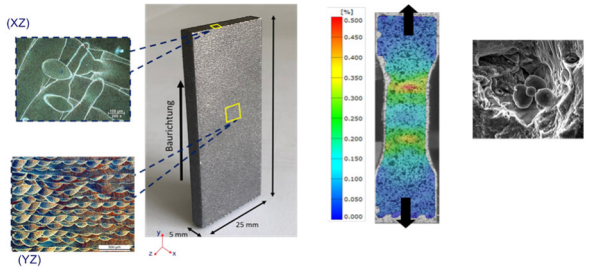
BIP - SUMMER SCHOOL 2024

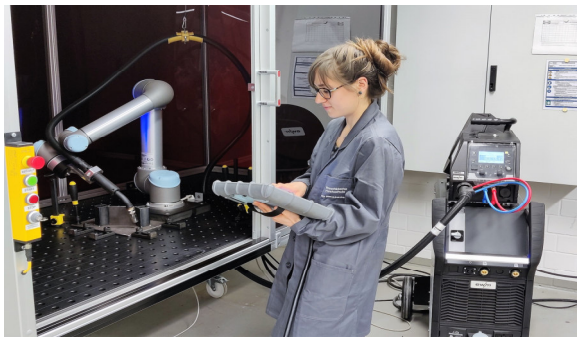
Westphalian University of Applied Sciences

together with

Ankara Yildirim Beyazit University, Turkey
Babes-Bolyai University, Cluj, Romania
Óbuda University, Budapest, Hungary
Politehnica University Timisoara, Romania

Institute for Mechanical Engineering





Modeling, Additive Manufacturing and Testing of Components in Engineering

02.05.2024 - 18.10.2024

Prof. dr. eng. Ghazal Moeini
Dr. rer.nat. Gabriela Marginean
Prof. dr. eng. Klaus Mecking

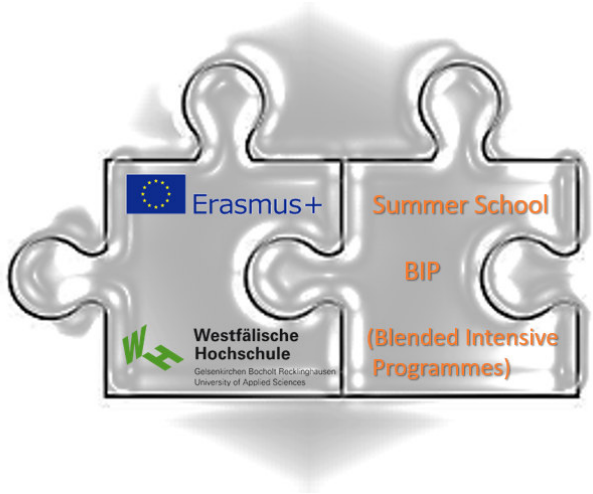
Programm Part 1

May-June-2024 – on-line courses
9 days (2 hours/day)

Programm Part 2

07-11 October 2024 – on-site activities, practical experiments in Gelsenkirchen, Germany

October 2024 - on-line project evaluation (2h)
Form of evaluation: Development of an individual or team project (3 ECTS).



Gelsenkirchen

Additive Manufacturing
Modeling
International
interdisciplinary
Testing
Materials
Institute of Mechanical Engineering

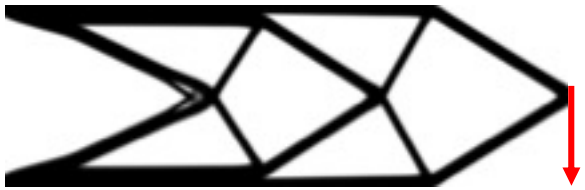
Foreword

Innovative manufacturing processes, like additive manufacturing techniques for producing 3D components are an important part of today's manufacturing chain. Many industries, such as automotive and aerospace, are focusing on the development, characterization, testing and modeling of additively manufactured components to realize high-performance lightweight structures.

A deep understanding of the relationship between process, structure and properties not only enables prediction of mechanical performance, but also provides the opportunity to leverage and apply knowledge of each material state to optimize microstructure to improve performance and associated energy and resource efficiency during manufacturing. The summer school will focus on metallic and polymeric materials developed for additive manufacturing. Moreover, various aspects concerning the topology optimization of the components to be printed are also addressed in the lectures respectively during the practical activities on site.

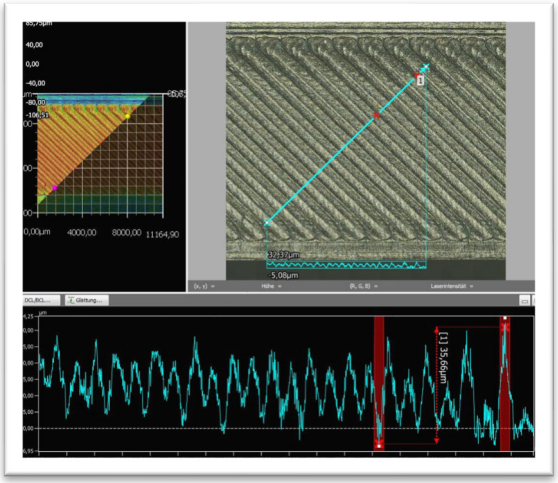
The participants have the possibility to design and print a previously defined component and will get the possibility to evaluate in person (in an international team) the achieved mechanical properties associated with related failure modes.

The design is done with a very easy to use Matlab code. After a short introduction to the theory of topology optimization, it is explained how the program works, what the goals are and how to achieve them, and also what the weak points in the design are.

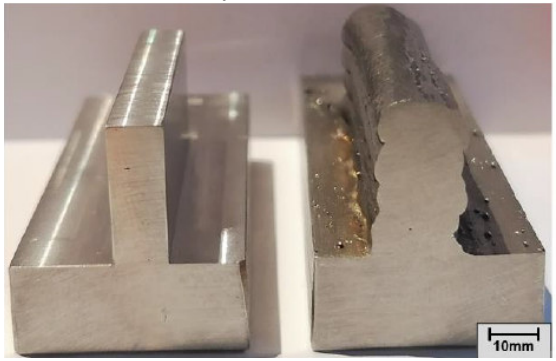


Visiting of some regional companies are also scheduled.

Confocal Laser Scanning Microscopy (CLSM) of FDM-Printed PLA-sample



WAAM printed CrNi-steel



Where?

Westfälische Hochschule Gelsenkirchen, Germany

Who?

The BIP-Summer School targets Bachelor and Master students working or interested in the additive manufacturing.

Involved Universities

Ankara Yildirim Beyazit University, Turkey
Babes-Bolyai University, Cluj, Romania
Óbuda University, Budapest, Hungary
Politehnica University Timisoara, Romania
Westphalian University of Applied Sciences, Germany

Costs

Accommodation and most meals are covered by the organisers. Transfer to Germany could be covered by Erasmus+ financial support.

Registration

Since the number of participants is limited, the registrations will be considered in the order of their receipt. “first come first serve!”
To help us plan ahead, we ask you for feedback by February 01, 2024.
An average of 5 students/partner University is estimated.

Contact

Gabriela Marginean
Institute of Mechanical Engineering
Neidenburger Straße 43
45897 Gelsenkirchen
E-Mail: gabriela.marginean@w-hs.de

Westfälische Hochschule
Gelsenkirchen Bocholt Recklinghausen
University of Applied Sciences