

Programme Specification 2019-20

**Master of Studies in Healthcare Data: Informatics, Innovation and
Commercialisation**
**Postgraduate Diploma in Healthcare Data: Informatics, Innovation and
Commercialisation**
Postgraduate Certificate in Healthcare Data and Informatics

Awarding body	University of Cambridge
Teaching institution	University of Cambridge
Accreditation details	None
Name of final award	Master of Studies (MSt) Postgraduate Diploma (PgDip) Postgraduate Certificate (PgCert)
Programme title	Healthcare Data: Informatics, Innovation, and Commercialisation (MSt, PgDip) Healthcare Data and Informatics (PgCert)
UCAS code	n/a
HECoS code(s)	100994 (health informatics)
Relevant QAA benchmark statement(s)	None
Qualifications framework level	FHEQ Level 7
Date specification produced	July 2020

*Cognate Faculty endorsement - School of Clinical Medicine

Update June 2020: From mid-March 2020 the COVID-19 pandemic resulted in all course teaching switching to emergency remote delivery, using video-based teaching methods and the Virtual Learning Environment. Learning outcomes were unaffected and assessed appropriately.

Introduction

Cambridge is a world leading centre for innovation in electronic patient and clinical trial data. This is underpinned by an extensive and vibrant community of clinicians, researchers, entrepreneurs, and commercial and public sector organisations. There is a recognised shortage of the appropriate technical and practical skills in the workforce to be able to work with and effectively utilise healthcare data for practical application and commercialisation¹⁻⁶.

The ramifying benefits to patient care, clinical research, and commercial opportunities arising from digital health data are apparent. As is the need to nurture this potential and develop suitable rigorous and practically-focussed training programmes that align with the UK Life Sciences Industrial Strategy² and support the further development of clusters of digital health

¹ http://www.hefce.ac.uk/pubs/year/2017/CL_242017/

² <https://www.gov.uk/government/publications/life-sciences-industrial-strategy>

³ http://www.hi7.org.uk/marketing/archive/2008/080723_informatics.asp

⁴ <https://www.abpi.org.uk/about-us/resources/publications-library/bridging-the-skills-gap-in-the-biopharmaceutical-industry/>

⁵ <https://www.gov.uk/government/publications/using-information-technology-to-improve-the-nhs>

organisations and supporting infrastructure. Creation of training opportunities, professional networks, and an innovative culture are required to address this skills deficit and allow professionals to acquire the skills to transform healthcare data and informatics into commercially valuable activity.

Educational aims

The programme will develop individuals with the necessary knowledge and skills to be able to understand and critically evaluate electronic healthcare data in a manner compatible with innovative commercialisation opportunities

The course will:

- Provide professionally relevant teaching and learning of the knowledge and skills that underpin, and are at the forefront, of successful understanding and utilisation of electronic healthcare data.
- Develop, create and upskill healthcare data experts with the necessary expertise, and originality of application, to pursue and expand their roles in the context of the rapidly evolving environment of electronic healthcare data
- Promote a comprehensive understanding of the practical and ethical considerations relevant to healthcare data, informatics, innovation and commercialisation.
- Ensure a systematic understanding of the skills and knowledge required to facilitate the development of critical thinking, and appropriate analytical and problem-solving skills relevant to the utilisation of healthcare data.
- Provide work relevant learning and practical expertise in the context of a critical awareness of current problems, best-practice, challenges and potential solutions in the use of healthcare data.
- Instil a critically reflective approach to the development of innovative and commercially viable application of healthcare data.
- Create a professional network of like-minded individuals as leaders in the field of healthcare data commercialisation.
- For students completing the PgDip or Masters programme provide students with the skills and knowledge to execute the entire process from initial curiosity driven database queries, through to data analysis and visualization, completing with data entrepreneurship, commercialisation, and digital marketing. And for Masters students to do this in a work-relevant and practical manner via their research dissertation.

Learning outcomes

The programme provides the skills and knowledge needed to convert digital health data within electronic patient records, trial registries, and audit networks into effective research, service improvement, and commercially viable tools.

In particular the over-arching learning outcomes are:

Knowledge and understanding

⁶ <https://www.gov.uk/government/publications/uk-digital-strategy>

- To enhance the students' systematic knowledge and critical understanding of the diverse range of healthcare data produced, the way this is stored and handled and the problems this presents
- To develop students' ability to evaluate and to critically compare healthcare data sets in order to make value-based judgements on the most appropriate analytical and visualisation approaches to use
- To enable students to describe and critique the functional and organisational structure of healthcare datasets
- To provide a comprehensive understanding of the skills necessary to enable students' to critically review and interpret healthcare data in the context of developing novel and innovative commercial applications
- To create an enquiring perspective to enable critical and evaluative discussion that extends student understanding of key ethical issues in the acquisition and use of healthcare data
- To develop students' ability to evaluate best practices in the use of healthcare data and apply appropriate methods to their own work.
- To enable students to understand and apply the academic and professional theories and applications of change management, innovation, commercialisation, and entrepreneurship to the utilisation of healthcare data
- To enhance the students' systematic knowledge and critical understanding of the importance, relevance, breadth and applicability of healthcare data in the modern world
- To develop students' ability to critically evaluate subject matter
- To enable students to describe and critique key analytical, visualisation, and commercialisation techniques and approaches relevant to healthcare data.

Skills and other attributes

- To develop a data query and follow this with appropriate application of analytical and visualisation tools.
- To define, develop and implement the process of change management in a healthcare context.
- To demonstrate systematic knowledge of the skills and methodologies necessary to: understand healthcare data in a repository; to perform appropriate analytical interpretation of the data; to apply appropriate visualisation tools and techniques; to identify innovative commercial potential in a critically evaluative manner, under their own initiative.
- To present an appropriate understanding of, and technical competence in, the analytical and visualisation methods required for understanding healthcare data and for engaging downstream user groups and stakeholders
- To design, prepare, implement and evaluate a business case and digital marketing strategy for the innovative commercialisation of healthcare data.

Teaching methods

The course is delivered in a blended manner through a mixture of face to face and online delivery. Interactive lectures, webinars, practical demonstrations and workshops, problem based learning and small group working will be delivered and facilitated by subject experts. Teaching sessions integrate academic theory with practical application and allow for discussion and critical appraisal. Online resources, provided through a Virtual Learning Environment, focus on individual study topics, worked examples and the exploration of appropriate resources.

Assessment methods

All units on the course use summative assessment approaches designed to ensure experiential learning and work-based real-life relevance. Approaches may include, but are not limited to: critical analysis case-studies, assessment of evidence-based portfolios, assessment of work and sector relevant group presentations and projects, short answer questions, essays, the ability to handle, analyse and visualise unseen datasets, and research dissertations.

The students receive continual formative feedback throughout the course using a variety of strategies and techniques including evidence of regular reflection.

Programme structure

The Healthcare Data: Informatics, Innovation, and Commercialisation course programme is taught part-time in 6 distinct units and leads to the following University of Cambridge degrees or awards:

- Postgraduate Certificate (PgCert) in Healthcare Data and Informatics - a one-year part-time Masters level programme resulting in 60 FHEQ (Framework for Higher Education Qualifications) level 7 credits and a University of Cambridge award (**Units 1 and 2**).
- Postgraduate Diploma (PgDip) in Healthcare Data: Informatics, Innovation, and Commercialisation - a two-year part-time Masters level programme resulting in 120 FHEQ level 7 credits and a University of Cambridge award (**Units 1, 2, 3, 4 and 5**).
- Masters of Studies (MSt) in Healthcare Data: Informatics, Innovation, and Commercialisation - a two-year part-time Masters level programme resulting in 180 FHEQ level 7 credits and a University of Cambridge degree (**Units 1, 2, 3, 4, 5 and 6**).

The taught units are structured as follows:

Unit 1: Research Skills, Governance, and Innovation (20 Credits)

Aims: To provide students with theoretical, academic and practical understanding of what healthcare data is and how it can be used; to instil a critical ethical and regulatory awareness for the appropriate utilisation of healthcare data; to introduce students to the key conceptual elements of successful healthcare data analysis, innovation and commercialisation.

Indicative content:

- Developing an understanding of what healthcare data is, and where and how it is stored.
- The relationship between Good Clinical Practice and healthcare data.
- Identifying, understanding and critically engaging with the ethical and legal aspects of healthcare data utilisation, including issues such as ownership, security and relevant legislation.
- Critical analysis of the healthcare data landscape and example case studies in the context of innovation and commercial orientated opportunities.

- An introduction to the statistical analysis of healthcare data.
- How to identify and design a research question and study using healthcare data.

Unit 2: Data Structures, Storage, and Queries (40 Credits)

Aims: To provide students with a critical understanding of the relationship between healthcare data, populations, and diseases; to provide students with the necessary technical skills and awareness to make value-based judgements around how to extract, refine, and structure data to permit effective healthcare research.

Indicative content:

- Exploring the epidemiology of big data in a healthcare context.
- Developing an understanding of diseases, populations, and public health through healthcare data.
- Database structures and archiving – data storage, archiving, access and security
- Introducing and developing the coding, sampling, statistical, analytical and visualisation skills to successfully evaluate and analyse healthcare data.

Unit 3: Finding Relationships (20 Credits)

Aims: To provide students with the technical skills and academic understanding to perform academically appropriate statistical analysis and visualisation of healthcare data in a manner suited to the downstream audience or purpose.

Indicative content:

- The use of R and other tools to visualise healthcare data and present complex ideas.
- Advanced statistical techniques for the critical analysis of healthcare data.
- Machine learning and natural language processing.

Unit 4: Change Management and Decision Support (20 Credits)

Aims: To enable students to understand and facilitate a process of change management; to develop skills in critical thinking to aid identification of problems which may be solved by healthcare data.

Indicative content:

- Healthcare systems – what they are and how they change.
- The process of modelling change.
- Implementation and evaluation of change management systems.
- The importance of digital decision support

Unit 5: Medical Technology Innovation and Commercialisation

Aims: To provide students with a rigorous understanding of commercial innovation and to equip them with suitable skills to develop realistic proposals for the commercialisation and innovative application of healthcare data.

Indicative content:

- Introduction to innovation, commercialisation and entrepreneurship.
- Commercial collaboration between public and private sectors.
- The applicability of healthcare data for commercialisation.
- Preparing a business case and digital marketing strategy.

Unit 6: Research Dissertation

Aims: To enable students to apply and develop their learning from units 1 to 5 through the development of an innovative application of healthcare data and the production of an academically rigorous dissertation.

Indicative content:

- Production of a dissertation covering the commercialisation of healthcare data from the point of conception, through the analysis and visualisation of the data, to the proposed innovative and commercial output.

Entry and/or progression requirements

1. Applicants are normally expected to hold a 2i degree or higher from a UK university or an equivalent from an overseas university in a life sciences subject.
2. Applicants to the programme are expected to demonstrate proficiency in the English language; students whose first language is not English must be able to satisfy the current English Language Competence requirements of the University's Board of Graduate Studies in the year in which they apply for admission to the course.
3. The structure of the programme allows international students to attend on Student Visitor Visas, and those in full-time employment, whether in the UK or abroad, to work and study at the same time.

Student support

Students have access to learning support from the Institute of Continuing Education, along with comprehensive details of the programme, contact details and academic and general advice. The course VLE holds generic and subject specific learning resources. Students have borrowing rights in the University Library and can access the library's online resources. Matriculated students have access to the full range of University support services.

Management of teaching quality and standards

The University ensures high standards of teaching and learning in the following ways:

- The completion of Annual Quality Updates by each Faculty and Department, to enable central overview of provision and assist in dissemination of good practice
- Scrutiny of the reports of External Examiners for all teaching programmes
- Encouraging student engagement at both the local level, through involvement in Faculty and Departmental Committees, and at a central level by participation in the nationally-benchmarked surveys
- Holding reflective, centrally-coordinated, Learning and Teaching Reviews for all teaching institutions every six years to explore provision and suggest constructive courses of action
- Mentoring, appraisal, and peer review of staff, and encouraging staff participation in personal development programmes

Graduate employability and career destinations

The majority of students are in full-time or part-time employment in the public or private sector in a field closely aligned with the utilisation of healthcare data. They choose to take this programmes for reasons of professional and career development, advancement, personal development, or to enhance their skills and knowledge. Some students are recent graduates looking to develop a career in healthcare data and informatics.

Students are IT-literate graduates for whom health informatics is, or will become, a significant part of their professional lives. They include speciality trainees in medical disciplines, PhD graduates, lifescience and computer science graduates. Students develop in to senior leaders in healthcare data in their employing organisations

Preparation for employment in general is provided in the opportunities for the acquisition of relevant transferable skills outlined in this programme specification. Where programmes with a significant vocational or professional element are accredited by Professional, Regulatory or Statutory Bodies details are given above.

The Careers Service maintains links with employers and takes their needs and opinions into account in the services which it provides for students. The Careers Service also allocates a Careers Adviser to each College, faculty and department to act as a point of contact.

Every effort has been made to ensure the accuracy of the information in this programme specification. At the time of publication, the programme specification has been approved by the relevant Faculty Board (or equivalent). Programme specifications are reviewed annually, however, during the course of the academical year, any approved changes to the programme will be communicated to enrolled students through email notification or publication in the *Reporter*. The relevant faculty or department will endeavour to update the programme specification accordingly, and prior to the start of the next academical year.

Further information about specifications and an archive of programme specifications for all awards of the University is available online at: www.camdata.admin.cam.ac.uk/