Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)

Date: 13.10.2017

Department of Mechanical Engineering

Circular

The of Department of Mechanical Engineering, BIHER glad to conduct on six days value added program on "***Computational Fluid Dynamics***" from 27.11.2017 for 30 hours. Those who are interested to participate do register your name to the program coordinator.

Resource persons:

Dr.D.Ravi,
Associate Professor,
BIHER

Dr.K.Durairaj ,
Works Manager,
AVADI TANK Factory,
Avadi, Chennai.

Maximum no. of registration Allowed – 60

***First come first serve basis.**

Program Coordinator:

Mr.R J Golden Renjith Nimal
Associate Professor
Mr.R.Hariharan
Assistant Professor,
E-Mail:goldenrenjith.mech@bharathuniv.ac.in

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Department of Mechanical Engineering
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH
Chennai-600 073

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Department of Mechanical Engineering

One Week Value added Program on "Computational Fluid Dynamics"

27th Nov to 2nd Dec 2017

Program Schedule

Date	Morning Session (9 AM – 12 PM)	Afternoon Session (1:30 PM – 3:30 PM)
27 – 11 – 2017 (Monday)	*Program Inauguration* **Dr.D.Ravi**,Associate Professor, BIHER *Introduction to CFD*	**Dr.K.Durairaj** , Works Manager, AVADI TANK Factory, Avadi, Chennai. *Governing Equations and Boundary Conditions*
28 – 11 – 2017 (Tuesday)	**Dr.K.Durairaj** , Works Manager, AVADI TANK Factory, Avadi, Chennai. *Derivation of finite difference equations*	**Dr.D.Ravi**, Professor, BIHER *Finite Volume Methods For Diffusion*
29 – 11 – 2017 (Wednesday)	**Dr.D.Ravi**, Associate Professor, BIHER *Volume Method for Convection Diffusion*	**Dr.K.Durairaj** , Works Manager, AVADI TANK Factory, Avadi, Chennai. *properties of discretization schemes – Conservativeness, Boundedness, Transportiveness, Hybrid, Power-law, QUICK Schemes*
30 – 11 – 2017 (Thursday)	**Dr.K.Durairaj** , Works Manager, AVADI TANK Factory, Avadi, Chennai. *FLOW PROCESSES: FINITE VOLUME METHOD*	**Dr.D.Ravi**, Professor, BIHER *Pressure based algorithms, SIMPLE, SIMPLER & PISO algorithms*
01 – 12– 2017 (Friday)	**Dr.D.Ravi**, Associate Professor, BIHER *Representation of the pressure gradient term and continuity equation – Staggered grid – Momentum equations – Pressure and Velocity corrections*	**Dr.K.Durairaj** , Works Manager, AVADI TANK Factory, Avadi, Chennai. *Pressure Correction equation, SIMPLE algorithm and its variants. Turbulence models, mixing length model, Two equation (k-Є) models – High and low Reynolds number models*

02 – 12 – 2017 (Saturday)	**Dr.D.Ravi**, Associate Professor, BIHER *Practical Session using software*	*Quiz/ Feedback / valedictory Session*

Program Coordinator:
Mr.R J Golden Renjith Nimal
Associate Professor
Mr.R.Hariharan
Assistant Professor,
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Computational Fluid Dynamics

OBJECTIVES:

- To introduce Governing Equations of viscous fluid flows
- To introduce numerical modeling and its role in the field of fluid flow and heat transfer
- To enable the students to understand the various discretization methods, solution procedures and turbulence modeling.
- To create confidence to solve complex problems in the field of fluid flow and heat transfer by using high speed computers.

[DAY: 1]

MODULE 1 Governing Equations and Boundary Conditions (5 Hrs)
Basics of computational fluid dynamics – Governing equations of fluid dynamics – Continuity, Momentum and Energy equations – Chemical species transport – Physical boundary conditions – Time-averaged equations for Turbulent Flow – Turbulent–Kinetic Energy Equations – Mathematical behaviour of PDEs on CFD – Elliptic, Parabolic and Hyperbolic equations.

[DAY: 2]

MODULE II Finite Difference and Finite Volume Methods For Diffusion (5 Hrs)
Derivation of finite difference equations – Simple Methods – General Methods for first and second order accuracy – Finite volume formulation for steady state One, Two and Three - dimensional diffusion problems –Parabolic equations – Explicit and Implicit schemes – Example problems on elliptic and parabolic equations – Use of Finite Difference and Finite Volume methods.

[DAY: 3]

MODULE III Finite Volume Method for Convection Diffusion (5 Hrs)
Steady one-dimensional convection and diffusion – Central, upwind differencing schemes properties of discretization schemes – Conservativeness, Boundedness, Transportiveness, Hybrid, Power-law, QUICK Schemes.

[DAY: 4]

MODULE IV FLOW PROCESSES: FINITE VOLUME METHOD (5 Hrs)
Discretisation of incompressible flow equations – Pressure based algorithms, SIMPLE, SIMPLER & PISO algorithms

[DAY: 5]

MODULE V Calculation Flow Field by FVM (5 Hrs)
Representation of the pressure gradient term and continuity equation – Staggered grid – Momentum equations – Pressure and Velocity corrections – Pressure Correction equation, SIMPLE algorithm and its variants. Turbulence models, mixing length model, Two equation (k-Є) models – High and low Reynolds number models

[DAY: 6]

Practical Session using software **(5 Hrs)**

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Value Added Course - CFD

PARTICIPANTS LIST

S.No	Reg.No	Name	Department
1.	U16AM007	SUNDARESWARAN	Automobile Engineering
2.	U16AM008	PALAPANDALA	Automobile Engineering
3.	U16AM009	THAMIM ANSARI	Automobile Engineering
4.	U16AM010	JAI KUMAR	Automobile Engineering
5.	U16AM012	MOHAMED IMTHIYAZ	Automobile Engineering
6.	U16AM015	PARIMI SAI SURYA VAMSI	Automobile Engineering
7.	U16AM017	AMAL PHILIP GEORGE	Automobile Engineering
8.	U16MT010	SAKTHI	Mechatronics
9.	U16MT011	MELVINE ROHAN	Mechatronics
10.	U16MT014	SARATHKUMAR	Mechatronics
11.	U16MT015	SOMENDRAN	Mechatronics
12.	U16MT018	RATHISH KRISHNAN	Mechatronics
13.	U16MT501	MUGILAN	Mechatronics
14.	U16MT502	VIGNESHWAR	Mechatronics
15.	U16MT503	KARUPHIN KAWIN J	Mechatronics
16.	U16MT701	CHANDRASEKAR	Mechatronics
17.	U16MT702	CHIRANJEEVI	Mechatronics

18.	U16MT703	VIGNESH	Mechatronics
19.	U16MT704	AJITH	Mechatronics
20.	U16ME002	DINESH KUMAR	Mechanical Engineering
21.	U16ME011	AJITH KUMAR	Mechanical Engineering
22.	U16ME012	MOHANRAJ	Mechanical Engineering
23.	U16AM501	MOHAMED FARIZ	Automobile Engineering
24.	U16AM502	GOPINATH	Automobile Engineering
25.	U16AM701	BISANI YASWANTH SAI	Automobile Engineering
26.	U16AM702	MUHAMED ASHARUDEEN	Automobile Engineering
27.	U16ME029	DINESH KUMAR	Mechanical Engineering
28.	U16ME031	ZHAKIRHUSSAIN	Mechanical Engineering
29.	U16ME033	SHERIN T	Mechanical Engineering
30.	U16ME035	PARTHAN	Mechanical Engineering
31.	U16ME041	SUVODEEP	Mechanical Engineering
32.	U16ME049	MOHAMED ABDULLAH	Mechanical Engineering
33.	U16ME055	DEEPAK	Mechanical Engineering
34.	U16ME056	YOGESH	Mechanical Engineering
35.	U16ME059	JEFRON	Mechanical Engineering
36.	U16ME062	DANIEL	Mechanical Engineering
37.	U16ME066	VASANTH KUMAR	Mechanical Engineering
38.	U16ME078	KAMASANI	Mechanical Engineering
39.	U16ME080	MAJID	Mechanical Engineering

40.	U16ME082	HARISH	Mechanical Engineering
41.	U16ME087	ANAND KUMAR	Mechanical Engineering
42.	U16ME093	MACHUNURU PRASAD KUMAR	Mechanical Engineering
43.	U16ME094	GOPAL KUMAR	Mechanical Engineering
44.	U16ME098	PRAJEESH S NAIR	Mechanical Engineering
45.	U16ME100	NAGIREDDY AJAYKUMAR	Mechanical Engineering
46.	U16ME101	VIJAY	Mechanical Engineering
47.	U16ME104	MULLAGURA BHARATH KUMAR	Mechanical Engineering
48.	U16ME105	CHALLA CHARANKUMAR	Mechanical Engineering
49.	U16ME106	RAJEEV KUMAR	Mechanical Engineering
50.	U16ME107	MANOJ	Mechanical Engineering
51.	U16ME113	PYNKHLAINBORLANG	Mechanical Engineering
52.	U16ME115	GUNA	Mechanical Engineering
53.	U16ME119	PALAPALA	Mechanical Engineering

Mr. R.T. Golden Renjith Nimal

Mr. R. Hariharan

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Feedback Form

* Required

Email address *

Harish124@gmail.com

Name of the Participant *

Use Capital Letters , It will be Printed In Certificate

Harish (U16ME082)

Name of the Institution *

BIHER

Content of the Presentation *

- (●) More than Expected
- ( ) As Expected
- ( ) Satisfactory
- ( ) Not Satisfactory

Audio/ Video Quality *

	1	2	3	4	5	
Very Poor	( )	( )	( )	( )	(●)	Very Good

Bharath Institute of Higher Education and Research

DEPARTMENT OF MECHANICAL ENGINEERING

Certificate of Participation

This is to certify that

HARISH

of

Bharath Institute of Higher Education and Research

has attended the value added program on "Computational Fluid Dynamics" organized by the Department of Mechanical Engineering, Bharath Institute of Higher Education and Research, Chennai on November (27-30), December (1-2), 2017.

Mr.R J Golden Renjith Nimal **Mr.R.Hariharan**
Coordinators

Dr.D.Ravi
Resource Person

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Value Added Course - CFD - SNAP SHOT