Health Informatics

Continuing Professional Development Programme

November 2020 to March 2021

go.ncl.ac.uk/health-informatics
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Programme Details

Objective
To provide a foundation for beginners in Health Informatics from which they can build additional knowledge in the field.

Outcomes
By the end of this programme, the participants will be able to:

1. Define Health Informatics
2. Identify the key Health Informatics concepts
3. Describe Health Informatics problems and discuss ways to address them
4. Reflect on their digital practice and learning.

Target Audience
The programme is aimed at Doctors, Nurses, Pharmacists, IT personnel, Clinical Coders, and other healthcare professionals interested in learning about Health Informatics. No prior knowledge on any of the topics is assumed.

Programme Level
All the 10 courses in the programme are at an introductory level aimed at beginners with little to no background knowledge on the respective topics.

Delivery
The programme will be delivered fully online for 2020/21.

Each course will include synchronous and asynchronous learning elements. As part of the asynchronous learning, delegates will be provided with a pre-recorded lecture and any activities to complete a week before the ‘live’ session to view at their own pace. The live session, with the lecturer(s) will constitute the synchronous element of the course. It will be interactive in nature and hosted remotely on Zoom or MS Teams. It will bring together the various aspects learnt, enable discussion and answer any outstanding questions. The pre-recorded lectures will be of approximately 90 minutes in duration and the live sessions of approximately 60 minutes in duration. The exact time durations may vary for the individual courses but the total learning time for each course is 3 hours, which also includes time to complete pre-course activities as required. The total learning time for the course, Clinical Informatics in Practice, is 4 hours. All the courses will be delivered by academic and/or clinical experts in their respective fields and who bring with them vast experience and knowledge.

Accreditation
The programme content has been submitted to the UK Faculty of Clinical Informatics (FCI) for accreditation. Accreditation of CPD courses is important as it ensures high quality training and also enables delegates to get credit for learning in the form of CPD hours/points. Course/programme completion certificates will be provided to delegates, which will mention the number of CPD hours applicable. Moreover, in this programme, each course has been mapped to the relevant competencies in the Clinical Informatics Competency Framework. The accreditation will thus enable delegates to evidence their having achieved the corresponding competencies. It will also be possible to claim additional competencies on completion of all the 10 courses in the programme. Outcome of the accreditation process will be updated on the website in due course.
Content Development

The course has been co-developed by the Institute of Coding (IoC) at Newcastle University with Health Education England North East and North Cumbria.

IoC is an initiative funded by the Department for Education through the Office for Students to address the digital skills gaps. It is a partnership of 37 universities and more than 100 employers across England and Wales with Newcastle University being one of the partners. IoC at Newcastle University offers three postgraduate Degree Apprenticeships in Data Analytics, Cyber Security, and Software Engineering as well as CPD courses in digital skills, knowledge, and technologies.

Schedule

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Courses

1. LEADERSHIP IN HEALTH INFORMATICS: AN INTRODUCTION

Summary
This course will provide an introduction to health informatics, from the perspective of a practising clinician, and its context within the structures of the National Health Service and social care. It will consider aspects of leadership, some recognised leadership styles and behavioural drivers. The role of digital leaders in managing and promoting change will also be reviewed.

Learning Outcomes
By the end of this course, learners will be able to:

1. Define ‘Health Informatics’ and describe its importance in clinical practice.
2. Explain the present structures and relationships in the National Health Service.
3. Outline recognised leadership styles and reflect on how you can have impact.
4. Identify Kahler’s behavioural drivers and understand the impact of these on work within teams.
5. Describe the processes associated with change and understand techniques for management of such changes.
6. Explain the importance of leadership skills and change management in the work of a health informatician.

Outline
Below is an outline of the content covered in the course:

1. Overview and history of the National Health Service
2. Principles of Health Informatics
3. Fundamental informatics concepts (data, information, knowledge, wisdom)
4. Leadership: recognised models and styles
5. Power and drivers as influences in leadership
6. The process of change and how individuals can lead and manage it

Pre-course completion
1. Review of video
2. A link will be sent for delegates to complete Kahler’s behavioural drivers questionnaire before the live session
3. Delegates will be asked to reflect on two challenges in leadership they have faced
4. Delegates will be asked to reflect on a period of change they were involved with, identifying areas that went well and less well, to use in an exercise

Lecturer
Dr Lesley Kay

Lesley is a consultant rheumatologist, National Clinical Lead for Rheumatology in the Getting It Right First Time Programme, NHS England and Improvement and Deputy Medical Director at the Healthcare Safety Investigation Branch. She is an Honorary Senior Clinical Lecturer at Newcastle University, a Member of the Faculty of Clinical Informatics, vice chair of the Northern Clinical Senate Council and holds a Masters in Leadership and Quality Improvement via the GenerationQ programme from the Health Foundation. She lives in Northumberland and is developing her skills in remote presentation.
2. INTRODUCTION TO HEALTH INFORMATION SYSTEM INTEROPERABILITY

Summary
This course will begin with a discussion on the key terms associated with health information systems and will then proceed to a discussion on standards, which are integral to the functioning of information systems. For health information to be useful and useable, it must be shared consistently and meaningfully between information systems. Standards play a critical role in ensuring this information exchange and interoperability. The course will thus focus on the role and usage of interoperability standards within healthcare information systems. The learners will also learn about the organisations that create and maintain these standards.

Learning Outcomes
By the end of this course, learners will be able to:

1. Explain the concepts 'interoperability standard' and 'terminology'.
2. Understand computer science principles and terminology used when discussing health information systems.
3. Identify the main organisations responsible for the creation of health interoperability standards (with a particular focus on those used within the UK).
4. Describe the characteristics of the main health informatics standards systems used within the UK, including coding systems, data structures and system-to-system messaging.

Outline
Below is an outline of the content covered in the course:

1. What is an interoperability standard?
   a. ATMIST-AMBO
   b. interoperability standard vs terminology
2. Basics of information systems architectures and language:
   a. Client
   b. Server
   c. Database
   d. Network
   e. Data centre
   f. Cloud computing
   g. API
   h. XML
   i. JSON
3. Who creates standards?
   a. International standards organisations:
      i. HL7
      ii. OpenEHR
      iii. IHTSDO / SNOMED International
      iv. IHE
      v. NEMA
   b. Adapting international standards for local use
   c. UK standards organisations:
      i. NHS Digital
      ii. INTEROPen
      iii. PRSB
4. What standards are in use?
   a. International standards:
      i. HL7 V2
      ii. HL7 V3
iii. HL7 CDA  
iv. HL7 FHIR  
v. OpenEHR  
vi. SNOMED-CT  
 Matrix. IHE-XDS  
vii. DICOM  

b. National standards:  
i. DM&D  
ii. ITK  
iii. GP Connect  
iv. Care Connect  

5. Further resources  
6. Summary  
7. Q&A  

Lecturer  
Dr Dunmail Hodkinson  

Dunmail is the Chief Technology Officer (CTO) at Black Pear Software Ltd. As the CTO, he is responsible for developing interoperable systems for Local Health and Care Record Exemplars using standards from HL7 and IHE. He has also developed Black Pear’s Prime Minister’s Challenge Fund software, the first production implementation of HL7 FHIR in the UK and one of the first globally.  

Dunmail is also the Immediate Past Chair at HL7 UK having served as the Chair from June 2017 to June 2019. HL7 is the global authority on standards for interoperability of health technology. HL7 UK looks after HL7 activities in the UK. As Chair of HL7 UK, Dunmail was responsible for providing advice on interoperability standards to stakeholders including INTEROPen, TechUK, NHS England, and NHS Digital.  

Dunmail has a PG Cert in Computing from The Open University, PhD from The University of Sheffield, and BSC in Biological Sciences from Durham University.
3. HUMAN COMPUTER INTERACTION IN HEALTHCARE

Summary
This course will introduce the subject of Human Computer Interaction as a field of research in its own right and identify how interface design is critically important in the context of digital health. The course is designed as an introduction to understanding how promoting good practices in human interaction with enabling digital technologies is an overriding influence in the success of health informatics products. Examples and case studies will be used to allow learners the ability to contextualise the material presented in accessible real-world settings.

Learning Outcomes
By the end of this course, learners will be able to:

1. Identify engineering terms that help communicate with designers to improve (digital) interface design.
2. Recognise the different interaction patterns and their usefulness.
3. Understand the role human factors play in design of computer interfaces.
4. Discuss the application of user-centred design in HCI.
5. Analyse an interface design and describe good and poor design judgement based on the design’s intended use.

Outline
Below is an outline of the content covered in the course:

1. Evolution of Human Computer Interaction
   a. HCI theory
   b. Models for interface design
2. Human Factors Engineering (HFE)
   a. What is HFE?
   b. Why HFE?
   c. Human factors in HCI design
   d. User-centred design
   e. Usability testing
   f. Human limitations
3. Interface design: good and poor design

Lecturer
Dr Graham Morgan

Graham is the Deputy Head of School and Reader in the School of Computing at Newcastle University. He works extensively with healthcare professionals to create digital health solutions for diverse medical conditions using the latest cloud and virtual reality technologies. For example, he has led several projects, some of which are: i) ICURe Cohort 9: ASTEROID, the fun 3D eye test (Research England), ii) HICF - Accurate and patient friendly measurement of binocular visual function using a 3D mobile device (Wellcome Trust), iii) Augmented Reality Stories for Upper Limb Rehabilitation of Preschool Children with Hemiplegic Cerebral Palsy (Action Medical Research), iv) and Additional vision tests for Asteroid device (Medical Research Council) among others. His work and projects involve innovative use and application of human computer interaction principles and technology, game technology, and artificial intelligence.
Graham is the co-director of the Network and Ubiquitous Systems Engineering group in the school. He also leads the Computer Game Engineering MSc and runs the Game Lab at Newcastle University. The Game Lab carries out research and provides education related to video game technology. It is the only lab of its type within a Russell Group university in the United Kingdom.
4. CLINICAL INFORMATION SYSTEMS

**Summary**

This course will begin with an overview of Clinical Information System (CIS) in healthcare and take the learners through the different types of CIS in practice. The course will then focus on Clinical Decision Support System (CDSS) as a specific type of CIS. With the context of CDSS, learners will learn about the key considerations in the different stages of CIS development including design, implementation and evaluation. As the course progresses, learners will be able to analyse how CDSS assist human-decision making and lead to improved care outcomes.

**Learning Outcomes**

By the end of this course, learners will be able to:

1. Define Clinical Information Systems (CIS) including the different types of CIS in practice.
2. Describe the purpose of CDSS and their applications.
3. Critically analyse the enablers and barriers for the adoption of CDSS.
4. Analyse the key considerations when designing and implementing CIS in the context of clinical decision support.
5. Recognise the different approaches to evaluating CIS and determine which one(s) to utilise in practice.

**Outline**

Below is an outline of the content covered in the course:

1. Introduction to Clinical Information Systems (CIS) in healthcare
   a. Overview of CIS at different stages of care delivery (diagnostic, prescribing, administration, monitoring, patient facing)
2. Clinical Decision Support Systems (CDSS) and their applications in practice
3. Enablers and barriers to the adoption of CDSS
4. Examples of designing and implementing CIS for clinical decision support
   a. Different approaches: Active and Passive; workflow considerations
   b. ‘Building blocks’ of CDSS – leveraging data within the EHR
   c. Safety (overreliance) and Alert fatigue
5. Approaches to evaluation
6. Group Activity: Identification of a clinical problem or target where CDSS could be beneficial and design an end to end project to address this.

**Lecturer**

Dr Clare Tolley

Clare is a Research Associate in the School of Pharmacy at Newcastle University. In this role, she works on a large project spearheaded by Alzheimer’s Research UK to use commercially available digital tools in the early detection of neurodegenerative diseases. She was previously the project manager of a large programme of work funded by an EU Horizon 2020 grant. She engages with patient and public involvement groups, has been involved in the implementation of a healthcare intervention on a large hospital Trust, performs data collection and analysis and evaluates digital tools for their usability in acceptability. Clare received her PhD from, Durham University in 2018, entitled “An investigated of healthcare professionals’ experiences of training and using electronic prescribing systems” as part of which, she undertook four literature reviews and two qualitative studies in the UK hospital context. Clare is a Registered Pharmacist, has a Certificate in Clinical Pharmacy and is a Fellow of the Higher Education Academy.
5. DIGITAL ETHICS IN HEALTHCARE

Summary

This course will explore ethical considerations relating to digital innovation in healthcare and health systems. It will consider how broader debates around digital ethics (e.g. relating to artificial intelligence and data collection and reuse) apply in health contexts.

In particular, the course will focus on the uses of data in healthcare and health systems and ethical considerations relating to data collection, storage and use/reuse. This includes use of data in developing and utilising new technologies including Artificial Intelligence (AI).

The course will move from considering broader issues around digital ethics to focus on practical examples and actual clinical applications. The learners will examine current governance mechanisms in place to address digital ethics and a range of approaches that can be employed (including the role of Patient and Public Involvement in the use/reuse of health data).

Learning Outcomes

By the end of this course, learners will be able to:

1. Explain how digital ethics applies in health contexts.
2. Describe updated and clinically relevant governance procedures relating to the increase in digital technologies for example, grey areas such as use of personal mobile devices to communicate patient information.
3. Recognise the ethical considerations relating to the transfer and retrieval of digital patient data including elements of shared care, data protection and security.
4. Identify the current governance mechanisms and approaches: including regulations, the role of Caldicott Guardian, and Patient and Public Involvement (PPI).

Outline

Below is an outline of the content covered in the course:

1. Background: why digital ethics?
2. Examples of ethical dilemmas in digital innovation (particularly in health contexts)
3. Consideration of practical examples in relation to clinical applications
4. Current governance mechanisms and approaches: including regulation, policy, the role of Caldicott Guardian, and Patient and Public Involvement (PPI)

Lecturer

Dr Mhairi Aitken

Mhairi is a Senior Research Associate at Newcastle University. Her research examines social and ethical considerations relating to digital innovation, particularly around data science and Artificial Intelligence (AI). Her research has focussed in particular on data-intensive health research and uses of AI in the banking sector. Previously, she was a Research Fellow at the University of Edinburgh where she held roles as a Public Engagement Research Fellow in both the Farr Institute of Health Informatics Research and the Scottish Health Informatics Programme (SHIP). As a research fellow, she worked on two consecutive large interdisciplinary and multi-institution projects, examining social and ethical dimensions of innovation in health informatics research and their implications for governance. Mhairi has been a guest lecturer/tutor between 2016 and 2018 on University of Edinburgh’s Distance Learning MSc Global EHealth. As part of this role, she developed online tutorials, online course materials, and participated in discussion forums with students. Mhairi holds a PhD and a Postgraduate Certificate in Research Methods from The Robert Gordon University.
6. SNOMED CT BASICS

**Summary**
Electronic patient records are fundamental to providing efficient, effective care in the 21st century. Within a patient record, it is crucial that the data is of quality, is quick to find important information and that the data is correctly interpreted by others reading that record as well as for the computer to process that data. In order to do this, all electronic health record systems used by the NHS need to use the same clinical vocabulary for entering data into the record; this is the role of a terminology.

SNOMED CT provides the clinical terminology used within the systems in use in the NHS and addresses the needs of all clinical professions and clinical specialties. It is imperative that all clinical staff and those processing patient records understand the basics of SNOMED CT.

Terminologies have evolved over the years, becoming more sophisticated as computers have evolved. SNOMED CT is the only international terminology that meets the needs of the NHS; the NHS was instrumental in its creation and maintains a role in its ongoing development. While SNOMED CT in its fullest capability is a complex terminology, it can be viewed through different lenses. At its most basic level, the fundamentals of SNOMED CT are quick to assimilate; for those undertaking clinical research and undertaking data analysis; or those developing systems to use SNOMED CT; there is a greater level of detail required.

This course will address the basics, but also provide an appreciation of the capabilities of SNOMED CT. Learners will also receive guided and exploratory opportunities to understand the structure and content in SNOMED CT through hands-on activities.

**Learning Outcomes**
By the end of this course, learners will be able to:

1. Differentiate between healthcare terminologies and classifications; promote the use of terminology to other clinicians.
2. Describe the background of SNOMED CT, the role of SNOMED International and know how to request changes to the UK Edition.
3. Understand the importance of using SNOMED CT to record patient information and illustrate to others for what information.
4. Describe SNOMED CT’s structure and where to find specific content.
5. Demonstrate the ability to navigate SNOMED CT using the NHS Digital SNOMED CT browser; use SNOMED CT to record information within an EPR.
6. Differentiate between the types of SNOMED CT expressions
7. Describe SNOMED CT reference sets and their purpose
8. Describe the benefits of using SNOMED CT in data analysis and research.

**Outline**
Below is an outline of the content covered in the course:

1. What are healthcare terminologies and classifications?
2. Why SNOMED CT?
3. Introduction to SNOMED CT, the UK Edition and SNOMED International
4. SNOMED CT structure and content
5. Exploring SNOMED CT using NHS Digital SNOMED CT browser
6. SNOMED CT expressions and their use to analyse clinical data
7. SNOMED CT reference sets
Lecturers

Denise Downs

Denise was the Principal Terminology Implementation and Education Specialist at NHS Digital. In this role, she has been the terminology SME (subject matter expert) for the project to transition general practice to SNOMED, has led the work for SNOMED CT in mental health and was project manager and SME lead delivering the COVID 19 national test results into GP records. Denise has also worked with a number system suppliers to drive the implementation of SNOMED CT as well as working with of professional bodies to deliver awareness and training for clinicians. Previously, she has held various posts in Huddersfield University from Senior Lecturer in Software Engineering to Director of Research and Knowledge Transfer. Denise has a MA in Software Systems Design from Manchester University, MA in Education from Open University, and BA (First-Class Honours) in Computing and Mathematics from Lancaster University.

Dr Tejal Shah

Tejal is a Lecturer in the Institute of Coding at Newcastle University. In this role, her responsibilities include designing computing courses for professionals from non-computing backgrounds and mentoring apprentices undertaking the Level 7 Digital and Technology Solutions Specialist degree apprenticeship. Previously, she was a Research Associate in the Institute of Health and Society at Newcastle University working on the Connected Health Cities (CHC) Programme. Prior to joining Newcastle University, she worked as a Research Assistant in the School of Information Technologies at the University of Sydney where she was responsible for implementing SNOMED CT in the in-house health information system that was developed as part of a research project. Tejal received her PhD in Computer Science from the University of New South Wales, Sydney, Australia. She holds a Master of Health Informatics degree from The University of Sydney, Australia and Bachelor of Dental Surgery (BDS) from Government Dental College, Mumbai, India.
7. CYBER SECURITY FOR HEALTHCARE

Summary
This introductory course will begin with an explanation of some of the fundamental concepts in cyber security and impart an understanding of information system security requirements. By analysing real-world examples, practical aspects of cyber security including threats and vulnerabilities, with a particular focus on the potential threats to health data, will be discussed. Learners will learn about good practices in cyber security to establish a security culture. Through the course, important questions such as “why is cyber security important for healthcare?” and “does healthcare have a cyber security problem?” will be considered and discussed.

Learning Outcomes
By the end of this course, learners will be able to:

1. Identify the fundamental concepts of cyber security.
2. Recognise the relevance of the National Cyber Security strategy and the NDG Data security standards.
3. Explain the importance of cyber security in the information age.
4. Identify the vulnerabilities and threats and respond to cyber security incidents.
5. Recognise what constitutes the cyber essentials scheme and what are the key security controls.
6. Review the lessons learnt from WannaCry.
7. Understand the relationship between GDPR and cyber security.

Outline
Below is an outline of the content covered in the course:

The basics:
1. Cyber security fundamentals
2. NDG Data Security Standards

The threats:
1. Cyber security threats in general (STRIDE model)
2. Risk assessment
3. Specific aspects to clinical information system safety and patient safety
4. Hazards and accidents: Introduction to safety culture, risk management and ALARP incident response
5. Cyber security technologies (technologies for implementing privacy, security and trust)
6. Examples:
   a. Learning from the 2017 WannaCry ransomware attack

The practical stuff:
1. Cyber security good practices
   a. UK Cyber essentials scheme (https://www.cyberessentials.ncsc.gov.uk/)
      i. Key security controls (secure devices and software, access control to data and services, malware and virus protection, devices and software update, secure internet connection)
   b. 10 steps to cyber security (https://www.ncsc.gov.uk/collection/10-steps-to-cyber-security)
2. Multiple attack steps: Mat Honan attack
3. Cyber security and GDPR
**Lecturer**

**Professor Aad van Moorsel**

Aad is a Professor in Computer Science, specialising in Cyber Security, at Newcastle University. His research focusses on security, privacy and trust where it takes the perspective of the user and the decision-maker, and asks the questions: how can we run IT, make decisions about IT, and implement IT such that the business is secured but efficient and people feel safe but can be productive.

Aad is also the lead for Newcastle University in the Institute of Coding, a scheme offering postgraduate degree apprenticeships and various CPD courses to improve digital skills. He teaches on several undergraduate and postgraduate courses as well as regularly consults and delivers CPD sessions on Blockchain and Cyber Security to professionals from several industries and diverse backgrounds.
8. Data Privacy and Protection in Healthcare

Summary
With the goal of improving patient care and health outcomes, an ever-increasing amount of patient data is being collected and analysed by healthcare organisations. This however raises the critical challenges of ensuring data privacy and protection. Regulations such as the Data Protection Act (DPA) 2018 and the General Data Protection Regulation (GDPR) are aimed at organisations that handle personal data implement appropriate measures to protect against data breaches and inappropriate use. Given the sensitivity of health data, it is considered as special category of data and requires additional measures for protection as stipulated in the regulations.

This course will focus on the key provisions of GDPR that apply to health data as well as on the rights and obligations associated with the processing of health data. Further, the impact of GDPR on cyber security will also be analysed. The learners will be guided through exercises to understand the privacy challenges associated with some common problems such as data re-identification and de-anonymisation.

Learning Outcomes
By the end of this course, learners will be able to:

1. Explain why privacy and data protection laws matter for the healthcare sector.
2. Describe the types of health data as defined in the legislations.
3. Identify the key elements of DPA and GDPR that apply to health data.
4. Recognise the roles and responsibilities of organisations under DPA and GDPR.

Outline
Below is an outline of the content covered in the course:

1. Privacy & Data Protection in general: the basics
2. What constitutes personal and special category data?
3. The problem of re-identification/de-anonymisation
   a. k-anonymity; suppression/generalisation (a bit about differential privacy)
4. Key elements of the Data Protection Act 2018 and GDPR
5. How does the GDPR relate to the DPA and what does it mean for the healthcare sector?
6. Role of the Data Protection Officer
7. Accountability, obligations, and transparency under GDPR
8. National data opt-out
9. Review of Caldicott principles to ensure safe and respectful handling of information
10. What does GDPR mean for cyber security?
11. Misuse of GDPR

Lecturer
Dr Charles Morisset
Charles is a Senior Lecturer in Security in the School of Computing at Newcastle University. He is the degree programme director of MSc in Computer Security and Resilience, leads the undergraduate System and Network Security module, and also co-leads the postgraduate System Security Module. Charles also co-organised the Cyber Security: Safety at Home, Online, in Life online course that explores practical cyber security including privacy online, payment safety and security at home. His research interests include decision-making for security systems in general, and access control in particular as well as security and resilience of infrastructure systems.
Summary
In this course, the appropriate usage of digital information and associated technologies within medicine in the context of their risk, fiscal economy, and improved patient outcomes and safety will be discussed. The course is designed as an introduction to understanding how digital information and enabling technologies based on such information are influencing current medical practices and the possibilities for the future. Examples and case studies will be used to allow learners the ability to contextualise the material presented in accessible real-world settings.

At the end of the course, learners will be able to analyse how these technologies add value to healthcare systems and be better prepared to participate in the digital transformation of healthcare.

Learning Outcomes
By the end of this course, learners will be able to:

1. Describe how information evolution impacts working practices.
2. Analyse how Artificial Intelligence may be utilised for improved outcomes.
3. Identify problematic issues in information leakage across digital platforms.
4. Assess the usefulness of digital products in personalised medicine.
5. Identify the applications of Gamification in healthcare.

Outline
Below is an outline of the content covered in the course:

1. Near-future information innovations and how these may impact medical industries
2. Influence of digital infrastructures on current working practices
3. Case studies that highlight balancing risks and benefits in the digital age
4. Gamification within the context of medical products and services

Lecturer
Dr Graham Morgan

Graham is the Deputy Head of School and Reader in the School of Computing at Newcastle University. He works extensively with healthcare professionals to create digital health solutions for diverse medical conditions using the latest cloud and virtual reality technologies. For example, he has led several projects, some of which are: i) ICURe Cohort 9: ASTEROID, the fun 3D eye test (Research England), ii) HICF - Accurate and patient friendly measurement of binocular visual function using a 3D mobile device (Wellcome Trust), iii) Augmented Reality Stories for Upper Limb Rehabilitation of Preschool Children with Hemiplegic Cerebral Palsy (Action Medical Research), iv) and Additional vision tests for Asteroid devlice (Medical Research Council) among others. His work and projects involve innovative use and application of human computer interaction principles and technology, game technology, and artificial intelligence.

Graham also leads the Computer Game Engineering MSc and runs the Game Lab at Newcastle University. The Game Lab carries out research and provides education related to video game technology. It is the only lab of its type within a Russell Group university in the United Kingdom.
a) Design and Implementation of a large Health Informatics Transformation Programme in the NHS

Summary
It is essential to have reliable IT infrastructure, technical support and clinical systems, but it is the quality of the clinical engagement in the design and implementation of a health informatics system which determines its success. We have worked together on the Newcastle Global Digital Exemplar programme over the past 3 years and would like to share our experiences and lessons learned with anyone undertaking this kind of work. This will be a very practical session including a presentation, a short interactive workshop and time for questions.

Learning Outcomes
By the end of this course, learners will be able to:

1. Understand the scope of a large health informatics implementation.
2. Recognise that successful health informatics projects and programmes are underpinned by a collaborative effort involving people in different roles and domains.
3. Identify the principal barriers to change at scale.
4. Explain the main steps required for planning and delivery of transformation change.
5. Analyse the most important challenges and opportunities within their own organisation.

Outline
Below is an outline of the content covered in the course:

1. Background and context of a large Health Informatics Transformation Programme in the NHS
2. Funding – for the programme and long-term support
3. Leadership
5. Project initiation and governance
6. Current state analysis
7. Setting the context – a preview event
8. Design and development
9. Testing
10. Training
11. Hardware
12. Business continuity
13. Clinical safety and risk management
14. Go-live – planning, communications, command structure
15. Early life support
16. Adoption
17. Evaluation – benefits and lessons learned
18. What’s next?

Discussion Questions
1. What is the greatest challenge in your organisation to implementing this kind of programme? What support would you need?
2. What would be its greatest opportunity for improving patient outcomes?
**Lecturers**

**Dr Chris Plummer**

Chris is a Cardiologist and Chief Clinical Information Officer at the Newcastle upon Tyne Hospitals NHS Foundation Trust. He has worked with clinical and IT colleagues to deliver the Newcastle Hospitals’ Global Digital Exemplar programme over the last 4 years, during which he completed the NHS Digital Academy post-graduate diploma in digital health leadership. He believes strongly in clinical leadership in health informatics, but always in close collaboration with technical, business analysis and project management experts. His other interests include medical education - from interviewing medical students to chairing the European Examination in General Cardiology – and cardio-oncology, the cardiovascular effects of cancer treatments where he is secretary of the British Cardio-Oncology Society and a Nucleus Member of the European Society of Cardiology Council of Cardio-Oncology.

**Daniel Simms**

Daniel is an accomplished technology leader with a passion for delivering large scale transformational change. Daniel is the Head of IT Delivery at the Newcastle upon Tyne Hospitals NHS Foundation Trust and has worked with clinical and IT colleagues as the Programme Director to deliver the Trusts Global Digital Exemplar programme over the last 4 years. Daniel is also the Programme Director for the Great North Care Record and the North East Nightingale Hospital. His background is in bespoke software projects, working with organisations such as Nissan, Scottish Power, VP PLC, Grainger PLC and Canadian Railways to deliver innovative solutions to complex problems.

**b) Change and adoption in a digital healthcare landscape**

**Summary**

This session will bring together the resistance in practice to introducing new digital concepts, strategies to gain adoption, clinical leadership in practice, utilisation and usability and the patient facing digital solutions and how to move the agenda forward.

**Learning Outcomes**

By the end of this course, learners will be able to:

1. Understand the resistance to change within NHS staff and settings and how to get buy in for a digital health solution or pathway, creating adoption and utilisation.
2. Understand the clinical safety implications of introducing new digital solutions to the public.
3. Challenge the traditional model of healthcare to strategically work towards a patient centric model of shared decision making and self-help in health.
4. Measuring metrics, identifying the big questions and solutions to promote change, using the metric results to scale change.
5. Understand the future landscape and the changing role of the patient and clinician in digital healthcare.

**Outline**

Below is an outline of the content covered in the course:

1. Cultural issues of digital change, deployment, and adoption for the change fatigued NHS
2. Nudging the patient to adopt new models of healthcare, accepting change, and the paradigm shift required to self-help healthcare.
3. How do we change the spoon-feeding NHS model of paternalistic healthcare to a shared decision-making model?
4. How can digital solutions radically change healthcare delivery?

Lecturer
Fiona McDonald

Fiona is an experienced clinical informatician for over ten years leading major national digital transformation programmes across England. She has successfully clinically-led the Electronic Prescription Service development, assurance, clinical engagement, and implementation, GP Online Services, standards for GP practice websites and transforming prescribing practice across General Practices and pharmacy. Fiona has extensive clinical engagement and change management experience, working with multidisciplinary clinical teams, to adopt and adapt IT systems to ensure efficiency gains in practice. She developed the patient preferences and engagement strategy, testing and deployment of patient preferences software, in collaboration with patients, clinicians, and information governance expertise and agile developers on behalf of the Great North Care Record. She is experienced in clinical change management, agile techniques, and influencing change. Fiona has extensive board level experience in an executive capacity at regional and national level, including Northern Region Digital Delivery Board, Digitising medicines domain programme board, Electronic Prescription Board and CCIO Advisory board.

To book your place visit go.ncl.ac.uk/health-informatics
Any questions? Email ioc.ne@ncl.ac.uk