

Office of Global Education and Mobility

Summer Programme: 3D Printing

MPxxxx: 3D Printing and Additive Manufacturing: Principles and Applications

No of Academic Units: 3

Pre-requisites: Nil

Learning Objectives

This course aims to provide a general understanding of Additive Manufacturing or 3D Printing as it is more commonly known. It starts with an introduction and the importance of 3D Printing and describes the process chain.

The course will equip the students with all the 3D printing systems and technologies, their pros and cons. It will also cover the file format used in 3D printers. More importantly, a comprehensive range of applications and case studies will be covered. Finally, benchmarking, growth and trends will be described.

Topical Course Outline

Lesson	Description
1	Introduction
2	Process Chain
3	Liquid Based 3D Printing Systems
4	Solid Based 3D Printing Systems
5	Powder Based 3D Printing Systems
6	STL File Format
7	Applications and Case Studies
8	Benchmarking, Growth and Trends
9	Workshop exposure to 10 different 3D Printers

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Learning Outcome

Upon successful completion of the course, students will be able to:

- 1) Understand the motivation behind 3D Printing or Additive Manufacturing, basic concepts and process chain.
- 2) Compare the strengths and limitations of the various techniques of 3DP or AM.
- 3) Undergo a workshop of 10 different 3D printers.
- 4) Have a deep appreciation of the Stereolithography file format, problems and repair.
- 5) Appreciate the applications in Design, Engineering and Manufacturing
- 6) Learn about real case studies in aerospace, automotive, fashion, weapon, food, biomedical, movie, building and construction.
- 7) Gain an understanding into benchmarking, growth and trends of 3DP/AM.

Assessment

1. Class Attendance and Participation: 20%
2. Assessment: 80%

Participation and Attendance

1. For the purpose of participation assessment, any unexcused lateness beyond 20 minutes of class start time will be marked as an absence.

Textbooks/References

1. 3D Printing and Additive Manufacturing: Principle and Applications. Chua CK and Leong KF, 4th edition, World Scientific Publishing, August 2014.