

DARE
DIGITAL LIFELONG PREVENTION
CODE NO. PNC0000002

Spoke 3 Deliverable
**S3.D6.1 Plan for enhanced educational
programming**

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Plan for Enhanced Educational Programming

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1. Advanced education

WP6 “Education, Training and Career Pathways” has the aim to coordinate the training and retraining activities of the DARE project. The purposes of WP6 are:

- adopting digitally-enabled solutions for secondary and tertiary prevention;
- training qualified personnel and improve the digital skills in the context of secondary and tertiary prevention, which employers and employees require.

The activities developed within Spoke 3 will be coordinated with the WP6 activities of Spokes 1 and 2.

Task 6.1, “Establishing Education, Research and Career Pathways”, will be set up by postgraduate university courses and doctoral programmes focusing on essential and advanced digital and computational skills regarding the digitally enabled secondary and tertiary prevention.

The target group includes master’s students from the contributing beneficiaries of SP 1-2-3, the current project workforce and newly hired ones and employees working in the research of primary and secondary prevention tools.

The educational plan is developed dynamically with the readiness of updating topics if needs related to DARE project emerge.

The contents of the newly developed activities are planned by a Scientific committee with the aim to propose a detailed syllabus and to identify the lecturers.

1.1. Learning activities open to external participants

To promote a culture focused on secondary and tertiary prevention, several activities will be proposed to the public with the aim to improve its competencies in the field. Some of them are already part of the learning offer of the partner universities but will be adapted to the context of Digital Prevention.

The advanced learning programmes we propose are:

- **Lifelong Learning Certificate “From data to decision”** an international course promoted by the Una Europa Alliance (to which UNIBO belongs) to introduce professionals to fundamentals of data science in a non-technical way, providing them

with the skills to understand the importance of data-driven decision making and interact with technical data science teams in their organizations. The 24-25 edition will be focused on health data science.

- **Hands-On Statistics for Life Sciences.** This course, provided by UNIROMA2, gives a comprehensive and practical approach to understanding and applying statistical methods in research. The program focuses on equipping students with both theoretical knowledge and hands-on skills necessary for analyzing and interpreting data relevant to their specific fields. Core topics include descriptive statistics, probability theory, hypothesis testing, regression analysis, and multivariate statistical methods. Special emphasis is placed on experimental design and the interpretation of results, ensuring students can critically evaluate statistical approaches in scientific research. Advanced modules cover specialized statistical techniques commonly used in life sciences, such as survival analysis, time series analysis, and Bayesian statistics. The course also introduces students to statistical software packages like R and Python, providing them with the skills to use these tools for data analysis in their research projects.

Interactive workshops, group discussions, and project work are integrated into the course to foster a collaborative learning environment. By the end of the program, participants will have a solid foundation in statistical principles, enhanced ability to apply statistical methods to their own data, and improved proficiency in using statistical software for effective data analysis in life science research.

- **Healthcare data management and analytics.** This course, provided by UNIPD, discusses some of the main difficulties in healthcare data management and analytics (e.g., heterogeneity of the data, lack of centralized programming resources), and present tried-and-true, first-line solutions specifically scoped for the biomedical context.
- **Elements of Analytical Chemistry for biomedical applications,** provided by UNIBA.
- **Bioinformatic analysis of metagenomic data for the study of the microbiome through Shotgun Metagenomics and DNA-Metacarcoding approaches: from sequencing data to statistical analysis.** Provided by UNIBA.

- **Artificial Intelligence and computational pathology.** This course is provided by UNIBA.

The final educational output of DARE will be:

- **Online School on Digital Prevention.** It will be publicly available and will be aimed at providing an in-depth knowledge of digital prevention in healthcare, borrowing from the DARE experience. The partners will contribute with recorded classes that together will provide a guideline for people interested in improving their competence in the DARE topic.

1.2. Learning activities for newly hired and DARE workforce

Other pathways that will be part of the training offer dedicated to DARE current workforce and newly hired one are:

- **Summer School on Digital Prevention** aimed at providing in-depth knowledge of digital prevention in healthcare with an interdisciplinary approach.
- **Alphabetization Course on Evolutionary algorithms for machine learning in the medical field.** It introduces the main variants of EC algorithms (genetic algorithms, genetic programming, swarm intelligence) by showing some application examples, including signal and image processing of medical interest. In particular, problems with machine learning applications will be considered, thus proposing EA as an alternative to these techniques.

The following pathways are offered by university partners who will make some of the master's modules available in asynchronous mode:

- **Master's Degree Course in Health policies and digital transformation** provided by UNIBO aims at providing students with the conceptual and analytical tools necessary to understand the implications of health policies arising from the increasing availability of large databases and sophisticated tools for their analysis, as well as the growing spread of digital technology tools also available to citizens and patients.

- **Master's Degree Course in Biomedical Engineering**, provided by UNIPA, with the aim of offering multidisciplinary skills in industrial engineering, information engineering and medical-biological engineering.
- **Master's Degree Course in Medicine, Surgery and Applied Technology (MED-IT)**, provided by UNIPA, aims to train students with a clear awareness and vision of the potential offered to the medical field by technological advances and the correct use of the most advanced and innovative technologies in the medical field, from prevention to diagnosis, treatment and rehabilitation.
- **Master's Degree Course in Health care and environmental protection techniques (preventive class)**, provided by UNIPA, has the aim to train health professionals with the scientific and technical knowledge required for the profession of prevention technician.
- **Master's Degree Course in Organization and management of health care facilities and services**, provided by UNIPA, aims to train professionals capable of carrying out care, management, training and research processes in the relevant field of the completion of prevention activities dedicated to the individual and the environment in an increasingly One-Health logic in line with the directives of the World Health Organization.

1.3. Educational platform and certifications

The design and the implementation of the education, research, and career pathways will take into account blended delivery systems through a specific learning environment provided by the partner BI-REX.

Specific didactic multimedia approaches dedicated to adult education will be adopted that will include innovative teaching strategies involving collaborative learning, for example, debates, case studies, simulations and live interaction with learners.

These pathways will be certified through the ECTS system and also micro-credentials and open badges for shorter courses that can be shared, portable and combined into larger credentials.

ECTS credits will be provided where appropriate.