LeaRn4LIFE
Learning Radon

LeaRn4LIFE REPORT ON THE PRE-TEST EDITION OF THE TRAINING PROGRAMMES

Contains:

REPORT WITH THE OUTCOMES OF THE QUESTIONNAIRES PERFORMED TO THE PARTICIPANTS IN THE PRE-TEST OF TRAINING PROGRAMME

DELIVERABLE 2.4

Consortium

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LeaRn4LIFE REPORT ON THE PRE-TEST EDITION OF THE TRAINING PROGRAMMES

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EXECUTIVE SUMMARY

This report presents the results of the test phase of the training programmes developed within the project, bringing together feedback from organisers, lecturers and participants involved in the first editions delivered in Portugal (PT) and Spain (ES). Its purpose is to assess the effectiveness of the training programmes, identify areas for improvement, and define the adjustments required before the courses are finalised.

Overall, the findings demonstrate that the training programmes successfully achieved their intended learning objectives and were very positively received. Organisers and lecturers considered the courses to be well structured, relevant and aligned with the objectives defined during their development. Participants also reported high levels of satisfaction with the course content, trainer expertise, organisation and the applicability of the knowledge acquired to their professional activities.

The quantitative results obtained through the questionnaires further confirm this positive assessment in both countries. Participants particularly valued the trainers' expertise, the quality and relevance of the content, and the usefulness of the training for their professional activities. Overall course evaluations were consistently high, with all participants rating the courses positively, with responses concentrated in the highest evaluation categories available in the respective questionnaires.

Despite these positive outcomes, the feedback collected also highlighted several opportunities for improvement. In both countries, the most frequently mentioned recommendation was to strengthen the practical dimension of the training programmes, particularly in Courses 2 and 3. Participants expressed a strong interest in additional practical exercises, demonstrations, case studies and hands-on learning activities. Suggestions were also made to improve the training materials, slide design, content organisation and coordination between modules.

Some recommendations were common to both countries, while others reflected specific national contexts and implementation experiences. In Portugal, improvements were mainly identified in relation to the legal framework component of Course 2 and the structure and content of Course 3. In Spain, particular emphasis was placed on expanding construction-related applications, strengthening the practical remediation component and adapting certain contents to the Spanish regulatory framework.

Based on these findings, a series of common and country-specific alterations have been defined. These include the revision of training materials, improvements to slide design, development of trainer guidelines, reinforcement of practical components, enhancement of participant support materials and refinement of specific course modules. Implementing these improvements will ensure that the final training programmes are more consistent, practical and better aligned with the needs of their target audiences.

Overall, the test phase successfully validated the structure and relevance of the training programmes while providing valuable evidence to support their final refinement. The results confirm that the courses provide a robust foundation for capacity building in the field of radon measurement, monitoring and remediation and are well positioned for future implementation.

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INTRODUCTION

This report compiles and analyses the feedback collected from the training programme organisers, lecturers and participants involved in the pre-test phase of the training programmes. Its main purpose is to support the adjustment and refinement of the courses based on the feedback gathered, contributing to the preparation of their final versions.

The document includes the results of the questionnaires conducted with participants as part of Deliverable 2.4, focusing on the first editions of the training programmes implemented in Portugal (PT) and Spain (ES). These questionnaires were designed to assess participants' satisfaction, as well as the perceived relevance and applicability of the training.

In addition to participant feedback, this report also incorporates input from the course organisers and trainers, contributing to the identification of specific elements that require adjustment to improve the training programmes.

The report is structured into three main sections. The first section presents feedback from the organisers and trainers. The second section (Deliverable 2.4) focuses on the analysis of the questionnaire results and is divided into two subsections: the Portuguese (PT) and Spanish (ES) first editions. The final section provides an overall analysis of the findings and outlines the key alterations to be implemented to finalise and strengthen the training programmes.

This approach ensures that the final versions of the courses are directly informed by participants' feedback, enhancing their relevance, quality and practical applicability.

FEEDBACK FROM THE ORGANISERS AND LECTURERS

This section presents the feedback gathered from the perspective of the organisers and the trainers during the first editions of the training programmes. The analysis aims to assess the overall structure, quality, and effectiveness of the courses, as well as to identify areas for improvement in both content and delivery, based on the experience of those directly involved in the implementation of the training.

From the perspective of the organisation and the trainers, the courses are generally well designed and aligned with the intended training objectives. However, across all courses, it was identified that the theoretical materials would benefit from a final editorial and formatting review to ensure consistency, clarity and overall quality. In addition, certain design-related aspects of the slides require improvement. There are inconsistencies in colour contrast that may affect readability, and in some cases, font sizes are too small to ensure clear visibility during training sessions. All these aspects will be systematically reviewed by the consortium and finalised with the support of the design team to ensure consistency, clarity, and the overall quality of the training materials.

Furthermore, trainer guidelines will be developed for all courses, covering both theoretical and practical components. The objective is to ensure smooth and consistent course delivery by providing clear guidance to trainers at each stage of the training process. These guidelines will include the time allocated to each module, the trainers responsible for delivery, and the recommended number of participants for each activity.

The results are organised into subsections corresponding to the first editions of the training programmes implemented in each country, providing a structured overview of the main observations and areas for improvement.

1. Feedback from PT 1st edition

From the perspective of both the organisers and the trainers, the courses delivered in Portugal are overall well-structured and appropriate for their intended format.

- Course 1 is well designed for a one-day training session, with an appropriate balance between content and timing. No major adjustments are required.
- Course 2 is also well structured; however, improvements are needed in the legal framework component. In particular, the content should better address radiological protection aspects, with a clearer explanation of the different types of exposure (existing, planned, and emergency). Additionally, the time allocated to Module C “Radon Monitoring” should be extended by approximately 15 minutes. The exercises and demonstrations are appropriate, requiring only minor adjustments to the timing.
- Course 3 requires some structural and content adjustments. The agenda needs to be revised, as the first edition was delivered over five days due to its overlap with the CINEA project visit, which does not reflect the intended standard format. The slides for Modules IV and V (both related with radon in buildings) should be reviewed to eliminate repetitions and correct misaligned content. Furthermore, Module VI “Radon Communication” should be adapted to better reflect communication practices within the construction sector, ensuring that the examples focus on interactions between construction companies and their clients.

2. Feedback from ES 1st edition

From the perspective of both the organisers and the trainers, the courses delivered in Spain were considered to be well structured and closely aligned with their intended learning objectives. The overall quality of the content, the trainers' performance and the participants' engagement were rated very positively. Nevertheless, several opportunities for improvement were identified based on the experience gained during the first implementation.

- Course 1 achieved its objectives and provided participants with a solid introduction to radon, measurement techniques and remediation principles. However, given that the main target audience is expected to consist predominantly of professionals from the construction sector, greater emphasis should be placed on construction materials, building solutions and practical remediation techniques. This would improve the alignment of the course with the participants' future professional activities.
- Course 2 was also considered well balanced in terms of its agenda and learning content. Nevertheless, both the organisers and the trainers concluded that the practical component should be further reinforced, allowing participants to spend more time working with monitoring equipment, measurement procedures and remediation techniques through practical demonstrations and hands-on activities.
- Course 3 largely confirmed the conclusions already identified during the Portuguese edition. However, the practical component, particularly the sessions dedicated to radon remediation techniques, should be significantly expanded. Based on the experience gained during the first edition, the current duration of the course limits the amount of practical training that can be provided. For this reason, extending the course by one, or preferably two, additional days should be considered. Furthermore, the course content related to radon remediation should be reviewed to better reflect the Spanish regulatory and technical framework. Although many concepts are common to both Portugal and Spain, important differences exist, particularly with regard to legal obligations and the practical implementation of remediation activities, and these should be more clearly addressed in the Spanish version of the course.

DELIVERABLE 2.4

REPORT WITH THE OUTCOMES OF THE QUESTIONNAIRES PERFORMED TO THE PARTICIPANTS IN THE PRE-TEST OF TRAINING PROGRAMME

This section presents the results of the questionnaires conducted with participants during the pre-test phase of the training programmes, within the scope of Deliverable 2.4. The analysis aims to assess participants' satisfaction, as well as the perceived relevance and applicability of the training content. As partners were given flexibility to adapt the evaluation instruments to their respective contexts, the questionnaires used in Portugal and Spain were not identical. Nevertheless, both questionnaires were designed to assess the same core dimensions of participant satisfaction and training quality, and the results reveal highly consistent trends across the two countries.

The findings are organised into two subsections, corresponding to the first editions of the training programmes implemented in Portugal (PT) and Spain (ES). Each subsection provides a detailed overview of the questionnaire results, highlighting key trends and insights derived from participants' responses.

1. Questionnaire analysis from the PT 1st edition

The questionnaires (as in Annex 1) were distributed only in Course 2 and Course 3. Course 1 was delivered as a one-day training course attended by five participants. Given its limited duration and small number of participants, feedback was collected mainly through verbal comments. Overall, the feedback was positive and included suggestions for more detailed coverage of legislation in the theoretical component. It should be noted that, among the participants in Course 1, only two were professionals belonging to the course's primary target group (building workers wishing to become specialized in radon mitigation). Course 2 and Course 3 had 23 and 24 participants, respectively, with 23 responses obtained for each course. In Course 2, participants included professionals from the target audience, such as technicians from public bodies, occupational health technicians and healthcare professionals. In Course 3, only 15 participants belonged to the course´s core target group (engineering and architecture professionals), while the remaining participants were professionals more closely aligned with the target audience of Course 2.

The questionnaire began with 12 statements that participants were asked to rate on a 5-point scale, ranging from 'strongly agree' to 'strongly disagree'. These questions aimed to assess their overall satisfaction and experience with the training in a quantitative way. The results of the questionnaires completed by participants in Course 2 and Course 3 are presented in Figure 1 and Figure 2, respectively.

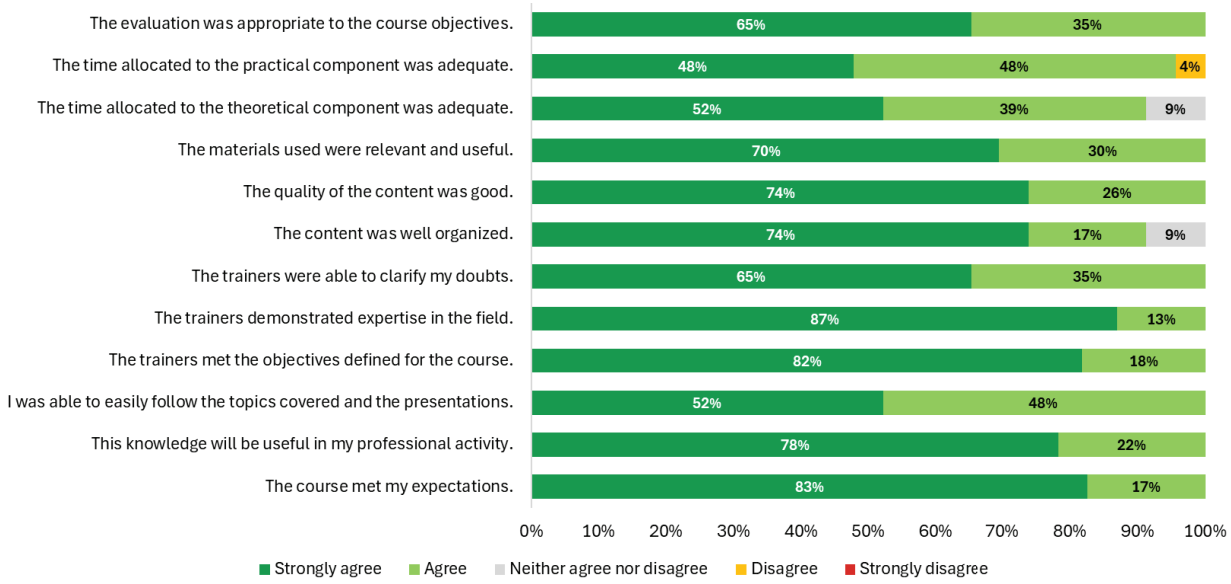


Figure 1 – Distribution of participants' responses to 12 statements assessing the course 2.

The Figure 1 presents participants' feedback on several dimensions of course 2, using a Likert scale ranging from "Strongly disagree" to "Strongly agree". Overall, the results indicate a very high level of satisfaction, with responses heavily concentrated in the "Agree" and "Strongly agree" categories across all items.

The strongest positive perceptions relate to the trainers' performance and the overall achievement of course objectives. A particularly high proportion of participants (87%) strongly agreed that the trainers demonstrated expertise in the field, with the remaining 13% also agreeing. Similarly, 82% strongly agreed that the trainers met the defined course objectives, and 65% strongly agreed that the trainers were able to clarify doubts, with the remaining participants expressing agreement. These findings highlight the trainers' perceived competence and effectiveness as a key strength of the course.

Content-related aspects were also evaluated very positively. Approximately 74% of respondents strongly agreed that the quality of the content was good and that it was well organised, with only small proportions expressing neutrality (9% regarding the organization of content). In addition, 70% strongly agreed that the materials used were relevant and useful, and the remaining 30% agreed.

Regarding the alignment of the course with expectations and its practical value, the feedback is equally strong. A total of 83% of participants strongly agreed that the course met their expectations, while 78% strongly agreed that the knowledge gained would be useful in their professional activity. These results suggest that the course is perceived as both relevant and impactful.

In terms of course structure, the evaluation of time allocation reveals slightly more variation. While most participants agreed that the time allocated to both the theoretical (52% strongly agree, 39% agree) and practical components (48% strongly agree, 48% agree) was adequate, there is a small proportion of less positive responses. Notably, 4% of participants disagreed with the adequacy of time for the practical component, and 9% expressed neutrality regarding the theoretical component. This suggests that, although generally well received, the time allocated for theoretical and practical sessions could be improved.

Finally, accessibility and clarity of the sessions were positively rated, with 52% strongly agreeing and 48% agreeing that they were able to easily follow the topics covered and the presentations. Additionally, the evaluation method itself was considered appropriate by all respondents, with 65% strongly agreeing and 35% agreeing.

In conclusion, the feedback demonstrates a consistently high level of satisfaction across all evaluated dimensions. Improvements could be considered in optimizing the balance of time allocated to different course components, but overall, the results reflect a very successful training experience.

Participants were also asked to provide an overall evaluation of the course by responding to the question, "What is your overall evaluation of the course?". The results show that 77% of participants rated the course as "Excellent" and 23% as "Good", with no responses in the "Average", "Poor", or "Very poor" categories.

Finally, participants were asked whether there were aspects of the course that could be improved. The results indicate that 87% of participants identified areas for improvement, while 13% considered that no improvements were necessary.

A total of 19 participants provided suggestions for improving the course. The most frequently mentioned recommendation was the need for more exercises and a stronger practical component, highlighted in nine responses, indicating a clear interest in reinforcing hands-on learning. Additionally, four participants pointed out that slides or supporting bibliography were not provided, suggesting a need to improve access to learning materials, despite the prior clarification that these materials would only be made available at a later stage, as the content was still in a trial phase.

Some suggestions focused on course structure and content. Two participants indicated that more time should be allocated to the theoretical component or to individual topics. Other suggestions, each mentioned once, included improving the connection between theory and practice, adjusting the pace of presentations to allow more time for discussion and Q&A.

Further recommendations addressed practical and operational aspects of the course. These included incorporating implementation cost estimates for the solutions presented, as well as adding a module outlining the sequence of actions of the services. Notably, one respondent also indicated that charging a registration fee would not be considered a barrier.

Overall, the suggestions reinforce the positive evaluation of the course while highlighting specific opportunities for improvement, particularly in enhancing the practical dimension, supporting materials, and organization of content.

Finally, participants were invited to provide any further comments and suggestions, with a total of 9 responses received. The most frequently mentioned point was the need for more editions of the course, more frequent sessions, and the need for regular training sessions to ensure continuous content refresh, address updates and changes, and incorporate emerging topics (5 responses), highlighting a strong interest in continued training opportunities. Positive feedback was also reinforced, with participants noting that the course was well structured (2 responses) and that it provided a good learning environment supported by competent professionals (2 responses). Other suggestions, each mentioned once, included improving the organization of content and speakers, enhancing the practical component by including the analysis of

laboratory reports and guidance on preparing final reports and communicating results to clients, and recognizing the overall quality of the content.

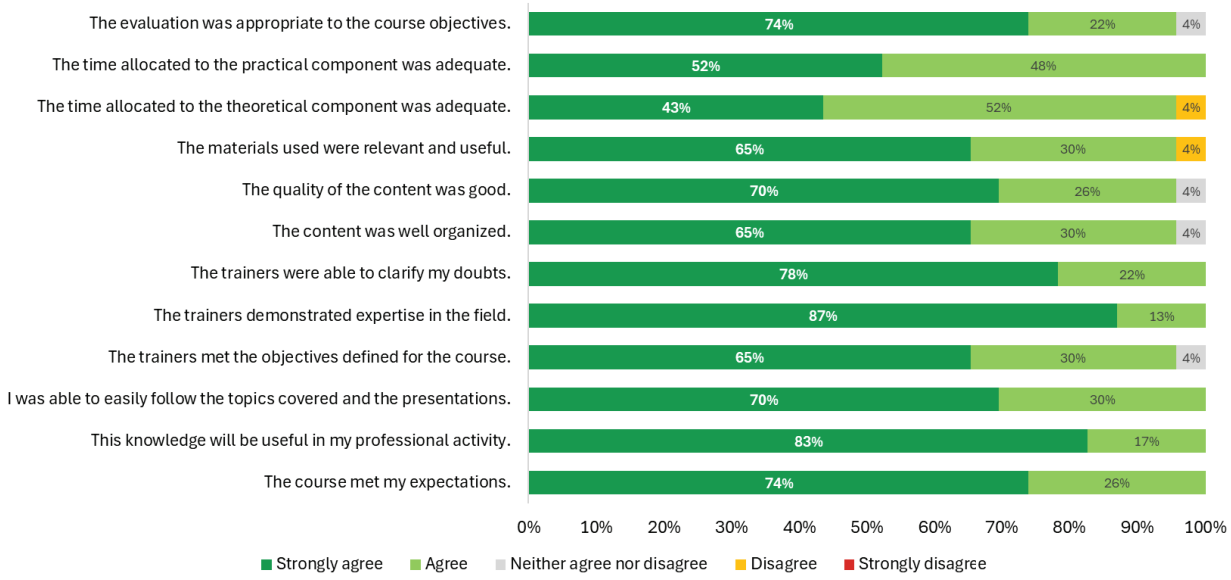


Figure 2 – Distribution of participants' responses to 12 statements assessing the course 3.

Figure 2 presents participants' feedback on several aspects of the course 3, using a Likert scale from "Strongly disagree" to "Strongly agree". Overall, the results show a very high level of satisfaction, with most responses in the "Agree" and "Strongly agree" categories.

The most positive results are related to the trainers. Most participants (87%) strongly agreed that the trainers showed strong expertise, and the remaining participants agreed. In addition, 78% strongly agreed that the trainers clarified doubts effectively, and 65% strongly agreed that the course objectives were achieved. These results show that the trainers were a key strength of the course.

The course content was also rated very positively. About 70% of participants strongly agreed that the content quality was good, and 65% strongly agreed that it was well organised. Around 30% agreed with these statements, and only a small number (4%) gave neutral responses. The materials used were also well evaluated, with 65% strongly agreeing that they were useful and relevant, 30% agreeing, and 4% remaining neutral.

Regarding usefulness and expectations, the feedback is also very positive. Most participants (83%) strongly agreed that the knowledge gained would be useful for their work, and 74% strongly agreed that the course met their expectations. This shows that the course was both relevant and useful.

There is slightly more variation in the evaluation of time allocation. Most participants considered the time adequate for both the practical component (52% strongly agree, 48% agree) and the theoretical component (43% strongly agree, 52% agree). However, a small number of participants (4%) disagreed with the time allocated to the theoretical component, and another 4% gave a neutral response. This suggests that the time distribution needs to be improved.

Participants also gave positive feedback on the clarity of the sessions. A total of 70% strongly agreed and 30% agreed that they were able to follow the topics and presentations easily. The evaluation method was also well received, with 74% strongly agreeing, 22% agreeing, and 4% giving a neutral response.

In general, the results show a very positive evaluation of the course across all aspects. Although some improvements could be made, especially in terms of time allocation, participants' feedback indicates a very successful training experience.

Participants were also asked, "What is your overall evaluation of the course?". The results show that 61% rated the course as "Excellent" and 39% as "Good", with no lower ratings ("Average", "Poor", or "Very poor").

To conclude the questionnaire, participants were asked whether any aspects of the course could be improved. Most participants (76%) said that improvements could be made, while 24% said no improvements were needed.

A total of 16 open-ended responses were analysed according to participants' professional background, distinguishing between architects/civil engineers and other professionals (e.g., occupational safety technicians and environmental specialists), in order to assess whether differences in perspectives could be identified, particularly considering that Course 3 is specifically targeted at engineers and architects, making it important to understand their feedback in this context. Overall, no significant differences were observed between the two groups, with similar suggestions and concerns raised across professional profiles.

The most common feedback focused on the need to strengthen the practical component, particularly in areas such as ventilation and active detectors, as well as allocating more time to measurement guidelines and exercises related to detector placement. Participants from both groups also highlighted the importance of improving the organisation and structure of the course content, including better alignment between sessions and, in some cases, reducing the overall course duration.

Additional suggestions included the provision of supporting materials, particularly slides or bibliography (although participants were informed that these materials would be made available at a later stage), as well as improving coordination within the practical component and allowing more time for discussion and interaction during sessions. Some participants also recommended including implementation cost estimates, dedicating more time to specific topics (such as ventilation), and enhancing communication and logistics during the course. Finally, references were made to the importance of addressing health risk aspects and strengthening the link with communication-related topics, potentially involving professionals from the health field.

Finally, participants were invited to provide any additional comments and suggestions, resulting in a total of 9 responses. The general feedback reinforces the positive evaluation of the course, with participants highlighting its strong structure, combining both theoretical and practical components (2 responses), as well as the positive learning environment and the quality of the professionals involved (2 responses). In terms of suggestions, some participants recommended including end-of-day summaries and a more detailed overall presentation of the course. Other comments pointed to the need for further development of specific components, particularly ventilation. Improvements in the organization of content and coordination between speakers were also mentioned, as well as the importance of greater promotion of the topic.

Overall, these comments highlight both the strengths of the course and participants' interest in its continuity and further development, particularly in terms of content improvement and enhanced structuring of sessions.

2. Questionnaire analysis from the ES 1st edition

The questionnaires applied in the Spanish (ES) first edition of the training programmes followed a structure similar to the Portuguese version, although some differences existed between the questionnaires. Feedback was collected from participants attending Courses 1, 2 and 3, involving a total of 44 participants.

Course 1 included 11 participants, mainly temporary workers from ENUSA Industrias Avanzadas with a professional interest in the radon field. Course 2 involved 12 participants, primarily professionals from ENAC-accredited laboratories for radon measurements using track detectors, conventional and accredited UTPR services recognised by the Spanish Nuclear Safety Council, and companies interested in radon remediation activities. Course 3 had 21 participants, mainly directors and professionals from ENAC-accredited companies for radon measurements, conventional and accredited UTPR services, the Nuclear Safety Council, and companies interested in remediation activities.

Similarly to the Portuguese editions, participants evaluated several dimensions of the courses using a satisfaction scale. Although some items differed slightly between the Spanish and Portuguese questionnaires, the overall results demonstrate a very high level of satisfaction across all courses.

In Course 1, participants' responses were highly positive, with agreement levels ranging between 75% and 98% across the evaluated items. The strongest positive evaluations were associated with the usefulness of the course, the trainers' expertise, and the overall achievement of course objectives. Participants highlighted the overall quality of the training, with comments indicating that the course was considered "excellent" and that participants were highly satisfied with the learning experience.

The strongest evaluations were associated with the lecturers' performance, the overall organisation of the course, and the usefulness of the content. Participants particularly valued the ability of the trainers to explain complex theoretical concepts in an accessible and practical way, as reflected in several written comments. The practical component was also positively assessed, although some variation was observed in this dimension when compared with other evaluation items.

Overall, the results indicate that Course 1 successfully fulfilled participants' expectations and provided a solid introductory approach to radon, remediation and measurement methodologies. The comments collected reinforce the perception of a positive learning environment supported by experienced and highly qualified professionals.

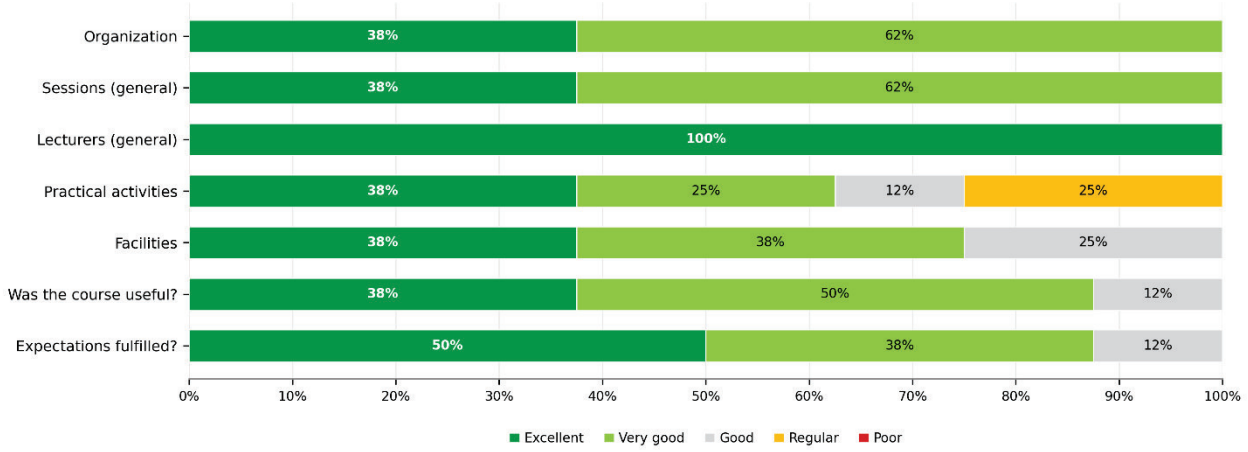


Figure 3 – Distribution of participants' responses assessing Course 1 (ES).

Course 2 also received extremely positive feedback. Most items achieved agreement levels above 95%, reaching 100% in one of the evaluated dimensions. Participants particularly valued the trainers' expertise, the usefulness of the content, and the overall organisation of the course. Suggestions for improvement mainly focused on practical and organizational aspects, including the need for more detailed information prior to the course regarding the content, dedicating more time to practical sessions related to monitors and remediation techniques, improving the visual quality of presentation materials, and providing participants with the curriculum vitae of the speakers in advance.

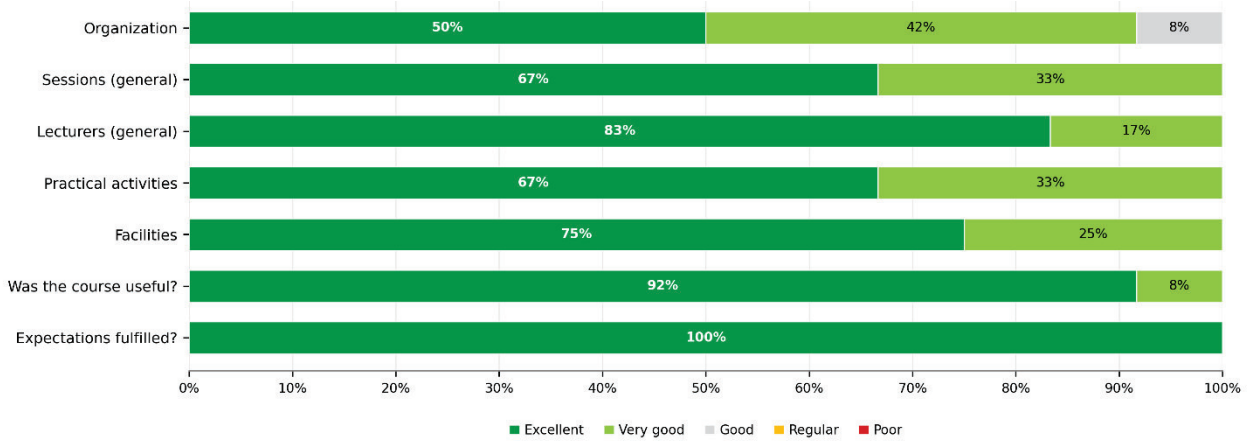


Figure 4 – Distribution of participants' responses assessing Course 2 (ES).

The evaluation of Course 3 followed the same positive trend. Most responses showed agreement levels above 90%, with several items reaching 97% to 99% positive evaluations. Participants highlighted the relevance of the content, the trainers' competence, and the usefulness of the course for professional activities. The suggestions for improvement reinforced some of the points already identified in Course 2, namely the need for more practical sessions related to remediation and monitoring techniques, as well as more detailed information about course content before the training. Additional recommendations included

carrying out exercises related to dose calculation for workers and the public and extending the duration of the remediation component of the course.

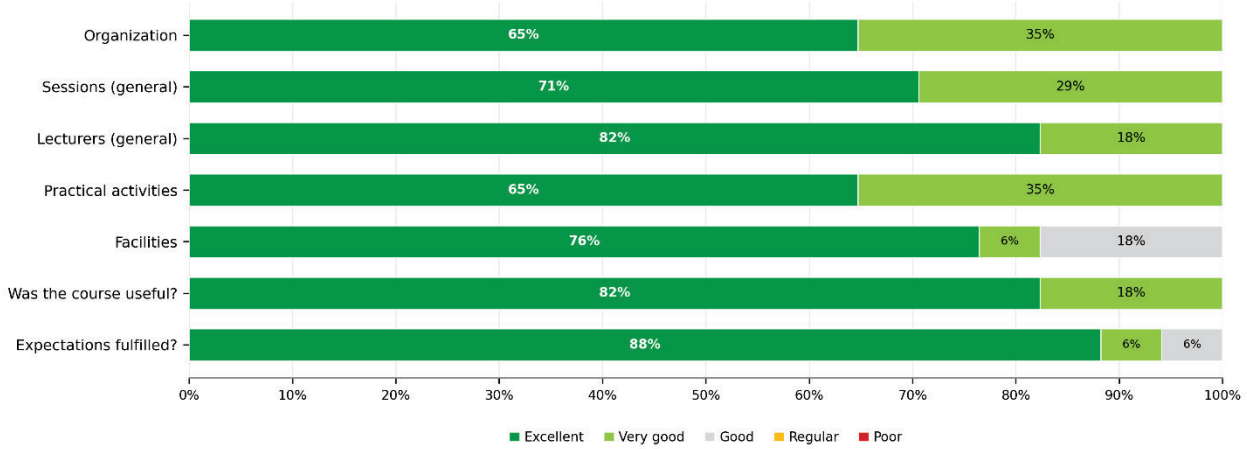


Figure 5 – Distribution of participants' responses assessing Course 3 (ES).

Overall, the results from the Spanish editions reveal a very high degree of participant satisfaction, closely aligned with the feedback obtained in the Portuguese editions. The suggestions collected mainly point towards reinforcing the practical dimension of the training programmes, improving supporting materials and communication before the courses, and dedicating more time to highly specialized technical topics. These findings provide important guidance for the refinement and final adjustment of the training programmes before their final implementation.

OVERALL ANALYSIS AND PROPOSED IMPROVEMENTS

The feedback collected from organisers, lecturers and participants during the first editions of the training programmes in Portugal and Spain demonstrates that the courses successfully achieved their intended learning objectives and were well received by all. Participants consistently reported high levels of satisfaction with the quality and relevance of the content, the expertise of the trainers, the organisation of the courses and the applicability of the knowledge acquired to their professional activities. Likewise, organisers and lecturers confirmed that the overall course structures are appropriate and aligned with the objectives originally defined during the development of the training programmes.

The analysis of the feedback against the initial course agendas and intended learning outcomes confirms that the courses effectively address the key themes envisaged for each training pathway, namely radon awareness, measurement and monitoring methodologies, radiological protection, remediation techniques and communication aspects. Nevertheless, several recommendations emerged to further improve the quality, consistency and practical applicability of the training programmes.

A common finding across both countries was the need to strengthen practical components, particularly in Courses 2 and 3. Participants and lecturers highlighted the value of practical demonstrations, case studies and hands-on activities as essential elements for supporting the future professional application of the knowledge acquired. Similarly, improvements to the training materials, course organisation and trainer guidance were consistently identified by both national teams.

At the same time, some recommendations were specific to the Portuguese and Spanish editions, reflecting differences in participant profiles and implementation experiences.

Based on the feedback received and its consistency with the original course agendas and learning objectives, the following improvements will be implemented.

1. Improvements applicable to both the PT and ES editions

The following improvements were identified by organisers, lecturers and/or participants in both countries and will therefore be implemented across all training programmes:

- Review and correction of theoretical materials to eliminate typographical errors, formatting inconsistencies and minor content issues.
- Improvement of slide design, including colour contrast, readability and font size.
- Development of trainer guidelines for all courses, covering learning objectives, time allocation, trainer responsibilities, practical activities and the recommended number of participants.
- Strengthening the links between theoretical concepts and their practical application.
- Inclusion of additional opportunities for participant interaction, discussion and Q&A sessions.
- Improved coordination between modules and trainers to ensure greater consistency throughout the courses.
- Expansion of practical demonstrations, exercises and case studies whenever feasible, particularly in Courses 2 and 3.
- Inclusion of improved session summaries and a clearer presentation of the overall course structure, particularly in Courses 2 and 3.

2. Improvements specific to the PT Edition

The feedback collected in Portugal highlighted several specific aspects requiring adjustment.

- Course 1: Although the overall structure was considered appropriate, participants suggested a more detailed presentation of the legislative and regulatory framework. Therefore, additional explanations regarding the relevant legislation and regulatory requirements will be incorporated into the theoretical component.
- Course 2: In line with the original objective of providing knowledge on monitoring and regulatory aspects, the following adjustments will be implemented:
  - Revision and expansion of the legal framework module, with particular emphasis on radiological protection concepts.
  - Clearer explanation of existing, planned and emergency exposure situations.
  - Extension of the time allocated for the Module C by approximately 15 minutes, as recommended by trainers.
  - Inclusion of additional practical exercises and examples in response to participants' requests for more hands-on learning.
- Course 3: Several improvements were identified regarding the structure and content of the course:
  - Revision of the course agenda to reflect the intended standard course format, removing the adaptations introduced to accommodate the CINEA project visit.
  - Review of Modules IV and V to eliminate duplicated content and improve the alignment of the material presented.
  - Adaptation of Module VI to better address communication practices within the construction sector and interactions between companies and clients.
  - Greater emphasis on ventilation-related topics, reflecting participants' specific interests.

3. Improvements specific to the ES Edition

The feedback collected in Spain generally reinforced the conclusions drawn from the Portuguese edition, while also identifying additional needs related to the target audience and the national context.

- Course 1: Given that a significant proportion of future participants are expected to work in the construction sector:
  - Greater emphasis will be placed on construction materials, building solutions and practical remediation techniques.
  - Additional sector-specific examples and case studies will be incorporated.
- Course 2: Participants and trainers highlighted the need for a stronger practical component. Therefore:
  - Additional practical sessions involving monitoring equipment and measurement methodologies will be introduced.
  - More demonstrations of remediation techniques will be included.
  - The pre-course information provided to participants will be expanded to clarify the course content and participants' expectations.

- Course 3: The strongest recommendations concerned the remediation component and its adaptation to the Spanish context:
  - Expansion of the practical training related to remediation techniques and monitoring activities.
  - Evaluation of the possibility of extending the course duration by one, and preferably two, additional days.
  - Review of the remediation-related content to ensure full alignment with the Spanish legal and technical framework.
  - Inclusion of additional practical exercises on effective dose calculations.
  - Further development of case studies reflecting Spanish remediation practices and regulatory requirements.

4. Final Considerations

Overall, the feedback received from organisers, lecturers and participants confirms that the training programmes are robust, relevant and well aligned with their original objectives. The proposed improvements are primarily aimed at strengthening the practical dimension of the training, enhancing the training materials and ensuring closer alignment with professional needs and national regulatory frameworks. While several improvements are common to both countries, specific refinements have also been introduced to address the findings from the first editions in Portugal and Spain, thereby ensuring that the final versions of the courses are both consistent and responsive to national needs.

Annexes

I. Questionnaire | PT version

QUESTIONÁRIO

1ª edição dos programas de formação do projeto LeaRn4LIFE

Este questionário tem como objetivo conhecer a opinião dos participantes da **1ª edição dos programas de formação do projeto LeaRn4LIFE**. A sua participação permitirá ao projeto avaliar a relevância do curso na área do radão e a identificar oportunidades de melhoria ou ajustes nos tópicos e conteúdos do curso, sempre tendo em consideração a opinião dos participantes.

A sua participação é anónima e voluntária. Todas as respostas serão tratadas de forma confidencial.

O preenchimento do questionário irá demorar cerca de 7 minutos.

A sua opinião é muito importante.

Gostaríamos de saber a sua opinião sobre a 1ª edição dos programas de formação do projeto LeaRn4LIFE.

A. Por favor, indique a sua opinião sobre as seguintes afirmações:

	Concordo Plenamente	Concordo	Não concordo nem discordo	Discordo	Discordo Completamente
O curso correspondeu às minhas expetativas.	❍	❍	❍	❍	❍
Estes conhecimentos serão úteis na minha atividade profissional.	❍	❍	❍	❍	❍
Consegui acompanhar facilmente os temas abordados e as apresentações.	❍	❍	❍	❍	❍
Os formadores cumpriram os objetivos definidos para o curso.	❍	❍	❍	❍	❍
Os formadores demonstraram experiência na área.	❍	❍	❍	❍	❍
Os formadores conseguiram esclarecer as minhas dúvidas.	❍	❍	❍	❍	❍
Os conteúdos estavam bem organizados.	❍	❍	❍	❍	❍
A qualidade dos conteúdos era boa.	❍	❍	❍	❍	❍
Os materiais utilizados foram pertinentes e úteis.	❍	❍	❍	❍	❍
O tempo destinado à componente teórica foi adequado.	❍	❍	❍	❍	❍
O tempo destinado à componente prática foi adequado.	❍	❍	❍	❍	❍
A avaliação foi adequada aos objetivos do curso.	❍	❍	❍	❍	❍

B. Como avalia o curso em geral?

Excelente	Bom	Médio	Fraco	Muito fraco
❍	❍	❍	❍	❍

C. Existem aspetos que podem ser melhorados?

Sim	Não
❍	❍

C1. Se sim, quais? *(p.ex. conteúdos, exercícios, componente prática, duração, avaliação, …)*

D. Se tiver outros comentários ou sugestões, por favor indique-os aqui:

E. Indique por favor a área de formação e o contexto profissional da sua participação, se aplicável.

Obrigada pela sua participação!

II. Questionnaire | ES version

LeaRn4LIFE
Learning Radon

Co-funded by the European Union

CURSO 1, 2, 3

Encuesta de satisfacción

Por favor, valora los siguientes aspectos propuestos:

1	MALO
2	REGULAR
3	BUENO
4	MUY BUENO
5	EXCELENTE

Organización	1	2	3	4	5
Sesiones (en general)	1	2	3	4	5
Ponentes (en general)	1	2	3	4	5
Actividades prácticas	1	2	3	4	5
Instalaciones	1	2	3	4	5
¿Ha sido útil este curso para usted?	1	2	3	4	5
¿Se han cumplido sus expectativas?	1	2	3	4	5

Comentarios, observaciones y sugerencias para la mejora del curso:

III. Agenda from the 1st edition of the Courses 1, 2 and 3 in Portugal

AGENDA – CURSO 1

LOCAL e DATA

Mina da Urgeiriça, Canas de Senhorim | coordenadas GPS local e estacionamento

17.03.2026

08:00	Saída de Coimbra
09:00	Chegada à Urgeiriça e Receção dos participantes
09:30	**Radão, monitorização e mitigação de radão** Alcides Pereira e Paulo Pinto
11:00	Coffee-break
11:15	**Demonstração sobre detetores passivos** Paulo Pinto
12:30	Almoço
14:00	*Chalet Aurora* **Técnicas de remediação + monitorização com detetores ativos** Alcides Pereira, Gustavo Luís, Paulo Pinto, Carlos Martins
16:30	Encerramento e coffee-break
17:00	Saída da Urgeiriça

AGENDA – CURSO 2

LOCAL E DATA

Departamento de Ciências da Terra, Universidade de Coimbra, Polo II, Edifício central, Torre C, Sala 335
Rua Sílvio Lima 3030-790 Coimbra |coordenadas GPS

18.03.2026 e 19.03.2026

DIA 1 | 18.03.2026	
09:00	Chegada e receção dos participantes
09:15	**Módulo A – RADIAÇÃO, RADÃO E EFEITOS NA SAÚDE** Alcides Pereira, Catarina Antunes
10:30	Coffee-break
11:00	**Módulo A – LEGISLAÇÃO** Margarida Malta
12:00	**Módulo B – MAPAS** Gustavo Luís, Filipa Domingos
13:00	Almoço
14:30	**Módulo C – MONITORIZAÇÃO DE RADÃO** Alcides Pereira, Gustavo Luís, Paulo Pinto, Inês Simão, Filipa Domingos
16:00	Coffee-break
16:30	Visita ao Laboratório de Radioatividade Natural (LRN)
17:30	Fim do 1º dia

DIA 2 | 19.03.2026	
09:00	**Módulo D – RADÃO EM EDIFÍCIOS** Alcides Pereira, José Costa, Paulo Pinto, Carlos Martins
10:30	Coffee-break
11:00	**Módulo E – COMUNICAÇÃO DE RADÃO** Catarina Antunes
12:30	Almoço
14:00	**Exercícios: locais de trabalho e cálculo de dose efetiva** Inês Simão, Catarina Antunes
16:00	Coffee-break
16:30	**Demonstração: colocação de detetores** Inês Simão, LRN
17:30	Fim do 2º dia

LOCAL E DATA

Mina da Urgeiriça, Canas de Senhorim | coordenadas GPS local e estacionamento

20.03.2026

DIA 3 | 20.03.2026	
08:00	Saída de Coimbra*
09:00	Chegada à Urgeiriça e Receção dos participantes
09:30	*Chalet Aurora* **Técnicas de remediação + monitorização com detetores ativos** Alcides Pereira, Gustavo Luís, José Costa, Carlos Martins
11:00	Coffee-break
11:30	*Chalet Aurora* **Técnicas de remediação + monitorização com detetores ativos** Alcides Pereira, Gustavo Luís, José Costa, Carlos Martins
12:30	Almoço
14:00	**Avaliação**
15:30	Coffee-break
16:00	**Wrap-up e encerramento**
16:30	Fim do 3º dia e saída da Urgeiriça

*Saída de Coimbra pelas 8h:

Departamento de Ciências da Terra, Universidade de Coimbra, Polo II, Rua Sílvio Lima 3030-790 Coimbra | coordenadas GPS

AGENDA – CURSO 3

LOCAL E DATA

Departamento de Ciências da Terra, Universidade de Coimbra, Polo II, Edifício central, Torre C, Sala 335
Rua Sílvio Lima 3030-790 Coimbra |coordenadas GPS

23.03.2026 e 24.03.2026

DIA 1 | 23.03.2026	
09:00	Chegada e receção dos participantes
09:15	**Módulo I – EXPOSIÇÃO AO GÁS RADÃO: CONCEITOS BÁSICOS** Alcides Pereira, Catarina Antunes, Margarida Malta
11:00	Coffee-break
11:30	**Módulo II – MAPEAMENTO DO RADÃO** Alcides Pereira, Filipa Domingos
12:30	Almoço
14:00	**Módulo III – MONITORIZAÇÃO DO GÁS RADÃO** Alcides Pereira, Gustavo Luís, Inês Simão, Filipa Domingos
15:30	Coffee-break
16:00	**Módulo IV – FATORES QUE INFLUENCIAM AS CONCENTRAÇÕES DE RADÃO NO INTERIOR DE EDIFÍCIOS** Alcides Pereira, José Costa, Carlos Martins
17:00	Fim do 1º dia

DIA 2 | 24.03.2026	
09:00	**Módulo V – PREVENÇÃO E MITIGAÇÃO DE RADÃO** Carlos Martins, José Costa, Paulo Pinto, Alcides Pereira
11:00	Coffee-break
11:30	**REMEDIAÇÃO DE RADÃO – O caso da Urgeiriça** Carlos Martins
12:30	Almoço
14:00	**Exercícios: locais de trabalho e cálculo de dose efetiva** Inês Simão, Margarida Malta
15:00	**Demonstração: colocação de detetores** Inês Simão, Alcides Pereira, LRN
15:30	Coffee-break
16:00	Visita ao Laboratório de Radioatividade Natural (LRN)
17:00	Fim do 2º dia

LOCAL E DATA

Mina da Urgeiriça, Canas de Senhorim | coordenadas GPS local e estacionamento

25.03.2026, 26.03.2026 e 27.03.2026

*Saída de Coimbra dia 25/03 pelas 8h:

Departamento de Ciências da Terra, Universidade de Coimbra, Polo II, Rua Sílvio Lima 3030-790 Coimbra | coordenadas GPS

DIA 3 | 25.03.2026	
08:00	Saída de Coimbra*
09:00	Chegada à Urgeiriça e Receção dos participantes
09:30	*Chalet Aurora* **Radão nos solos (exterior)** Alcides Pereira, Gustavo Luís, Margarida Malta, Carlos Martins
11:00	Coffee-break
11:30	*Chalet Aurora* **Radão nos solos (interior)** Alcides Pereira, Gustavo Luís, Filipa Domingos, José Costa
12:30	Almoço
14:00	*Chalet Aurora* **Membranas** Alcides Pereira, Carlos Martins, Helena Beleza, Óscar Silva
15:30	Coffee-break
16:00	*Chalet Aurora* **Ventilação** Alcides Pereira, Carlos Martins, José Costa, Paulo Pinto
17:30	Fim do 3º dia

DIA 4 | 26.03.2026	
09:15	*Hotel Urgeiriça* **Projetos de remediação | Trabalho de grupo** José Costa, Carlos Martins, Paulo Pinto
12:30	Almoço
14:00	**Visita ao complexo mineiro (com visita a habitação com remediação implementada)** Carlos Martins, Alcides Pereira
15:15	*Chalet Aurora* **Resumo (técnicas de remediação + monitorização com detetores ativos)** Alcides Pereira, Carlos Martins, Paulo Pinto, José Costa, Gustavo Luís, Filipa Domingos
16:30	Coffee-break
17:00	Esclarecimento de dúvidas (Projetos remediação)
17:30	Fim do 4º dia

DIA 5 | 27.03.2026	
09:30	**Projetos de remediação | Apresentação e discussão dos trabalhos** Alcides Pereira, José Costa, Carlos Martins, Paulo Pinto
11:30	Coffee-break
12:00	**Módulo VI – Comunicação de radão** Catarina Antunes
13:00	Almoço
14:30	**Avaliação**
15:30	**Wrap-up e encerramento**
16:00	Coffee-break
16:30	Fim do 5º dia e saída da Urgeiriça

IV. Agenda from the 1st edition of the Courses 1, 2 and 3 in Spain

AGENDA – CURSO 1

LOCAL y FECHA

Instalaciones del Laboratorio de Radiactividad Ambiental, ENUSA Industrias Avanzadas, Sealices el Chico, Salamanca

13.04.2026

09:00	LLegada à ENUSA y Recepción de los participantes
	TEÓRICAS
09:30	**Física de las radiaciones, Radón, efectos sobre la salud, legislación** Luis Quindos y Juan Mantero
11:00	Coffee-break
11:15	**Monitoreo de radón, factores que afectan al radón en interiores, técnicas de mitigación de radón, nuevas construcciones – código de la edificiación** Paulo Norte Pinto
13:00	Comida
	PRÁTICAS
15:00	**Medidas de radón com detectores de trazas, Potencial de radón en "situ", radón en suelo y permeabilidad, medidas de tasa, de exposición de gamma, casa piloto y medidas de remédio** Luis Quindos, Juan Mantero, Paulo Norte Pinto
17:30	Cierre de curso y coffee-break
18:00	Salida

AGENDA – CURSO 2

LOCAL y FECHA

Instalaciones del Laboratorio de Radiactividad Ambiental, ENUSA Industrias Avanzadas, Sealices el Chico, Salamanca

15, 16 y 17.04.2026

DIA 1 | 15.04.2026

08:45	LLegada à ENUSA y Recepción de los participantes
	TEÓRICAS
09:00	**Nociones sobre la exposición humana al radón** Luis Quindos y Juan Mantero
10:00	**Mapas de radón** Alicia Fernandez
11:00	Coffee-break
11:30	**Medida de radón** Paulo Norte Pinto
12:15	**Factores que influyen en la concentración de radón en interiores** Paulo Norte Pinto
13:00	**Comunicación del riesgo** Paulo Norte Pinto
14:00	Comida
	PRÁTICAS
15:30	**Medidas de radón con detectores de trazas** Paulo Norte Pinto
16:00	**Potencial de radón en "situ", radón en suelo y permeabilidad** Luis Quindos
16:45	**Medidas de tasa de exposición de gamma** Luis Quindos
17:30	Cierre de dia y coffee-break
18:00	Salida

DIA 2 | 16.04.2026

08:45	LLegada à ENUSA y Recepción de los participantes
	TEÓRICAS
09:00	**Remediación y prevención de radón** Paulo Norte Pinto
10:30	**Visita a casa piloto**
11:30	Coffee-break
12:00	**Casos de estúdio – grupos de trabajo**
14:00	Comida
	Preparación de presentación de casos de los alumnos

DIA 3 | 17.04.2026

08:45	LLegada à ENUSA y Recepción de los participantes
	TEÓRICO-PRÁCTICA
09:00	**Remediación y prevención de radón** **Presentación y discusión de casos de los alumnos** Borja Frutos y grupos de trabajo
11:00	**Examen final**
11:30	Coffee-break
12:00	**Resolución conjunta del examen y encuesta**
13:00	Cierre de curso

AGENDA – CURSO 3

LOCAL y FECHA

Instalaciones del Laboratorio de Radiactividad Ambiental, ENUSA Industrias Avanzadas, Sealices el Chico, Salamanca

20, 21, 22, 23 y 24.04.2026

DIA 1 | 20.04.2026

08:00	LLegada à ENUSA y Recepción de los participantes
	TEÓRICAS
09:00	Nociones sobre la exposición humana al radón Carlos Sainz, Juan Mantero, Luis Quindós
11:00	Coffee-break
11:30	Mapas de radón Alicia Fernandez
12:15	Medida de radón Daniel Rábago, Ismael Fuente
13:00	Factores que influyen en la concentración de radón en interiores Paulo Norte Pinto
14:00	Comida
16:00	Resumen y discusión de las charlas de la mañana
16:30	Comunicación del riesgo Roser Sala
18:00	Cierre del dia y coffee-break
18:30	Salida

DIA 2 | 21.04.2026

08:00	LLegada à ENUSA y Recepción de los participantes
	PRACTICAS
09:00	**Medidas de radón con detectores de trazas** Daniel Rábago, Luis Quindós Lopez, Paulo Norte Pinto
10:15	**Potencial de radón en "situ", radón en suelo y permeabilidad** Henrique Fernandez, Jorge Quindós
11:15	Coffee-break
11:45	**Medidas de tasa de exposición de gamma y cámara de radón** Carlos Sainz, Luis Quindós
14:00	Comida
16:00	**Presentación y visita a la casa piloto** Daniel Rábago, Luis Quindós
18:00	Cierre del dia y coffee-break
18:30	Salida

DIA 3 | 22.04.2026

08:00	LLegada à ENUSA y Recepción de los participantes
	TEÓRICAS
09:00	**Remediación y prevención de radón** Ricardo Pol
11:00	Coffee-break
11:30	**Presentación y discusión de casos práticos** Ricardo Pol y grupos de trabajo
14:00	Comida y cierre del dia

DIA 4 | 23.04.2026

08:00	Salida en autobús en dirección a Urgeiriça, Portugal
10:00	**Llegada a Urgeiriça, visita de la casa remediada** Carlos Martins
10:45	**Visita a Las instalaciones de la mina de Urgeiriça** Carlos Martins
11:30	**Visita a la casa piloto del proyecto LeaRn4LIFE** Alcides Pereira
14:00	Comida
15:30	Regreso
18:00	Cierre del dia

DIA 5 | 24.04.2026

08:00	LLegada a ENUSA y Recepción de los participantes
09:00	**Lecciones aprendidas con los cursos LeaRn4LIFE en Portugal** Catarina Antunes
09:45	**Mapa de radón de Portugal** Alcides Pereira
10:30	**Remediación en Urgeiriça** Carlos Martins
11:15	Coffee-break
11:30	Examen
12:00	Encuesta y cierre de curso
13:00	**Salida de la mina**