



PROJECT: ECOLOGICAL AND INNOVATIVE TECHNOLOGIES FOR RECOVERING
INDUSTRIAL AREAS FROM LCA AND ENERGY EFFICIENCY POINT OF VIEW
2020-1-RO01-KA203-080223

3D PRINTING IN FACTORY



This work is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/).

"The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein".



Universitatea
Transilvania
din Braşov

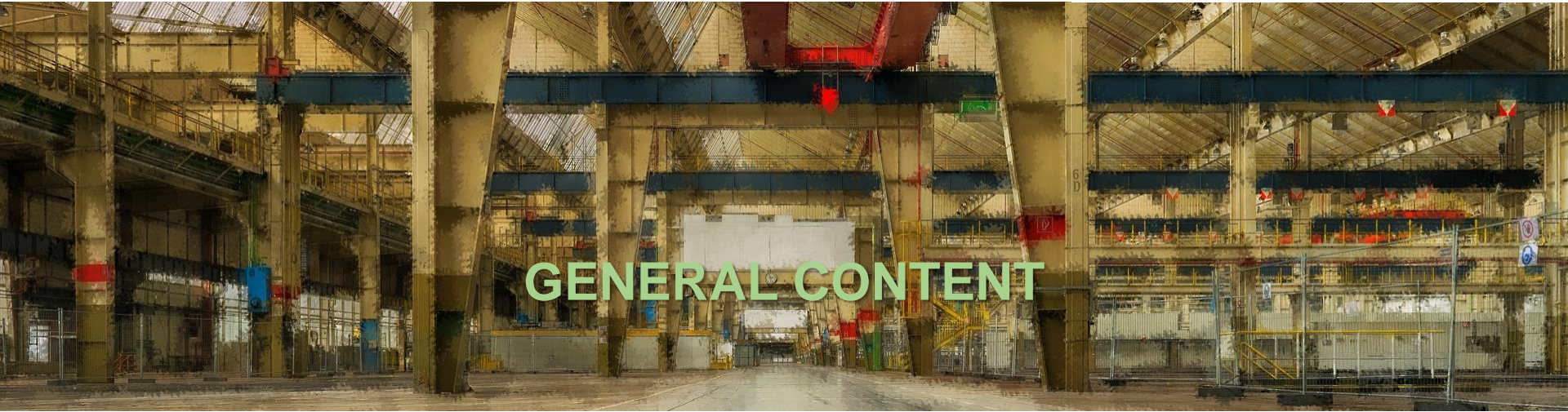


ROMANIA
GREEN
BUILDING
COUNCIL



Co-funded by the
Erasmus+ Programme
of the European Union





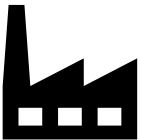
GENERAL CONTENT

1. INTRODUCTION
2. COMPUTER NUMERICAL CONTROL (CNC) MACHINES
3. TYPES OF CNC MACHINES
4. PRACTICAL CASE

1. INTRODUCTION

3D printing in factory

- It is the construction of a three-dimensional object from a CAD model or a digital 3D model..
- Different mixtures and materials to produce the desired product.



Advantages in factory:

1. It possible to manufacture structures that are both lightweight and stable.
2. Extremely complex geometries.
3. Less material use, reduced energy consumption.
4. Production on demand.

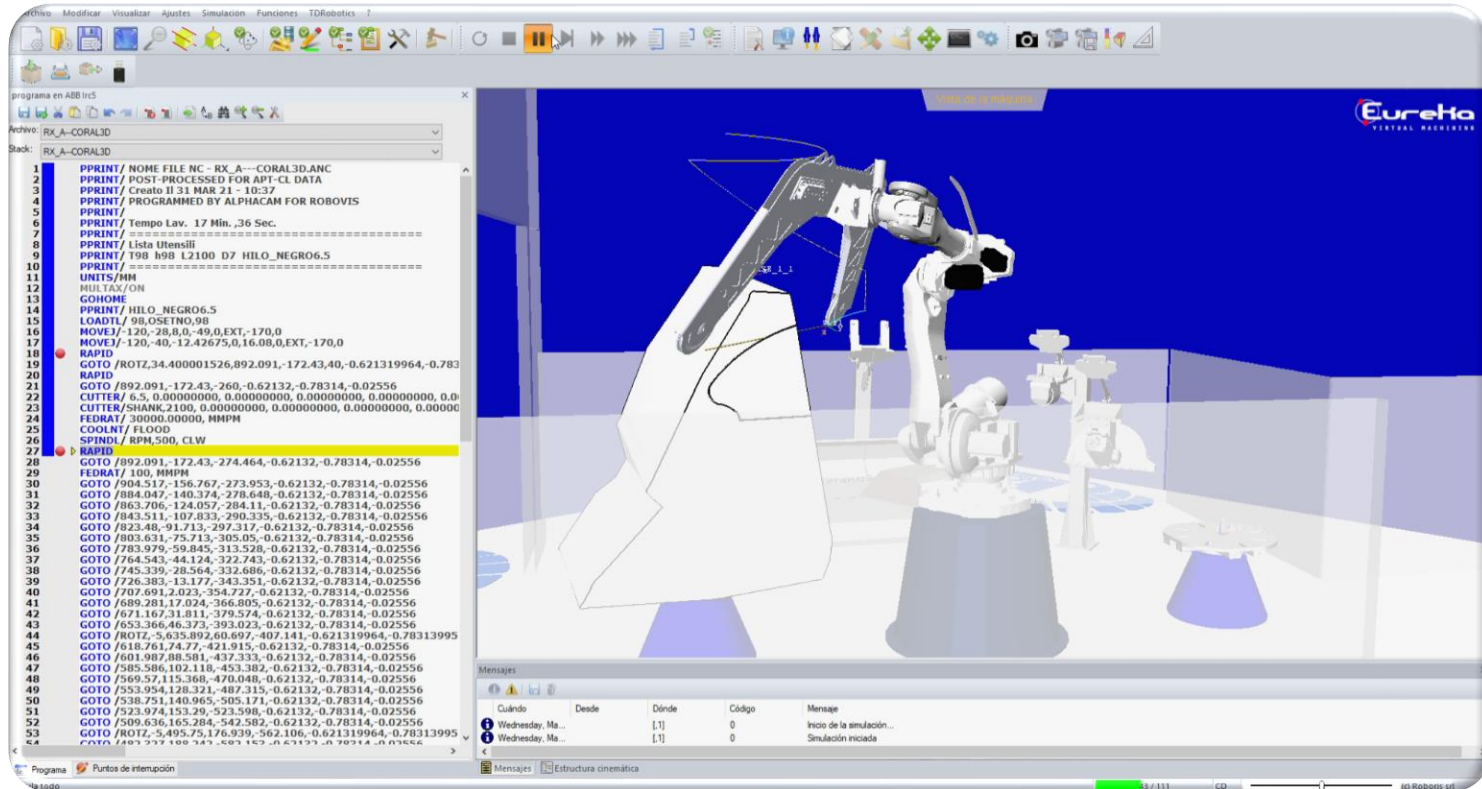
2. COMPUTER NUMERICAL CONTROL (CNC) MACHINES



- The CNC machine is equipped with number control technology to accurately perform tasks like:
 - cutting
 - shaping
 - machining
- metals, wood, plastics and other materials
- The CNC has a computer with a GPS positioning system that controls the movements, speed and other parameters.
 - High level of precision.
 - Once programmed, it executes all operations on its own.

2. COMPUTER NUMERICAL CONTROL (CNC) MACHINES

Computer Numerical Control (CNC) machines



3. TYPES OF CNC MACHINES

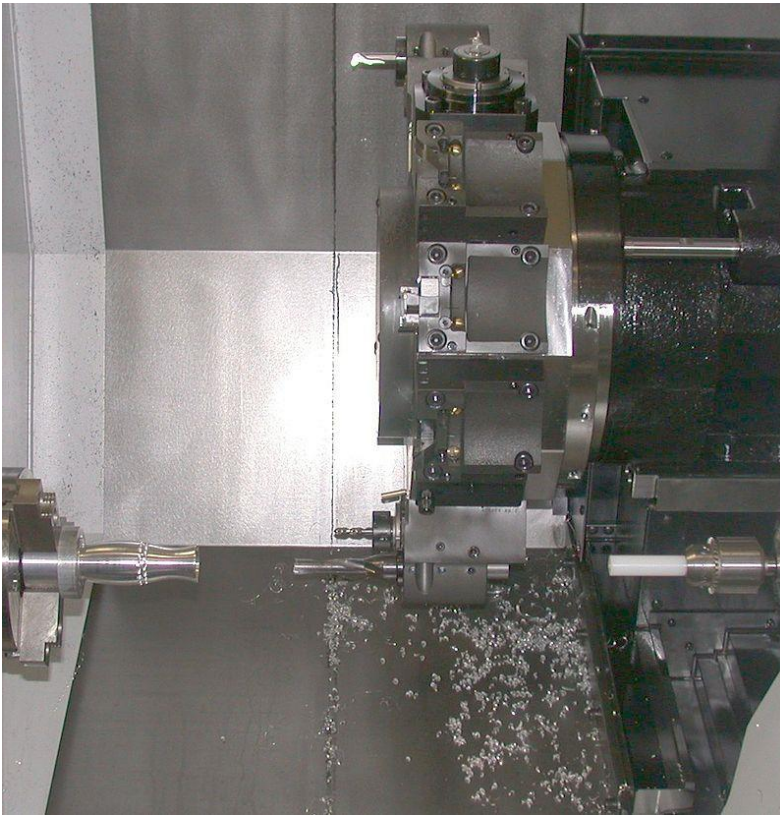
Types of CNC machines

- CNC Lathes
- CNC milling machines
- CNC router
- CNC plasma cutters
- CNC 3D printers

3. TYPES OF CNC MACHINES

CNC Lathes

Types of CNC machines



© Glenn McKechnie ([CC BY-SA 3.0](#)) [File:MoriSeiki-examples.jpg](#) - [Wikimedia Commons](#)

3. TYPES OF CNC MACHINES

CNC lathes

Types of CNC machines



3. TYPES OF CNC MACHINES

CNC milling machines

Types of CNC machines

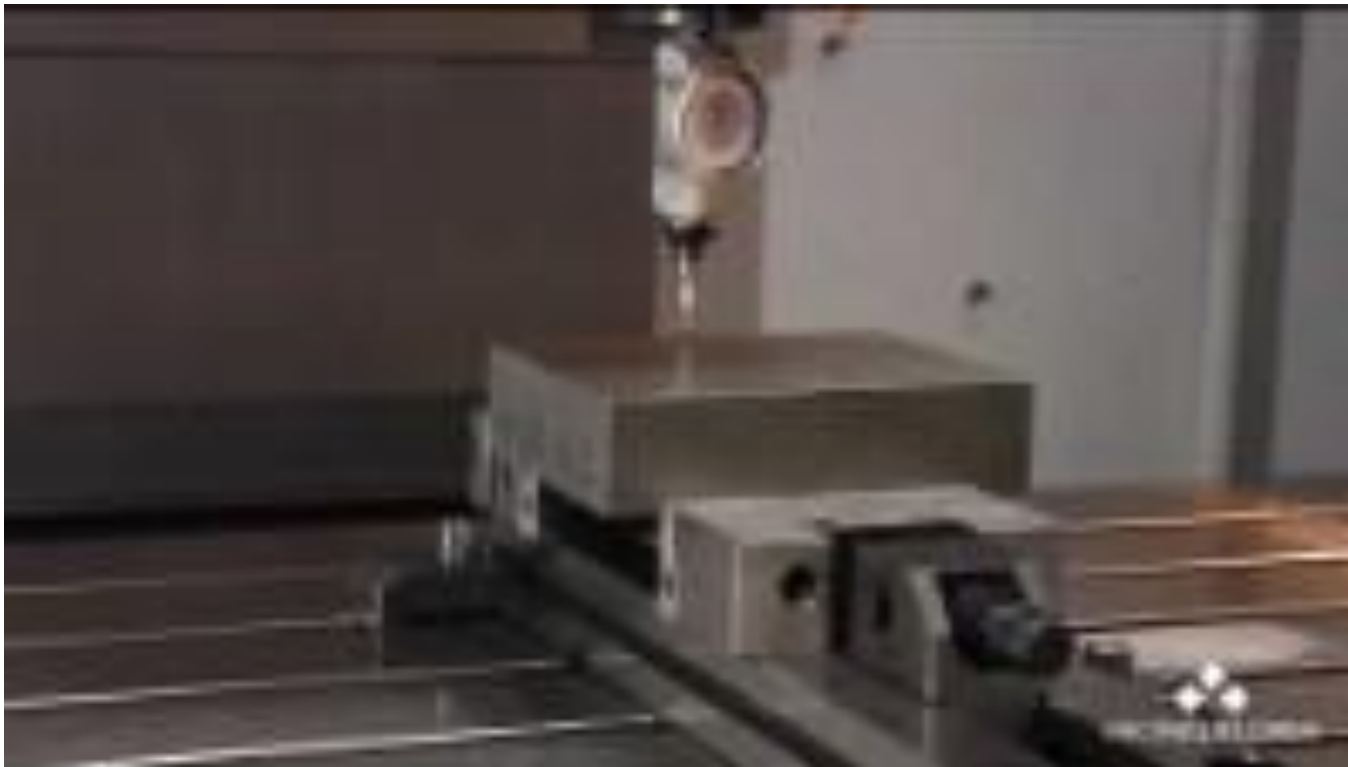


©Mecanizados Garrigues. <https://www.mecanizadosgarrigues.es/blog/que-es-fresadora-cnc/>

3. TYPES OF CNC MACHINES

CNC milling machines

Types of CNC machines



3. TYPES OF CNC MACHINES

Types of CNC machines

CNC router



©SIDEKO. <https://sideco.com.mx/que-es-un-router-cnc/>

3. TYPES OF CNC MACHINES

Types of CNC machines

CNC router



3. TYPES OF CNC MACHINES

CNC plasma cutters

Types of CNC machines



©SOHO Cutting. <https://www.sohocutting.com/es/cnc-plasma-cutter-best-guide-how-to-buy-in-2021/>

3. TYPES OF CNC MACHINES

Types of CNC machines

CNC plasma cutters



3. TYPES OF CNC MACHINES

Types of CNC machines

CNC 3D printers

Types of CNC 3D printing in factory:

- Printing with additive manufacturing
- CNC with wire or water cutting

3. TYPES OF CNC MACHINES

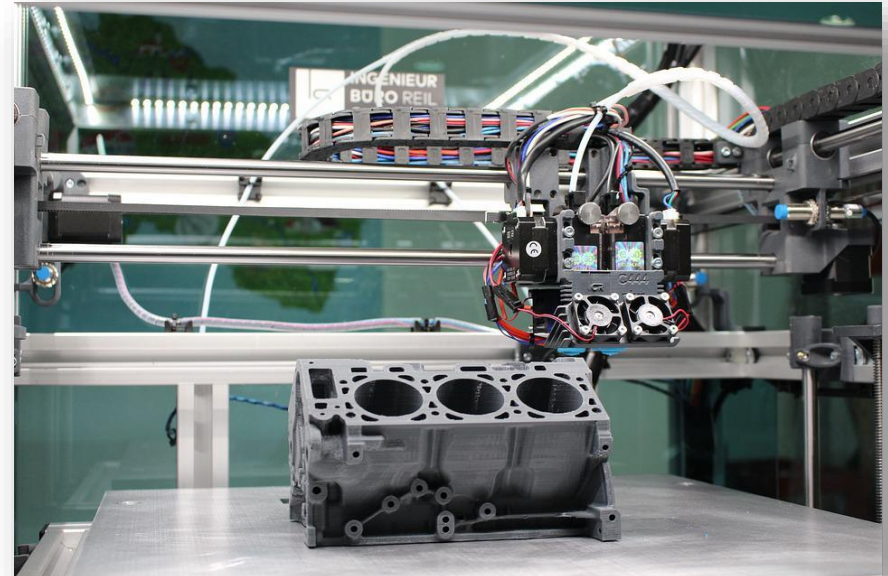
Types of CNC machines

CNC 3D printers

Types of CNC 3D printing in factory:

➤ Printing with additive manufacturing

- Techniques of manufacturing by the addition of material.
- 3D printing could be a type of additive technology.
- Laser sintering, UV curing or the addition of a binder.



3D PRINTING IN FACTORY

3. TYPES OF CNC MACHINES

Types of CNC machines

CNC 3D printers

Types of CNC 3D printing in factory:

- Printing with additive manufacturing



3. TYPES OF CNC MACHINES

Types of CNC machines

CNC 3D printers

Types of CNC 3D printing in factory:

➤ Printing with additive manufacturing



- Deposition of layers of material to create a mold.
- The mold is then filled with the desired mixture to produce the desired part.

© Creative Tools ([CC BY 2.0](#)) [CreativeTools.se - ZPrinter-made plastic injection mold 52... | Flickr](#)

3. TYPES OF CNC MACHINES

Types of CNC machines

CNC 3D printers

Types of CNC 3D printing in factory:

- Printing with additive manufacturing



3. TYPES OF CNC MACHINES

CNC 3D printers

Types of CNC machines

Types of CNC 3D printing in factory:

➤ **CNC with wire or water cutting**

➤ Metal or diamond wire cutting



Diamond wire
© Diamond Solutions

<http://www.aguiladiawerk.com/Corte-mural/Hilo-diamantado>

➤ Water jet



Diamond wire
© AMKA Chilena

<http://www.amkachilena.cl/corte-por-chorro-de-agua>

3. TYPES OF CNC MACHINES

CNC 3D printers

Types of CNC machines

Types of CNC 3D printing in factory:

- CNC with wire or water cutting
- Metal or diamond wire cutting



3D PRINTING IN FACTORY

3. TYPES OF CNC MACHINES

CNC 3D printers

Types of CNC machines

Types of CNC 3D printing in factory:

➤ CNC with wire or water cutting

➤ Water jet



3. TYPES OF CNC MACHINES

Types of CNC machines

CNC 3D printers

Types of CNC 3D printing in factory:

➤ CNC with wire or water cutting



CNC molding plastic
©Sentinel Plastics
Limited

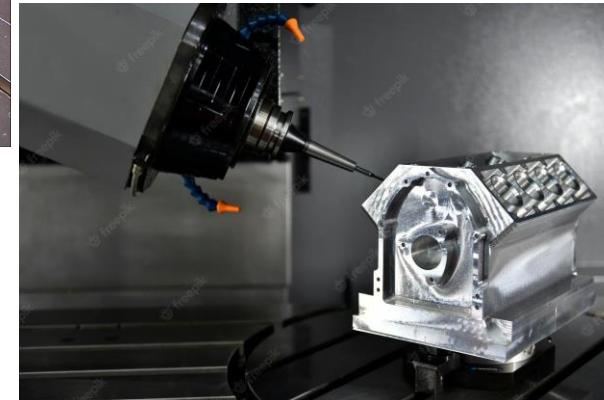
<https://www.sentinelplastics.co.uk/plastic-machining/plastic-cnc-milling/>



CNC molding wood ©Ineo
[Ineo - Mecanizado CNC](#)



CNC molding stone © CTM

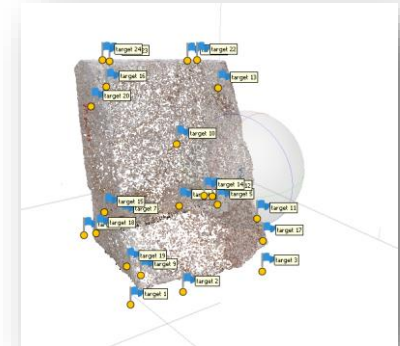


CNC molding metal

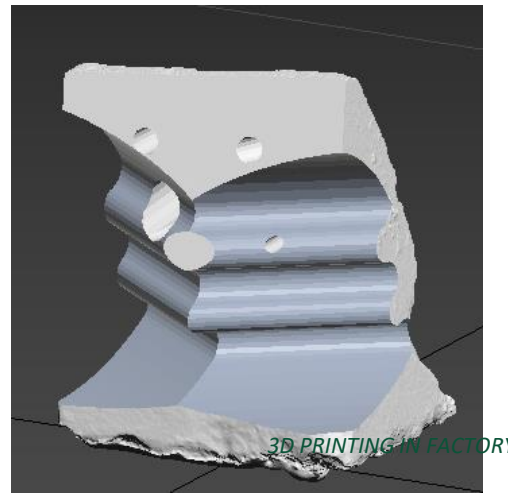
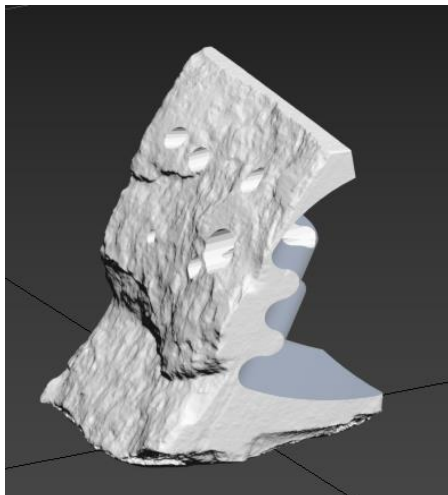
4. PRACTICAL CASE

CORAL3D. A project using 3D printing CNC machine for manufacturing an artificial reef

Industrial tomography



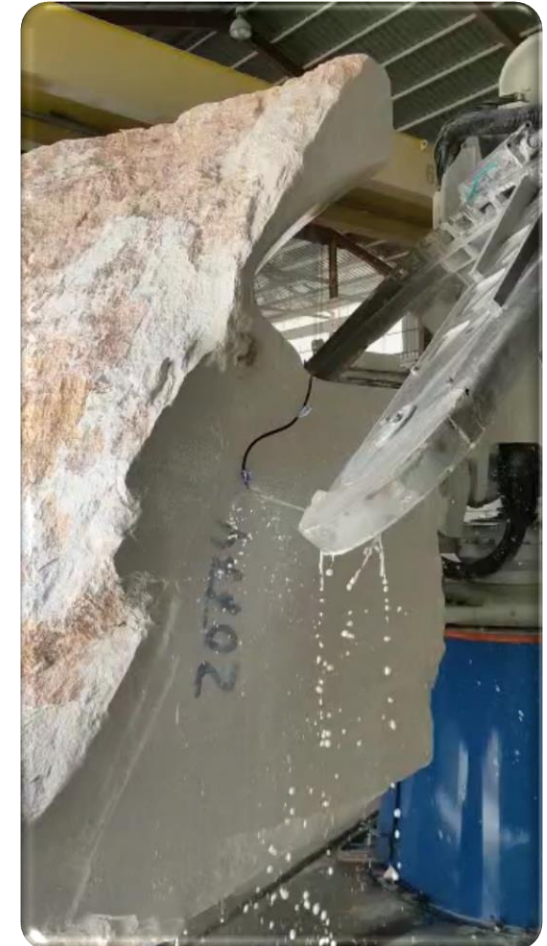
Artificial reef prototype



4. PRACTICAL CASE

CORAL3D. A project using 3D printing CNC machine for manufacturing an artificial reef

CNC working



4. PRACTICAL CASE

CORAL3D. A project using 3D printing CNC machine for manufacturing an artificial reef

Result





ECOLOGICAL AND INNOVATIVE TECHNOLOGIES FOR RECOVERING INDUSTRIAL AREAS FROM LCA AND ENERGY EFFICIENCY POINT OF VIEW 2020-1-RO01-KA203-080223

CONTACT

www.recoverind.eu



Erasmus+