TRANSFORMATIVE DIGITAL SKILLS for HEALTHCARE

An innovative, interdisciplinary, and impactful programme for healthcare professionals to lead projects and apply digital technologies in the health and care sectors.

> Blended learning Technical knowledge Transferable skills Real-world scenarios

ΕΗΙ





EIT Health is supported by the EIT, a body of the European Union



Programme partners

Experts in digital technologies and learning design have created an innovative, interdisciplinary, interactive and impactful programme for healthcare professionals.

> The content has been developed by three partner organisations: Fraunhofer, Europe's leading application-oriented research organisation; Universitat de Barcelona, listed as the best university in Spain in the QS World University Rankings of 2018 and TheHill, the digital innovation team of Oxford University Hospitals NHS Foundation Trust, one of the UK's largest teaching hospitals and one of the largest hospitals in Europe.

The programme is funded by EIT Health, a network of bestin-class health innovators backed by the EU. EIT Health is a Knowledge and Innovation Community (KIC) of the European Institute of Innovation and Technology (EIT), an independent body of the European Union.

Supported by





Partnering with







Oxford University Hospitals NHS Foundation Trust



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Schedule

| | Module | Date | Application deadline | Duration | Audience |
|-----------------------------|-----------------------|-------------------|-------------------------|--------------|---|
| | M5 | 27 Oct - 17th Nov | 13 Oct | Over 4 weeks | Healthcare professionals (clinicians, AHPs, radiologists, operational service managers, pathologists) |
| TheHill, Oxford CLICK | M6 | 12 Nov - 10 Dec | 28 Oct | Over 5 weeks | Healthcare professionals |
| HERE For more info | M8 | 4 Nov - 25 Nov | 22 Oct | Over 4 weeks | Healthcare management and clinicians with decision making authority |
| | Programme overview | On application | + | 2 hours | Hospital managers, healthcare professionals |
| | M1 | 12 Oct - 6 Nov | 30 Sept | Over 4 weeks | Healthcare professionals |
| Fraunhofer | M2 | 9 Nov - 4 Dec | 30 Oct | Over 4 weeks | Healthcare professionals with management responsibilities |
| CLICK | M3 | 30 Nov - 18 Dec | 20 Nov | Over 3 weeks | Hospital managers, healthcare professionals |
| For more info | M4 | 2 - 20 Nov | 23 Oct | Over 3 weeks | Healthcare professionals IT health care managers Hospital managers |
| | Μ7 | 23 Nov - 18 Dec | 13 Nov | Over 4 weeks | Healthcare professionals |



For a schedule of the programme run by our partner Universitat de Barcelona, please see their website.

Overview

Digital innovations are revolutionising healthcare

From clinicians to hospital managers, healthcare professionals need to be able to innovate, adapt and engage with new technologies and the changing pace of medicine.

Our programme enables you to lead projects and apply digital technologies in the health and care sectors.

Participants will gain an understanding of emerging digital technologies; how to transform processes, structures and cultures; and measure the value and benefit of these technologies in patient care.

A European team of leading experts in digital technologies and learning design have come together to create a programme that is innovative, interdisciplinary, interactive and impactful; providing technical knowledge and transferrable skills.

Programme structure

Participants are able to tailor their own individual pathway to acquire the specific set of skills that best suits their needs. Each module chosen will require a time investment of approximately 15 hours over a 4 or 5 week period. For 2020, all sessions will be online, and each week will be a combination of live group workshops and independent study/ project work.

Practical interactive learning

This programme emphasises practical learning. Our real-world scenarios help spotlight unique challenges that projects may face and how digital health technologies can help overcome those challenges across a range of medical specialities. We have developed these clinical use cases after many hours of in-depth conversations with healthcare professionals across the hospital, ranging from clinical to management roles. Their collective experience, reflections and questions helped us shape a story, set in a real clinical setting, that consolidates understanding and stimulates discussion on how healthcare innovation should be executed to ultimately improve patient care.

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Online learning

More than simply static content, the course will use dynamic remote learning tools and techniques. Learners will be able to communicate with each other as well as experts and tutors through moderated discussions and live webinars. We look forward to fostering communities of learners where ideas, issues, experiences and solutions can be developed and exchanged.

Project work

Learning individually or as part of a project team you will be able to engage with the programme at your own pace. Individual contact with tutors will support you through a series of homework assignments.

Leadership, understanding and transformation

To successfully lead a digital health strategy in your hospital you will need an understanding of the economics of implementing digitalisation, cost savings and service improvements. You will also need an understanding of the project management methodologies used to implement these programmes. We will equip you with the necessary tools to take on this leadership role.

There are many elements of digital transformation: new technology and new processes for using it. Healthcare professionals need to understand what changes may be proposed and make appropriate recommendations for how these can be implemented in their area. Through our real-world scenarios showing implementation across a range of specialities, you will be able to see what challenges lie along the way and how new technologies have been used to provide improved patient care.

Certification

Each module studied will result in a Certificate of Attendance. CPD accreditation is in progress.

Programme overview



This programme overview provides an easily accessible introduction to digital transformation in the health sector, illustrates the high relevance of the topics of the course for health professionals in the hospital context, and offers a tangible guide to how the learning opportunities of the course can be used in an individualised manner.



Essential skills for innovative healthcare

Essential digital skills that exceed exclusively technical ones, are required to seize the full potential of digital technologies in healthcare. These skills enable healthcare professionals to assess the benefits and risks of digital technologies in facilitating patient-centred, high quality care, and integrating these technologies productively into their work practices. Participants of the module will gain an insight into the opportunities offered by telemedicine, mobile health and electronic health records and receive guidance on the informed use of these technologies. The aim of this module is to equip participants with a good understanding of essential digital skills and specific digital technologies required to improve hospital routines and patient care.

MODULE CONTENT

- Relevance of essential skills for innovative healthcare
- Introduction to telemedicine
- Guidance for conducting telemedicine appointments with patients
- Introduction to electronic health record systems
- Introduction to mobile health technologies
- Guidance for assessing mobile health technologies





Leading the healthcare transformation

A culture of innovation and learning is key to harnessing the opportunities offered by digital transformation in healthcare. This module focuses on the relevance of organisational culture and leadership in the productive and sustainable integration of digital health technologies in hospital practices. It illustrates the role of emotion in this process and discusses the opportunities for agile approaches to healthcare. It provides participants with the principles and tools for driving this organisational transformation.

MODULE CONTENT

- Understanding change in complex health systems
- Future-proofing organisational culture in healthcare
- The significance of leadership in driving the digital healthcare transformation
- The relevance of agile approaches to healthcare transformation
- Approaches for driving the organisational transformation of hospitals





Smart devices for healthcare professionals

Smart devices increasingly work alongside physicians and medical staff to perform repetitive and routine tasks reducing the physical and mental workload for medical personnel. This module provides physicians and hospital managers with an overview of current and future smart devices for hospitals. It discusses possible use cases and challenges participants to think about how and where they could add value in their workplace. The module encourages healthcare professionals to be innovators themselves by giving them the tools required to take the first steps on the path to a successful commercialisation of their ideas.

MODULE CONTENT

- Overview and examples of medical robots and their intended uses
- Overview and examples of hospital robots and their application in clinics
- Important technology trends for medical devices: IoT, AI, AR/VR and 5G
- Medical innovators and entrepreneurs:
 - Understanding Need and Problem Pathway
 - Competitors and Existing Solutions
 - Stakeholder analysis
 - Market analysis
- ⁹ Bonus: Insights from a clinical innovator and entrepreneur who, eight years ago, started a high-tech medical company and today employs two hundred people to develop a technical solution to a real-world clinical problem and a business model to support it





Security of computerised systems in healthcare

Cybersecurity threats exist everywhere, especially in healthcare. The implications of this cannot be overlooked. This module aims to provide healthcare professionals responsible for information-processing systems with increased awareness for identifying and assessing cybersecurity threats alongside knowledge to prevent accidents and actions to take in critical situations. The course addresses technical aspects as well as infrastructural and social dimensions.

MODULE CONTENT

- Overview of cybersecurity threats and counter measures
- Practical guide to the prevention of information security threats
- Worst-case examples, explained
- Examples of current use cases
- Best practices and pointers
- Devise an action plan
- Leveraging technology benefits for healthcare





Usability and user experience (UX) of medical devices

The value of a medical system depends heavily on its ease of use and accessibility. Learning how the principles of design and evaluation affect user experience will allow users to enable assessment of the quality of medical devices, and inform feedback and contribute to the improvement of such systems. The aim of this module is to provide training about the principles of user interface design and evaluation in the context of medical devices and eHealth applications, to improve their performance, users' acceptance and satisfaction.

MODULE CONTENT

- Introduction to Usability-UX and its importance
- Understanding the stages of Design Thinking, its application and methods including
 - Emphasise and Define stage
 - Identification of user requirements
 - Ideation, prototyping, and test stages
 - Usability evaluation
 - Accessibility: audit and peer evaluation
- Supporting methods to include: interview and observational techniques, focus groups, task analysis and personas
- Techniques for documenting and collecting technology user requirements
- Introduction into clinical investigations

- The needs of diverse users;
 accessibility guidelines (WCAG), plain language and related methodologies, design, implementation and evaluation of an accessibility audit
- Risk assessments and identification of risks to users when a device is not usable
- Cognitive walkthrough of expert reviews
- Methodologies for usability
 evaluation in clinical settings
 (formative and summative)
- Conducting usability evaluations and methodologies in clinical settings)





Machine learning for precision medicine

Teaching machines to learn and draw conclusions from data is key to the development of intelligent assistants for many tasks in clinical institutions. Machine learning (ML) tools allow users to analyse enormous amounts of clinical data and elaborate precise methods to help clinicians in their practice, helping them to handle the complexity of integrating information from different data sources. The goal of this module is to improve personalised healthcare and individual outcomes by giving participants the tools for more patientcentred care decisions by improving diagnosis, treatment and monitoring of diseases, and streamlining administrative processes in hospitals.

MODULE CONTENT

- Online resources for medical information about commercial or scientific ML offerings
- Introduction to data science topics: efficient data storage, missing data, training, testing, validation data, parameter spaces, dimensionality reduction, etc.
- ML methods for clinical diagnosis: impact, potential, and limitations
- Modelling tasks like measuring, classification, detection, and prediction in clinical environment
- Probability and uncertainty of predictive ML algorithms
 - Accuracy, risks, and tools in predicting diagnoses with ML
 - Key elements of operational data in hospital management

- Confidence in predictive risk outcomes: accuracy and implications for safety, ethics, and privacy
- Key GDPR elements impacting on training in AI/ ML algorithms
- Applying ML for clinical data profiling
- Anomaly detection to find pathological vs. healthy data
- Regression models for predicting clinical resources
- Accuracy and confidence of predictive risk outcomes: implications on safety, ethics, and privacy
- Black box effect: transparency, explainability and uncertainty
- Deep learning and its interpretability





Integrated healthcare

Healthcare of a patient involves many stakeholders, who work and live in different places in various circumstances, using a variety of tools, and processing specific parts of the electronic health record. Integrated healthcare allows the development of state of the art eHealth tools, which provide every stakeholder with efficient access to the data required for their work. This ensures personalised care plans for every patient available to all stakeholders, avoiding duplicate examinations and contradictory medications and facilitating optimised cost structures. Integrated healthcare eliminates proprietary data formats that lead to isolated data silos and stand-alone systems. Isolated systems do not extend potential benefits to their users, and cause high deployment and maintenance costs. The module will focus both on clinicians' requirements such as interoperability and on the importance of patient empowerment in order to improve the entire healthcare journey.

MODULE CONTENT

- The history of eHealth
- eHealth standards
- Why integrated healthcare?
- Tools used by clinicians and patients to access and use EHRs
- Web protocols & Formats: HL7, CCD, FHIR, and EHR, EMR, PHR
- Health-related data standards interoperability
- Mobile web applications in healthcare

- Server-side and client-side scripting:
- Asynchronous and distributed web applications
- Patient status monitoring, capturing sensor measurements related to health parameters
- Documentation, evaluation and validation methodologies
- Medical product characteristics





Health economics

Building awareness of the economic impact of digital health technology for patients, users and the wider system is crucial to improving the confidence of clinicians in decision making and enabling them to focus on value-based healthcare services. The goal of this module is to provide knowledge and tools to understand why health economics is important, to define a problem, and to use different types of analysis commission/ co-design and interpret the outcome of a health economic evaluation.

MODULE CONTENT

This module will focus on the following topics:

- How to measure outcomes in health economic analysis, and how to value those outcomes
- The health economics principles of healthcare decision making - scarcity of resources, opportunity cost, willingness to pay
- Understand what information economic evaluations can provide
- How economics fits alongside other important decision criteria
- The different costing methodologies used in economic evaluation
- The most common types of health economic evaluations: cost effectiveness, cost utility and cost benefit analysis
- Sources of existing healthcare data
- Deciding whether primary data needs to be collected

- Outcomes used in specific forms of evaluation:
- Natural units in cost effectiveness
- QALYs and other patient reported outcomes in Cost Utility analysis
- Discrete Choice Experiments and Willingness to Pay in Cost Benefit analysis

Different forms of modelling: decision tree and Markov

How costs and outcomes are bought together in economic models

How budget impact models are calculated: The Incremental Cost Effectiveness Ratio (ICER)

Using checklists to ensure economic evaluations are produced according to a standardised approach



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We are open for applications

The programme is now open for applications, and all modules are fully funded for those applicants accepted to attend the programme in 2020*



Application form (Also found on our website)

For any additional information or to join our waiting list for this programme in 2021, please contact our programme team

connect@thehilloxford.org

* Fully funded for 2020 for the programmes led by TheHill, Oxford and Fraunhofer. Following on from this fully funded pilot, the charges for 2021 modules will be available from December 2020.



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