

INTRODUCTION TO ADDITIVE MANUFACTURING (3D PRINTING)

General information

Semester: **1 and 2**

Language: **English**

Modality: **Online Nahieran**

Description

Additive Manufacturing (AM) is one of the enabling technologies for the 4th industrial revolution. Even if AM is in its earliest stage of development, it is already applied in high added-value applications like in health, sport, robotics or aeronautics. The scope of the present course is to present the basic concepts of the technology and the specific virtual tools for design and manufacturing with AM.

Methodology

- Theoretical concepts will be understood by reading selected papers and book chapters, as well as videos and tutorials, which will be complemented by a discussion session for each topic.
- The guided mini-project, carried out by teams, serves to understand the theory's practical aspects.. A schedule with the intermediate deliverables related to each topic will be used for evaluating the progress. The main result will be your 3D-printed prototype.

Contents

- 1. Additive Manufacturing (AM) basic principles**
 - What is AM?
 - Pros, cons and challenges
 - New business models based on AM
- 2. Design for Additive Manufacturing (DfAM)**
 - Generative design approach
 - Topology Optimisation
- 3. Additive Manufacturing technologies**
 - Material extrusion
 - Material jetting
 - Vat photopolymerization
 - Powder bed fusion
 - Directed energy deposition
 - Binder jetting
- 4. Additive Manufacturing and sustainability**
 - In terms of product, processing and market