CENTRE FOR ACADEMIC COURSES
ANNA UNIVERSITY
CHENNAI – 600 025

Dr. SANJIB KUMAR PATTANAIK
DIRECTOR

Letter No:4370/AU/VA/CAC/2019   28.11.2019

To
The Controller of Examinations
Anna University
Chennai - 25.

Sir,

    Sub : AU - CAC – Affiliated Institutions - Value Added Courses - Reg.
    Ref : Letter No. AUC 002/2019-20/Even, dated 21.11.2019.

<p align="center">******</p>

With reference to the letter cited above, the following Value Added Course offered by Jansons Institute of Technology, Affiliated Institutions is allotted the course code as detailed below.

S. No	Code Allotted	Title	L	T	P	C
1.	CVA020	3D Printing Technology for Civil Engineering	1	0	0	1

This is for your kind information and necessary action at your end.

Yours faithfully,

DIRECTOR

Copy to:
1. The Chairperson, Faculty of Civil Engineering, Anna University, Chennai - 25.
2. The Principal, Jansons Institute of Technology, Karumathampatti, Coimbatore – 641 659.
3. The Stock File

A.SYLLABUS
3D PRINTING TECHNOLOGYFOR CIVIL ENGINEERING

LPTC
1001

Course Objectives:

- To explore technology used in Additive Manufacturing (AM).
- To understand the significance of various additive manufacturing in recent manufacturing process.
- To obtain knowledge in AM techniques and develop skills to select relevant additive manufacturing process.
- To high-lighten the importance of additive manufacturing in various industrial sectors
- To apply 3D printing technology in the field of Civil Engineering.

Prerequisites:

Basic knowledge in AutoCAD, Creo and Solid Works.

UNIT 1 - INTRODUCTION OF ADDITIVE MANUFACTURING   4

Introduction to AM - Historical development - Advantages of AM-AM process chain – Conceptualization- 3D modeling - Data Conversion to STL - Building setup - Post processing - AM data formats - Classification of AM process -Applications to various fields.

UNIT 2 - PRE-PROCESSING IN AM   3

Reverse engineering - Reconstruction of 3D-CAD model using reverse engineering, Part orientation and support generation – Slicing - Material preparation to build product.

UNIT 3 - LIQUID BASED AND SOLID BASED AM SYSTEMS   3

Liquidbasedsystem–Stereo Lithography Apparatus (SLA)–Principle-process –advantages and disadvantages - applications and case studies. Solidbasedsystem– Fused Deposition Modeling (FDM) – Principle – process – advantagesanddisadvantages - applications - case studies.

UNIT 4 - POWDER BASED AM SYSTEMS   3

Selective Laser Sintering (SLS)- Principle – process - advantages and disadvantages - applications and case studies - Laser Engineered Net Shaping (LENS) – Principle – process - advantages and disadvantages- applications - case studies.

UNIT 5 - MEDICAL AND BIO-AM   2

Customized implants and prosthesis - Design and production - Bio-Additive Manufacturing - Computer Aided Tissue Engineering (CATE) - Case studies.

Total periods -15

Credits   - 1

Course Outcomes:

By the end of this course, students should be able to:

- Identify the various process utilized in AM
- Choose suitable process and materials used in AM
- Apply the obtained knowledge of AM in various real-life applications
- Apply reverse engineering for geometry transformation in AM

REFERENCES

1. Chua C.K., Leong K.F. and Lim C.S Rapid prototyping: Principles an Applications, World Scientific publications, 3rdEd., 2010
2. D.T. Pham and S.S. Dimov, "Rapid Manufacturing", Springer, 2001
3. Terry Wohlers, " Wholers Report 2000", Wohlers Associates, 2000
4. Paul F. Jacobs, " Rapid Prototyping and Manufacturing", ASME Press, 1996
5. Ian Gibson, Davin Rosen and Brent Stucker "Additive Manufacturing Technologies, Springer, 2nd Ed, 2014.

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