

<b>Course Title</b>	<b>Course Code:</b>	<b>Credit Hours:</b>
Additive Manufacturing	AE-462	2-1

**Textbooks:**

- Li Yang, Keng Hsu, Brian Baughman, Donald Godfrey, Francisco Medina, Mamballykalathil Menon, and Soeren Wiener, "Additive Manufacturing of Metals: The Technology, Materials, Design and Production", Springer International Publishing
- Rafiq I. Noorani, "Rapid Prototyping: Principles and Applications", Wiley

**Reference Book:**

- Frank W. Liou, "Rapid Prototyping and Engineering Applications: A Toolbox for Prototype Development", CRC Press

**Course Objective:**

This course aims to equip students with the operating principles and characteristics of current commercialized rapid prototyping systems. Students will be able to choose a rapid method based on the requirements of the model or testing, and also learn the working of 3D scanners and software for reverse engineering.

**Course Outline:**

- Introduction to Additive Manufacturing and Rapid Prototyping
- History and Development of Additive Manufacturing Systems
- Applications of Additive Manufacturing in Education
- Applications of Additive Manufacturing in Industry
- Principles of Rapid Prototyping
- Liquid-Based Rapid Prototyping Systems
- Solid-Based Rapid Prototyping Systems
- Powder-Based Rapid Prototyping Systems
- Materials for Rapid Prototyping Introduction
- Types of Materials for Rapid Prototyping
- Case Study Fabricating a Prototype Using 3D Printing
- Reverse Engineering in Rapid Prototyping
- Introduction to Rapid Tooling

- Indirect Methods of Rapid Tooling
- Direct Methods of Rapid Tooling
- Case Study Sheet Metal Forming by Rapid Tooling
- Medical Applications of Rapid Prototyping
- Industry Perspectives Trends and Guidelines for Rapid Prototyping
- Research and Development Improvement of FDM Process Using Design of Experiment