



**BUSINESS SCHOOL**  
Te Kura Pakihi

**Department of Information Science**

# **DIGH701: Principles of Digital Health Informatics**

## **Course Outline**

**Semester One 2023**

### **Paper Description and Aims**

The focus of this paper is on understanding the strategies and frameworks that support the development and safe application of digital and information systems technology in healthcare.

This course will cover:

- Digital Health Strategies
- Processes enabling systems integration
- Risk mitigation strategies
- Ethical management of health data
- Applications of digital and information systems

The aim of this paper is to enable students to develop an understanding of information systems and digital health concepts and frameworks including integrated health information system components and architecture, the electronic medical record, telehealth, artificial intelligence, health information interoperability standards, future trends in digital health, and social and ethical issues. Students will gain an understanding of the different types of data collected from these systems and its potential to influence individual and population health.

### **Learning Outcomes**

Upon successful completion of this paper, you should be able to:

1. Critically appraise digital health strategic goals (national and global) and articulate how digital technologies help address key public health priorities.

2. Identify and demonstrate an understanding of the frameworks and key principles in place to guide the development of digital health and technology in the health sector.
3. Explain the foundational concepts in healthcare information technology: software, messaging standards, reference sets, etc.
4. Consider the uses for the range of data and terminologies used in the health sector, acquisition, management, storage and governance.
5. Assess the ethical issues and risks associated with the application and use of digital and information technology and their mitigation.

## Teaching Staff

### Paper Coordinator

Name: Dr Chris Paton

Email: [chris.paton@otago.ac.nz](mailto:chris.paton@otago.ac.nz)

### Tutor

Name: Dr Meriel Bladon

Email: [meriel.bladon@otago.ac.nz](mailto:meriel.bladon@otago.ac.nz)

## Course Delivery

**Lecture Day/Time:** Lectures will take place on Tuesday mornings 9-11am and Thursday evenings 6-8pm

**Delivery:** Lectures will be delivered online through Microsoft Teams.

This paper is live streamed to students via the internet. There will be two sessions of two hours per week. Students and the lecturers will be online and able to communicate to all participants during the sessions. The sessions will also be recorded for students to use as resources.

The papers will be supported using Teams chat, email and videoconferencing which can be organised individually or in small groups. Every week students must attend lectures on Tuesdays and Thursdays delivered online.

Lectures present the key conceptual material through discussion and interaction between teaching staff and students. Lectures are supported by readings and online videos.

# Course Calendar

The course calendar (in this outline) details scheduling information. Note that this calendar may change as the course proceeds. Any changes will be announced at lectures and be detailed on Teams.

	Tuesday 9am - 11am	Thursday 6pm - 8pm
<b>Week 1</b>	<b>28<sup>th</sup> February</b>	
	9am Introduction to Digital Health	6pm Guest Lecture
	10am Principles of Digital Health	7pm Group discussion
<b>Week 2</b>	<b>7<sup>th</sup> March</b>	
	9am Digital Health Systems	6pm Guest Lecture
	10am Clinical Decision Support Systems	7pm Group discussion
<b>Week 3</b>	<b>14<sup>th</sup> March</b>	
	9am Usability of Digital Health Systems	6pm Guest Lecture
	10am Modelling Usability	7pm Group discussion
	<b>17<sup>th</sup> - 18<sup>th</sup> March</b> <b>Hack Aotearoa – Auckland (Optional)</b>	
<b>Week 4</b>	<b>21<sup>st</sup> March</b>	
	9am International Standards	6pm Guest Lecture
	10am NZ Health IT Standards	7pm Group discussion
<b>Week 5</b>	<b>28<sup>th</sup> March</b>	
	9am HL7 FHIR	6pm Guest Lecture
	10am SNOMED-CT	7pm Group discussion
<b>Week 6</b>	<b>Wed 5<sup>th</sup> April (4-6pm)</b>	
	9am Ethics and Security	6pm Guest Lecture
	10am Privacy and Trust	7pm Group discussion
<b>Mid-semester Break: 10<sup>th</sup> April – 14<sup>th</sup> April</b>		

<b>Mid-semester Break: 10<sup>th</sup> April – 17<sup>th</sup> April</b>		
	<b>Tuesday 9am - 11am</b>	<b>Thursday 6pm - 8pm</b>
<b>Week 7</b>	<b>18<sup>th</sup> April</b>	<b>20<sup>th</sup> April</b>
	9am Quality Improvement 10am Major NZ Health IT Projects	6pm Guest Lecture 7pm Group discussion
<b>Week 8</b>	<b>25<sup>th</sup> April</b>	<b>28<sup>th</sup> April</b>
	9am Recording, Analysing and Interpreting Data 10am Theories of Health Informatics	6pm Guest Lecture 7pm Group discussion
<b>Week 9</b>	<b>2<sup>nd</sup> May</b>	<b>4<sup>th</sup> May</b>
	9am Digital Learning for Healthcare Professionals 10am Global Digital Health	6pm Guest Lecture 7pm Group discussion
<b>Week 10</b>	<b>9<sup>th</sup> May</b>	<b>11<sup>th</sup> May</b>
	9am Investment and Entrepreneurship 10am Machine Learning in Healthcare	6pm Guest Lecture 7pm Group discussion
<b>Week 11</b>	<b>16<sup>th</sup> May</b>	<b>18<sup>th</sup> May</b>
	9am The Learning Healthcare System 10am Evidence-based Digital Health	6pm Guest Lecture 7pm Discussion
<b>Week 12</b>	<b>23<sup>rd</sup> May</b>	<b>25<sup>th</sup> May</b>
	9am Presentations	6pm Presentations
<b>Week 13</b>	<b>30<sup>st</sup> May</b>	<b>1<sup>st</sup> June</b>
	9am Presentations	6pm Presentations

**Students are expected to prepare for and attend all classes to gain full benefit from the course.**

These activities should be prepared for by reviewing information detailed on Teams and completing any assigned readings. Students unable to attend a lecture are expected to catch up on missed material. Unless stated otherwise, all aspects of the course are examinable.

## Expectations and Workload

Activity	Hours	
Lectures Teams Sessions	52	4 hours per week for 13 weeks
Class preparation	78	2 hours per lecture, 3 lectures per week x 13 weeks
Written assignments	120	3 assignments each requiring 25 hours research, 15 hours writing
Private study / Reading	70	7 hours week / 10 weeks
Teams chat activities	5	10 x 0.5 hour engagement
Final presentation preparation	27	Presentation preparation
Meetings with supervisor	6	6 hours total over 13 weeks
Final exam (presentation)	2	2 hours including peer evaluation
<b>TOTAL HOURS</b>	<b>360</b>	

# Course Resources

## Websites

- **Ministry of Health: Digital Health:** <https://www.health.govt.nz/our-work/digital-health>
- **Health Informatics New Zealand (HINZ):** <https://www.hinz.org.nz/>
- **HINZ eHealth Forum:** <https://www.hinz.org.nz/page/eHealthFORUM>
- **NZ Health IT:** <https://www.healthit.org.nz/>

## Youtube Videos

The following YouTube videos have been created by the US Office of the National Coordinator for Health IT. They provide a comprehensive (albeit US-orientated) overview of Health IT, Health Informatics and Digital Health and should be watched during the following weeks of the course (or before):

- Week 1:** [Introduction to Digital Health](#)
- Week 2:** [Installation and Maintenance of Health IT Systems](#)
- Week 3:** [Usability and Human Factors](#)
- Week 4:** [Networking and HIE](#)
- Week 5:** [Interoperability of Health IT Systems](#)
- Week 8:** [Quality Improvement](#)
- Week 9:** [Healthcare Data Analytics](#)
- Week 10:** [Training and Instructional Design](#)
- Week 11:** [Value-based Care](#)
- Week 12:** [Population Health Informatics](#)

## Useful Books

We will reference chapters from the following books in some of the lectures. You can download the full PDF of each book through your University of Otago Library account.

### **Principles of Interoperability – FHIR, HL7 and SNOMED-CT**

4<sup>th</sup> Edition

by Tim Benson and Grahame Grieve

[Download PDF using University of Otago Login](#)

### **Applied Interdisciplinary Theory in Health Informatics : A Knowledge Base for Practitioners**

By P. Scott, N. de Keizer, and A. Georgiou

[Download PDF using University of Otago Login](#)

# Technical Information

## Microsoft Teams

Microsoft Teams will be used to provide you with access to the course materials and to deliver the online lectures. You will be given a [Microsoft 365 account](#) which you will need to use to log onto teams to access the materials and attend the online lectures. Please check on Teams regularly to view chat messages and announcements. You can also download the Teams app to your computer and mobile devices to ensure you are kept up to date with the course.

## Student Webmail

### IMPORTANT - DO THIS NOW:

Forward your University email address to an email address that you use regularly as follows:

1. [Log into your StudentMail account](#) using your student username and password
2. Click **Cog button (top right corner) > Options**
3. Under **Account**, select the **Forward your email** shortcut under the **Short Cuts** menu on the right side of the screen.
4. Under the Forwarding heading, type in the email address you want your email to be forwarded to. You can also choose to have a copy of these emails kept on your StudentMail account, so please check the box if you would like this.
5. Click the **Start forwarding** button.

# Assessment

All material presented is examinable (except where stated otherwise) by assignments and the final presentation. All-important assessment information such as due dates and times, content, guidelines and so on will be discussed at lectures and, where appropriate, detailed on Microsoft Teams. Students are responsible for ensuring that they are aware of this information, keeping track of their own progress, and catching up on any missed classes.

Assessment	Due date	Marks	Description
Assignment 1: Research paper analysis.  3000 words	Friday 10 <sup>th</sup> March at 5pm	25	Select a research paper that discusses the potential for digital health relevant to your area of work or experience. Use an appropriate systematic approach to critique the paper (5 marks), including what are the drivers for digital health (5 marks) and the current major challenges in your area of work (5 marks), and how the research paper addresses these drivers and challenges (10 marks).
Assignment 2: Interoperability and Standards  3000 words	Friday 31st March at 5pm	25	Discuss an issue or problem in your work or local context that could be addressed by applying an existing Digital Health solution. Describe the method you used to investigate appropriate technologies (5 marks), describe the digital health solution (5 marks), describe how the system shares data with other systems (interoperability) (5 marks) and explain how health IT standards are or could be applied to address the issue/problem using the solution you have chosen (10 marks).
Assignment 3: Ethical management of health data  3000 words	Friday 28 <sup>th</sup> April at 5pm	25	Write an essay on the ethical use of digital health technology and data. Draw on the example in Assignment 2 to discuss the ethical dilemmas that arise relating to the use of data collected from the system.
Presentation	Submit abstract by Friday 26 <sup>th</sup> May at 5pm	25	Choose one of your assignments to develop into a 20 minute oral presentation to the rest of the class in the style of a conference presentation. Provide an abstract/synopsis of the presentation to the lecturer by Friday 26 <sup>th</sup> May at 5pm.



## Grading System

The grading scheme used at Otago is:

<b>A+</b>	90-100	<b>C+</b>	60-64
<b>A</b>	85-89	<b>C</b>	55-59
<b>A-</b>	80-84	<b>C-</b>	50-54
<b>B+</b>	75-79	<b>D</b>	40-49
<b>B</b>	70-74	<b>E</b>	<40
<b>B-</b>	65-69		

## Academic Integrity and Academic Misconduct (Plagiarism)

**Students should ensure that all submitted work is their own.** Plagiarism is a form of academic misconduct (cheating). It is defined as copying or paraphrasing another's work and presenting it as one's own. Any student found responsible for academic misconduct in any piece of work submitted for assessment shall be subject to the University's dishonest practice regulations, which may result in serious penalties, including forfeiture of marks for the piece of work submitted, a zero grade for the paper, or in extreme cases, exclusion from the University. The University of Otago reserves the right to use plagiarism detection tools.

Students are advised to inform themselves about University policies concerning dishonest practice and take up opportunities to improve their academic and information literacy. If necessary, seek advice from academic staff, or the Student Learning Centre. The guideline for students is available at this link:

<http://www.otago.ac.nz/study/academicintegrity/index.html>

## Assignment Submission Procedure

Essays should be submitted through Microsoft Teams.

## Late Assignments

All requests for special consideration for internal assessments must be made as early as possible to the course coordinator and will be dealt with on a case-by-case basis. Should you be unable to attend or complete any internal assessment component for medical or personal reasons, appropriate documentary evidence (such as a medical certificate) is required. Requests and associated documentation must be provided as early as possible so that alternate arrangements can be made. Any late requests are likely to be turned down. Students who wish to apply for special consideration for the final examination should contact the Registry.

## Referencing Style and Style Guide

For this paper the referencing style is APA. Here is a link to the style guide:

[https://otago.libguides.com/c.php?g=171590&p=1130354&\\_ga=2.103662976.1426091138.1612905303-209796052.1612905303](https://otago.libguides.com/c.php?g=171590&p=1130354&_ga=2.103662976.1426091138.1612905303-209796052.1612905303)

# Quality Assurance

At the Otago Business School we monitor the quality of student learning and your learning experience. Your assessed work may be used for assurance of learning processes, such as evaluating the level of achievement of learning outcomes, with the aim of improving the quality of our programmes. All material used for quality assurance purposes will be treated as confidential and the outcome will not affect your grades.

## Student Learning Support and Information

### Student Charter

- <http://www.otago.ac.nz/about/otago005275.html>

### Guidelines for Learning at Otago

- <http://hedc.otago.ac.nz/hedc/wp-content/uploads/2012/12/Guidelines-for-Learning.pdf>
- <http://hedc.otago.ac.nz/hedc/learning/>

### Student Learning Centre

The Student Learning Centre, which is part of the Higher Education Development Centre, provides learning support, free of charge, to ALL enrolled students. Their services include:

- a workshop programme designed to help students to improve their learning strategies and their generic skills;
- individual assistance with learning issues;
- on-line study skills advice;
- a student leadership programme
- a student-led peer support programme for students of all ages and backgrounds.
- conversational English groups for students from a non-English speaking background

The Centre also provides two very helpful study guides, “Guidelines for Writing and Editing” and “Writing University Assignments” and these are available on the SLC website.

<http://slc.otago.ac.nz/>

### Library Support

The Library website <http://www.otago.ac.nz/library> provides access to resources and services, including group room bookings, library hours and locations, past exam papers, subject guides, article databases and more.

If you need assistance either check out the self-help guides

<http://otago.libguides.com/selfhelp>, or ask Library staff at the ground floor service desks, or email [ask.library@otago.ac.nz](mailto:ask.library@otago.ac.nz)

## **Disability Information and Support**

Students are encouraged to seek support if they are having difficulty with their studies due to disability, temporary or permanent impairment, injury or chronic illness. It is important to seek help early, through one of the contacts below:

Website: <http://www.otago.ac.nz/disabilities>

65 Albany St, West Lane, ISB, Student Services

Tel: +64 3 479 8235 Email: [disabilities@otago.ac.nz](mailto:disabilities@otago.ac.nz)

## **Student Feedback**

We encourage your feedback. This can be in the form of contacting staff, participating in course evaluation surveys, and communicating with class representatives. Continual improvements will be made to this course based in part on student feedback.

## **Class Representatives**

The class (or student) representative system is an avenue for encouraging communication and consultation between staff and students. It provides you with a vehicle for communicating your views on the teaching and delivery of the paper and provides staff with an opportunity to communicate information and gain constructive feedback from students. It contributes to the development of a sense of community within a department and it adds a further dimension to the range of support services offered to students.

Volunteers for the role of class representatives will be called early in the semester. The OUSA invites all class representatives to a training session, conducted by OUSA, about what it means to be a class representative and some of the possible procedures for dealing with issues that arise. They also provide information on the services that OUSA offers and the role OUSA can play in solving problems that may occur. The OUSA provides support to class representatives during the semester. Departmental staff will also meet with class representatives during the semester to discuss general issues or matters they wish to have considered.

Your class representative's name and contact details will be posted on Teams early in the semester.

## **Concerns about the Course**

We hope you will feel comfortable coming to talk to us if you have a concern about the course. The Course Co-ordinator will be happy to discuss any concerns you may have. Alternatively, you can report your concerns to the Class Representative who will follow up with departmental staff. If, after making approaches via these channels, you do not feel that your concerns have been addressed, there are University channels that may aid resolution. For further advice or more information on these, contact the departmental administrator or head of department.

**Disclaimer**

While every effort is made to ensure that the information contained in this document is accurate, it is subject to change. Changes will be notified in class and via Teams. Students are encouraged to check Teams regularly. It is the student's responsibility to be informed.