UNIMORE
UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA

Dipartimento di Scienze e Metodi
dell'Ingegneria

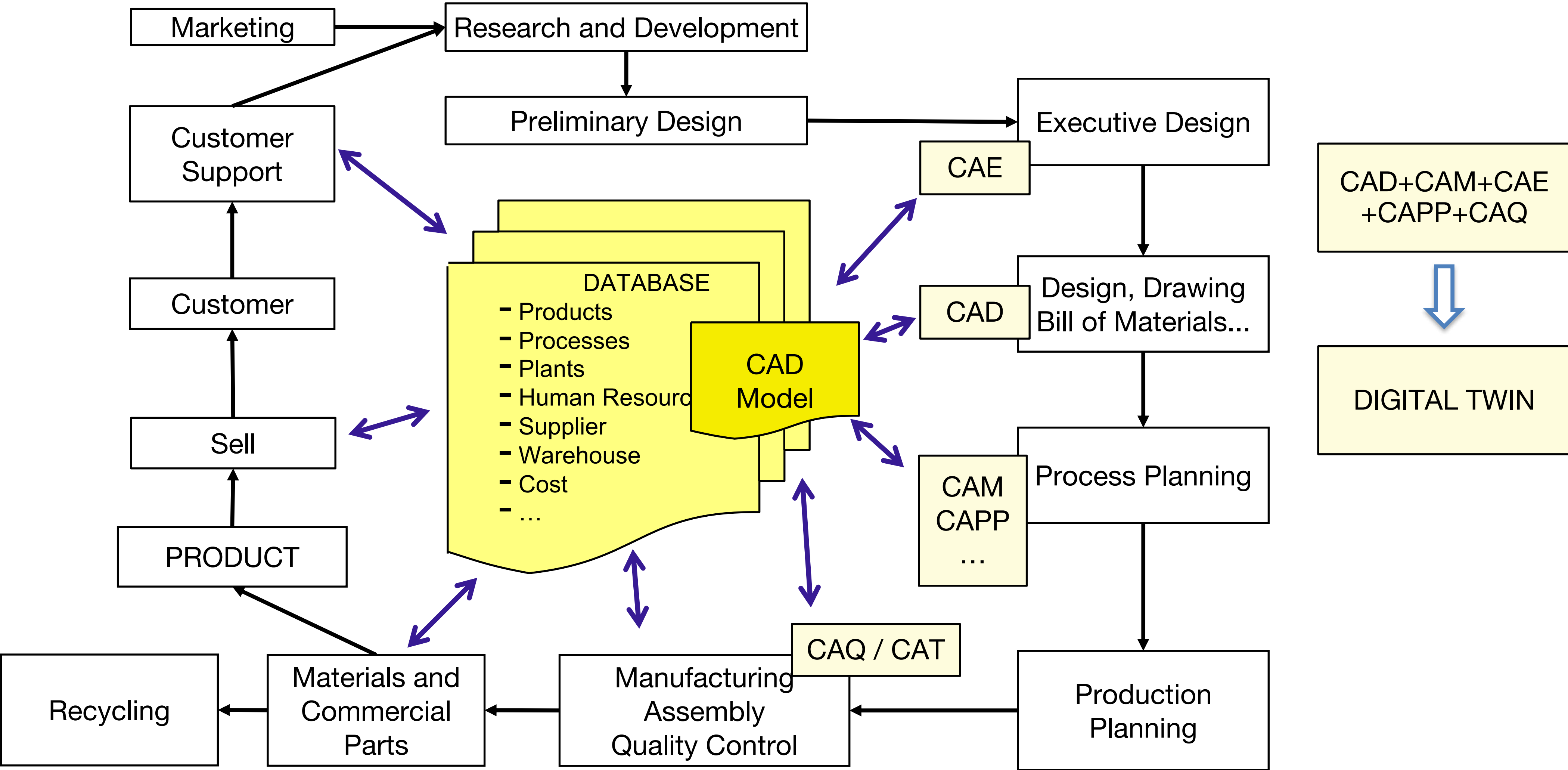# Virtual Solutions for Smart Manufacturing
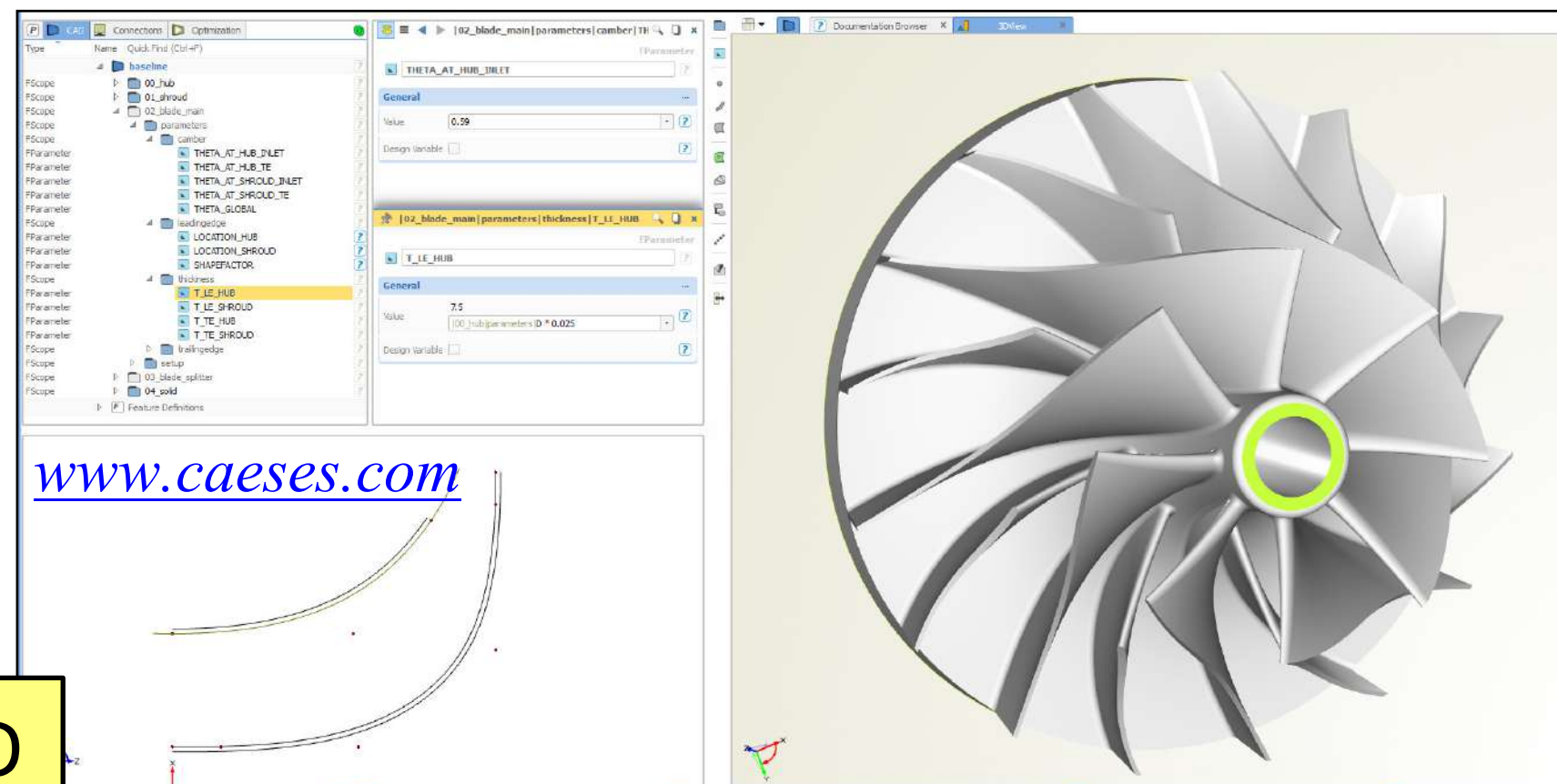
COURSE INTRODUCTION

Prof. Leonardo Orazi
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Smart Manufacturing: Concurrent Engineering

Marketing → Research and Development

Research and Development → Preliminary Design

Preliminary Design → Executive Design

Customer Support

Customer

Sell

PRODUCT

Recycling ← Materials and Commercial Parts ← Manufacturing Assembly Quality Control ← Production Planning

DATABASE
- Products
- Processes
- Plants
- Human Resources
- Supplier
- Warehouse
- Cost
- ...

CAD Model

CAE

Design, Drawing Bill of Materials...

CAD

CAM CAPP ...

Process Planning

CAQ / CAT

CAD+CAM+CAE +CAPP+CAQ

DIGITAL TWIN

Virtual Solutions for Smart Manufacturing

www.caeses.com

CAD

CAM

CAE

www.renishaw.com

CAT

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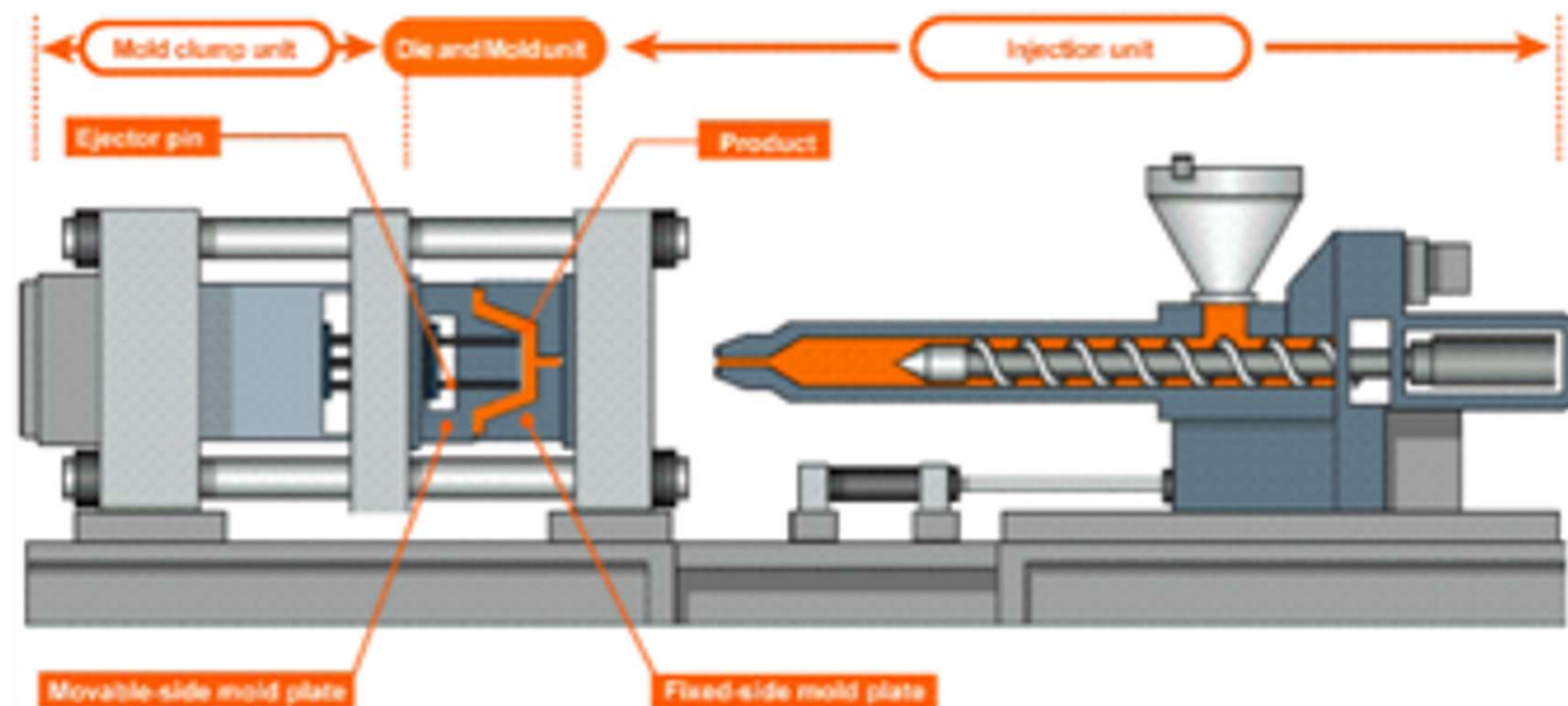
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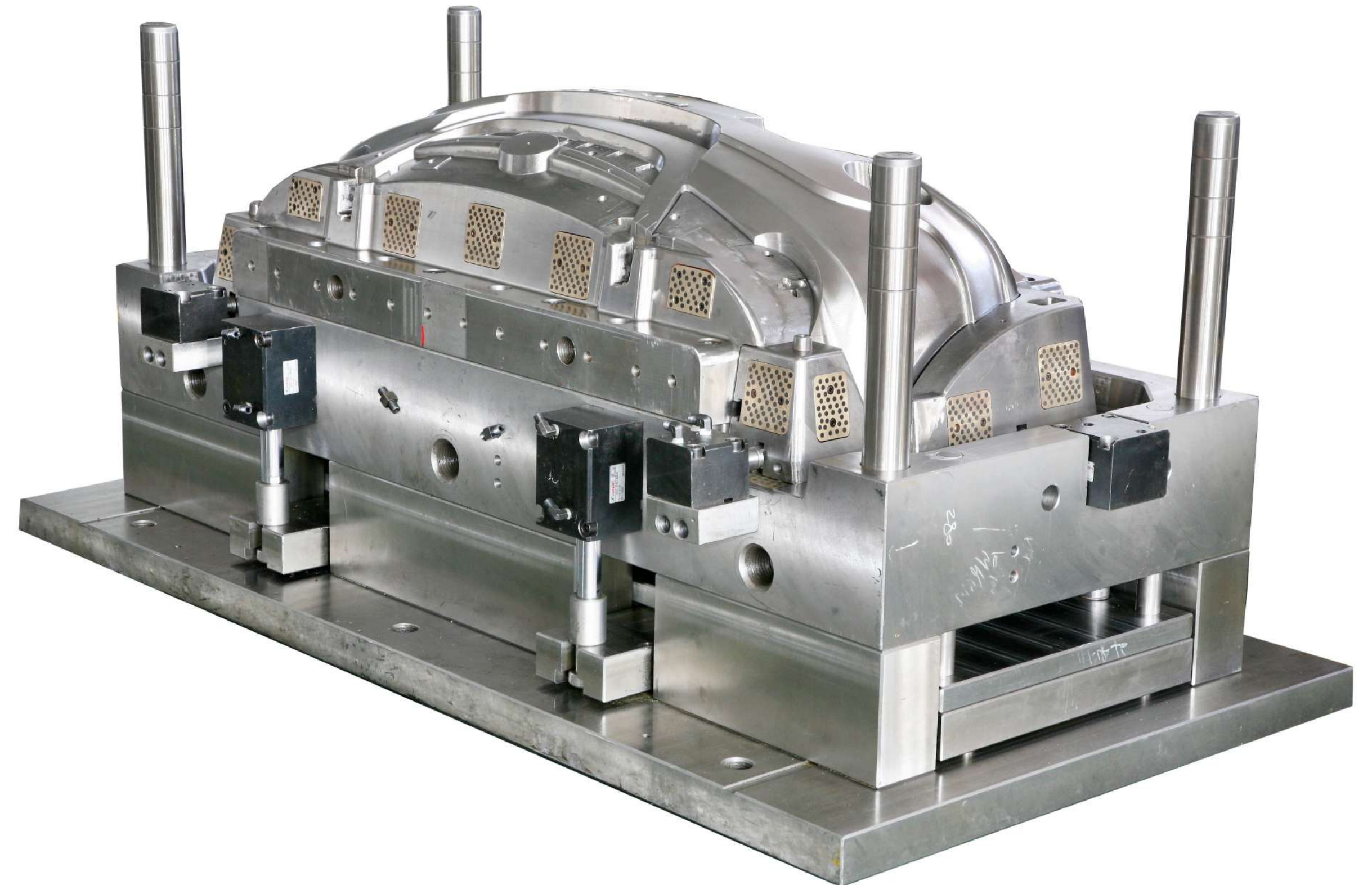# Plastic Injection Molding as representative manufacturing process

‣ Complex Geometries

‣ High Surface Quality

‣ Large Production Volumes

‣ Complex Production Chain

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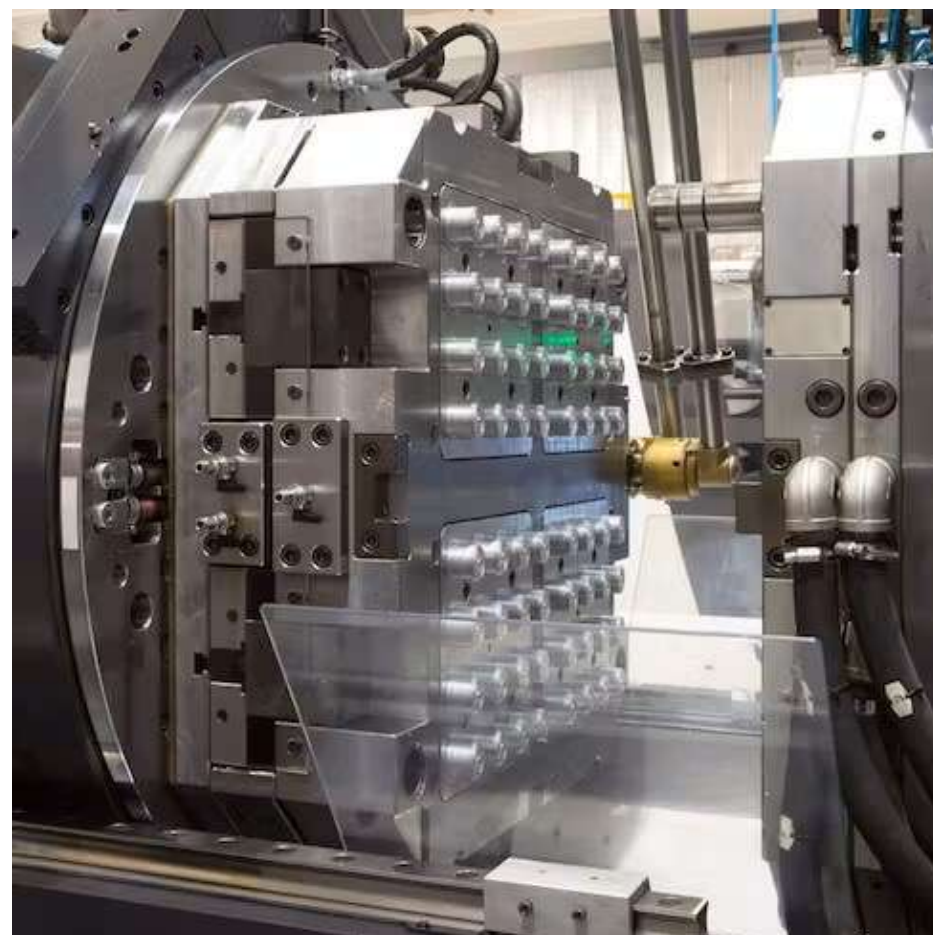Prof. Leonardo Orazi
Virtual Solutions for Smart Manufacturing

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Plastic Injection Molding as representative manufacturing process

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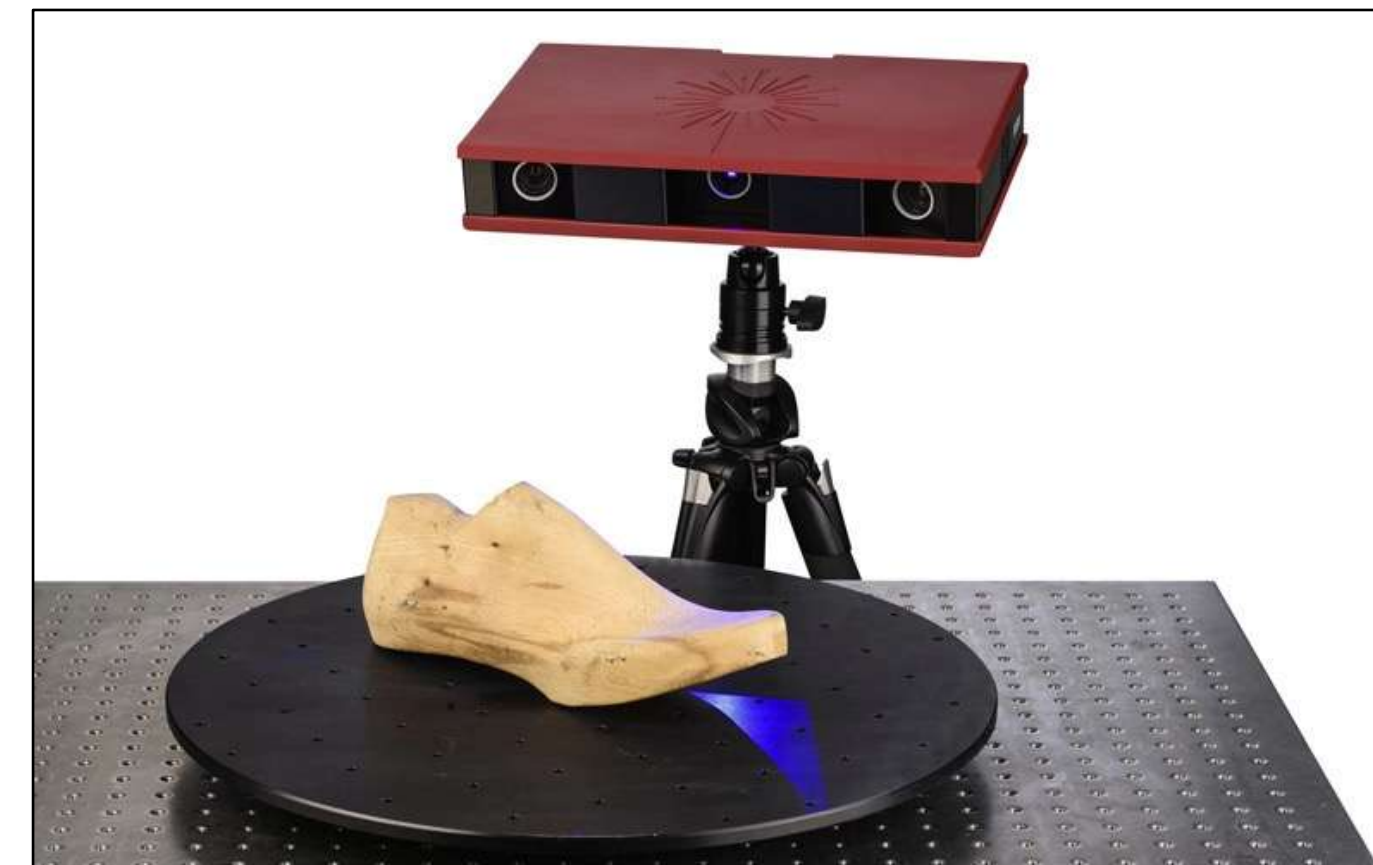Virtual Solutions for Smart Manufacturing

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Course activities

PROCESS DESIGN & PROCESS SIMULATION
CAD -> Process Simulation (MoldFlow)
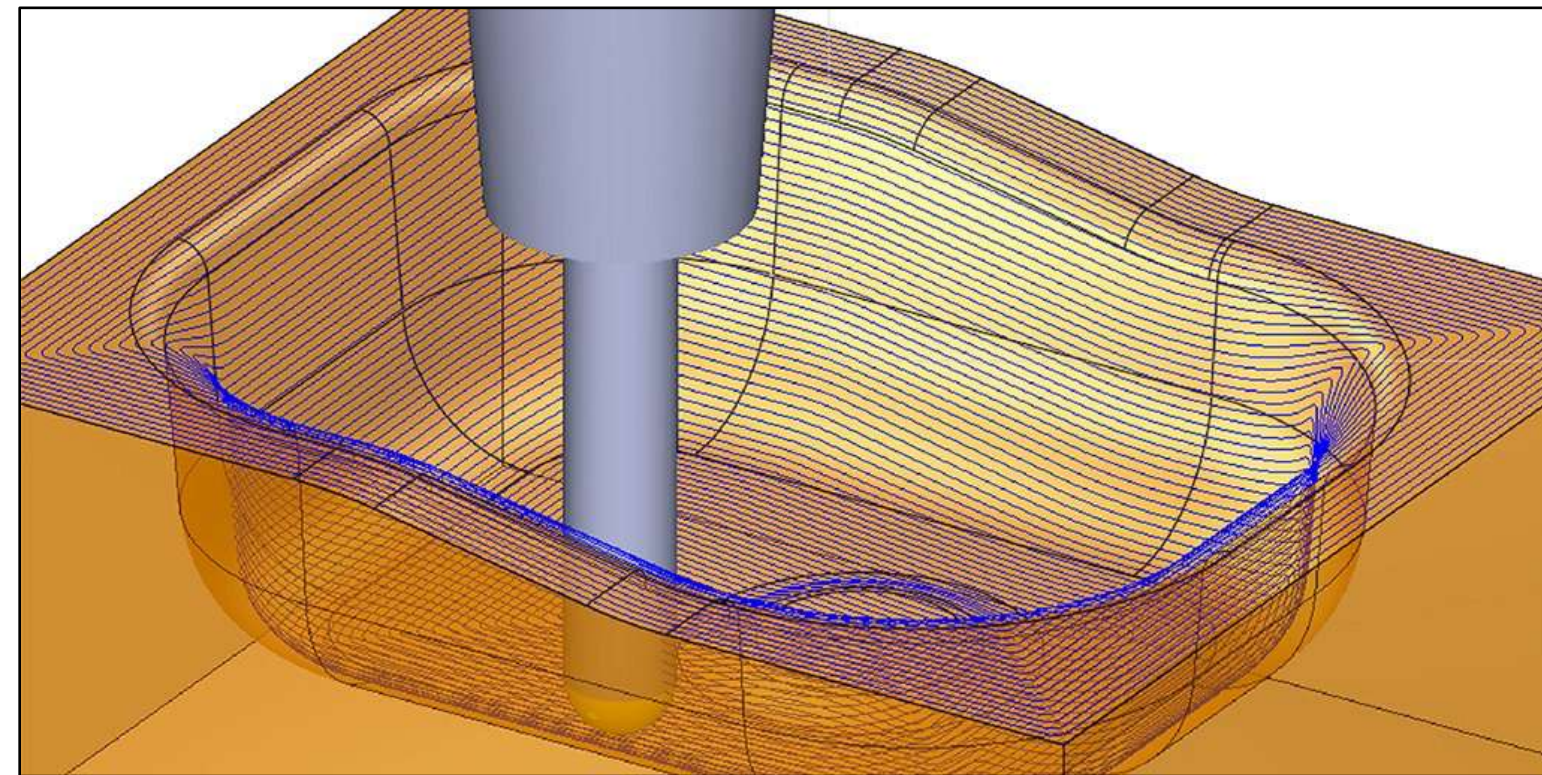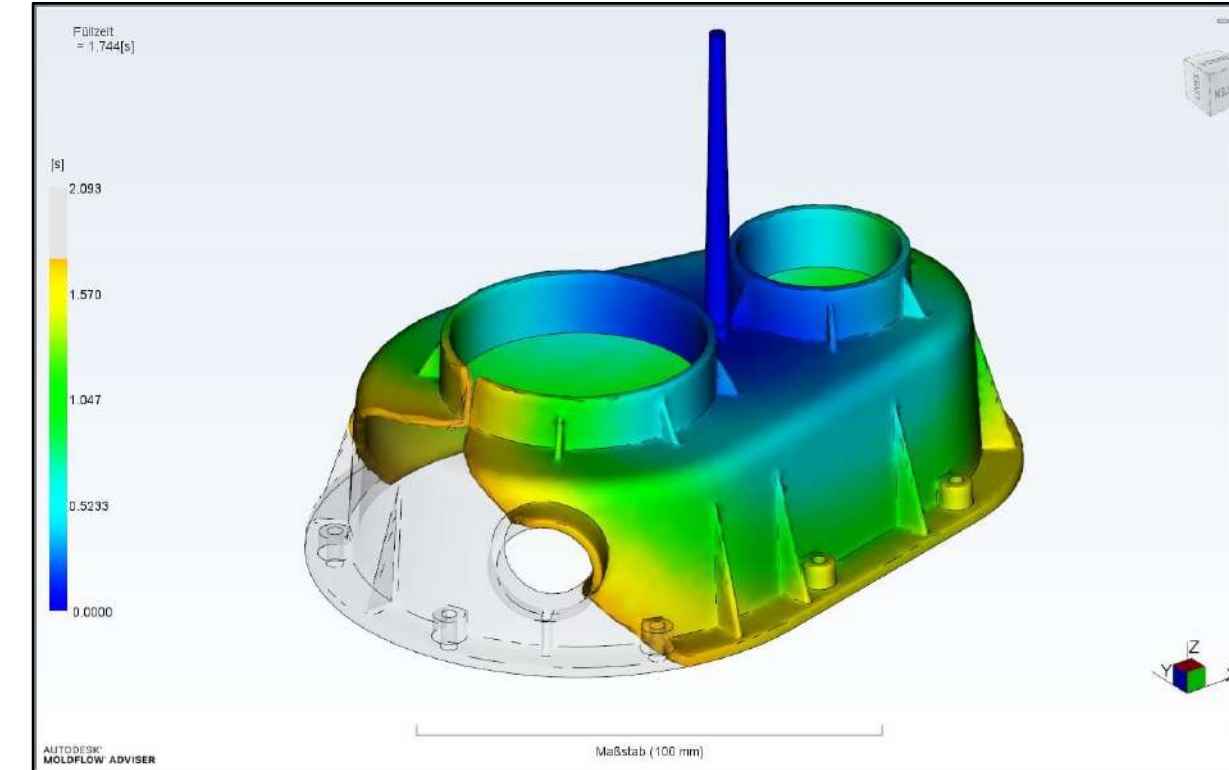
MANUFACTURING
CAD -> CAM (Fusion 360 / Cimatron E)

QUALITY CONTROL
3D Scanning (GOM Atos)

Course Outline

- ‣ INTRODUCTION (2 hours)

- ‣ CNC MACHINE TOOLS (4 hours)

- ‣ CAD/CAM (16 hours)
  - Practical exercises with Autodesk Fusion 360/Cimatron E CAM systems.

- ‣ ADVANCED PROCESS SIMULATION (16 hours)
  - Practical exercises with Moldflow process simulation system.

- ‣ ADDITIVE MANUFACTURING (8 hours)
  - General principles. Seminars on AM process simulation.

- ‣ 3D SCANNING (8 hours)
  - Practical exercises with GOM Atos

- ‣ Didactic Activities
  - Lectures
  - Exercises with software
    - – Fusion 360
    - – Cimatron E
    - – Moldflow
  - Software available both on virtual lab and for installation on personal PC

- ‣ Exam
  - Written and an oral part + software practical assessment

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