

# KRISHNASAMY

College of

## ENGINEERING & TECHNOLOGY

Approved by AICTE & Affiliated to Anna University

Anand Nagar, Nellikuppam Main Road, S. Kumarapuram, Cuddalore - 607 109, Tamil Nadu.

☎ (04142) 285 601 - 604

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From

Head of the Department/MECH,

KCET,

Cuddalore.

DATE: 26.07.2024

To

The Principal,

KCET,

Cuddalore.

Respected Sir,

SUB: Conduction of Value Added Course-Requisition - Reg.


The Department of Mechanical Engineering has planned to conduct the following Value Added Course for the academic year 2023-2024. The course is provided to the students considering its importance in manufacturing field. The classes will be conducted from 05.08.2024 to 09.08.2024. The syllabus and the outcome of the course are attached for your kind reference.

S.No.	Course Code	Name of the Course	Year/ Semester	No. of Period	Course Coordinator
1	ME-VAC2303	Rapid Prototyping	III / VI	30	Dr.G.Magesh, Asst.Prof/Mech Er. L.Purushothaman, Asst.Prof/Mech

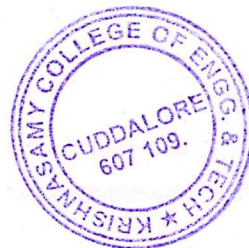
Kindly grant permission for conducting the above-mentioned Value Added Course.

Thanking You,

Recommended and Submitted  
to the Principal

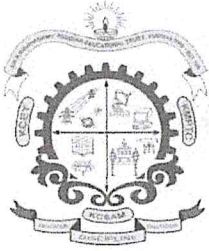
  
26/7/24  
Vice-Principal

  
26/7/24  
HOD/MECH



  
26/7/24  
Principal

Dr. G. ELANGO, M.E., Ph.D.  
PRINCIPAL,  
KRISHNASAMY COLLEGE OF  
ENGINEERING & TECHNOLOGY,  
S.KUMARAPURAM, CUDDALORE-607109



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## SYLLABUS

**Subject Code/ Subject Name: ME-VAC2303 - RAPID PROTOTYPING**

**Duration: 30 Hours**

### **COURSE OBJECTIVES**

- To introduce about different classes of Rapid Prototyping (RP) systems
- To impart knowledge about applications of various RP processes
- To introduce about rapid tooling.
- Understand about RP Technology selection.

### **MODULE I : INTRODUCTION**

**6**

Introduction to Prototyping, Need for the compression in product development, History of Rapid Prototyping (RP) systems, Survey of applications, Growth of RP industry, Classification of RP systems. Traditional Prototyping Vs. Rapid Prototyping (RP), Need for time compression in product development, Usage of RP parts, Generic RP process, Distinction between RP and CNC.

### **MODULE II : CAD MODELING AND DATA PROCESSING FOR RP**

**4**

CAD model preparation, Data Requirements, Data formats (STL, SLC, CLI, RPI, LEAF, IGES, HP/GL, CT, STEP), Data interfacing, Part orientation and support generation, Support structure design, Model Slicing and contour data organization, direct and adaptive slicing, Tool path generation

### **MODULE III : RP SYSTEMS & RAPID TOOLING**

**8**

**RP Systems:** Photo polymerization, Stereo lithography (SL), SL resin curing process, SL Scan patterns, Selective laser Sintering (SLS), Laminated Object Manufacturing (LOM)  
**Rapid Tooling:** Conventional Tooling Vs. Rapid Tooling, Classification of Rapid Tooling, Direct and Indirect Tooling Methods, Soft and Hard Tooling methods.

### **MODULE IV : 3D PRINTING & REVERSE ENGINEERING**

**6**

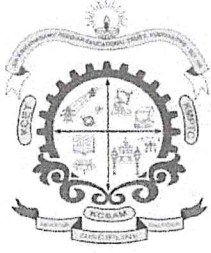
3D printing (3DP), Research achievements in printing deposition, Technical challenges in printing, Printing process modeling, Applications of Printing Processes,  
**Reverse Engineering:** Basic concept, Digitization techniques, Model Reconstruction, Data Processing for Rapid Prototyping.

### **MODULE V : RP APPLICATIONS**

**6**

Design, Engineering Analysis and planning applications, Rapid Tooling, Reverse Engineering, Medical Applications of RP.

**Total No. of Periods 30**



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## COURSE OUTCOMES

- Ability to perform complex and intricate cutting operations without human interference.
- understand the importance of time compression technologies
- Select of appropriate technology for particular application.
- Apply RP software packages
- Recognize various types of rapid tooling.

## TEXT BOOKS

- Prasad H and Badri narayanan, K S, "Rapid Prototyping and Tooling", SPI Page turners, Bangalore, India, 2013.
- Chua C K, Leong K F, Chu S L, Rapid Prototyping: Principles and Applications in Manufacturing, World Scientific. Syllabus for Master of Technology

## REFERENCES

- Gibson D W Rosen, Brent Stucker., Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing, Springer.
- Noorani R, Rapid Prototyping: Principles and Applications in Manufacturing, John Wiley & Sons.
- Hilton P, Jacobs P F, Rapid Tooling: Technologies and Industrial Applications, CRC press

## List of Experiments:

1. Review of CAD Modeling Techniques and Introduction to RP.
2. Generating STL files from the CAD Models & Working on STL files
3. Processing the CAD data in Catalyst software (Selection of Orientation, Supports generation, Slicing, Tool path generation)
4. Fabricating the physical part on a RP machine / 3D Printing
5. Learning techniques for fabricating an assembly
6. Prepare a CAD model with complex geometry and study effect of slicing parameters on final product manufactured through RP/3D Printing.

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