

UNIVERSITÀ CATTOLICA del Sacro Cuore



Advanced course in assessment of the applications of artificial intelligence (AI) in healthcare

1st Edition 2023/2024



Faculty

Scientific Director: Prof. Giuseppe Arbia

Scientific Committee: Prof. Giuseppe Arbia, Prof. Vincenzo Valentini, Prof. Americo Cicchetti, Prof. Fabrizio Massimo Ferrara, Ing. Ernesto Iadanza, Prof. Ira Hebold Haraldsen, Dr. Marco Marchetti, Dr. Teresa Petrangolini, Eng. Giovanni Arcuri, Prof. Wija Oortwijn

Scientific coordinators: Dr. Luca Tagliaferri, Dr. Rossella Di Bidino

Tutor: Sara Papavero (PhD Candidate)

Course Learning Objectives

The Graduate School of Health Economics and Management (ALTEMS) proposes the first edition of the post-degree “Advanced course in assessment of the applications of artificial intelligence (AI) in healthcare”. The course aims to promote the use of the principles and methodology of Health Technology Assessment (HTA) to Artificial Intelligence solutions.

Course Description

The aim of the course is to provide and share the tools for a multidisciplinary and multi-domain assessment of AI/ML-based healthcare technologies for the purpose of their optimal integration with care pathways.

Attention will be given to HTA methodology applied to AI and machine learning (ML) in the different stages of their development and adoption, including regulatory and assessment processes. Related topics will be addressed such as data management and analysis within the European Health Data Space.

In addition, experiences in the development and implementation of AI/ML-based technologies in healthcare will be presented.

Syllabus

The course is divided into eight modules of 10 hours each for a total duration of 80 hours. The course is divided into modules that have the purpose of introducing and aligning the participants on the central themes of the course (HTA, AI, digital health), to deepen specific aspects and present experiences of development, use and multidimensional evaluation of AI.

Case studies will be presented.

The following topics will be addressed:



- Digital Health, Artificial Intelligence and Health Technology Assessment.
- The impact of AI for clinicians: Next generation of evidence-based medicine.
- Framework(s) for the assessment of digital technologies and in particular those based on AI.
- Regulatory aspects, reimbursement and sustainability of AI.
- Introduction to AI/ML models and clinical studies.
- Data management and analysis, with a focus on quality and reliability of data sources.
- Real world data, big data and the European Health Data Space.
- Analysis of economic impact.
- Analysis of the organizational impact of AI.
- Ethical implications of AI.
- Role of patients.

The course will be held in-person.

Some of the lectures can be made at distance in real time.

Lecturers

- Prof. Giuseppe Arbia - Catholic University of the Sacred Heart, Roma – Italy
- Prof. Americo Cicchetti - Alta Scuola di Economia e Management dei Sistemi Sanitari (ALTEMS), Università Cattolica del Sacro Cuore, Roma – Italy
- Dr. Luca Tagliaferri – Chief Technical, Information & Innovation Officer – Gemelli Generator – Roma, Italia
- Dr. Rossella Di Bidino – Lead of the "Laboratorio di Health Technology Assessment (HTA) ed intelligenza artificiale (Unit on HTA for AI)" in ALTEMS AND Direzione Tecnica, ICT e Innovazione Tecnologie Sanitarie (Department of Health Technologies, ICT, and Innovation) - Fondazione Policlinico Universitario Agostino Gemelli IRCCS
- Prof. Fabrizio Massimo Ferrara – Scientific Director of the "Laboratorio sistemi informativi sanitari (Unit on Health Information Systems)"- ALTEMS Alta scuola economia management sistemi sanitari

- Eng. Giovanni Arcuri – Chief Technical, Information & Innovation Officer - Fondazione Policlinico Universitario Agostino Gemelli IRCCS
- Prof.ssa Stefania Boccia - Epidemiology & Biostatistics - Gemelli Generator – Roma, Italia
- Dr. Luca Boldrini- Bioinformatics - Gemelli Generator – Roma, Italia
- Ing. Federico Cabitza - Università degli Studi di Milano-Bicocca
- Prof. Andrea Damiani - Real World Data - Gemelli Generator – Roma, Italia
- Dr. Carmen Furno - Direzione Tecnica, ICT e Innovazione Tecnologie Sanitarie (Department of Health Technologies, ICT, and Innovation) - Fondazione Policlinico Universitario Agostino Gemelli IRCCS
- Dr. Luciano Giacò- Bioinformatics - Gemelli Generator– Roma, Italia
- Dr. Tim Govers - Senior Scientist and Advisor Medical Technology - Radboud University Medical Center



- Prof. Ira Hebold Haraldsen – Coordinator the European Project Europeo AI-MIND – Oslo University Hospital
- Ing. Ernesto Iadanza - Senior Assistant Professor in Bioengineering (tenure-track RTD-b), Department of Medical Biotechnologies, University of Siena
- Prof. Giovanni Iorio - Università degli Studi di Milano-Bicocca
- Dr. Marco Marchetti – Director of the Health Technology Assessment Unit, The Italian National Agency for Regional Healthcare Services (Agenas)
- Dr. Carlotta Maschiocchi – Real World Data - Gemelli Generator – Roma, Italia
- Prof. Wija Oortwijn - President at Health Technology Assessment international (HTAi) – Associate Professor Leiden University Medical Center - Senior Scientific Researcher Radboud University Medical Center
- Dr. Teresa Petrangolini – Director of the Patient Advocacy Lab ALTEMS
- Eng. Tina Pasciuto- Data Collection - Gemelli Generator – Roma, Italia
- Eng. Alice Ravizza - Founder, InsideAi srl
- Prof. Dario Sacchini - Associate Professor of Bioethics at Università Cattolica del Sacro Cuore
- Dr. Entela Xoxi - Senior Scientific Advisor – Lecturer of Alta Scuola di Economia e Management dei Sistemi Sanitari (ALTEMS), Università Cattolica del Sacro Cuore, Roma – Italy
- Prof. Vincenzo Valentini – Scientific Director of Gemelli Generator
- Dr. Giuseppe Vetrugno - Fondazione Policlinico Universitario Agostino Gemelli IRCCS – Roma, Italia
- Rappresentanti dell’iniziativa RWE4Decisions (A Multi-Stakeholder EU Learning Network on Real-World Evidence (RWE))

Prerequisites and Corequisites

The course is open for candidates with a university degree. They could be professionals who are not experts in the topics of the course, as well as experts who wish to deepen and update their knowledge and skills related to the assessment of digital health technologies and in particular those based on artificial intelligence. There will be lectures to introduce participants to the basics of HTA, AI/ML methods and data analysis.

The course is aimed at: researchers/consultants in the field of Health Technology Assessment or digital health; decision makers; clinicians and pharmacists a professional interest in HTA.

The maximum number of participants is 40.

The course will be activated with minimum 8 candidates.

Planning

The modules will take place on Friday afternoon and Saturday morning, in the academic year 2023/2024 between February-October 2024. The course is located in Faculty of Economics of the Catholic University of the Sacred Heart - Rome. Attendance is compulsory (at least 80% of the lessons).

Agenda

	Topic	Brief description
February 9-10	Introduction to digital health and HTA	Students will be introduced to the course and its main topics (digital health, artificial intelligence, HTA, data management). Main lecturers: Prof. Arbia, Prof. Cicchetti, Prof. Ferrara, Dr. Marchetti, Dr. Tagliaferri, Dr. Di Bidino
March 8-9	HTA and sustainability of AI	The issues that will be addressed are: HTA and reimbursement processed, HTA frameworks for digital health, HTA patient perspective (introduction). In addition, case studies will be discussed. Main lectures: Dr. Petrangolini, Dr. Di Bidino, representatives of HTAi/IFMBE/SIHTA.
April 19-20	Impact assessment of AI (part I)	This module will cover aspects as: economical and organizational impact, ethical implications, legal aspects of AI. In addition, case studies will be discussed. Main lecturers: Prof. Sacchini, Dr. Basile, Prof. Iorio, Dr. Tagliaferri.
May 10-11	Focus on AI	Students will be introduced to the different models of AI/ML as well as guidelines on trials for AI solutions. It will be introduced and discussed the EU project AI-MIND. In addition, it will be explained the working group on the assessment of an AI/ML technologies. Main lecturers: Eng. Iadanza, Prof. Arbia, Prof. Haraldsen.
June 7-8	Impact assessment of AI (part II)	The issues that will be addressed are: AI and patients, environmental impact, the perspective on HTA of AI/ML developers. In addition, case studies will be discussed. Main lecturers: Dr. Di Brino, Dr. Tagliaferri, Dr. Govers.
July 12-13	Data management and analysis	Big data, RWD/RWE and quality assessment of the data will be discussed. Then, the guided assessment of an AI/ML technologies will proceed. In addition, case studies will be discussed. Main lecturers: Dr. Xoxi, Dr. Facey, Prof. Ferrara, Prof. Arbia.
September 13-14	HTA of AI along the TRL	Students will understand how the assessment of AI/ML and digital technologies could evolve along all the Technology Readness Levels. Then, the guided assessment of an AI/ML technologies will proceed. In addition, case studies will be discussed. Main lecturers: Eng. Arcuri, Dr. Furno, Prof. Arbia, Dr. Tagliaferri
October 18-19	Assessment of an AI solution	The groups will be completed their guided assessment of an AI/ML technologies and share the results of their assessment. Main lecturers: Prof. Arbia, Prof. Cicchetti, Prof. Ferrara, Dr. Marchetti, Dr. Tagliaferri, Dr. Di Bidino

Fees

The cost of the courses is € 1,800.

Special fees are defined for special categories (i.e. PhD candidates, former students of ALTEMS) and scholarships are available.

Final certification

A certification will be issued to participants that have completed the entire modules.

Contacts

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