

Course Package

Personalized monitoring and Coaching – 1B

Name module	Personalized monitoring and Coaching – 1B
Educational programme	MSc Health Sciences
Period	Second block of the first semester (block 1B)
Study load	15 ECTS
Coordinator	A.H Prins

Personalized monitoring and Coaching			
block 1A	block 1B	block 2A	block 2B
	eHealth Development: A Holistic Approach (5 EC)		
	Telemedicine and Data Analysis for Monitoring (5 EC)		
	Monitoring & Persuasive Coaching (5 EC)		

Required preliminary knowledge: Basic knowledge of Excel.

eHealth Development: A Holistic Approach

eHealth refers to the use of (ICT) technologies to support health, well-being and healthcare. It is a term that captures concepts about health context, technology, and people. In this master course we will provide the students with insights into the domain of eHealth. Students will be introduced to concepts of user-friendly, value driven and persuasive eHealth technologies and to address the holistic development process.

Lecture 1 will focus on information about the relevance, chances and barriers of eHealth, and students will be introduced to the CeHRes Roadmap, a framework that can be used in the development of eHealth applications. Lecture 2 will pay attention to the contextual inquiry which focuses on getting an understanding of prospective users and their context, and the weak and strong points of the current provision of care. Students will be introduced to different research methods

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(e.g. interviews, focus groups and questionnaires) that can be used in this phase. Lecture 3 focuses on user requirements, which are extracted from users' needs and wishes, and students will learn how to translate these requirements in a lo-fi prototype. Lecture 4 will focus on the goal and relevance of persuasive technology and behaviour change theories in the context of eHealth technologies. Lecture 5 will pay attention to usability testing. Its meaning and relevance will be discussed and students get to know different methods (e.g. cognitive walkthrough) that can be used to test the usability of an eHealth technology. In lecture 6 adherence and user engagement will be addressed. We will focus on questions such as why it is important that users stay adherent to a eHealth application, and how can we measure user engagement? Lecture 7 will address the concepts of business modelling and implementation. As an expert in the field of eHealth it is not only important to focus on the development of eHealth technology, but it is equally important to think about the implementation of this technology in practice. In the last lecture, we will focus on the evaluation of the impact and uptake of an eHealth application and students will gain insights in several suitable evaluation methods for eHealth.

Telemedicine and Data Analysis for Monitoring

In Telemedicine we study theories, approaches and systems that focus on treating and assisting people in managing chronic health conditions or lifestyle changes in their own daily environment thereby supported by health care professionals when needed (Remote monitoring and coaching). To understand these systems, analyse them and to design them, we need to understand the health issues and problems that have to be addressed by the telemedicine system and we need to understand what the suitable building blocks and architectures are to design these systems. Furthermore, we need to be able to evaluate the system and understand how they can be implemented in every day care practice.

A telemedicine system can be decomposed into four main functional building blocks:

Monitoring – this part of the system takes care of sensing relevant health related parameters and whenever needed environmental parameters. It will often include some data processing so as to remove measurement artifacts or to extract basic features from the sensor data. Monitoring may also include the transfer of data to some local or remote data-store facility, and it may include presentation of the (raw) data.

Data Analysis – this part of the system takes care of analyzing and interpreting the with respect to biomedical or clinical metrics, or to estimate the state (either physical or mental) of the The two other functional building blocks are Decision Support and Feedback & coaching. In decision support the outcomes of the analysis are used to make decisions on whether or not action should be undertaken and which action. The question here is how we can derive and construct decision models and how should these be used. Once a decision has been made, proper feedback and coaching to the patient is needed in order to effectuate the action and/or move the patient into the desired direction.

This course is about the design and development of a remote monitoring, data analysis and coaching system by addressing these four different building blocks. Especially the rising age of the Dutch citizen as well as an increasing number of people with chronic diseases puts an extra pressure on our society as both elderly and people with chronic diseases are more viable to become victim of all kind of complaints and with the consequence of problems with their balance between work and private life. Supporting these people in deploying a healthier life style is considered important. Employers, communities and the taxpayer all bear the costs of working-age ill-health which is estimated to run to around several billion Euros every year. Since health, work and well-being are closely and powerfully linked, they need to be addressed together. Well-being applications at work and at home are expected to help people to continue contributing to society, the marketplace and the economy. Furthermore, these applications may help suppressing the rising costs of chronic disease and ill-health.

Two aspects related to deploying a healthier lifestyle are physical activity and stress. These two will be studied as cases in this course.

Monitoring & Persuasive Coaching

Through the digitalization of society, a boundless amount of personal data becomes available, e.g. data on a person's physiological state, their location, or their subjective wellbeing. Technology has the potential to translate these data into meaningful information that can be used to improve health and wellbeing: data can be used to monitor behavior and to coach people in improving their unhealthy behavior. On top of that, data is of added value in the development of technologies that can increase health, wellbeing or healthcare.

During this course we will focus on the use of data for monitoring and coaching purposes in order to improve health and wellbeing on an individual, personalized level. You will learn the meaning of and relationship between monitoring, coaching, health, data and technology development. You will also gain on-hand experience with these concepts by completing three different projects, based on ongoing research projects.