UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

3d Printing for Medical Applications

2425-3-H4102D046

Aims

To acquire the basic knowledge about Additive Manufacturing. To understand the digital workflow from medical images or reverse engineered devices to the physical prototype both theretically and operatively. To understand the potential of Additive Manufacturing in Medicine. To present relevant case study where AM can support physicians' tasks.

Contents

The course aims at providing the students with the basic knowledge about the process to obtain physical prototype of biomedical devices (knee prostheses) and anatomical district (cardiovascular) by 3D printing technologies. After a brief theoretical overview about AM, two case studies will be presented and discussed. Finally, the students will go through all the digital workflow and the machine settings till the realization of a real prototype.

Detailed program

"Overview on Additive Manufacturing Technology; Medical application of 3D printing technology; Digital thread for additive manufacturing; Machine parameters and building cycle setup; from reverse engineering to 3D printing of human organs: presentation, discussion, practical session; from medical images to 3D printing of cardiovascular system elements: presentation, discussion, practical session."

Prerequisites

Teaching form

Frontal lectures, case description and discussion. Examples of use of devices and software solutions for mesh editing and 3D printing software and hardware. The lessons will be planned and communicated via email or on e-learning platform.

Textbook and teaching resource

Course Handout (slides)

Semester

Assessment method

The exam consists to create the real model of a specific anatomical district (e.g., knee, heart, shoulder) using 3D modeling tools and a 3D printer shown during the lectures starting from medical images (DICOM) provided by the Professor.
Assessment method: eligibility.

Office hours

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING