second set of secondments

## Secondment#3

WP	DC	Beneficiary	Host	Sector	WP	Country	Start Month	End Month
WP1	1	UPM	Zensor	Non-academic	3	Belgium	M27	M28
	2	CEA	ENI	Non-academic	3	Italy	M26	M27
	3	IZFP	UPM	Academic	1	Spain	M29	M30
	4	UEiffel	Isamgeo	Non-academic	2	Italy	M29	M30
	11	UBRI	Airbus	Non-academic	3	Spain	M29	M30
WP2	5	BAM	Zensor	Non-academic	3	Belgium	M27	M28
	6	Isamgeo	BAM	Academic	2	Germany	M25	M26
	7	UEiffel	ENI	Non-academic	3	Italy	M26	M27
WP3	8	ULB	UEiffel	Academic	2	France	M28	M29
	9	Airbus	ULB	Academic	3	Belgium	M26	M27
	10	Zensor	Airbus	Non-academic	3	Spain	M29	M30

Table 5: List of the third set of secondments

### 4.1.4. Training through practice

The DCs will gain a valuable training experience by actively participating in various consortium activities, such as the online workshops, the training school, the final conference, as well as communication and

dissemination tasks. This involvement will contribute to their development in terms of organizational and managerial skills, encompassing responsibilities like designing content, liaising with guest speakers, handling logistical aspects, and facilitating sessions, among others. This approach ensures that the DCs receive a balanced blend of structured and hands-on training. Furthermore, a customized practical training plan will be tailored for each fellow as part of their individual Career Development Plan (CDP).

## 5. Feedback of Doctoral Candidates

After each training, all DCs must complete the following feedback form. Additional questions regarding the lectures in the training, will be added later to this form.

Project USES2  
HORIZON – MSCA - 2021 – DN  
Project n° 101072599

This project has received funding from the  
European Union's Horizon 2021  
research and innovation programme Marie Skłodowska-Curie  
grant agreement No. 101072599



Project: 101072599 — USES2 — HORIZON-MSCA-DN-2021



**USES** of novel **U**ltraSonic and **S**eismic **E**mbdeded **S**ensors

for the non-destructive evaluation and structural health monitoring  
of infrastructure and human-built objects

**TRAINING WEEK #01**  
**CEA, Paris, France**  
**15-20 January 2024**

**FEEDBACK FORM**  
**- DCs -**

1 - What is your overall assessment of the training week?

(1=insufficient; 2=average; 3=correct; 4=good; 5=very good)

1    2    3    4    5

Comments :

2 - The topics covered were relevant to me.

(1=not at all; 2=partly, a little; 3=partly, a lot; 4=all of it)

1    2    3    4

Comments :

3 - Which topics or aspects of the training week did you find the most interesting or useful?

- 
- 
- 
- 

4 - The content was organised and easy to follow.

(1=not at all 2=partly, a little 3=partly, a lot 4=all of it)

1    2    3    4

Comments :

5 - Were the slides/documents of good quality?

(1=insufficient; 2=average; 3=correct; 4=good; 5=very good)

1    2    3    4    5

Comments :

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Project: 101072599 — USES2 — HORIZON-MSCA-DN-2021

1 2 3 4 5



**6 - The time allotted for the training was sufficient.**

(1=not at all 2=partly, a little 3=partly, a lot 4=all of it)

1 2 3 4

Comments :

12 - Comments and suggestions (including activities or initiatives you think would be useful for the future)

**7 - The meeting room and facilities were adequate and comfortable.**

(1=not at all 2=partly, a little 3=partly, a lot 4=all of it)

1 2 3 4

Comments :

**13 - Other...**

(If you have any comments, suggestions about the training weeks and/or the management of the project in general)

**8 - Did the training week achieve your objectives? Did knowledge and information gained from the training week meet your expectations?**

Yes No

If no, why ?

**9 - Will the training week be useful and applicable in your work?**

Definitely Mostly Somehow Not at all

Comments:

**10 - How do you think the training week could have been made more effective?**

**11 - Please comment on the organisation of the event.**

(1=insufficient; 2=average; 3=correct; 4=good; 5=very good)