Off: 22357077 / 73
22357074
Fax / Dir : 22352272

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY
CHENNAI – 600 025

Dr. R. RAJU
DIRECTOR

Letter No: 2565//AU/VA/CAC/2019

03.06.2019

To
The Controller of Examinations
Anna University
Chennai - 25.

Sir,

Sub : A.U. - CAC - Affiliated Institutions - Value Added Course - Reg.
Ref : Letter received from the Principal, Jansons Institute of Technology, Dated 27.05.2019.

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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
1.	CVA003	Computational Fluid Dynamics

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

Yours faithfully,

3/6/19

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, Tamil Nadu, INDIA
3. The Stock File

3/6/19

R2017

Value Added Course

"JCEV51-COMPUTATIONAL FLUID DYNAMICS"

AY2019-2020

Odd Semester

Department of Civil Engineering

JANSONS INSTITUTE OF TECHNOLOGY

KARUMATHAMPATTI, COIMBATORE – 641659

27.05.2019,
Karumathampatti.

From

The Head of the Department,
Department of Civil Engineering,
Jansons Institute of Technology,
Karumathampatti,
Coimbatore - 641659

To

The Principal,
Jansons Institute of Technology,
Karumathampatti,
Coimbatore - 641659

Respected Sir,

Sub: Proposal for the Value Added Course "Computational Fluid Dynamics (JCEV51)" - reg.,

As per the guidelines of Anna University, the Dept. of Civil Engineering has proposed to offer a one credit Value Added Course (VAC) titled, **JCEV51-Computational Fluid Dynamics** for the 2017-2021 batch students (R2017).

Have herewith, attached the syllabus, committee members and the course schedule for your kind perusal.

Thanking you.

Yours truly,

S.Ragunath.

PRINCIPAL
JANSONS INSTITUTE OF TECHNOLOGY
KARUMATHAMPATTI
COIMBATORE - 641 659.

JANSONS INSTITUTE OF TECHNOLOGY ★ JIT

A. Syllabus

L	T	P	C
1	0	0	1

JCEV51-COMPUTATIONAL FLUID DYNAMICS

Objectives

This course focus on

- Imparting basic knowledge on Computational Fluid Dynamics
- Creating awareness about possibilities of problem solving using mathematical modelling
- Obtaining the possibilities of applying CFD concept in Civil Engineering

Prerequisites

Basic knowledge on Fluid mechanics and Hydraulic Engineering

Unit - 1 Introduction **(2)**

Types of Fluid – Fluid dynamics – Newtonian Fluid dynamics – Non Newtonian Fluid dynamics – History and Philosophy of Computational Fluid Dynamics – Problem solving using CFD – Applications.

Unit – 2 Problem Solving **(5)**

Problem Solving – Physical Model – Mathematical model – Numerical Simulation – Geometry modelling – Mathematical modelling – Discretization methods – FDM – FEM – FVM – Choice of Discretization method.

Unit – 3 Equations of Fluid Flow **(2)**

Continuity Equation – Momentum Equation – Energy Equation – Viscous flow Equation – Navier-Stokes Equation – Types – Equation for Inviscid Flow – Euler Equations.

Unit – 4 CFD in Engineering **(6)**

CFD in Engineering applications – CFD in Civil Engineering – Rheology of Water bodies – Behavior of structures – Material manufacturing process – Case Studies.

Total Hours: 15

Credits: 1

Outcomes:

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

- Understand the concept of CFD and its applications.
- Develop knowledge in mathematical modelling by discretization methods.
- Apply the knowledge of CFD in various civil engineering disciplines.

REFERENCES

1. Versteeg H K; Malalasekera W,"An Introduction to Computational Fluid Dynamics", Pearson Education, 2nd edition, 2008.
2. Date Anil W,"Introduction to Computational Fluid Dynamics", Oxford University Press, 2007.
3. Jr., John D. Anderson, "Computational Fluid Dynamics with basic applications", Mc graw Hill Publications.
4. Eyosias Beneberu, "Computational Fluid Dynamics for Civil Engineering Infrastructure".

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B. Schedule

Department of Civil Engineering
Value Added Course
"JCEV51-COMPUTATIONAL FLUID DYNAMICS"
Academic Year 2019-2020 Odd Semester

Sl No	Date	Day & Time	Topics to be covered	No. of hours
UNIT I Introduction				
1.	26.06.2019	Wednesday (3.45pm – 4.45pm)	Introduction, Newtonian Fluid dynamic & Non Newtonian Fluid dynamics	1
2.	28.06.2019	Friday (3.45pm – 4.45pm)	History and Philosophy of Computational Fluid Dynamics, Problem solving using CFD & its applications.	1
UNIT II Problem Solving				
3.	03.07.2019	Wednesday (3.45pm – 4.45pm)	Problem Solving in CFD, Physical Model & Mathematical model	1
7.	05.07.2019	Friday (3.45pm – 4.45pm)	Numerical Simulation &Geometry modelling	1
8.	10.07.2019	Wednesday (3.45pm – 4.45pm)	Mathematical modelling	1
9.	12.07.2019	Friday (3.45pm – 4.45pm)	Discretization methods – FDM, FEM & FVM.	1
10.	17.07.2019	Wednesday (3.45pm – 4.45pm)	Choice of Discretization method.	1
UNIT III Equations of Fluid Flow				
11.	19.07.2019	Friday (3.45pm – 4.45pm)	Continuity Equation ,Momentum Equation, Energy Equation, Viscous flow	1
12.	31.07.2019	Wednesday (2.30pm – 3.30pm)	**CIA I** (1 Hour)	1
13.	07.08.2019	Wednesday (3.45pm – 4.45pm)	Navier-Stokes Equation, Types & Equation for Inviscid Flow, Euler Equations.	1
UNIT IV CFD in Engineering				
14.	09.08.2019	Friday (3.45pm – 4.45pm)	CFD in Engineering applications	1
15	23.08.2019	Wednesday (3.45pm – 4.45pm)	CFD in Civil Engineering	1
16	28.08.2019	Friday (3.45pm – 4.45pm)	Rheology of Water bodies	1

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17	30.08.2019	Wednesday (3.45pm – 4.45pm)	Behavior of structures	1
18	04.09.2019	Wednesday (3.45pm – 4.45pm)	Material manufacturing process	1
19	06.09.2019	Friday (3.45pm – 4.45pm)	Case Studies	1
20	17.09.2019	Tuesday (2.30pm – 3.30pm)	**CIA II** (1 Hour)	1
Total Hours				15+2(CIA)

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C. Details of Faculty

a. Faculty Handling the VAC

1. Mr.R.Jagadeesh Kumar, AP/Civil
2. Ms. M.R.Divya, AP/Civil

b. Evaluation Committee

1. Mr.R.Jagadeesh Kumar, AP/Civil
2. Ms. M.R.Divya, AP/Civil
3. Ms.L.Agnes Preethi, AP / Civil
4. Mr.S.Ragunath, HoD / Civil

c. VAC Coordinator

Ms.L.Agnes Preethi, AP / Civil

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