Diploma in Health Informatics 2021

Health Information Systems:
Requirements for a Successful Design and Implementation

Sistemas de Información en Salud:
Requisitos para un Diseño e Implementación Exitosa

Ago. 28 – Dic. 16
Santiago, Chile

Participants

Organizers Universidad de Chile

Steffen Härtel, PhD. Academic Director.
Centro de Informática Médica y Telemedicina, Programa de Anatomía y Biología del Desarrollo, Instituto de Ciencias Biomédicas, Facultad de Medicina, Universidad de Chile. Independencia 1027, Santiago, Chile.
+56 9 9885 1801
shartel@uchile.cl

Sandra de la Fuente, PhD. Public Health, MSc. Computer Science.
Academic Coordinator Santiago-Heidelberg, Chile
Centro de Informática Médica y Telemedicina, Facultad de Medicina, Universidad de Chile.
+56 9 8923 3993
sdelafue@uchile.cl

Malcolm Moreno, B.Ed.
Instituto de Ciencias Biomédicas, Centro de Informática Médica y Telemedicina, E-Learning, Facultad de Medicina, Universidad de Chile.
+56 2 2978 9642
mmoreno@cimt.uchile.cl,

Organizers Heidelberg University, Germany

Hartmut Dickhaus, PhD. Academic Director
Institute for Medical Biometry and Informatics, Department of Medical Informatics, Heidelberg University. Im Neuenheimer Feld 305, D-69120 Heidelberg, Germany.
+49 6221 56 7483
hartmut.dickhaus@med.uni-heidelberg.de
www.klinikum.uni-heidelberg.de/mi

Nils Benning MSc Inform. Med. Medical Computer Scientist
Research associate | Institute of Medical Biometry and Informatics | Dept. Medical Informatics, University Hospital Heidelberg | Im Neuenheimer Feld 130.3 |
69120 Heidelberg | Germany
+49 6221 56-5949
nils.benning@med.uni-heidelberg.de
ukhd.de/mi

Organizers Heidelberg Center, Chile

Johanna Höehl. PhD. Latin American Studies
Program Coordinator Centers of Excellence Heidelberg Center for Latin America.
Las Hortensias 2340, Providencia, Santiago, Chile
+56 2 2234 3466

j.hoehl@heidelbergcenter.cl
www.hcla.uni-hd.de

Academic Staff, Introduction

Rodrigo Martínez, MD, MSc.
Instituto de Salud Poblacional, Facultad de Medicina, Universidad de Chile.
+56 2 2978 9641
epi21@uchile.cl

Alvaro Donoso
Ingeniero Biomédico, Máster en Tecnologías de Información
adonoso@gmail.com

Academic Staff, Module I

Juan Ignacio Merino, Psicólogo
Director Ejecutivo Partners to Grow
Desarrollo de Personas y Organizaciones
+56 9 9829 0604
juanignacio@partnerstogrow.cl

Lorena Camus, Enfermera
Enfermera. Magister en Administración en Salud U. de Chile
 Consultora Especialista en GRDs
+56 9 9827 7570
lcamusb@gmail.com

Alvaro Donoso
Ingeniero Biomédico, Máster en Tecnologías de Información
adonoso@gmail.com

Academic Staff, Module II

Christian Haux, MSc Inform. Med. Medical Computer Scientist.
Researcher, Medical Informatics, University of Heidelberg.
+49 6221 567 634
Christian.Haux@med.uni-heidelberg.de

Raúl Manríquez, abogado
Abogado. Consultor y docente: regulaciones del sector salud.
+56 9 9321 8978
manriquez.v@gmail.com

Philippe Delteil, Ingeniero Civil en Ciencias de la Computación
Consultor Ciberseguridad, fundador Infosec.
+56 9 4456 1206
pdelteil@info-sec.cl

Álvaro Riquelme, MD, MSc Informática Médica
Join Project Manager Allm Inc
+ 56 9 9930 0198
a.riquelme@allm.inc

Academic Staff, Module III

Fernando Portilla, MSc. Ingeniero de Sistemas y Computación.
Consultor Estándares de Informática Médica
BID - Banco Interamericano de Desarrollo
Tel. +49 1764 737 5346
fportila@gmail.com

Reto Wettstein, MSc. Computer Scientist in Medical Informatics
Digital Health Engineer / Research Associate, University Hospital Heidelberg
reto.wettstein@med.uni-heidelberg.de

Oliver Heinze, PhD, Medical Computer Scientist
Deputy Director of the Department of Medical Information Systems (MIS) at Heidelberg University Hospital
oliver.heinze@med.uni-heidelberg.de

Angela Merzweiler PhD.
Deputy Head (MeDIC Heidelberg), Research Associate, Department of Medical Information Systems, University Hospital Heidelberg
angela.merzweiler@med.uni-heidelberg.de

Program

	LUNES	MARTES	MIERCOLES	JUEVES	VIERNES	SABADO	DOMINGO
	AGOSTO						
INTRO I	23	24	25	26	27	28	29
						I1 - 3h Start	
	SEPTIEMBRE						
	30	31	1	2	3	4	5
		I2 - 2h S. de la Fuente	I3 - 2h R. Martínez	I4 - 2h R. Martínez		I5 - 2h A. Donoso	
MODULO I	6	7	8	9	10	11	12
1 & 2 - 1h Videos				3 - 3h J.I. Merino		4 - 3h A. Donoso	
	13	14	15	16	17 FERIADO	18 FERIADO	19
	20	21	23	23	24	25	26
5 & 6 - 1h Videos				7 - 3h J.I.Merino		8 - 3h A. Donoso	
	OCTUBRE						
	27	28	29	30	1	2	3
9 & 10 - 1h Videos				11 - 3h L. Camus		12 - 3h A. Donoso	
	4	5	6	7	8	9	10
13 & 14 - 1h Videos				15 - 3h L. Camus		16 - 3 h A. Donoso	
MODULO II	11	12	13	14	15	16	17
17 & 18 - 1h Videos	FERIADO	EXAMEN I		19 - 3h R. Manriquez		20 - 3h C. Haux	
	18	19	20	21	22	23	24
21 & 22 - 1h Videos				23 - 3h P. Delteil		24 - 3h C. Haux	
	25	26	27	28	29	30	31
25 & 26 - 1h Videos				27 - 3h A. Riquelme		28 - 3h C. Haux	
	NOVIEMBRE						
	1	2	3	4	5	6	7
29 & 30 - 1h Videos	FERIADO			31 - 3h A. Riquelme		32 - 3h C. Haux	
MODULO III	8	9	10	11	12	13	14
		EXAMEN II					
	15	16	17	18	19	20	21
33 & 34 - 1h Videos				35 - 3h F. Portilla		36 - 3h OH/AM/RW	
	22	23	24	25	26	27	28
37 & 38 - 1h Videos				39 - 3h F. Portilla		40 - 3h OH/AM/RW	
	DICIEMBRE						
	29	30	1	2	3	4	5
41 & 42 - 1h Videos				43 - 3h F. Portilla		44 - 3h OH/AM/RW	
	6	7	8	9	10	11	12
45 & 46 - 1h Videos			FERIADO	47 - 3h F. Portilla		48 - 3h OH/AM/RW	
	13	14	15	16	17	18	19
		EXAMEN III			Charla Clausura		

Introduction: Basics Concepts in Health Informatics (10% of final grade)

Week 1:

Saturday 28 August 9:00-12:00h

I1	ALL	***Welcome Session:*** *Lecturers and students' presentation.*

Week 2:

Tuesday, 31 August 18:30-20:30h

I2	S. de la Fuente	***Introduction to u-cursos*** *Use of the platform u.cursos,*

Wednesday, 01 September 18:30-20:30h

I3	R. Martinez	**Identifying problems in Public Health:** *Discussing basic concepts in public health, epidemiology and IT.* *The students will receive instructions related with the first assignment.*

Thursday, 02 September 18:30-20:30h

I4	R. Martinez	***History of Health Information Systems*** *The participants will be able to analyze the most important changes in health information systems.* ***Evaluation of Health Information Systems*** *The students will be able to identify common challenges during the assessment of health information systems.*

Saturday, 04 September 9:00-12:00h

I5	A. Donoso	***Health Information Systems: Main concepts*** *The main concepts and modules of health information systems, both administrative and clinical, will be reviewed.*

Module I: Health Information Systems (30% of final grade)

Week 3:

Tuesday, 07 September

1	A. Donoso	***Asynchronous video (1/2h)*** ***Health Information Systems for Quality Assurance*** *In this video we will review how health information systems play a fundamental role in quality assurance and safety during patient care.*
2	J.I. Merino	***Asynchronous video (1/2h)*** ***Introduction to Change Management*** *In this introductory video, we will present the main concepts in the field of change management and their role in the implementation of information systems projects. We will review research data which validates the importance of change management. We will also present the scope and working methodology of the classes.*

Thursday, 09 September 18:30-21:30h

3	J.I.Merino	***3h: Synchronous Activities*** ***Change Management I*** *In our first module we will work on the main models and theoretical-practical approaches that explain human behaviour in the context of change and lay the foundations for transition management. In this session we will explain in detail the practical exercise that students will carry out to demonstrate application of the course contents.*

Saturday, 11 September 9:00-12:00h

4	A. Donoso	***3h: Synchronous Activities*** *In this class, we will review the main health information systems projects that are being implemented in various countries around the world*

Week 4:

Tuesday, 21 September

5 | A. Donoso

Asynchronous video (1/2h)
Introduction to Project Management in Health Information Systems
The basic concepts associated with projects will be presented and we will understand how their correct management is fundamental to implement hospital information systems.

6 | J.I. Merino

Asynchronous video (1/2h)
In this video we will present a step-by-step intervention model that will enable students to implement their own change management strategy and also serve as a tool for their practical exercise.

Thursday, 23 September, 18:30-21:30h

7 | J.I.Merino

3h: Synchronous Activities
Our last session will be dedicated to the leadership role in change processes and the key elements in managing the transition of teams (users). There will also be a question and answer session and guidance on the execution of the practical exercise that students must work on.

Saturday, 25 September 9:00-12:00h

8 | A. Donoso

3h: Synchronous Activities
Introduction to Project Management in Health Information Systems
In this session we will deepen the definitions given in the introductory video, as well as understand the concepts of success, failure and their causes. Also, we will review the main project management methodologies and standards

Week 5:

Tuesday, 28 September

9 | A. Donoso

Asynchronous video (1/2h)
Project Management in Health Information Systems: knowledge áreas
In this video students will learn the areas of knowledge defined by the PMI (Project Management Institute) and its main concepts.

10 | L. Camus

Asynchronous video (1/2h)
In this session the participants will learn to know the purpose and applicability of DRGs as an evaluation tool for clinical management.

Thursday, 30 September 18:30-21:30h

11 | L. Camus

3h: Synchronous Activities
The participants will learn the basic concept of DRGs, the structure and metric specific.
During the session will take place clinical case and interpretation of DRGS metrics.

Saturday, 02 October 9:00-12:00h

12 | A. Donoso

3h: Synchronous Activities
Project Management in Health Information Systems: main knowledge areas
In this class, we will delve into the main areas of project management knowledge: time, scope, cost and quality.

Week 6:

Tuesday, 05 October

13 | A. Donoso

Asynchronous video (1/2h)
Project Management in Health Information Systems: Agile Methodologies
This introductory video will provide the main concepts of the agile methodologies during health information projects.

14 | L. Camus

Asynchronous video (1/2h)
In this session the participants will learn to know the purpose and applicability of DRGs as payment mechanisms of public hospitals.

Thursday, 07 October 18:30-21:30h

15 | L. Camus
3h: Synchronous Activities
The participants will learn the relevance of data quality and use of classification systems of diagnosis and procedures (ICD10 and ICD 9 MC) for grouping DRGs.
During the session, the participants will develop clinical case exercises estimating the payment associated with each DRGs.

Saturday, 09 October 9:00-12:00h

16 | A. Donoso
3h: Synchronous Activities
Process Management for Health Information Systems Implementation
In this class we will deepen the basic concepts of process management, we will provide the main tools for its survey and we will understand its notation.

Module II: Clinical Registries, Quality / Risk Management (30% of final grade)

Week 7:

Tuesday, 12 October

17 | C. Haux
Asynchronous video (1/2h)
Patient Records, Systematic Medical Documentation, and Spreadsheets

18 | R. Manriquez
Asynchronous video (1/2h)
Health Information: system of laws applicable in Chile.

Tuesday, 12 October 18:30-20:30h

Ex | S. de la Fuente
Examen I

Thursday, 14 October 18:30-21:30h

19 | R. Manríquez
3h: Synchronous Activities
Health Information: General and specific laws related to health data protection.

Saturday, 16 October 9:00-12:00h

20 | C. Haux
3h: Synchronous Activities
Patient Records. Introduction.
The participants get an overall view of the different kinds of patient records and the stored data. The paper patient record will be discussed in depth.

Patient Records. In depth view.
The participants will learn about electronic patient records, shared patient records and health records. For each patient record a SWOT analysis (strengths, weaknesses, opportunities and threats) will be performed.

Systematic Medical Documentation. 1st Part.
The participants will learn about the different layers of a systematic planning of medical documentation, the documentation protocol and terminology standards.

Systematic Medical Documentation. 2nd Part.
The participants will learn about healthcare informatics interoperability standards, data quality and analyses. Exercises for spreadsheets.

Week 8:

Tuesday, 19 October

21 | C. Haux
Asynchronous video (1/2h)
Patient Registries: Definition, planning, and design
Relational databases

22 | P. Delteil
Asynchronous video (1/2h)

Introduction to cybersecurity: What is hacking? What does a hacker do? Why should we worry about cybersecurity in the healthcare sector?

Thursday, 21 October 18:30-21:30h

23 | P. Delteil

3h: Synchronous Activities
Details about the biggest data breach in Chile (Minsal's Network) Let me show you how easy it is to hack. Practical examples of hacking of medical devices.

Saturday, 23 October 9:00-12:00h

24 | C. Haux

3h: Synchronous Activities
Patient Registry. Definition.
The participants will get an overall view of the Heidelberger myeloma registry and will learn about the different kinds of registries and its purposes.

Creating Patient Registries. Planning.
The participants will learn about the different steps in planning a register and the register protocol.

Creating Patient Registries. Design.
The participants will learn about appropriate research questions, the target population and the definition of necessary and non-essential elements.

Exercises for relational databases

Week 9:

Tuesday, 26 October

25 | C. Haux

Asynchronous video (1/2h)
Patient registries: Data sources and data elements
Talend Open Studio

26 | A. Riquelme

Asynchronous video (1/2h)
Introduction to telehealth
Definitions, types of telehealth with some examples, regulation and legal responsibilities of the use of telehealth.

Thursday, 28 October 18:30-21:30h

27 | A. Riquelme

3h: Synchronous Activities

Telehealth: Doctor to Patient Telehealth (DtoP)
Description of 'clinic to patient classical telemedicine'. Technologic environment, minimum technical requirements, telemedicine devices, clinical good practices, medical registry on telemedical consultation. Examples of DtoP telehealth implementations.

Telehealth: Doctor to Doctor Telehealth
Description of 'clinical teleassistance'. Technologic environment, minimum technical requirements, devices, classification of assistance (synchronous/asynchronous). Examples of DtoD telehealth implementations. Future of DtoD telehealth.

Saturday, 30 October 9:00-12:00h

28 | C. Haux

3h: Synchronous Activities

Creating Patient Registries. Data Sources and Linking of Data.
The participants will learn about primary and secondary use data and technical and legal aspects of using register data for different purposes.

Operating Patient Registries. Recruiting and Retaining Participants.
The participants will learn about procedural recommendations for patient recruitment and strategies to motivate participation.

Operating Patient Registries. Data Collection and Quality Assurance.
The participants will learn about procedural, personal and technical requirements and how to ensure quality and security.

Week 10:

Tuesday, 2 November

29	C. Haux	***Asynchronous video (1/2h)*** *REDCap, I2B2*
30	A. Riquelme	***Asynchronous video (1/2h)*** *Digital transformation using telehealth* *Some examples of clinical process digitalization using telehealth. Telemedical reports, IA assistance, Chilean Hospital Digital. Private teleconsultation modules.*

Thursday, 4 November 18:30-21:30h

| 31 | A. Riquelme | ***3h: Synchronous Activities***
Telehealth: Technology of Telehealth
Devices and networks which enable telehealth services. Signaling, protocols, telemedical registries and integrations. IoT for telemonitoring, POC devices and telehealth.

Telehealth: From planning to go live telemedicine implementation
Current clinical process diagnosis, technical and clinical gap finding, project planning, implementation, change management and go live in telehealth implementations. |

Saturday, 6 November 9:00-12:00h

| 32 | C. Haux | ***3h: Synchronous Activities***

Clinical and Biomedical Databases. Introduction. Example.
The participants will learn about data-warehouses and the ETL-process. The participants get an overall view of an open source data-warehouse (i2b2).

Practical exercises on registry tools (REDCap, OpenClinica, i2b2, Talend.
The participants will learn about the use of different tools to improve clinical registry.

Summary, Questions, Feedback.
The participants will discuss about the most relevant topics learned in this module. |

Week 11:

Tuesday, 9 November 18:30-20:30h

Ex	S. de la Fuente	***Examen II***

Module III: Interoperability in HealthCare (30% of final grade)

Week 12:

Tuesday, 16 November

33	F. Portilla	***Asynchronous video (1/2h)*** *Fundamentals of ICT in health*
34	O. Heinze, A. Merzweiler & R. Wettstein	***Asynchronous video (1/2h)*** *Introduction to eHealth & IHE, IHE Identity Management*

Thursday, 18 November 18:30-21:30h

| 35 | F. Portilla | ***3h: Synchronous Activities***

Fundamentals of ICT in health and telemedicine
The health organization is a complex place where different information systems are deployed according to the objectives and needs of the organization. What type of health information systems exist and how to use it in the health organization, prior to achieve interoperability. |

Saturday,20 November 9:00-12:00h

36	O. Heinze, A. Merzweiler & R. Wettstein	***Introduction to eHealth & IHE, IHE Identity Management*** *The participants will learn about the fundamentals of eHealth and the basic concepts of Integrating the Healthcare Enterprise (IHE) . Furthermore, we will take a look at the first group of IHE profiles in the IT-infrastructure domain regarding identity management.*

Week 13:

Tuesday, 23 November

37	F. Portilla	***Asynchronous video (1/2h)*** *Syntactic interoperability* There are different type of health interoperability standards, at semantic and syntactic level. With the course the participant will understand what, when, where, and how to use and apply it.
38	O. Heinze, A. Merzweiler & R. Wettstein	***Asynchronous video (1/2h)*** *IHE Document Sharing, IHE Privacy*

Thursday, 25 November 18:30-21:30h

39	F. Portilla	***3h: Synchronous Activities*** ***Syntactic interoperability*** *- HL7 V2, fundamentals, messaging, tools, hands on, experiences* *- HL7 CDA, fundamentals, clinical documents, tools, hands on, experiences* *- HL7 FHIR, fundamentals, resources, tools, hands on, experiences*

Saturday,27 November 9:00-12:00h

40	O. Heinze, A. Merzweiler & R. Wettstein	***3h: Synchronous Activities*** ***IHE Document Sharing, IHE Privacy*** *We will talk about the second group of IHE profiles regarding document sharing between organisations and how to integrate these profiles with the ones about identity management. Additionally, the participants will learn about securing IHE infrastructures using use-case dependant IHE privacy profiles.*

Week 14:

Tuesday, 30 November

41	F. Portilla	***Asynchronous video (1/2h)*** *Semantic interoperability*
42	O. Heinze, A. Merzweiler & R. Wettstein	***Asynchronous video (1/2h)*** *Data Privacy*

Thursday, 02 December 18:30-21:30h

43	F. Portilla	***3h: Synchronous Activities*** *Semantic interoperability* *- LOINC, fundamentals, search engines, uses* *- SNOMED CT, fundamentals, search engines, uses* *- Terminology Services, what is it, uses, FHIR and ST, experiences*

Saturday,04 December 9:00-12:00h

44	O. Heinze, A. Merzweiler & R. Wettstein	***3h: Synchronous Activities*** ***HE Mobile, Example HiGHmed & MeDIC, Example PEHR & Phellow*** *The participants will learn about IHE profiles to connect mobile devices into the IT-infrastructure we talked about in the previous two weeks. Furthermore, there will be two examples about the use of IHE profiles in the Medical Data Integration Center (MeDIC) and the Personal Electronic Health Record (PEHR) at Heidelberg University Hospital.*

Week 15:

Tuesday, 7 December

45 | F. Portilla | ***Asynchronous video (1/2h)***
Architectures for health interoperability

46 | O. Heinze, A. Merzweiler & R. Wettstein | ***Asynchronous video (1/2h).***
IHE Workflow, Data Sharing Framework, Summary & Questions

Thursday, 09 December 18:30-21:30h

47 | F. Portilla | ***3h: Synchronous Activities***
Architectures for health interoperability
IHE profiles
- IHE and FHIR
- National and regional interoperability, experiences
- Integration of biomedical devices

Saturday, 11 December 9:00-12:00h

48 | O. Heinze, A. Merzweiler & R. Wettstein | ***3h: Synchronous Activities.***
IHE Workflow, Data Sharing Framework, Summary & Questions
We will take a look at different possibilities to define workflows in hospital environments. Additionally, we will show an example of a framework to integrate data between hospitals for secondary use. The module will end with a short summary and an open discussion.

Week 16:

Tuesday, 14 December 18:30-20:30h

EX | S de la Fuente | ***Examen III***

Friday, 17 December 18:30-21:30h

49 | S. Härtel | ***3h: Synchronous Activities. Closing Session***