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Faculty Development Programme

Sl.No	Name of the Faculty	Title	Date
1.	Ms.Shiny Pradeepa	Block chain Technology	03.07.2023-07.07.2023
2.	Ms.Shiny Pradeepa	Role of Mathematics in Machine learning	20.02.2023-24.02.2023
3.	Ms.Shiny Pradeepa	Recent Research area and the Application in Mathematics	10.10.2022-15.10.2022
4.	Ms.Shiny Pradeepa	Trends and Challenges in the Development of Electric vehicles and hybrid electric vehicles	26.09.2022-30.09.2022
5.	Ms.Shiny Pradeepa	Current trends and Application in Mathematics	21.09.2022-04.10.2022
6.	Dr.A.Jasmine Gnanamalar	Recent trends in Electric vehicles	25.07.2022-29.07.2022
7.	Dr.S.Rajasekaran	Recent trends in Electric vehicles	25.07.2022-29.07.2022
8.	Mr.M.Murugan	Recent trends in Electric vehicles	25.07.2022-29.07.2022
9.	Dr.A.Bhuvanesh	Recent trends in Electric vehicles	25.07.2022-29.07.2022
10.	Mrs.M.Merline prabha	Recent trends in Electric vehicles	25.07.2022-29.07.2022
11.	Ms.P.Muthulaksmi	Recent trends in Electric vehicles	25.07.2022-29.07.2022
12.	Ms.V.Jenitha	Recent trends in Electric vehicles	25.07.2022-29.07.2022

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13.	Ms.Shiny Pradeepa	Recent trends in Electric vehicles	25.07.2022-29.07.2022
14.	Dr.J.Leema rose	Recent trends in Electric vehicles	25.07.2022-29.07.2022
15.	Ms.P.Kavya	Role of Artificial intelligence in Power sector	29.05.2023-02.06.2023
16.	Mr.K.Jebastin	Role of Artificial intelligence in Power sector	29.05.2023-02.06.2023
17.	Ms.A.Anburani	Role of Artificial intelligence in Power sector	29.05.2023-02.06.2023
18.	Ms.P.Muthulaksmi	Role of Artificial intelligence in Power sector	29.05.2023-02.06.2023
19.	Mr.S.Paramasivam	Role of Artificial intelligence in Power sector	29.05.2023-02.06.2023
20.	Mrs.N.Sivasankari	Role of Artificial intelligence in Power sector	29.05.2023-02.06.2023
21.	Mr.d.Joseph pushbaraj	Programme on Cloud computing	18.07.2022-22.07.2022
22.	Mrs.J.Yamuna bee	Programme on Cloud computing	18.07.2022-22.07.2022
23.	Dr.R.Satheeshraja	Emotional Intelligence	05.01.2023-07.01.2023
24.	Mr.A.C.Mariappan	Emotional Intelligence	05.01.2023-07.01.2023
25.	Mr.C.Indrakumar	Emotional Intelligence	05.01.2023-07.01.2023
26.	Mr.S.Jesuharin samuel	Emotional Intelligence	05.01.2023-07.01.2023

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27.	Dr.P.K.Manikanda prabhu	Emotional Intelligence	05.01.2023-07.01.2023
28.	Mr.K.Sudhakar	Emotional Intelligence	05.01.2023-07.01.2023
29.	Ms.C.Srimuthupriya	Emotional Intelligence	05.01.2023-07.01.2023
30.	Ms.C.Supriya	Emotional Intelligence	05.01.2023-07.01.2023
31.	Dr.Amirtha Sher Gill	Emotional Intelligence	05.01.2023-07.01.2023
32.	Mr.K.Sakthivel	Emotional Intelligence	05.01.2023-07.01.2023
33.	Dr.Pon Esakkiraja	Emotional Intelligence	05.01.2023-07.01.2023
34.	Mrs.Kanakalaksmi	Emotional Intelligence	05.01.2023-07.01.2023
35.	Mrs.H.Jeyalaksmi	Emotional Intelligence	05.01.2023-07.01.2023
36.	Mrs.J.Yamuna bee	Emotional Intelligence	05.01.2023-07.01.2023
37.	Mr.B.Muthuramu	Emotional Intelligence	05.01.2023-07.01.2023
38.	Mr.V.Ramesh	Emotional Intelligence	05.01.2023-07.01.2023
39.	Dr.Radhakrishnan	Emotional Intelligence	05.01.2023-07.01.2023
40.	Dr.A.Packiya antony amalan	Maritime Engineering	26.06.2023-02.07.2023

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41.	Mr.A.C.Mariappan	Maritime Engineering	26.06.2023-02.07.2023
42.	Dr.R.Satheeshraja	Maritime Engineering	26.06.2023-02.07.2023
43.	Mr.C.Indrakumar	Maritime Engineering	26.06.2023-02.07.2023
44.	Mr.A.Kasiviswanathan	Maritime Engineering	26.06.2023-02.07.2023
45.	Dr.K.Chandrsekar	Maritime Engineering	26.06.2023-02.07.2023
46.	Mr.G.Peter Packiyaraj	Maritime Engineering	26.06.2023-02.07.2023
47.	Dr.P.Palpandian	Maritime Engineering	26.06.2023-02.07.2023
48.	Mr.S.Rohith Ambadi	Maritime Engineering	26.06.2023-02.07.2023

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7XKBEG-CE000039

This is to certify that Mr. / Ms. / Dr. **SHINY PRADEEPA**
PSN COLLEGE OF ENGINEERING AND TECHNOLOGY
has participated in 5 days Faculty Development Programme on **"Blockchain Technology"**
organized by **Department of Computer Science and Engineering** in association with
CSI Students Chapter from 03.07.2023 to 07.07.2023. This was a virtual programme
conducted through Zoom.

DR. M. VARGHEESE
HOD/CSE

DR. V. MANIKANDAN

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SRM

INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act 1956)

Department of Mathematics
College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur 603203

5 Days Faculty Development Program For Skill Development

on
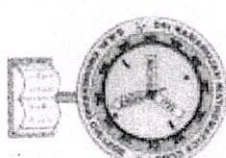
Role of Mathematics in Machine Learning

Certificate of Participation

A.Shiny Pradeepa

This is to certify that Mr/Ms...has

participated in the event ....in

PSN College of Engineering and Technology,Tirunelveli

5 Days Faculty Development Program For Skill Development on Role of Mathematics in Machine Learning organised by Department of

Mathematics, School of Basic Sciences, SRM Institute of Science and Technology, Kattankulathur from 20th – 24th February 2023.

Coordinator
Dr. G. Ramesh

Convenor
Dr. V. Subburayan

Chairperson
(School of Applied Sciences)
Dr. D. John Thiruvadigal

Dean, CET
Dr. T. V. Gopal
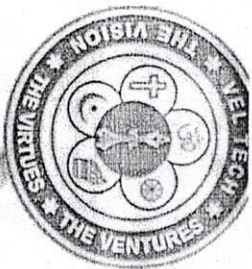
Vel Tech Multi Tech

Dr. Rangarajan Dr. Sakunthala Engineering College
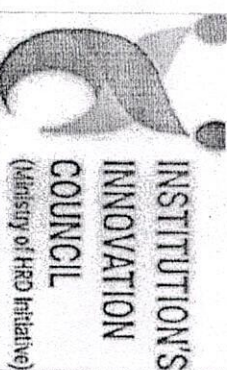
An Autonomous Institution

Certificate of Participation

Department Of Mathematics

This is to certify that **Ms. A. Shinypradeepa**

Assistant professor, PSN college of engineering and technology

has successfully completed one-week online FDP *on "Recent Research Area and its Application in Mathematics" from 10th to 15th October 2022.*

CONVENOR
(Dr. S. KARPAGAM)

HOD
(Dr. THANGEESWARI)

PRINCIPAL
(Dr. V. RAJAMANI)

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INSTITUTION'S INNOVATION COUNCIL
(Ministry of HRD Initiative)
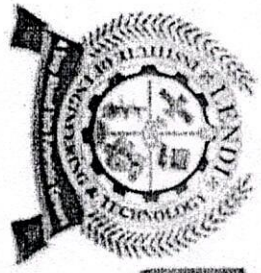
Lendi

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For B.Tech ECE|CSE|EEE|Mech.

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"A+A" by Careers 360

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CERTIFICATE OF PARTICIPATION

This certificate is presented to

Ms. SHINY PRADEEPA

PSN COLLEGE OF ENGINEERING AND TECHNOLOGY

for participating in the One Week International Online Faculty Development Program on "TRENDS & CHALLENGES IN THE DEVELOPMENT OF ELECTRIC VEHICLES & HYBRID ELECTRIC VEHICLES (SERIES-I)" held from 26th - 30th September, 2022, organized by the Department of Mechanical Engineering, Lendi Institute of Engineering & Technology, Vizianagaram, Andhra Pradesh

1659

V.V~J

Dr.V.V. Rama Reddy
Principal

Dr. Satish Pujari
Head of the Department

Dr. K. Shridhar
Convenor- FDP

CERTIFICATE
OF PARTICIPATION

Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

This is to certify that **A.SHINY PRADEEPA**, ASSISTANT PROFESSOR, Department of ELECTRICAL AND ELECTRONICS ENGINEERING, PSN COLLEGE OF ENGINEERING AND TECHNOLOGY,MELATHEDIYOOR,TIRUNELVELI,627152 has participated in a Two Week Online International Faculty Development Programme on **"Current Trends in Applications of Mathematics"**, organized by the Department of Mathematics, School of Sciences and Humanities, Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, Avadi, Chennai-62, Tamil Nadu, India from 21-09-2022 to 04-10-2022.

Dr.T.Gunasekar
Convener

Prof.M.L.Suresh
HOD - Mathematics

Prof.M.Sivakumar
Dean-FME

Prof.S.Salivahanan
Vice Chancellor
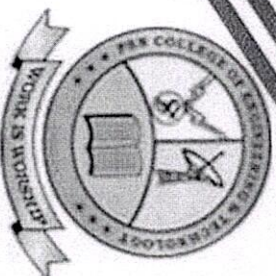
25th ANNIVERSARY
Since 1997
Vel Tech

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Melathediyoor, Tirunelveli - 627 152.

Certificate of Participation

This is to certify that Dr.A.Jasmine Gnana Malar of PSN College of Engineering and Technology has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.
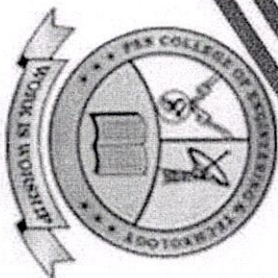
A.Shiny Pradeepa.

Ms.A.Shiny Pradeepa M.E, (Ph.D) - AP - EEE
Convener

Principal
Dr.V.Manikandan M.E, Ph.D

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Certificate of Participation

This is to certify that Dr.S.Rajasekran of PSN College of Engineering and Technology has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.
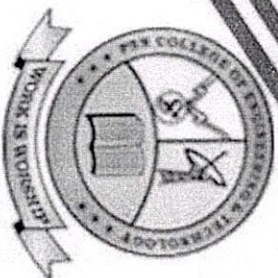
A-Shiny Pradeepa

Ms.A.Shiny Pradeepa M.E, (Ph.D) - AP - EEE
Convener

Principal
Dr.V.Manikandan M.E, Ph.D

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Certificate of Participation

This is to certify that Mr.M.Murugan of PSN College of Engineering and Technology has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.
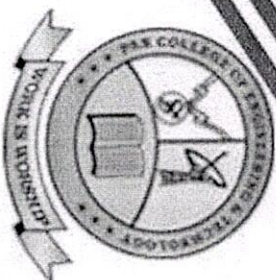
A.Shiny Pradeepa

Ms.A.Shiny Pradeepa M.E. (Ph.D) - AP - EEE
Convener

Dr.V.Manikandan M.E, Ph.D
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Certificate of Participation

This is to certify that Dr.A.Bhuvanesh of PSN College of Engineering and Technology has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.

A.Shiny Pradeepa

Ms.A.Shiny Pradeepa M.E, (Ph.D) - AP - EEE
Convener

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Certificate of Participation

This is to certify that Mrs.M.Merlin Prabha of PSN College of Engineering and Technology has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.

A.Shiny Pradeepa
Ms.A.Shiny Pradeepa M.E, (Ph.D) - AP - EEE
Convener

Principal
Dr.V.Manikandan M.E, Ph.D

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certificate of Participation

This is to certify that Ms.P.Muthulakshmi of PSN College of Engineering and Technology has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.

A.Shiny Pradeepa

Ms.A.Shiny Pradeepa M.E, (Ph.D) - AP - EEE
Convener

Dr.V.Manikandan M.E, Ph.D
Principal

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Certificate of Participation

This is to certify that Ms.V.Jenitha of PSN College of Engineering and Technology has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.

A.Shiny Pradeepa
Ms.A.Shiny Pradeepa M.E, (Ph.D) - AP - EEE
Convener

Dr.V.Manikandan M.E, Ph.D
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Certificate of Participation

This is to certify that SHINY PRADEEPA B.E,M.E,(PH.D) of PSNCET has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.

A·Shiny Pradeepa

Ms.A.Shiny Pradeepa M.E. (Ph.D) - AP - EEE
Convener

Dr.V.Manikandan M.E, Ph.D
Principal

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Certificate of Participation

This is to certify that Dr.J.Leemarose of PSN College of Engineering and Technology has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.

A.Shiny Pradeepa

Ms.A.Shiny Pradeepa M.E. (Ph.D) - AP - EEE
Convener

Dr.V.Manikandan M.E. Ph.D
Principal

Department of Electrical and Electronics Engineering

14.07.2022

From

The Head of the Department,

Electrical and Electronics Engineering,

PSN College of Engineering and Technology, Tirunelveli.

To

The Principal,

PSN College of Engineering and Technology, Tirunelveli.

Subject: Permission for conducting a FDP – Reg.

Respected Sir,

With due respect, I am writing this letter to request you to kindly let us to conduct a Faculty Development Program on **"Recent Trends in Electric Vehicles"**. The programme is to be held on **25.07.2022 to 29.07.2022** through Zoom Meeting. It will be a great opportunity for the students to attend the FDP as it will be full of knowledge and will help them in the future. Hoping for your favorable response about the matter.

I kindly request you to permit us to pay the remuneration for the resource persons at the amount of Rs. 7500.

Thank you very much.

Yours truly,

Head of the Department,
Dept of EEE
PSN College of Engg & Tech
Tirunelveli

PSN **College of Engineering and Technology**
An Autonomous Institution, Affiliated to Anna University
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Department of Electrical and Electronics Engineering

organizes

5 Days Virtual Faculty Developent Program on

Recent Trends in Electric Vehicles
25.07.2022 to 29.07.2022

Dr.D.Prince Winston, Professor, Kamaraj College of Engineering and Technology, Virudhunagar

Dr.Rajasekaran, Professor, PSN College of Engineering and Technology, Tirunelveli

Dr.Ebby Darney, Professor, RajaRajeswari College of Engineering, Bangalore.

Dr.M.Karuppasamy Pandian, Asst. Prof, Kalasalingam Academy of Research and Education, Krishnankoil

Ms.A.Shiny Pradeepa, Asst. Prof, PSN College of Engineering and Technology, Tirunelveli

zoom

Online Mode via Zoom Meeting

Time:
10.00 am to 12.00 pm

Head of the Department.
Dept of EEE
PSN College of Engg & Tech
Tirunelveli 627 152
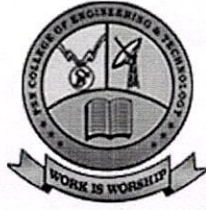
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Department of Electrical and Electronics Engineering

22/07/2022
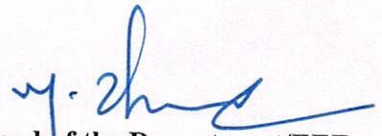
Ref.No: PSNCET/EEE/43/FDP/2022-2023/001

CIRCULAR

Sub: Faculty Development Programs for the academic year 2022-2023

     With reference to the above subject, this is to inform that the Department of Electrical and Electronics Engineering, PSN College of Engineering and Technology is conducting a Faculty Development Program on **"Recent Trends in Electric Vehicles"** from 25/07/2022 to 29/07/2022. Ms.A.Shiny Pradeepa, Assistant Professor, EEE, PSNCET is the coordinator. The registration can be done through the following link.

https://tinyurl.com/4st5d44v

Head of the Department/EEE

PSN ... ,9 , ,8C''
Tirunelveli - 627 152

Copy To

1. The Principal, PSNCET

2. IQAC, PSNCET

3. Department File

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Department of Electrical and Electronics Engineering

List of participants for the Five Days FDP on "Recent trends in Electric Vehicles"

S.No	Name	Branch	Designation	Organization	Attendance				
					Day 1	Day 2	Day 3	Day 4	Day 5
1	Indhumathi S	EEE	Assistant professor	PSN CET	✓	✓	✓	✓	✓
2	Prakash P	EEE	Assistant Professor	P A College of Engineering and Technology	✓	✓	✓	✓	✓
3	Dr.M.Siva Ramkumar	EEE	Assistant Professor	Karpagam Academy of Higher Education	✓	✓	✓	✓	✓
4	Maideen Abdhulkader Jeylani A	EEE	Assistant professor	Sree sakthi engineering College	✓	✓	✓	✓	✓
5	N.Loganathan	EEE	Assistant Professor	Sri Krishna College of Engineering and Technology	✓	✓	✓	✓	✓
6	ANN RUFUS A	EEE	Associate Professor	SCADCET	✓	✓	✓	✓	✓
7	Malini T	EEE	Assistant professor	Sri Krishna College of Engineering and Technology	✓	✓	✓	✓	✓
8	Palpandian M	EEE	Associate Professor	palpandianm@scadengineering.ac.in	✓	✓	✓	✓	✓
9	JEBA RAJ R	EEE	ASSISTANT PROFESSOR	SCAD CET	✓	✓	✓	✓	✓

	Name	Department	Designation	Institution				
10	Dr.S.Vijayabaskar	EEE	Professor	P.A.College of Engineering and Technology	✓	✓	✓	✓
11	Michael	EEE	ASSISTANT PROFESSOR	SRM UNIVERSITY	✓	✓	✓	✓
12	Sandhiya J	EEE	ASSISTANT PROFESSOR	PSN College of Engineering and Technology	✓	✓	✓	✓
13	Muthu Lakshmi P	EEE	AP	PSN College of Engineering and Technology	✓	✓	✓	✓
14	Leema Rose J	EEE	Associate Professor	PSN college of engineering and technology	✓	✓	✓	✓
15	G.ANNIE POORNIMA PRINCESS	CSE	ASSISTANT PROFESSOR	VV COLLEGE OF ENGINEERING	✓	✓	✓	✓
16	VIGNESHKUMAR M	EEE	Assistant Professor	P.A. College of Engineering and Technology	✓	✓	✓	✓
17	Manikandan S	EEE	Assistant Professor	Karpagam Institute of Technology	✓	✓	✓	✓
18	John Meshach	EEE	Project Manager	NISSI Engineering Solutions pvt Ltd	✓	✓	✓	✓
19	K.SAKTHIVEL	EEE	ASSISTANT PROFESSOR	PSN COLLEGE OF ENGINEERING AND TECHNOLOGY	✓	✓	✓	✓
20	V. JENITHA	EEE	Assistant professor	PSN College of Engineering and Technology	✓	✓	✓	✓
21	M. Asirvatham	ECE	Assistant Professor	SCAD COLLEGE OF ENGINEERING AND TECHNOLOGY	✓	✓	✓	✓
22	N.MOHAN	CSE	Assistant Professor	SCAD COLLEGE OF ENGINEERING AND TECHNOLOGY	✓	✓	✓	✓
23	Pon Nirmal.C	EEE	Assistant Professor	SCAD college of Engineering and Technology	✓	✓	✓	✓
24	Sanjeev Gupta	Mech	Associate professor	Government College of engineering and technology jammu	✓	✓	✓	✓

S.No	Name	Department	Designation	Institution					
25	SGOWDHAM KUMAR	EEE	ASSISTANT TRAINING OFFICER	PSG INDUSTRIAL INSTITUTE (PSG COLLEGE OF TECHNOLOGY)	✓	✓	✓	✓	✓
26	AJAI KUMAR E	Mech	Assistant Professor	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY	✓	✓	✓	✓	✓
27	Ramesh.L	ECE	Assistant Professor	M.Kumarasamy College of Engineering	✓	✓	✓	✓	✓
28	N.subramanian	EEE	Assistant Professor	Francis Xavier engineering college	✓	✓	✓	✓	✓
29	SREETHU S	EEE	Student	PSNCET Tirunelveli	✓	✓	✓	✓	✓
30	Kalaiyarasi M	EIE	Assistant Professor	Bannari Amman institute of Technology	✓	✓	✓	✓	✓
31	Dr C.Thirumarai Selvi	ECE	Professor	Sri Krishna College of Engineering and Technology	✓	✓	✓	✓	✓
32	G. Raja	Mech	Assistant Professor	Velalar College of Engineering and Technology	✓	✓	✓	✓	✓
33	Dr.P.Tamilvani	EEE	Associate Professor	M P NACHIMUTHU M JAGANATHAN ENGINEERING COLLEGE	✓	✓	✓	✓	✓
34	Sreenivasulu K N	ECE	Assistant Professor	NCET	✓	✓	✓	✓	✓
35	P.SIVASANKARAN	ECE	ASSISTANT PROFESSOR	SENGUNTHAR ENGINEERING COLLEGE (AUTONOMOUS), TIRUCHENGODE	✓	✓	✓	✓	✓
36	Dr. K. Sedhuraman	EEE	Associate Professor	Manakula Vinayagar Institute of Technology	✓	✓	✓	✓	✓
37	V. S. Winstor Jebakumar	Mechatronics	Assistant Professor	RVS Technical Campus - Coimbatore	✓	✓	✓	✓	✓

		2019-23	BE-ECE		✓	✓	✓	✓	✓
38	Karthi. S			Sengundhar Engineering College in Thiruchancode	✓	✓	✓	✓	✓
39	Poonguzhali G	ECE	Assistant professor	AVC college of engineering	✓	✓	✓	✓	✓
40	Ferminus Raj	EEE	Assistance professor	SCAD college of Engineering and Technology	✓	✓	✓	✓	✓
41	T.C.R. DINESH	Mech	Assistant Professor	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY	✓	✓	✓	✓	✓
42	D. KESAVAN	Mech	Assistant Professor	Velalar College of Engineering and Technology, Erode	✓	✓	✓	✓	✓
43	Manojkumar A	Mech	Assistant professor	Velalar college of engineering and technology	✓	✓	✓	✓	✓
44	SATISH KUMAR S	EEE	AP	AMET UNIVERSITY	✓	✓	✓	✓	✓
45	ARUN KUMAR S	Mech	Assistant Professor	Velalar College of Engineering and Technology	✓	✓	✓	✓	✓
46	Priyajit Ray	Commerce	Research Scholar	University of Calcutta	✓	✓	✓	✓	✓
47	MOHANKUMAR.V	Mechanical Engineering	AP/Mech	Velalar College of Engineering and Technology	✓	✓	✓	✓	✓
48	Ms.B.Mahalakshmi	physics	assistant professor	HINDUSTHAN COLLEGE OF ENGINEERING And technology	✓	✓	✓	✓	✓
49	RENURAMAN J	Mech	Assistant Professor	SRM INSTITUTE OF SCIENCE AND TECHNOLOGY	✓	✓	✓	✓	✓
50	Darwin Nesakumar A	ECE	Assistant Professor	R.M.K.Engineering Colege	✓	✓	✓	✓	✓
51	Dr.S.Sumathi	EEE	Professor	Mahendra Engineering College	✓	✓	✓	✓	✓
52	JEYAMURUGAN M	EEE	Assistant Professor	K.L.N. College of Engineering	✓	✓	✓	✓	✓

No.	Name	Department	Designation	College					
53	KARTHI T	AUTOMOBIL	ASSISTANT PROFESSOR	KONGU ENGINEERING COLLEGE	✓	✓	✓	✓	✓
54	GOVINDARAJ T	EEE	ASSISTANT PROFESSOR	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY	✓	✓	✓	✓	✓
55	Mr.R.RUBAN RAJA	EEE	Assistant professor	VIVEKANANDHA COLLEGE OF TECHNOLOGY FOR WOMEN	✓	✓	✓	✓	✓
56	Dr. M. SORNALAKSHMI	COMPUTER SCIENCE	ASSISTANT PROFESSOR	ARULMIGU KALASALINGAM COLLEGE OF ARTS AND SCIENCE	✓	✓	✓	✓	✓
57	MAHENDRAN S	ECE	ASSISTANT PROFESSOR (Sl.Gr)	BUILDERS ENGINEERING COLLEGE, KANGAYAM	✓	✓	✓	✓	✓
58	Mr.B.Vinoth kumar	EEE	Assistant Professor	SRM Institute of Science and Technology	✓	✓	✓	✓	✓
59	Dr.K.R.VINOTHINI	ECE	Assistant Professor	A.V.C COLLEGE OF ENGINEERING,MAYILADUTHURAI	✓	✓	✓	✓	✓
60	Dr.S.GIRIJA	MATHEMATICS	ASSOCIATE PROFESSOR	HINDUSTHAN COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE	✓	✓	✓	✓	✓
61	SUMATHI G	MECHATRONICS	LECTURER	CSI POLYTECHNIC COLLEGE SALEM	✓	✓	✓	✓	✓
62	PRAKASH N	ECE	ASSISTANT PROFESSOR	KALAIGNARKARUNANIDHI INSTITUTE OF TECHNOLOGY	✓	✓	✓	✓	✓
63	D.SATHIYARAJ	EEE	Assistant Professor	Sengunthar Engineering College (Autonomous)	✓	✓	✓	✓	✓
64	D.Maharajan	EEE	Assistant Professor	SRMIST, KTR	✓	✓	✓	✓	✓
65	RICHARD E. OLIPAS	N/A	FACULTY	SAEP	✓	✓	✓	✓	✓

No	Name	Information Technology	Adjunct Faculty	Institution					
66	AV Karthick			Alagappa University	✓	✓	✓	✓	✓
67	Dr. N. Mohananthini	EEE	Associate professor	Muthayammal Engineering College	✓	✓	✓	✓	✓
68	VIJAYKUMAR G	EEE	Research Scholar	GOVERNMENT COLLEGE OF ENGINEERING, SALEM	✓	✓	✓	✓	✓
69	Maheswari K.T	EEE	AP Level III	Bannari Amman Institute of Technology	✓	✓	✓	✓	✓
70	Yogeshwaran K	ECE	Assistant Professor	KIT-Kalaignarkarunanidhi Institute of Technology	✓	✓	✓	✓	✓
71	MOHANAPRIYA V	EEE	Assistant Professor (sl.gr)	Bannari Amman Institute of technology	✓	✓	✓	✓	✓
72	MANJUSHREE KUMARI.J	EEE	Research scholar	Gyanamani college of technology	✓	✓	✓	✓	✓
73	Nishalini j.a	EEE	Assistant professor	Karunya university	✓	✓	✓	✓	✓
74	NITHYA G	EEE	Assistant Professor	Bannari Amman Institute of Technology	✓	✓	✓	✓	✓
75	Perumal S	Mechanical engineering	Assistant professor	Muthayammal engineering college	✓	✓	✓	✓	✓

S.No	Name	Department	Designation	Institution					
76	VIJAYA RAGHAVAN J	EEE	ASSISTANT PROFESSOR	MANAKULA VINAYAGAR INSTITUTE OF TECHNOLOGY	✓	✓	✓	✓	✓
77	MERCY P	EEE	AP	Bannari Amman institute of technology	✓	✓	✓	✓	✓
78	Dr.V.SHANMUGASUNDARAM	EEE	Assistant Professor	Sona College of Technology	✓	✓	✓	✓	✓
79	SANTHOSHKUMAR.A	EEE	ASSISTANT PROFESSOR TRAINEE	BANNARI AMMAN INSTITUTE OF TECHNOLOGY, SATHYAMANGALAM	✓	✓	✓		✓
80	VENUGOPAL R	EEE	Research Scholar	SRM INSTITUTE OF SCIENCE AND TECHNOLOGY	✓	✓	✓	✓	✓
81	RAJALASHMI K	EEE	AP	Bannari Amman Institute of Technology	✓	✓	✓	✓	✓
82	NANTHAKUMAR.V	EEE	ASSISTANT PROFESSOR	Sengunthar Engineering college(autonomous)	✓	✓	✓	✓	✓
83	Sakthi Suriya Raj J S	EEE	Research Associate	Bannari Amman Institute of Technology	✓	✓	✓	✓	✓
84	P.SELVABHARATHI	EEE	Assistant Professor - II	Bannari Amman Institute of Technology	✓	✓	✓	✓	✓
85	ANDRIL ALAGUSABAI	EEE	Assistant Professor	Bannari Amman Institute of Technology	✓	✓	✓	✓	✓
86	Sathishkumar S	EEE	AP III	Bannari Amman Institute of Tech	✓	✓	✓	✓	✓

S.No	Name	Dept	Designation	Institution						
87	Dr. K. PRABHU CHANDRAN	ECE	ASSOCIATE PROFESSOR	SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES	✓	✓	✓	✓	✓	✓
88	Suresh Kumar P	ECE	Assistant Professor	Hindusthan College of Engineering and Technology	✓	✓	✓	✓	✓	
89	Dr. Balachander K	EEE	ASP	Karpagam Academy of Higher Education	✓	✓	✓	✓	✓	
90	Glory Priyadharshini J	EEE	ASSISTANT PROFESSOR	SRI RAMAKRISHNA INSTITUTE OF TECHNOLOGY	✓	✓	✓	✓	✓	
91	Prabha Maheswari M	EEE	Assistant Professor	Sri Ramakrishna Institute of Technology	✓	✓	✓	✓	✓	
92	R.Ramyea	ECE	Assistant Professor	Kongu Engineering College	✓	✓	✓	✓	✓	
93	SANTHOSH KUMAR K V	EEE	ASSISTANT PROFESSOR	BANNARI AMMAN INSTITUTE OF TECHNOLOGY	✓	✓	✓	✓	✓	
94	SIDHESWARAN M	EEE	Assistant professor	Mahendra Engineering College, Namakkal	✓	✓	✓	✓	✓	
95	Ashwanth S	EEE	AP	Velalar College of Engineering and Technology	✓	✓	✓	✓	✓	
96	R.BRINDHA	EEE	Assistant Professor	SRM IST	✓	✓	✓	✓	✓	
97	Dr SRINIVASAN MALLAN	EEE	ASSISTANT PROFESSOR	Bannari Amman Institute of Technology, Sathyamangalam	✓	✓	✓	✓	✓	

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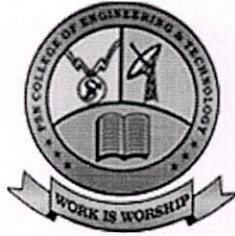
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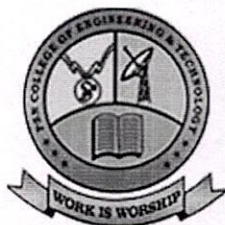
Resource Person Profile

Day 1: 25/7/2022

Dr.D.Prince Winston received his B.E. degree in Electrical and Electronics Engineering from R.V.S CET, Dindugal, in 2006 and his M.E. degree in Power Electronics and Drives from MEPCO Schlenk Engineering College, in 2008. He received his Ph.D. degree from Anna University, in 2013. Presently, he is working as Dean Research & Professor in the Department of Electrical and Electronics Engineering at Kamaraj College of Engineering and Technology, Madurai, India. He is recognized as top 2% Scientists Worldwide Listed by Elsevier BV, Stanford University. He is also recognized as top Scientists Worldwide Listed by AD Scientific Index. He has 13 years of teaching experience. He is the Research Supervisor at Anna University Chennai. Under his guidance 8 Ph.D. scholars had completed their research work; currently 11 research scholars are pursuing their Ph.D. He has published more than 60 papers in International Journals listed in SCOPUS/SCI/SCIE. He has also published two sole author papers in IEEE Transactions. He has received an award from IEEE Madras Section during the year 2019 & 2020 for publishing papers in IEEE Transaction. He has received young scientist fellowship from TNSCST (Government of Tamil Nadu) during the year 2018-19. Currently he is having an ongoing research project funded by AICTE under Research Promotion Scheme. He has filed 7 patents. He had completed 8 consultancy works for various industries. He is the reviewer/editorial board member in various SCI journals. He has attended more than 35 National / International Conferences and also organized many workshops / conferences /seminars / STTP / FDP. He has published many book chapters / books. He has developed various products for Industries/Institutions. He is serving as DC members for many research scholars. His current research interests include Solar PV, Solar Still, Energy conservation in electric motor drives, Power converters, Power quality, and Electric vehicles.

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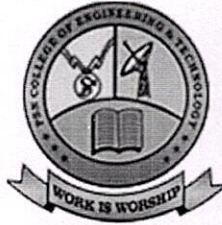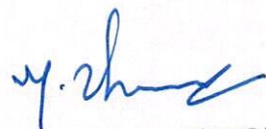
Department of Electrical and Electronics Engineering

Five Days FDP on "Recent Trends in Electric Vehicles"

Resource Person Profile

Day 2: 26/7/2022

DR.S.RAJASEKERAN is currently working as Professor in Department of Electrical and Electronics Engineering, PSN College of Engineering and technology, Tirunelveli. He has more than 20 years of teaching and 11 years of research experience. His areas of research are Power system, Optimization and Soft computing Techniques. He has published more than 10 papers in reputed international journals. He is a lifetime member of International Association of Engineers and ISTE. He has organized more than 5 seminars and FDPs.

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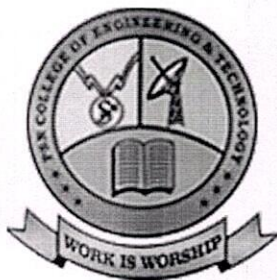
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## Department of Electrical and Electronics Engineering

Five Days FDP on "Recent Trends in Electric Vehicles"

Resource Person Profile

Day 3: 27/7/2022

Dr. P. Ebby Darney has obtained B.E, in EEE from Manonmaniam Sundaranar University during 2004 and M.E. in Control and Instrumentation from Anna University during 2006. He completed his PhD in 2019 from Anna University. He is currently working for RajaRajeswari College of Engineering, Bangalore. he has more than 16 years of teaching and experience. His area of interests include, Power quality optimization, BLDC motor, Electric Vehicles and Artificial Intelligence. He has published more than 20 research articles indexed by SCOPUS, WEB OF SCIENCE, SCIENCE DIRECT etc. Also have filed 6 patents out of which 3 are published. He is Vice-President for LIPS Research Foundation. He is an approved supervisor for European International University, France. He is also an advisory member of Aerozjet Pvt limited and Review member for 4 International journals. He is a life member in IEEE, ISTE and IJSRD.

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Department of Electrical and Electronics Engineering

Five Days FDP on "Recent Trends in Electric Vehicles"

Resource Person Profile

Day 4: 28/7/2022

Dr.M.KARUPPASAMY PANDIYAN received the B.E. degree in Electrical and Electronics Engineering from Anna University in 2011, M.Tech. degree in Power System Engineering from Kalasalingam University in 2014 and he is pursuing Ph.D. degree from Faculty of Electrical Engineering of Kalasalingam University. He has eight years of teaching and research experiences. His research interests are Available Transfer Capability Enhancement, power system planning and optimization algorithms. He is now working as an Assistant Professor in Department of Electrical and Electronics Engineering, Kalasalingam University, Tamil Nadu, India. He has published 12 papers in reputed international journals and 10 papers in international conferences. He is a MATHWORKS Certified MATLAB Associate Developer.
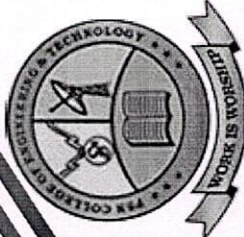
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Department of Electrical and Electronics Engineering

Five Days FDP on "Recent trends in Electric Vehicles"

Resource Person Profile

Day 5: 29/7/2022

Ms.A.Shiny Pradeepa received the B.E. degree in Electrical and Electronics Engineering from Anna University in 2009. M.E. degree in Power System Engineering from Annamalai University in 2011 and pursuing Ph.D. degree from Faculty of Electrical Engineering of VIT University Chennai campus. She is currently working in PSN College of engineering and technology. S has more than 10 years of teaching and experience. Her area of interests include, Power quality optimization, Power system, transmission and distribution and Artificial Intelligence. She has published more than 6 research articles in reputed international journals. She is a life member in ISRD, UACEEE, IRED, IAENG.

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Department of Electrical and Electronics Engineering

Report of the event

Name of the event	Five Days on "Recent Trends in Electric Vehicles"
Dates & Duration	25//07/2022 to 29/07/2022 & 5 days
Name(s) of the Resource Persons	Dr.D.Prince Winston, Professor, Kamaraj College of Engineering and Technology, Dr.Rajasekeran, Professor, PSN College of Engineering and Technology, Dr.P.Ebby Darney, Professor, RajaRajeswari College of Engineering and Technology, Dr.M.Karuppasamy Pandian, Assistant Professor, Kalasalingam University, Ms.A.Shiny Pradeepa, Assistant Professor, PSN College of Engineering and Technology
Name of the event coordinator	Ms.A.Shiny Pradeepa AP/EEE
No. of Participants	100

Remarks of the event coordinator about the FDP

Department of Electrical and Electronics Engineering, PSN College of Engineering and Technology organized Five Days FDP on "Recent Trends in Electric Vehicles" from 25/07/2022 to 29/07/2022 through Zoom Meeting. The FDP was inaugurated by Dr.V.Manikandan, Principal, PSN College of Engineering and Technology, Tirunelveli. 100 participants from various institutions have participated in this FDP. The program has covered the topics such as the components of Electric Vehicle, Comparison with Internal combustion Engine: Technology, Comparison with Internal combustion Engine: Benefits and Challenges, EV classification and their electrification levels, EV Terminology etc. The vote of thanks was delivered by Ms.A.Shiny Pradeepa, AP/EEE, PSN College of Engineering and Technology, Tirunelveli. The department of Electrical and Electronics Engineering is looking forward to organize future AICTE sponsored FDP on recent trends in electrical engineering.

Date: 1.08.2022

Signature of the Coordinator

Signature of the Head of the Department

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Department of Electrical and Electronics Engineering

Five Days FDP on "Recent Trends in Electric Vehicles"

1.08.2022

1. Overall how satisfied were you with this FDP?

479 responses
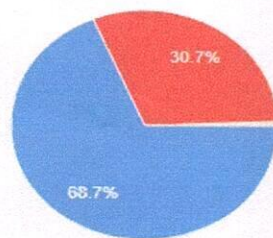
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- ● Very Satisfied
- ● Satisfied
- ● Neither satisfied nor unsatisfied
- ● Dissatisfied
- ● Very dissatisfied

30.7%

68.7%

2. How informative did you find our FDP?

479 responses
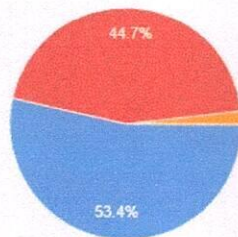
☐ Copy

- ● Extremely informative
- ● Very informative
- ● Moderately informative
- ● Not very informative
- ● Not informative at all

44.7%

53.4%

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3. How clear were the ideas and concepts we presented?

479 responses

- Extremely clear
- Very clear
- Moderately clear
- Not very clear
- Not at all clear

44.7%

54.3%
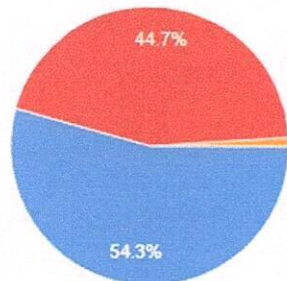
4. Were there any technical issues that prevented you from seeing or hearing the FDP?

479 responses

- No
- Yes
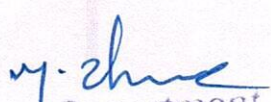
9.2%

90.8%
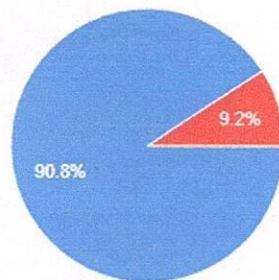
5. Was the subject matter of this FDP too simple, too involved, or at the right level?

479 responses

- Too simple
- A little simple
- Just right
- A little involved/complex
- Too involved/complex

44.7%

23%

19%
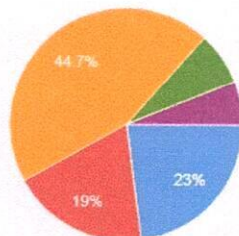
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6. Which topic has attracted you a lot?

479 responses
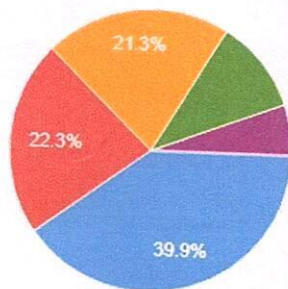
- Recent Trends in Electric vehicle
- Battery Technolgies and design
- Advancements in EV Battery Technologies
- Technolgies in Electric vehicle
- Power system in hybrid electric vehicle

21.3%
22.3%
39.9%

7. Any other comments or feedback.

479 responses

Nil

Good

No

Good

NIL

Nice

-

Excellent

Excellent

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Certificate of Participation

This is to certify that DURAI RAJ S of ST. ANNE'S COLLEGE OF ENGINEERING AND TECHNOLOGY has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.

A. Shiny Pradeepa
Convener
Ms.A.Shiny Pradeepa M.E, (Ph.D) - AP - EEE

Principal
Dr.V.Manikandan M.E, Ph.D

Head of the Department,
HoD-EEE
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INDIAN SOCIETY FOR TECHNICAL EDUCATION (ISTE)

Certificate of Participation

This is to certify that A.P.Herlin Rose of Bethlahem Institute of Engineering,Karungal has participated in the five Days FDP on "Recent Trends in Electric Vehicles" organized by Department of Electrical and Electronics Engineering conducted from 25.07.2022 to 29.07.2022.

A.Shiny Pradeepa
Convener
Ms.A.Shiny Pradeepa M.E, (Ph.D) - AP - EEE

Principal
Dr.V.Manikandan M.E, Ph.D

Head of the Department,
Dept. of EEE
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

22.05.2023

From

The Head of the Department,

Electrical and Electronics Engineering,

PSN College of Engineering and Technology, Tirunelveli.

To

The Principal,

PSN College of Engineering and Technology, Tirunelveli.

Subject: Permission for conducting a FDP – Reg.

Respected Sir,

With due respect, I am writing this letter to request you to kindly let us to conduct an Five Days FDP on "Role of Artificial Intelligence in Power Sector" from 29/05/2023 to 02/06/2023 through Zoom Meeting. Dr.I.Jacob Regland, Professor and Head, EEE, VIT, Velore, Dr.P.DURAI PANDY, Associate Professor and HOD, Department of EEE, JB Institute of Engineering and Technology, Hyderabad, Telangana, Dr. P.Anitha, Assistant Professor and HOD, Department of EEE, UVOCCE, Thoothukudi and Dr.M.Karuppasamy Pandiayan, Assistant Professor, Department of EEE, Kalasalingam Academy of Research and Education are the guest speakers. It will be a great opportunity for the faculties to attend this FDP as it will be full of knowledge and will help them in the future. Hoping for your favorable response about the matter.

Thank you very much.

Yours truly,

Head of the Department
Dept. of EEE
PSN College of Engg & Tec
Tirunelveli - 627152

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Organizes 5 Days Faculty Development Program on

Role of Artificial Intelligence in Power Sector

📅 29.05.2023 to 02.06.2023   🕙 10.00 AM   📹 zoom   Zoom Meeting

29.05.2023

Dr. I. Jacob Raglend
Professor and Head,
EEE, VIT Vellore

30.05.2023

Dr. M. Karuppasamy Pandiyan
Assistant Professor, EEE, Kalasalingam Academy of
Research and Education, Krishnankoil

31.05.2023

Dr. P. Durai Pandy
Associate Professor and Head, EEE, JB Institute of
Engineering and Technology, Hyderabad, Telangana.

01.06.2023

Dr. P. Anitha
Associate Professor and Head, EEE, University VOC
College of Engineering, Anna University, Tuticorin.

02.06.2023

Dr. A. Bhuvanesh
Associate Professor, EEE, PSN College of Engineering
and Technology, Tirunelveli

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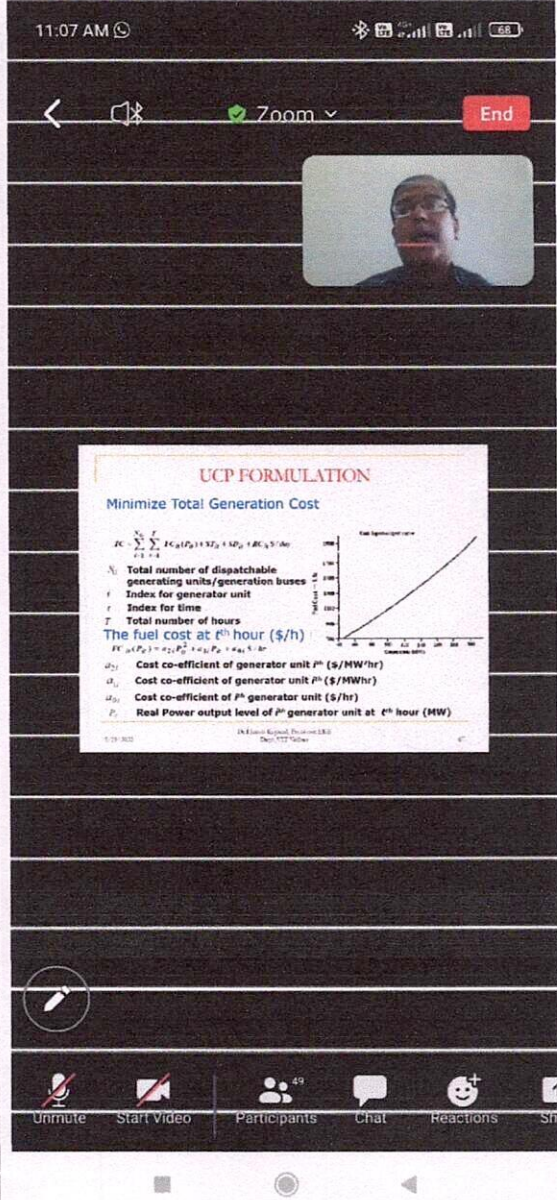
PRINCIPAL
PSN COLLEGE OF ENGINEERING & TECHNOLOGY
MELATHEDIYOOR, PALAYAMKOTTAI

Head of the Department.
Dept. of EEE
PSN College of Engg & Tech
Tirunelveli - 627 152

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

02.06.2023

List of participants for the Five Days FDP on "Role of Artificial Intelligence in Power Sector"

S.No	Name	Designation	Department	Institution
1	R.Siddthan	Asst Professor	Computer Applications	Yadava college, madurai
2	placement@avce.edu.in	Training and Placement Officer	ECE	Annai Vailankanni College of Engineering
3	DR AMIT GUPTA	Associate professor	Ece	Nalla Malla Reddy Engineering College
4	Dr. S. Muthukumar	Head of the Department	CS and IT	PVP College
5	Anon K. JENIFER	ASP	CSE	Annai Velankanni college of engineering
6	AMOSEDINAKARAN S	AP	EEE	Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology
7	K.PARVENTHAN	Assistant Professor	EEE	Mahendra Engineering College
8	RESNA S R	Asst.Professor	EEE	The Oxford College of Engineering
9	Sangeeta Agarwal	Professor	Chemistry pure	SSV College Hapur
10	MAHESWARI K P	ASSISTANT PROFESSOR	Computer Science	FATIMA COLLEGE
11	Priyajit Ray	Research Scholar	Kolkata	University of Calcutta
12	Dr. K. Prabhu chandran	Associate professor	ECE	Prathyusha engineering college
13	Dr.R.NIRAIMATHI	Associate Professor	EEE	Mohamed Sathak Engineering College
14	M.Raichel Ruby	Asst.professor	EEE	The Oxford College Of Engineering
15	K.Britto Alex	Assistant Professor	Computer Science	The American College
16	Dr. T. SURESH PADMANABHAN	Professor	EEE	E G. S Pillay Engineering College (Autonomous)
17	Vasa Swarna	Assoc.Professor	EEE	NECG
18	Mrs.R.CATHERINE JUNIA	Assistant Professor	Computer Science	The American College
19	P. Kavipriya	Associate Professor	ECE	Sathyabama Institute of Science and Technology
20	S.Amosedinakaran	Assistant Professor	EEE	Vel Tech Rangarajan Dr Sagunthala R&D Institute of Science and Technology
21	J.MARY MONICA	Assistant Professor	Computer Science	The American College

22	R.Prabha	Assistant Professor	Computer Science	The American College,Madurai.
23	Sankareswari K	Assistant Professor	Computer Science	The American College, Madurai
24	R.Uma Devi	Assistant Professor	ComputerApplications	Arulmigu Kalasalingam College of arts and science
25	N.KAVITHA	Research Scholar	COMPUTER SCIENCE	Mother Teresa Women's University Kodaikanal
26	Ashwanth.S	Assistant Professor	EEE	Velalar College of Engineering and Technology
27	J MARY MONICA	Assistant Professor	Computer Science	The American College
28	S.SELVARATHI PONMALAR	ASSISTANT PROFESSOR	ECE	Dr.G.U.POPE COLLEGE OF ENGINEERING
29	S SHANTHI	LECTURER	Instrumentation and control engineering	CSI POLYTECHNIC COLLEGE SALEM
30	JEYABHARATHI J	LECTURER	INSTRUMENTATION AND CONTROL ENGINEERING	CSI POLYTECHNIC COLLEGE,SALEM
31	SASIKALA M	LECTURER	INSTRUMENTATION AND CONTROL ENGINEERING	CSI POLYTECHNIC COLLEGE
32	S.Vinoth John Prakash	Assistant Professor	EEE	Vel Tech Rangarajan Dr.Sagunthala R&d Institute of Science and Technology
33	Sudharani. K	Assistant Professor	Computer Science	Madurai Sivakasi Nadars Pioneer Meenakshi Women's College, Poovanthi
34	Ayan Banik	Technical Assistant	Electrical Engineering	Ghani Khan Choudhury Institute of Engineering & Technology
35	KARTHI T	ASSISTANT PROFESSOR	AUTOMOBILE ENGINEERING	KONGU ENGINEERING COLLEGE
36	SENTHILNATH J	AP	EEE	velalar college of engineering and technology
37	M.CHITRA	ASSISTANT PROFESSOR	EEE	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
38	R. ANANDAVALLI	Assistant professor	Computer science	Arulmigu kalasalingam college of arts and science
39	K.prathibha	Assistant professor	EEE	SVEC
40	UNNI M R	Assistant Professor	Electrical and Electronics Engineering	YOUNUS COLLEGE OF ENGINEERING AND TECHNOLOGY
41	Dr. SAKTHI GOVINDARAJU	Professor	COMPUTER SCIENCE AND ENGINEERING	Galgotias University
42	Dr. K BASKAR	ASSISTANT PROFESSOR	CSE	Galgotias University
43	Dr. A. Sheela	Associate professor	Electrical & Electronics Engineering	Kongu Engineering College

44	MOHANAGAYATHRI R	Ph.D scholar	EEE	Kalasalingam Academy of Research and Education
45	S.CHITRA DEVI	Associate professor	EEE	Mohamed Sathak Engineering College Kilakarai
46	B. Gopinath	Assistant Professor	EEE	Christ The king Engineering College
47	D Citharthan	Assistant Professor	EEE	Christ the king engineering college
48	Dr. Pramod Sharma	Professor	ECE	Regional College for Education Research and Technology
49	Sumitha T L	Assistant Professor	Electrical and Electronics Engineering	The oxford College of Engineering
50	ANN RUFUS A	ASSOCIATE PROFESSOR	EEE	SCAD COLLEGE OF ENGINEERING AND TECNOLOGY
51	R.Vimal Prakash	Assistant Professor	Electrical and Electronics Engineering	V.R.S College of Engineering and Technology
52	Dr.U.Muthuraman	Associate Professor	EEE	Francis Xavier Engineering College
53	Maheshwari M	Assistant professor	EEE	VRS college of engineering and technology
54	N.subramanian	Assistant Professor	EEE	Francis Xavier Engineering College
55	B. T. THARANISRISAKTHI	ASSISTANT PROFESSOR	EEE	CHRIST THE KING ENGINEERING COLLEGE
56	ARVIN TONY A	Assistant Professor	EEE	KCG College of Technology
57	Dr P Ebby Darney	Professor	EEE	RajaRajeswari College of Engineering
58	M.chitra	Assistant professor	EEE	Velalar college of engineering and technology
59	M VAITHEESH	Assistant Professor	MBA	PSN College of Engineering and Technology (Autonomous)-Tirunelveli
60	R.Saranya	Asst.professor	Computer science and engineering	Amrita college of engineering and technology
61	Manoraja S	Assistant professor	Electrical and Electronics Engineering	PSN college of engineering and technology
62	Rajkumar D	AP	EEE	Velalar College of Engineering & Technology, Erode
63	Arun PR	Assistant Professor	EEE	MET Engineering College
64	P.KAVYA	Assistant Professor	MBA	PSN College of Engineering and Technology

65	UNNI M R	Assistant Professor	Electrical and Electronics Engineering	YOUNUS COLLEGE OF ENGINEERING AND TECHNOLOGY
66	Jebastin K	Assistant professor	Electronics and Communication Engineering	PSN college of engineering and technology
67	Ananthi s	Ap	Electrical and electronics engineering	Dr G U pope college of engineering
68	S.Angel Selva Packyam	Assistant Professor	EEE	Scad college of Engineering and Technology
69	A Anbu Rani	Assistant professor	ECE	PSN college of engineering and technology
70	P MUTHU LAKSHMI	AP	Electrical and Electronics Engineering	PSN College of Engineering and Technology
71	DR AMIT GUPTA	Associate professor	Ece	Nalla Malla Reddy Engineering college
72	S. Paramasivan	Assistant professor	Mechanical	Psncet
73	IDAYAVAN S	Assistant professor	EEE	Christ the King engineering college
74	M.B.ANNADURAI	Assistant professor	Electrical and Electronics Engineering	V.R.S College of engineering and Technology
75	K.KURALANBAN	Assistant Professor	Electrical and Electronics Engineering	V.R.S. COLLEGE OF ENGINEERING AND TECHNOLOGY
76	Prince Antony Joel J	Assistant Professor	Mechatronics Engineering	PSN Institute of Technology and Science
77	K.M.Annammal	Assistant Professor	Computer science and Engineering	Grace College of Engineering
78	Antony Robinson J	AP	EEE	Francis xavier engineering college
79	Revathy V	Assistant professor	Computer science and Engineering	Grace college of Engineering
80	Vengatesan V	Assistant professor	EEE	SRM TRP ENGINEERING COLLEGE
81	ANNIE POORNIMA PRINCESS	Assistant Professor	COMPUTER SCIENCE AND ENGINEERING	VV College of Engineering
82	Sumitha T L	Assistant Professor	Electrical and Electronics Engineering	The oxford College of Engineering
83	Sivasankari N	Assistant Professor	EEE	PSN College of Engineering and Technology
84	MAHENDIRAN C R	Assistant professor	EEE	V.R.S.COLLEGE OF ENGINEERING AND TECHNOLOGY
85	Salunke vaishali	Assistant Professor	Electronic science	M.S.G.College Malegaon Camp
86	E.Rajeswari	Assistant professor	ECE	Annai vailankanni college of engineering
87	Mrs.K.Jeyalakshmi	Assistant Professor	Computer Applications	Arulmigu Kalasalingam College of Arts and Science

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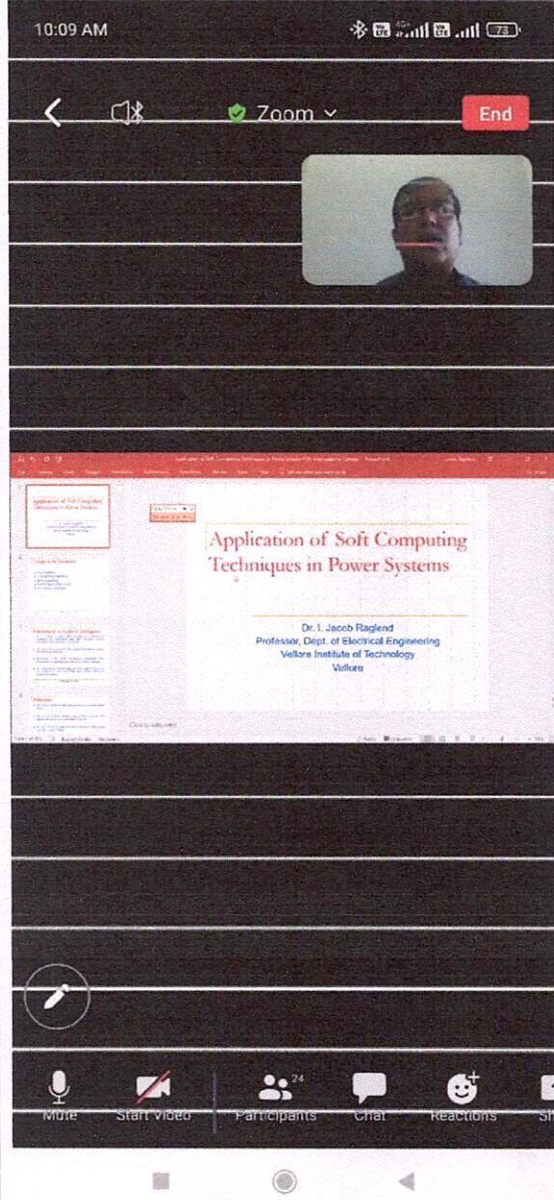
02.06.2023

Screenshots for the Five Days FDP on "Role of Artificial Intelligence in Power Sector"
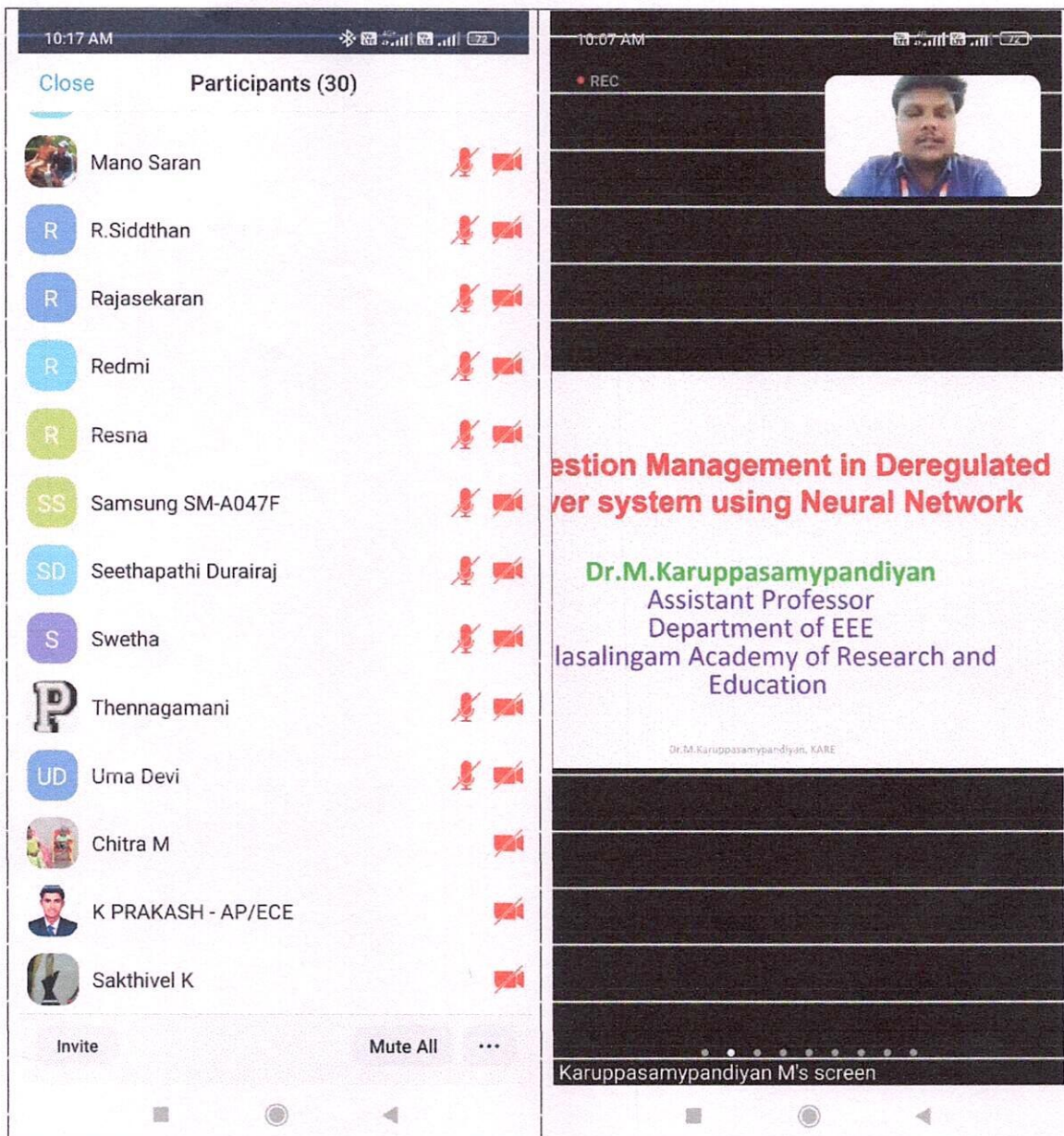
The resource persons are explaining the role of Artificial Intelligence in Power Sector

Head of the Department

Head of the Department.
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

29/05/2023

Five Days FDP on "Role of Artificial Intelligence in Power Sector"

Resource Persons Profiles

Day 1

Dr. I. Jacob Raglend received his Bachelors degree in Electrical Engineering from The Indian Engineering College and the Masters degree in Power Systems Engineering from Annamalai University with first class in 2000 and 2001 respectively. He has done his Ph.D. degree in the Department of Electrical and Electronics Engineering, Indian Institute of Technology, Roorkee, India in the year 2007. Presently he is working as a Professor and Head in the School of Electrical Engineering, Vellore Institute of Technology (VIT) India. His field of interest is Unit Commitment, Economic Dispatch, Smart Grid, Power System Restructuring and Deregulation, Artificial Intelligence Applications to Power System and FACTS.

Day 2

MR.M.KARUPPASAMY PANDIYAN received the B.E. degree in Electrical and Electronics Engineering from Anna University in 2011, M.Tech. degree in Power System Engineering from Kalasalingam University in 2014 and he is pursuing Ph.D. degree from Faculty of Electrical Engineering of Kalasalingam University. He has eight years of teaching and research experiences. His research interests are Available Transfer Capability Enhancement, power system planning and optimization algorithms. He is now working as an Assistant Professor in Department of Electrical and Electronics Engineering, Kalasalingam University, Tamil Nadu, India. He has published 12 papers in reputed international journals and 10 papers in international conferences. He is a MATHWORKS Certified MATLAB Associate Developer.

Day 3

Dr. P. DURAIPANDY completed his B.E and M.E in Electrical & Electronics Engineering and Power System Engineering in the year 2004 and 2006, respectively, from K.L.N College of Engineering, Madurai and ArulmiguKalasalingam College of Engineering, Krishnankoil. He is awarded doctoral degree from Kalasalingam Academy of Research and Education in the year 2017. He is presently working as Associate Professor & Head of Electrical and Electronics Engineering Department, J. B. Institute of Engineering & Technology, Hyderabad, Telangana, India. He is having 15 Years of Teaching Experience after

completing his PG. He has published 2 Book Chapters, 15 papers in International Journals and 39 papers in Conferences. He has 5 Patent Works as a Co-Inventor published in Indian Patent Office Journal and 1 Patent Work Granted in Australian Patent Office. His research interest includes Power system voltage stability analysis, Smart Grid, FACTS, Evolutionary Algorithms and Artificial Neural Networks. He is a Professional Member in IEEE and Life Member in ISTE. He has received 2 Best Paper Awards. He has delivered 15 Guest Lectures and Chaired 6 Conference Sessions. MHRD has recognized him as Institution's Innovation Cell Ambassador to promote and inculcate innovation among students and faculty. He has participated in 37 Faculty Development Programs and 15 Workshops. He was the NIRF and ARIIA Nodal Officer during 2019 and 2020. He has supervised 15 B.Tech Projects and 7 M.Tech Projects. He is also a supervisor for 1 Ph.D Student. He was a Member of Toastmasters club during the Academic Year 2017-18.

Day 4

P. Anitha is an Assistant professor in Electrical Department in the University VOC College of Engineering, Constituent College of Anna University, Tuticorin. She has published more than 10 research papers in journals of international repute. Her research areas of interest are Soft computing Algorithms, Power Electronics and Deregulation of Power System.
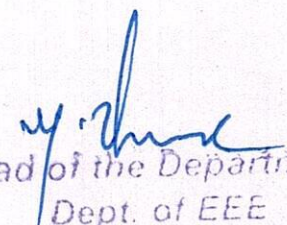
Day 5

Dr. A. BHUVANESH received the B.E. degree in Electrical and Electronics Engineering from Anna University in 2012, M.Tech. in Power System Engineering from Kalasalingam University in 2014 and Ph.D. degree from Faculty of Electrical Engineering of Anna University in 2019. He has nine years of teaching and research experiences. His research interests are in power system planning, Renewable energy sources, optimization techniques and application of nature-inspired algorithms in power systems. Dr. A.Bhuvanesh is now Associate Professor of Department of Electrical and Electronics Engineering, PSN College of Engineering and Technology, Tirunelveli, Tamil Nadu, India. He has published more than 50 papers in reputed international journals and 15 papers in international conferences. He is a life time member of International Society for Research and Development, International Association of Engineers.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

02.06.2023

Report of the event

Name of the event	Five Days FDP on "Role of Artificial Intelligence in Power Sector"
Dates & Duration	29/05/2023 to 02/06/2023 & 5 days
Name(s) of the Resource Persons	Dr.I.Jacob Regland, Professor and Head, EEE, VIT, Velore, Dr.P.DURAI PANDY, Associate Professor and HOD, Department of EEE, JB Institute of Engineering and Technology, Hyderabad, Telangana, Dr. P.Anitha, Assistant Professor and HOD, Department of EEE, UVOCCE, Thoothukudi and Dr.M.Karuppasamy Pandiayan, Assistant Professor, Department of EEE, Kalasalingam Academy of Research and Education and Dr.A.Bhuvanesh ASP/EEE, PSNCET
Name of the event coordinator	Dr.A.Bhuvanesh AP/EEE
No. of Participants	87

Remarks of the event coordinator about the FDP

Department of Electrical and Electronics Engineering, PSN College of Engineering and Technology organized Five Days FDP on "Role of Artificial Intelligence in Power Sector" from 29/05/2023 to 02/06/2023 through Zoom Meeting. The FDP was inaugurated by Dr.V.Manikandan, Principal, PSN College of Engineering and Technology, Tirunelveli. Dr.I.Jacob Regland, Professor and Head, EEE, VIT, Vellore, Dr.P.DURAI PANDY, Associate Professor and HOD, Department of EEE, JB Institute of Engineering and Technology, Hyderabad, Telangana, Dr. P.Anitha, Assistant Professor and HOD, Department of EEE, UVOCCE, Thoothukudi and Dr.M.Karuppasamy Pandiayan, Assistant Professor, Department of EEE, Kalasalingam Academy of Research and Education and Dr.A.Bhuvanesh ASP/EEE, PSNCET were the resource persons. 87 participants from various institutions have participated in this FDP. The vote of thanks was delivered by Dr.A.Bhuvanesh, ASP/EEE, PSN College of Engineering and Technology, Tirunelveli. The department of Electrical and Electronics Engineering is looking forward to organize future AICTE sponsored FDP on recent trends in electrical engineering.

Date: 02.06.2023

PO and PSO Mapping

PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
3	2	2	1	2	1	1	--	--	--	2	1	--	2

Signature of the Head of the Department

Head of the Department.
Dept. of EEE
PSN College of Engg & Tech
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02.06.2023

List of participants for the Five Days FDP on "Role of Artificial Intelligence in Power Sector"

1. Overall how satisfied were you with this FDP?

213 responses
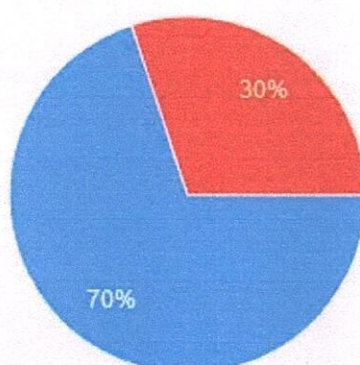
- Very Satisfied
- Satisfied
- Neither satisfied nor unsatisfied
- Dissatisfied
- Very dissatisfied

30%

70%

2. How informative did you find our FDP?

213 responses
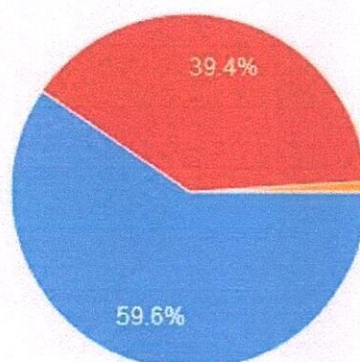
- Extremely informative
- Very informative
- Moderately informative
- Not very informative
- Not informative at all

39.4%

59.6%

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Dept. of EEE
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3. How clear were the ideas and concepts we presented?

213 responses

- Extremely clear
- Very clear
- Moderately clear
- Not very clear
- Not at all clear

40.8%

56.3%
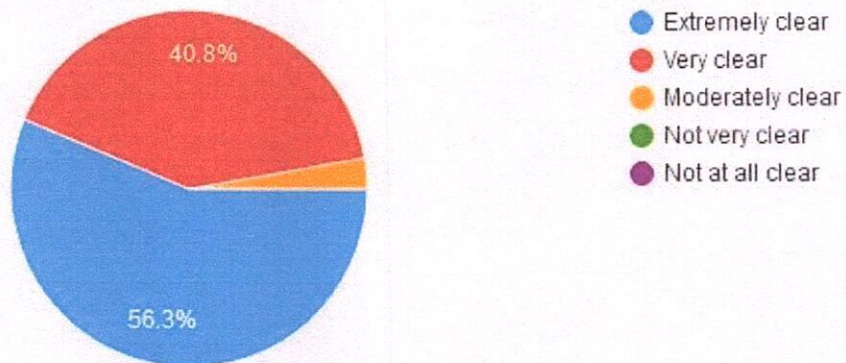
4. Were there any technical issues that prevented you from seeing or hearing the FDP?

213 responses

- No
- Yes

9.4%

90.6%
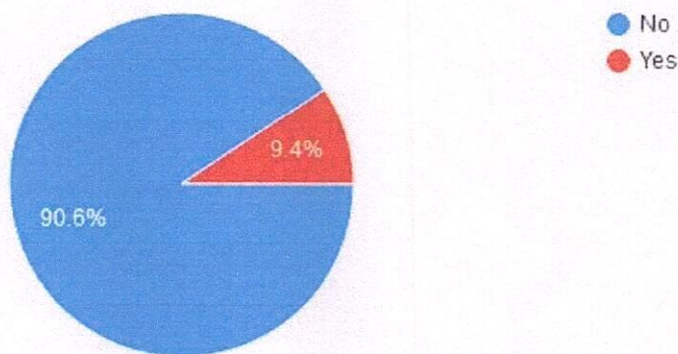
5. Was the subject matter of this FDP too simple, too involved, or at the right level?

213 responses
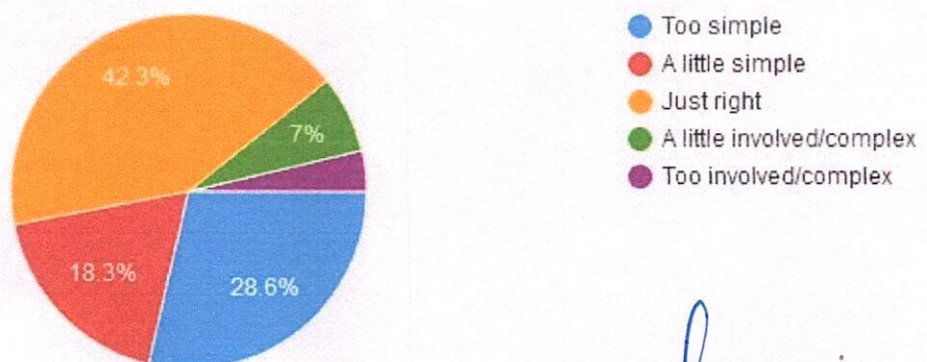
- Too simple
- A little simple
- Just right
- A little involved/complex
- Too involved/complex

42.3%

7%

18.3%

28.6%

6. Any other comments or feedback.

213 responses

Good

Nil

No

Good

-

Nice

Excellent

Nice

Well organized
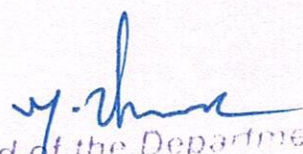
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Web site: www.psncet.ac.in **Email.ID:** principal@psncet.ac.in
Phone. No: 04634-279009

Department of Computer Science and Engineering

Date : 05.07.2022

Five days Faculty Development Program on Cloud Computing

Content of the FDP

➢ Introduction About Virtualization

➢ Virtualization Infrastructure

➢ Cloud Platform Architecture

➢ Programming Model

➢ Cloud Security

Proposed List of Experts to Deliver Lecture

S.No	Expert Name	Designation	Institution Name
1.	Mr.Saravana Kumar	Chief Executive Officer	Iconix Software Solution, Tirunelveli
2.	Dr.K.Jayakumar	Associate Professor	School of Computer and Engineering, VIT, Vellore
3	Dr.D. BeulahDavid	Professor	Saveetha School of Engineering, Chennai
4	Mr.Saravana Kumar	Chief Executive Officer	Iconix Software Solution Tirunelveli
5.	Dr.R.Palanikumar	Professor	PSR Engineering College

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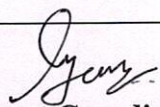Web site: www.psncet.ac.in **Email.ID:** principal@psncet.ac.in
Phone. No: 04634-279009
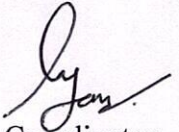
Department of Computer Science and Engineering

Date : 08.07.2022

Circular

Sub: Faculty Development Program on Cloud Computing– Reg.

This is to inform you that our Computer Science and Engineering department has planned to conduct Five days Faculty Development Program on **"Cloud Computing"** on 18-07-2022 to 22-07-2022 Interested faculty of our college and other College faculty shall register their names through Registration link, on or before 17.07.2022

Coordinator

Copy To

All HoDs / Aero, Civil, CSE, ECE, EEE, EIE, Marine, Mech& Auto, Mechanical, MBA, MCA & SOBES.

Principal

Executive Director

PSN COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

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Web site: www.psncet.ac.in **Email.ID:** principal@psncet.ac.in

Phone. No: 04634-279009

Department of Computer Science and Engineering

Five days FDP on "Cloud Computing"
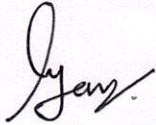
Participants List

S.No	Email	Name	Mobile Number	College Name
1	djoseph@psncet.ac.in	Joseph Pushparaj D	9750386546	PSN College of Engineering and Technology
2	jmjannie7@gmail.com	K.M.Annammal	8695521536	Grace College Of Engineering
3	singaravelan@psr.edu.in	Singaravelan S	8248610227	PSR ENGINEERING COLLEGE
4	arunadem@gmail.com	Dr. R. ARUN	9865390400	PSR Engineering College
5	Porkodi1795@gmail.com	S.Porkodi	8903249695	Grace College of Engineering
6	emilyestherrani@gmail.com	K.Emily Esther Rani	9865736624	Jayaraj Annapackiam CSI college of Engineering
7	anithag1011.sse@saveetha.com	ANITHA G	9884578056	SAVEETHA SCHOOL OF ENGINEERING
8	karpagamv1009.sse@saveetha.com	Karpagam V	9710127925	Saveetha School of Engineering
9	anitharajan1804@gmail.com	ANITHA A	8012027077	Francis Xavier Engineering college
10	arunadevim@francisxavier.ac.in	Arunadevi	9701528444	Francis Xavier engineering college
11	Yamunabee@psncet.ac.in	J. Yamuna Bee	9080607311	PSN college of engineering and technology
12	jeevamaha.lakshmi@gmail.com	Mahalakshmi	9941278427	Saveetha University
13	vinothini.nzt@gmail.com	Vinothini Mary W	9487669017	Jayaraj Annapackiam CSI college of Engineering
14	rukumathi.c29@gmail.com	rukumathi .c	9384762429	Francis Xavier engineering college
15	Christys.sse@saveetha.com	Dr. S. Christy	9884909250	Saveetha School of Engineering
16	malarkodik.sse@saveetha.com	Dr.K.Malarkodi	9442374742	Saveetha School of Engineering
17	shakilam1006.sse@saveetha.com	M.SHAKILA	9962003582	Saveetha school of Engineering
18	288sandhyajes@gmail.com	M.SANDHIYA	7871355514	Rajalakshnmi Engineering college
19	marisamysvk986@gmail.com	V.MARISAMY	9514094256	PSN College of Engineering and Technology
20	krishnamoorthi1607@gmail.com	JAYARAM. K	8608893894	PSN COLLEGE OF ENGINEERING AND TECHNOLOGY
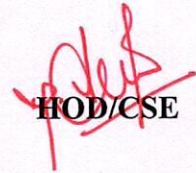
21	1903016exam@psncet.ac.in	V.Jothishwari	9150531293	Psn college of engineering and techbology
22	sobanamohan0@gmail.com	S.M.Sobana	7339271968	Psn college of engineering and technology
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46	vinothini304@gmail.com	A.VINOTHINI	8681883244	Veltech Multitech Dr Rangarajan Dr Sakuntha Engineering College

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82	kkirubananthavalli06@gmail.com	KIRUBANANTH AVALLI K	9994700508	Unnamalai Institute of technology

Event Coordinator

HOD/CSE

PSN COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

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Web site: www.psncet.ac.in Email.ID: principal@psncet.ac.in
Phone. No: 04634-279009

Department of Computer Science and Engineering

Report of the Event

Title of the Event	**Faculty Development Program on Cloud Computing**
Date& Time	18.07.2022 to 22.07.2022
Name(s) of the Resource Persons	Mr.Saravana Kumar Chief Executive Officer, Iconix Software solutions, Tirunelveli. Dr.K.Jeyakumar, Associate Professor, School of Computer and Engineering, VIT, Vellore. Dr.BeulahDavid.D, Professor, Saveetha School of Engineering,Chennai Mr.Saravana Kumar Chief Executive Officer, Iconix Software solutions,Tirunelveli Dr.R.Palanikumar, Professor, PSR Engineering College.
Name of the Event Coordinator	Mrs.J.Yamuna Bee, Assistant Professor, PSN College of Engineering and Technology
No. of Participants	82
Event Outcomes	

Upon the completion of this course, the Faculty members will able to
* Design a System, Component or Process as per needs and Specifications.

Remarks of the Coordinator about the Event

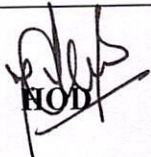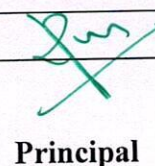A Five days FDP was organized by the Department of Computer Science and Engineering from 18-07-2022 to 22-07-2022. Mrs.J.Yamuna Bee, Assistant Professor/CSE was the event coordinator and Mr.Saravana Kumar Chief Executive Officer, Iconix Software solutions, Tirunelveli, Dr.K.Jeyakumar, Associate Professor, School of Computer and Engineering, VIT, Vellore, Dr.Beulah David.D, Professor, Saveetha School of Engineering, Chennai, Dr.R.Palanikumar, Professor, PSR Engineering College, are the resource persons of this Five day FDP.

However 82 faculty members were participated, benefitted and received their participant Certificates. The objective of the workshop was to provide the basic knowledge of Design a System, Component or Process as per needs and Specifications. Faculty members were impressed about the way the speaker delivered.

Date: 23.07.2022

Event Coordinator

Figure: Online Faculty Development Program on **"Cloud Computing"**

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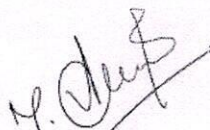
Tirunelveli - 627 152, Tamilnadu

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IQM270-CE000001

This is to certify that Dr. / Mr. / Ms. **Dr. M. Vargheese**

PSN College of Engineering and Tech

has participated in the Faculty Development Programme on **"Cloud Computing"** organized by **Department of Computer Science and Engineering** from 18th July to 22nd July 2022 [5 days]. This was a virtual programme conducted through Zoom.

DR. M. VARGHEESE
HOD/CSE

7/16/2022

DR. V. MANIKANDAN

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Phone. No: 04634-279009
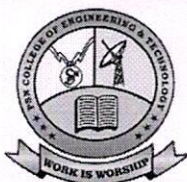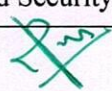
Department of Computer Science and Engineering

Faculty Development Program Outcomes (POs)

PO's No	KNOWLEDGE	Mapping	Topics
1	Engineering Knowledge	3	Introduction About Virtualization
2	Problem Analysis		
3	Design /Development of Solutions	2	Programming Model in Cloud
4	Conduct Investigations of Complex Problems		
5	Modern Tool usage	3	Cloud Security tools
6	The Engineer and Society		
7	Environment and Sustainability		
8	Ethics		
9	Individual and Team Work		
10	Communication		
11	Project Management and Finance		Applications using Cloud
12	Life-long Learning	2	Cloud Security

HOD

Principal

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Phone. No: 04634-279009
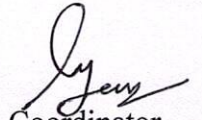
Department of Computer Science and Engineering

Date : 20.12.2022

Circular

Sub: Faculty Development Program on Emotional Intelligence– Reg.

This is to inform you that our Computer Science and Engineering department in association with ICT Academy has planned to conduct Three days Faculty Development Program on **"Emotional Intelligence"** from 05.01.2023 to 07.01.2023 Interested faculty of our college and other College faculty shall register their names through Registration link, on or before 02.01.2023.

Coordinator

Copy To

All HoDs / Aero, Civil, CSE, ECE, EEE, EIE, Marine, Mech& Auto, Mechanical, MBA, MCA & SOBES.

Principal

Executive Director

PSN COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
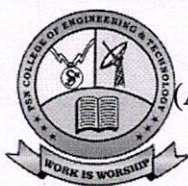
Melathediyoor, Tirunelveli – 627 152
(Approved by AICTE and Recognized by UGC Section 2f &12B)
(Accredited by NAAC with A+ grade, Affiliated to Anna University)
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Web site: www.psncet.ac.in **Email.ID:** principal@psncet.ac.in
Phone. No: 04634-279009
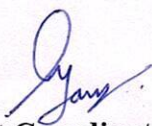
Department of Computer Science and Engineering
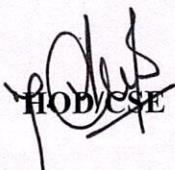
Three days FDP on "Emotional Intelligence"

Participants List

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Event Coordinator

HOD/CSE

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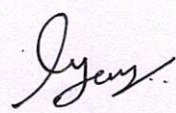
Department of Computer Science and Engineering

Report of the Event

Title of the Event	**Faculty Development Program on Emotional Intelligence**
Date& Time	05.01.2023 to 07.01.2023 (3 days)
Name(s) of the Resource Persons	Mr. Nirmal Kumar, Chief Trainer, ICT Academy, Chennai
Name of the Event Coordinator	Mrs.J.Yamuna Bee, Assistant Professor, PSN College of Engineering and Technology
No. of Participants	25

Event Outcomes

Upon the completion of this course, the Faculty members showed
- an increased ability to manage stress and depression, and better attitudes about themselves

Remarks of the Coordinator about the Event

A three days FDP was organized by the Department of Computer Science and Engineering in association with ICT Academy from 05.01.2023 to 07.01.2023. However 25 faculty members from our college and other colleges were participated, benefitted and received their participant Certificates. The objective of the workshop was to develop the self-awareness, self-control, and interpersonal skills that are vital for College, work, and life success. Faculty members were impressed about the way the speaker delivered.

Date: 10.01.2023

Event Coordinator
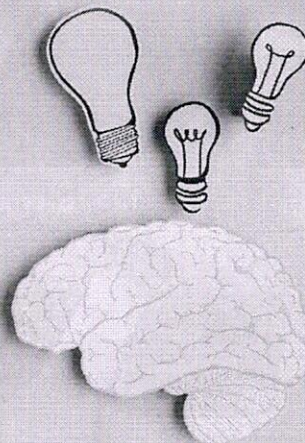
Figure: Poster - Faculty Development Program on **"Emotional Intelligence"**

Tirunelveli, Tamil Nadu, India
PSN College Rd, Tamil Nadu 627451, India
Lat 8.64549°
Long 77.635399°
05/01/23 10:43 AM

Tirunelveli, Tamil Nadu, India
JJRR+25C, Tirunelveli, Tamil Nadu 627451, India
Lat 8.639697°
Long 77.640657°
06/01/23 10:07 AM GMT +05:30

Figure: Faculty Development Program on **"Emotional Intelligence"**

PSN COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

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Phone. No: 04634-279009

Department of Computer Science and Engineering

Faculty Development Program Outcomes (POs)

PO's No	KNOWLEDGE	Mapping	Topics
1	Engineering Knowledge		
2	Problem Analysis		
3	Design /Development of Solutions		
4	Conduct Investigations of Complex Problems		
5	Modern Tool usage		
6	The Engineer and Society	3	self-awareness, self-control, and interpersonal skills
7	Environment and Sustainability		
8	Ethics	3	self-control
9	Individual and Team Work	2	How to develop Interpersonal skills
10	Communication		
11	Project Management and Finance		
12	Life-long Learning		

HOD

Principal

ICTACADEMY®

CERTIFICATE OF PARTICIPATION

C.No: 023-206010

Date: 07 Jan 2023

MRS. KANAGALAKSHMI,

PSN College of Engineering and Technology

has participated in 3 Day Faculty Development Program on

Emotional Intelligence

conducted by ICT Academy on 05 Jan 2023 to 07 Jan 2023 at

PSN College of Engineering and Technology

Hari Balachandran
Chief Executive Officer, ICT Academy

FACULTY DEVELOPMENT PROGRAMME

MARITIME ENGINEERING

(26TH JUNE – 02ND JULY 2023)

A REPORT

Submitted by

Dr. M. Muruganandam, *Associate Professor and Coordinator*

Department of Marine Engineering
(A2 Grade by DG Shipping Mumbai)
PSN College of Engineering and Technology
(An Autonomous Institution recognized by AICTE and affiliated to Anna University,
Accredited with A+ Grade by NAAC in the Third Cycle)
Melathediyoor – 627 152, Tirunelveli District, Tamil Nadu

CONTENTS

Overview of Faculty Development Programme on Maritime Engineering

The Virtual Faculty Development Programme (FDP) on Maritime Engineering was conducted for one week from 26th June 2023 to 02nd July 2023. The activities of the FDP Coordinatorduring this programme consisted of (1) Organizing the programme, (2) Conducting the programme, (3) Monitoring the attendance of participants, and (4) Report preparation.

FDP announcement was made by sending the Programme Brochure and Programme Schedule by email to various engineering institutions all over India. About 60 candidates from the following institutions registered for FDP: PSN College of Engineering and Technology, Noorul Islam Centre for Higher Education, College of Ship Technology, Indian Maritime University, Anglo-Eastern Maritime Academy, Indian Maritime University, Kolkata Campus, Institute of Marine Education and Research, Patna, Mohamed Sathak Engineering College, Odisha Maritime Academy, Sri Venkateswara College of Engineering, Maharashtra Academy of Naval Education and Training, Pune, Indian Maritime University, Kochi Campus, Vels Institute of Science, Technology, & Advanced Studies, and AMET University.

Excluding Saturday and Sunday (holidays), the programme schedule was done for five working days with two sessions on each day (Sessions 1-10). Session 4 was canceled because the expert was busy with his other commitments. Session 9 was canceled because enough participants did not turn up. Attendance of participants for a total of 8 sessions was monitored. The consolidated attendance report is shownon pages 5 and 6. The average attendance is 34.5 % (see pages 5 and 6). The number of participants who have attended all the sessions is 9. See the list of participants on pages 5 and 6 (highlighted with green). The number of participants who have less than 75 % attendance is 45. See the list of participants on pages 5 and 6 (highlighted in red). Reports for 8 sessions are given on pages 7 to 48. Feedback was received from twenty-six participants of FDP. A feedback analysis report is presented on pages 49 to 55.

M. Muruganandam, Ph.D.
Associate Professor and FDP Coordinator
Department of Marine Engineering
PSN College of Engineering of
Technology Melathediyoor – 627 152
24th July 2023

Attendance Report

Sl. No.	Name	Total number of sessions is 8	
		Present	Percentage
1	Dr. A. PACKIA ANTONY AMALAN	3	38
2	Mr. P. ATHI NARAYANAN	0	0
3	Mr. A. C. MARIAPPAN	0	0
4	Mr. ASHIK RAHMAN A. (STUDENT)	2	25
5	Mr. ASHISH SHARMA (STUDENT)	0	0
6	Dr. K. S. JAI AULTRIN	3	38
7	Mr. TEJINDER P. S. BHAMRA	8	100
8	Mr. BAIDYANATH SARKAR	8	100
9	Capt. MANOJ KUMAR	8	100
10	Mr. D. LOGESH	0	0
11	Capt. S. T. SREEDHARAN	6	75
12	Ms. J. DIVYA JOHNS	8	100
13	Dr. DEEPAK MISHRA	4	50
14	Mr. HARIARUNACHALAM S.	0	0
15	Dr. R. SATHEESH RAJA	3	38
16	Mr. C. INDRAKUMAR	0	0
17	Dr. V. K. JEBASINGH	8	100
18	Mr. JESON J. S.	3	38
19	Mr. A. KASIVISWANATHAN	3	38
20	Dr. K. CHANDRASEKAR	0	0
21	Mr. MANAS RANJAN BEHURA	4	50
22	Mr. A. MOHAN	7	88
23	Mr. VINOTH KUMAR N.	1	13
24	Mr. DINESH M.	0	0
25	Dr. M. GOPI KRISHNA	0	0
26	Mr. GHARSHOM F. (STUDENT)	0	0
27	Mr. MUNIASAMY M.	5	63
28	Mr. M. MURUGAN	0	0
29	Mr. NIKHIL MARUTI KUNJIR	5	63
30	Mr. G. PETERPACKIARAJ	0	0
31	Dr. P. PAUL PANDIAN	0	0
32	Mr. PRABHAKARAN M.	0	0
33	Mr. PRAY GIFT DAVIDSON	0	0
34	Capt. PRERIT MISRA	8	100
35	Capt. AMOL BHASKAR ATHALYE	8	100
36	Mr. P. SURENDAR	0	0
37	Mr. RAJESH S. JAGTAP	0	0
38	Mr. A. K. RATHEESH	0	0
39	Mr. R. KARUTHAPANDI	0	0
40	Mr. SATHEESH BABU K.	0	0

41	Mr. S. MANIVANNAN	6	75
42	Mr. THANGAVELU G.	0	0
43	Ms. SHABNAM PARVEEN	7	88
44	Mr. SHRIKANT U. GUNJAL	7	88
45	Mrs. R. SINDHUJA	0	0
46	Dr. S. JOHN LEON	7	88
47	Mr. S. RAJA	0	0
48	Mr. SREEJITH C. S.	5	63
49	Ms. T. SUBHASHINI	5	63
50	Mr. MAJENDRAN GOPINATH	8	100
51	Mr. SURAJIT GHOSH	8	100
52	Mr. SUSHIL KR. JHA	4	50
53	Mr. P. THAVARAJAN	0	0
54	Mr. ROHITH AMBADI S.	2	25
55	Mrs. THILAGAPATHY G.	0	0
56	Mr. TIMMY JOSEPH (STUDENT)	0	0
57	Mr. TUSHAR R. WAGHMARE	0	0
58	Mr. VIJAY D. PATIL	0	0
59	Mr. VIKRAMOORTHI A.	0	0
60	Mr. VISHNU S. H.	1	13

Day 1   **26.06.2023, Monday**

Session 1A   **9:40-10:00 Hrs.**

Inaugural Function – Felicitation Address by HOD Marine Engineering andPrincipal of PSNCET and Welcome Address by FDP Coordinator

Faculty Development Programme (FDP) on Maritime Engineering scheduled on 26.06.2023 at 9:40 a.m. was started with a felicitation address by Dr. R. Satheesh Raja, Head, Department of Marine Engineering, PSN College of Engineering and Technology (PSNCET) (see Figure 1A.1). Dr. V. Manikandan, Principal, PSNCET (see Figure 1A.2), emphasized that acquiring knowledge by faculty will improve the teaching-learning process.
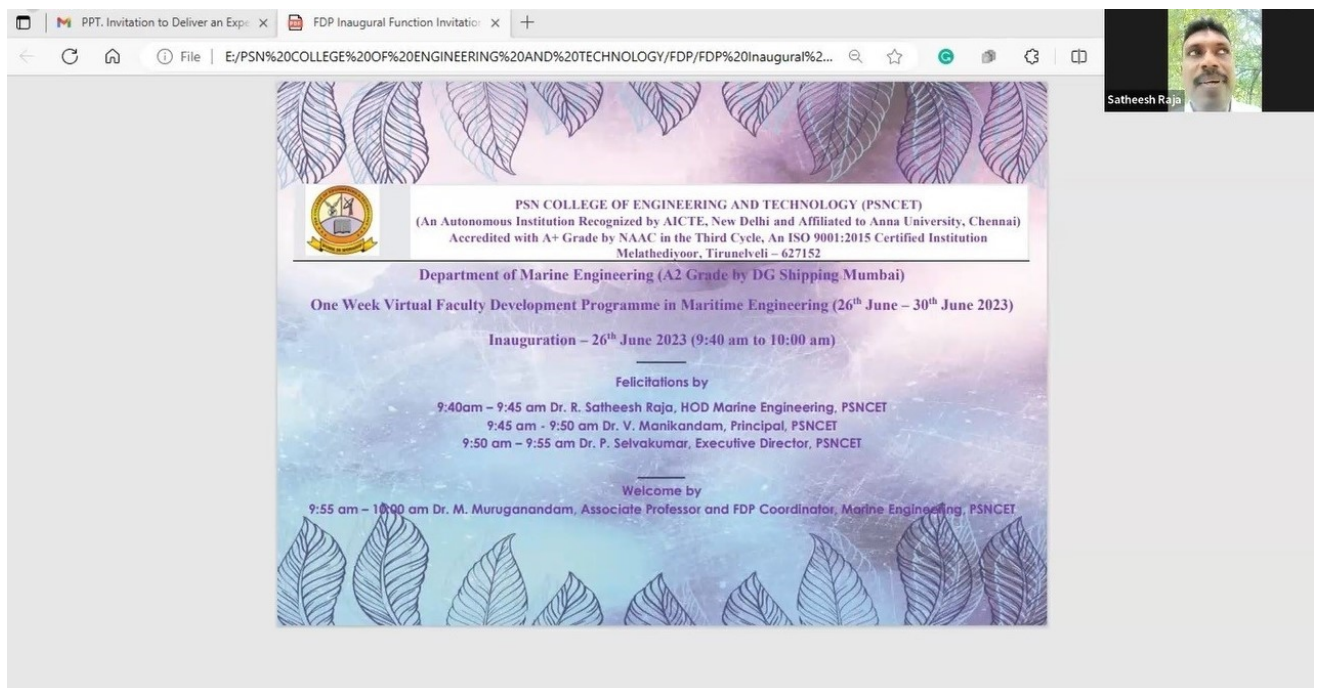
Figure 1A.1 Felicitation Address by Dr. R. Satheesh Raja, Head, Department of Marine Engineering, PSNCET

Dr. M. Muruganandam, Associate Professor and FDP Coordinator, Department of Marine Engineering, PSNCET (see Figure 1A.3), delivered the Welcome Address. He welcomed the participants from the various institutions in India. He highlighted the following objectives of the FDP on Maritime Engineering. This programme will (1) emphasize building and consolidating fundamental concepts and techniques required for designing, building, and testing ships and offshore structures for extreme conditions; (2) prepare the young faculty from engineering institutions with the necessary fundamental concepts and mathematical techniques required for teaching and research related to developing the skills that a student needs to become a naval architect and a marine engineer. Also, he
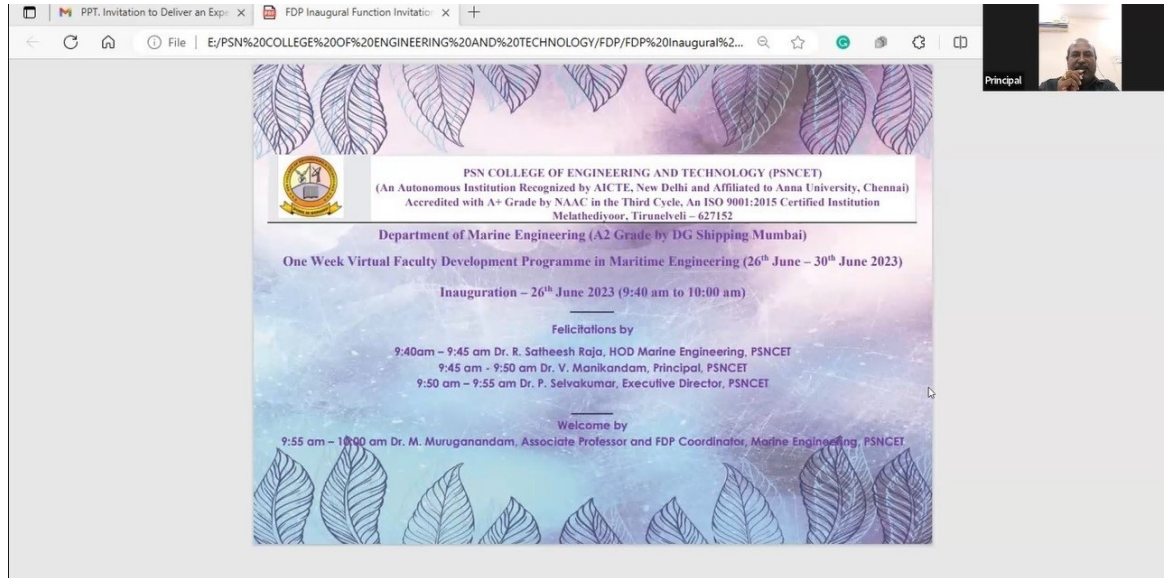
Figure 1A.2 Felicitation Address by Dr. V. Manikandan, Principal, PSNCET
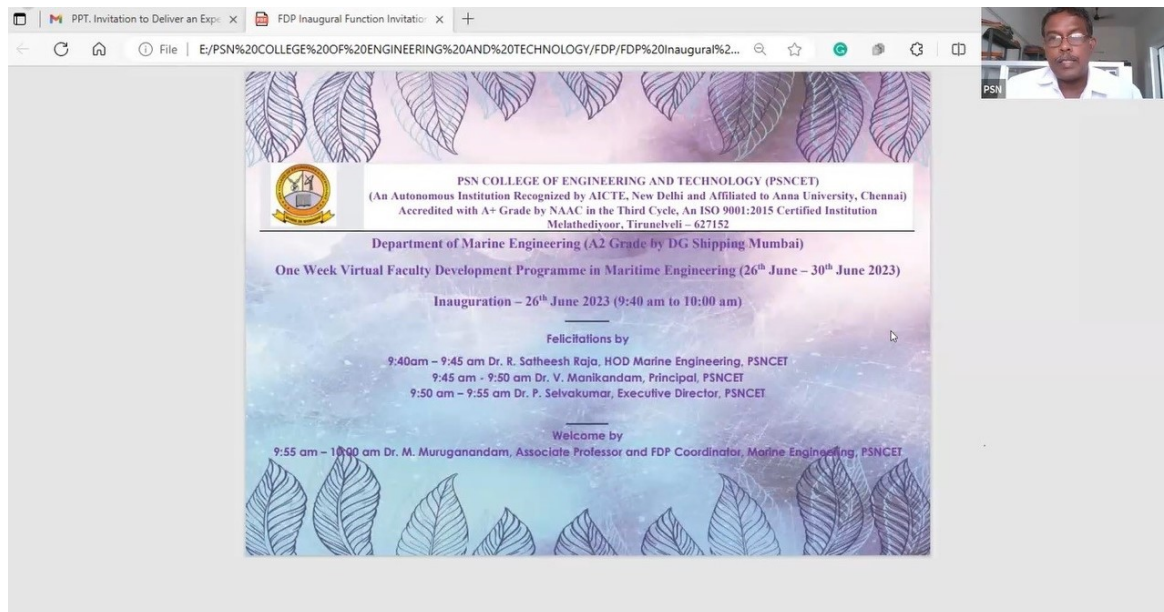
Figure 1A.3 Welcome Address by Dr. M. Muruganandam, Associate Professor and FDP Coordinator, Department of Marine Engineering, PSNCET

pointed out the following learning outcomes of FDP. The participants will be able to (1) analyze given physical problems related to ships and offshore structures and develop mathematical models; (2) predict the performance of ships and offshore structures; (3) demonstrate the skills required to become a naval architect and a marine engineer; (4) perform numerical simulations of ships and offshore structures, and interpret the solutions.

Day 1   **26.06.2021, Monday**

Session 1B   **10:00-12:00 Hrs.**

Marine Energy

Dr. Abdus Samad
Professor, Department of Ocean Engineering, Indian Institute of Technology (IIT) Madras, Chennai – 600 036.

Dr. Abdus Samad, Professor, Department of Ocean Engineering, IIT Madras, delivered an expert lecture on *Marine Energy*. He explained that 70% of the earth's surface is occupied by the ocean. By exploring various systems of ocean energy, the energy needs of every human being on the earth can be fulfilled, including the latest energy needs of electric vehicles. The following three systems of marine energy are found in the ocean, as shown in Figure 1B.1: (1) ocean thermal energy, (2) tidal energy, and (3) wave energy.
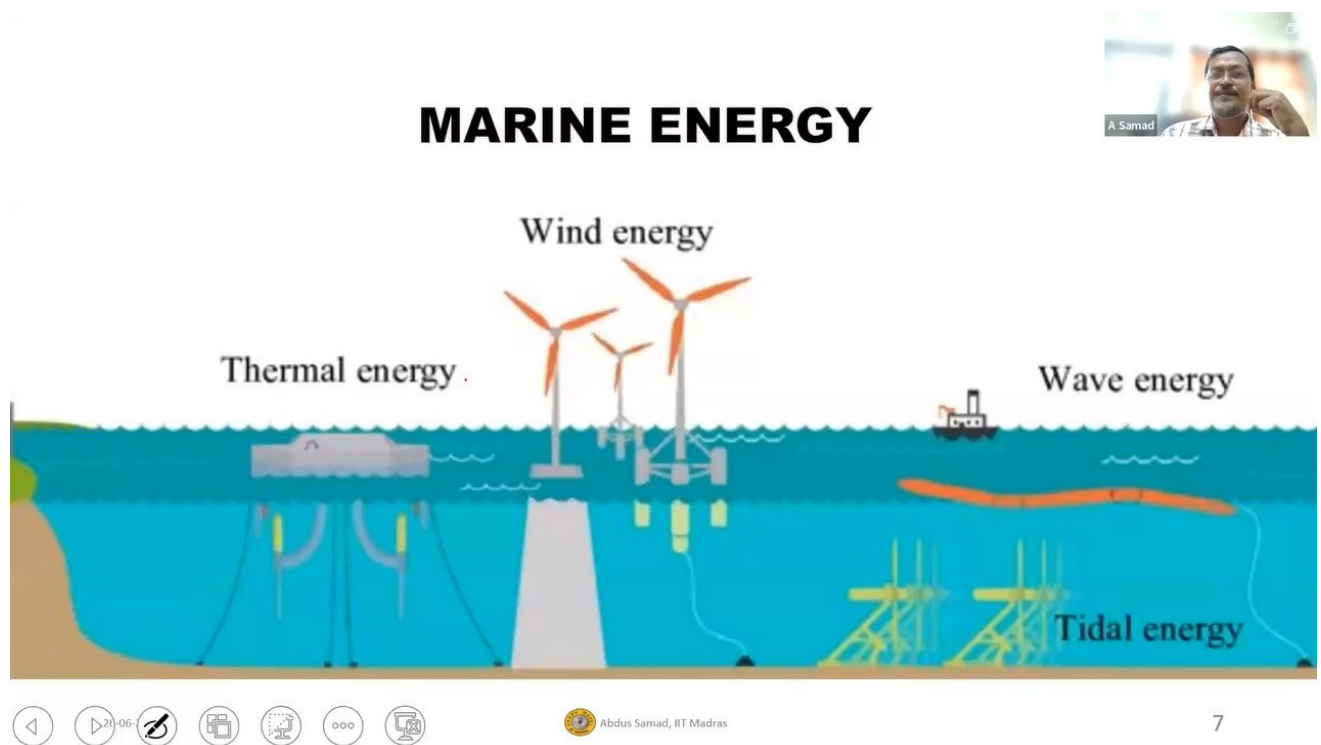
Figure 1B.1 Various systems of marine energy

Development of any technology takes place through a series of levels from TRL 1 to TRL 9 (see Figure 1B.2), where TRL stands for Technology Readiness Level. At TRL 1, technology is in a conceptual stage. By doing numerical calculations on that concept, one transcends to TRL 2. Laboratory experiments to validate the numerical calculations lead to TRL 3. Field trials of the concept place the technology at TRL 4. Finally, the technology is at TRL 9 when the product is launched, and

the product is used by the public. Most of the research efforts taken by academicians and scientists do not reach TRL 9 due to a lack of funding opportunities. Dr. Abdus Samad described this situation as a struggle for inventions to become innovations in the Darwinian Sea.
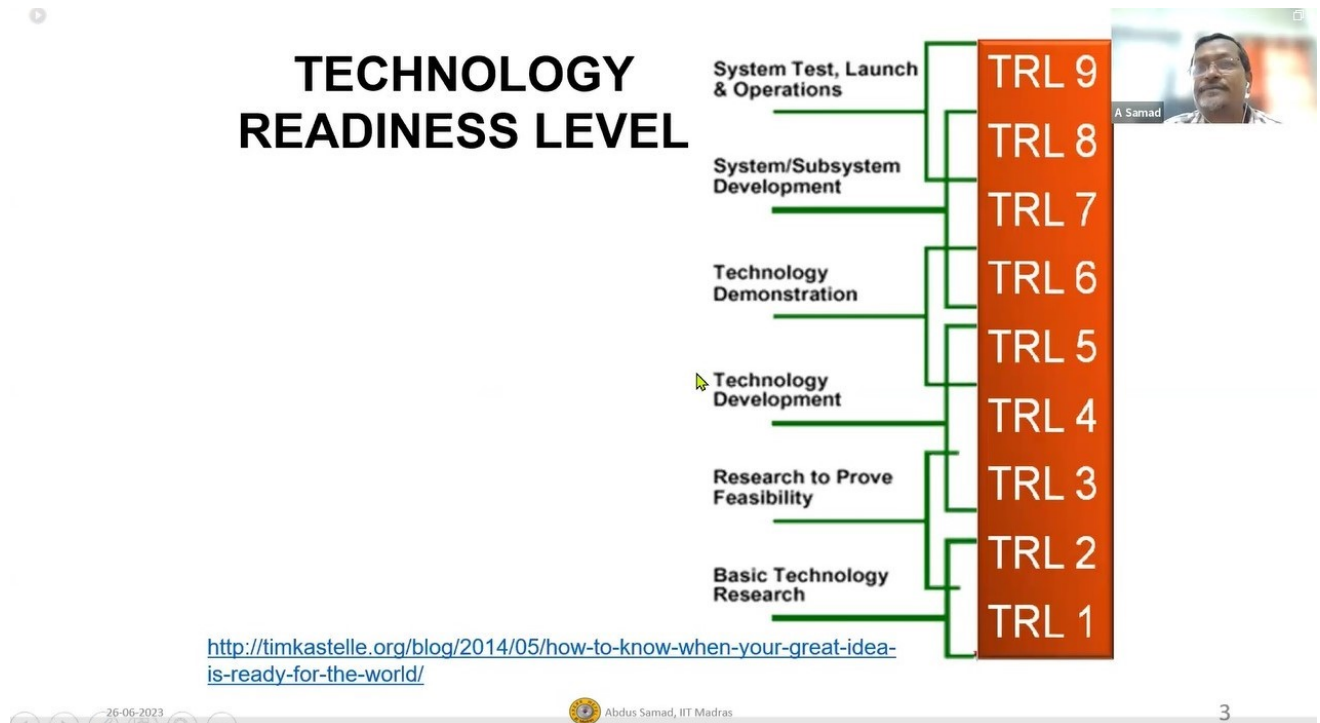
Figure 1B.2 Technology Readiness Levels

The standard of living in a country is dictated by the amount of energy used by every citizen of that country. As seen in Figure 1B.3, there is a negligible increase in the level of energy production in India, whereas there is a continuous and significant increase in the level of energy import in the form of coal and oil from other countries such as the USA, Russia, and the Middle East. If actions are taken to implement marine energy technologies, then the money spent on the import of energy can be utilized for various other basic development needs of our country, for example, education and health.

As per the policy report given by the International Energy Agency in 2006 (see Figure 1B.4), only wave energy itself can fulfill the energy needs of 7.8 billion people in the world today, which is expected to increase to 9.7 billion by 2050. Figure 1B.5 shows the global map of ocean thermal energy conversion potential (OTEC) - the temperature difference (ΔT) is shown between the ocean surface and the ocean bed. There is an average depth of 1000 m. It is seen that there is a ΔT of 22°C to 24°C offshore of India. National Institute of Ocean Technology, Chennai, designed an OTEC plant that is operating on Agatti island (see Figure 1B.6, 7.6 km long island situated at 459 km west of Kochi) which is a part
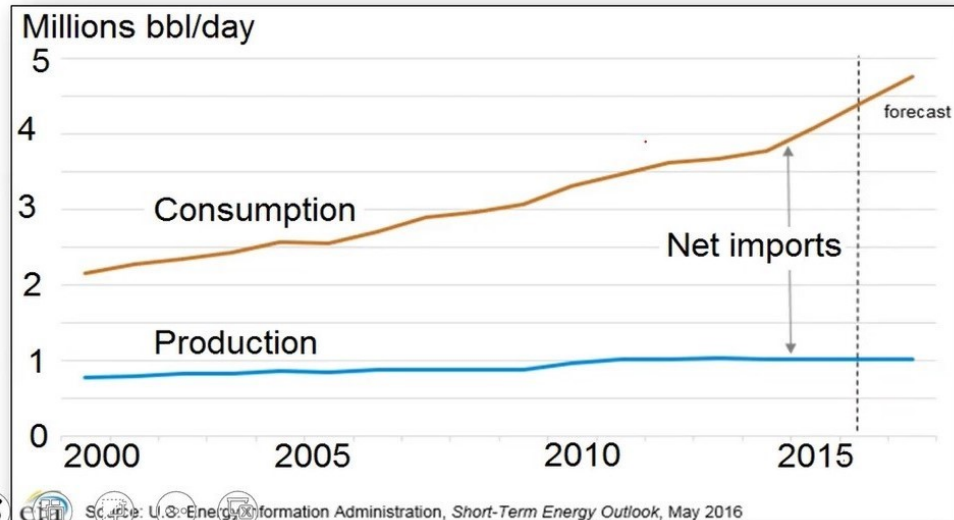
Figure 1B.3 Trend of energy production and energy import in India

Figure 1B.4 Global marine energy potential

of the Union Territory of Lakshadweep, India. Along the Indian coastal line, the wave energy potential is lower near Chennai than near Tuticorin, as shown in Figure 1B.7. Hence, a sea trial of the wave energy converter developed by IIT Madras has been done in the Indian coastal line near Tuticorin (see

Figure 1B.8). For further details, the reader is suggested to listen to the video recordings of Dr. Abdus Samad's lecture.
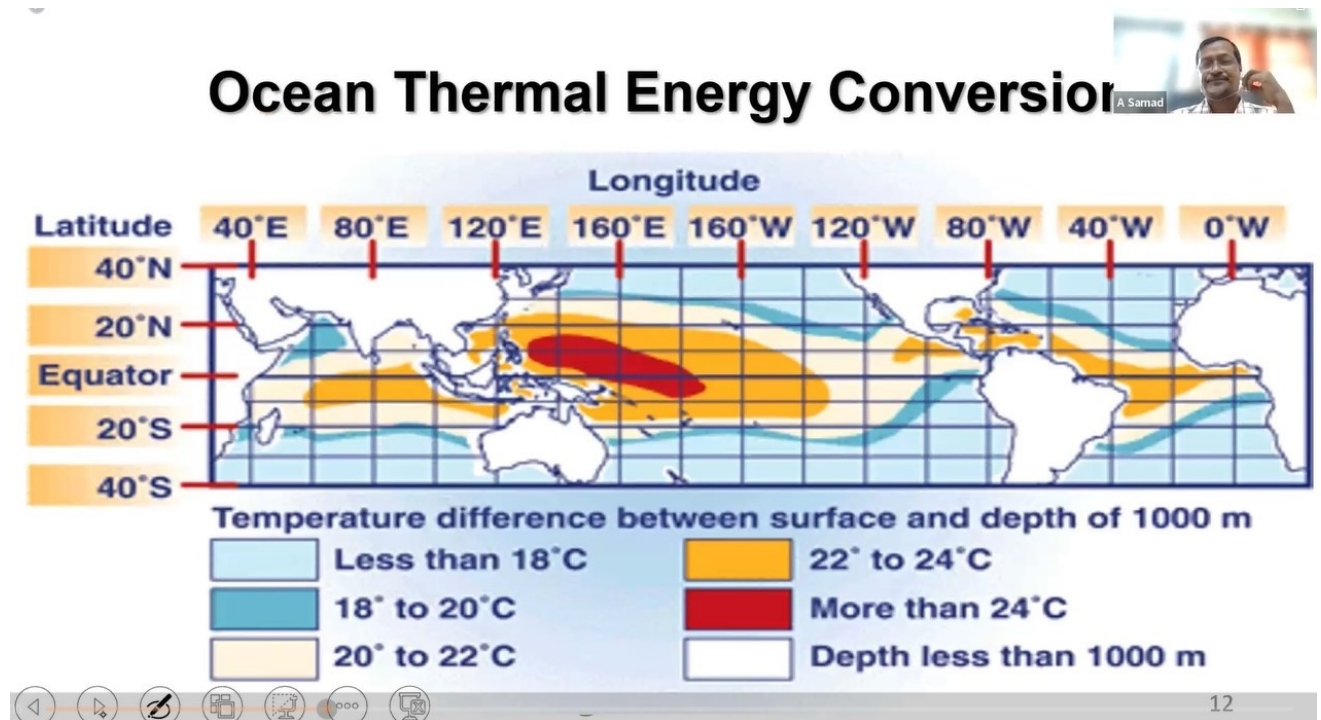
Figure 1B.5 Global ocean thermal energy potential
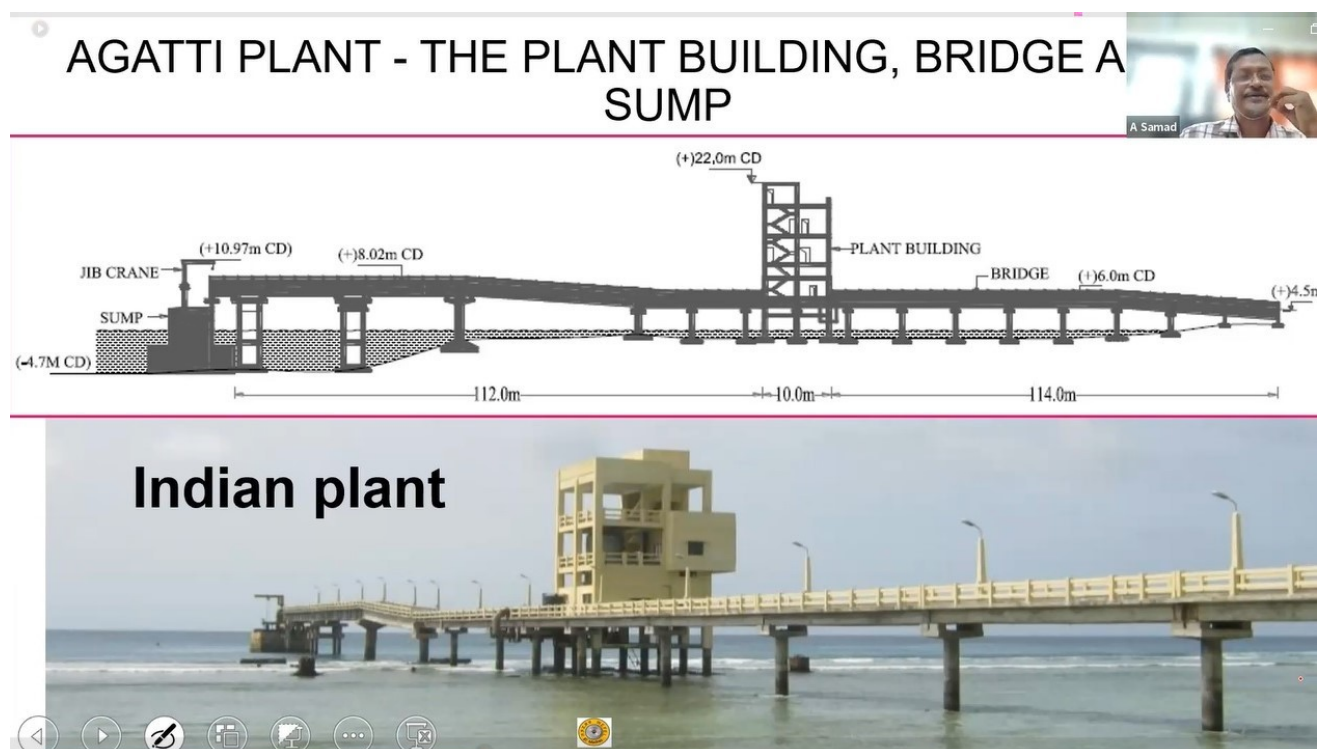
Figure 1B.6 Global ocean thermal energy potential

Figure 1B.7 Wave energy potential along the Indian coastal line

Figure 1B.8 Sea trial of wave energy converter developed by IIT Madras near Tuticorin

Day 1   **26.06.2021, Monday**

Session 2   **14:00-16:00 Hrs.**

State of the Art in Numerical Modelling for Ocean Engineering

Dr. Sriram Venkatachalam

Professor, Department of Ocean Engineering, Indian Institute of Technology (IIT) Madras, Chennai – 600 036.

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Dr. Sriram Venkatachalam, Professor, Department of Ocean Engineering, IIT Madras, delivered an expert lecture on *State of the Art in Numerical Modelling for Ocean Engineering*. Based on the type of restoring force, the waves are classified as follows (see Figure 2.1): (1) capillary waves, (2) ultra gravity waves, (3) ordinary gravity waves, (4) infra gravity waves, (5) long period waves, (6) ordinary tide waves, and (7) trans tidal waves. Surface tension is the restoring force in capillary waves. Gravity force is the restoring force in cases (2), (3), and (4). Coriolis force caused by storms and earthquakes is the restoring force for long-period waves. Wave period is chosen for numerical modelling based on this classification.
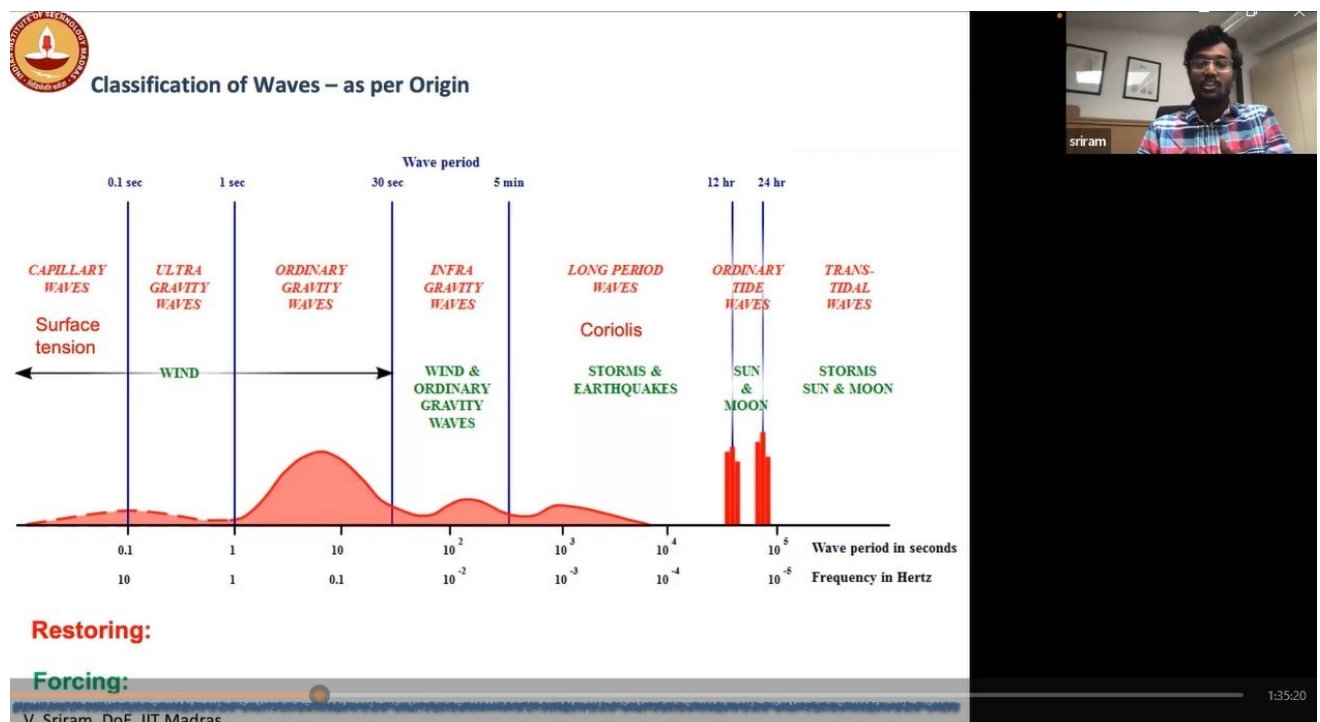
Figure 2.1 Classification of waves

Figure 2.2 shows snapshots of a 15 m high breaking wave that interacts with an observatory platform for fourteen seconds. At 00:44:44 hrs., the height of waves around the structure is negligible. After a second, a huge wave strikes the structure and interacts with the structure for 10 seconds. Again,

the surroundings of the structure return to its original state with negligible wave heights. It is one of the challenges in numerical modelling of such complex physical phenomena in ocean engineering.

Figure 2.2 Challenges in numerical modelling of a wave structure interaction in ocean
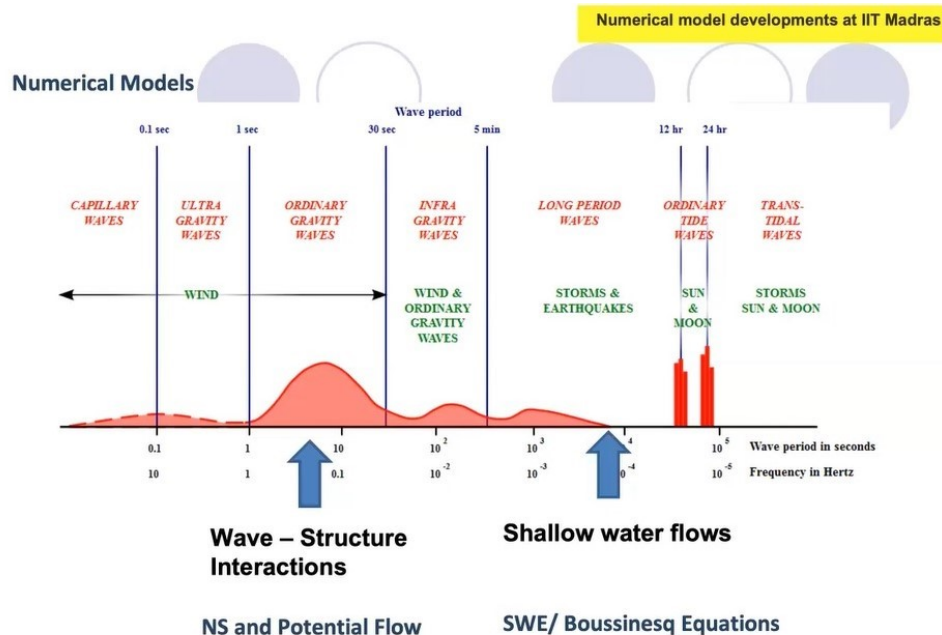
Figure 2.3 Types of fluid flow governing equations in numerical modelling of a wave structure interaction in ocean

As shown in Figure 2.3, for numerical modelling of wave structure interaction in the ocean, Navier-Stokes (N-S) fluid flow governing equations and fully nonlinear potential flow (FNP) equations are used. For numerical modelling of shallow water flows, Boussinesq equations are used. Among the three numerical models, such as the N-S flow model, FNP flow model, and Boussinesq flow model, the N-S model has the highest computation cost and accuracy. Among these three models, the Boussinesq model has the lowest computational cost and accuracy (see Figure 2.4).
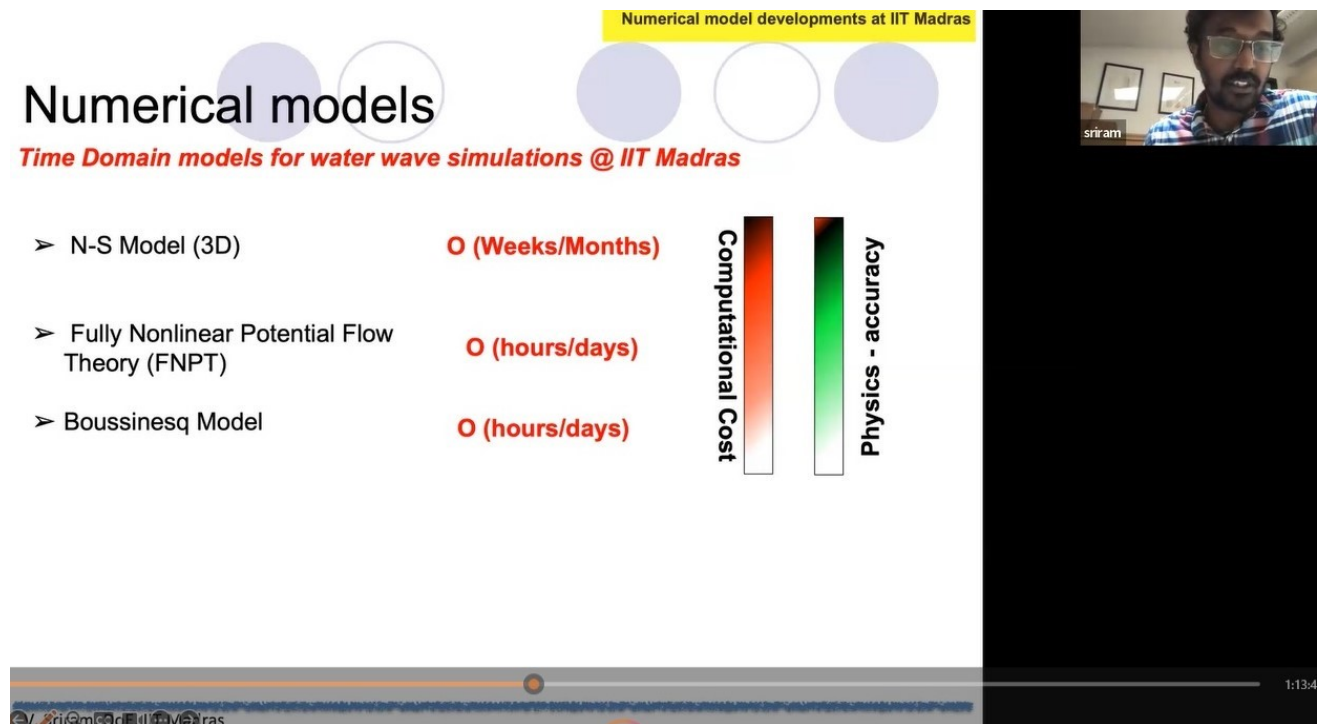
Figure 2.4 Comparisons of numerical models for water wave simulations based on computational cost and accuracy

However, Dr. Sriram Venkatachalam has developed a mesh-free numerical method that is based on two-dimensional and three-dimensional Taylor series approximations over the last fifteen years (see Figure 2.5). This improved meshless local Petrov-Galerkin (IMLPG) numerical method has been applied to analyze the real field problems in ocean engineering by his team in collaboration with the City University of London. Figure 2.6 shows the numerical results on instantaneous wave heights and pressure measured by applying the IMLPG numerical method on a domain of a tank having 60 cm length, 30 cm height, and 12 cm height of water at initial conditions. These results satisfy the following operating conditions in the tank filled with water: amplitude of wave = 5 cm, exciting period = 1.5 s, and filling ratio = 40%. This numerical model predicts the impact pressure acting in a tank of a cargo vessel due to sloshing and wave topping. Figures 2.7 and 2.8 show the numerical results of a few more problems. For further information on this topic, the reader is suggested to listen to the recordings of

this session.

Figure 2.5 Improved meshless local Petrov-Galerkin (IMLPG) numerical method developed by IIT Madras and City University of London
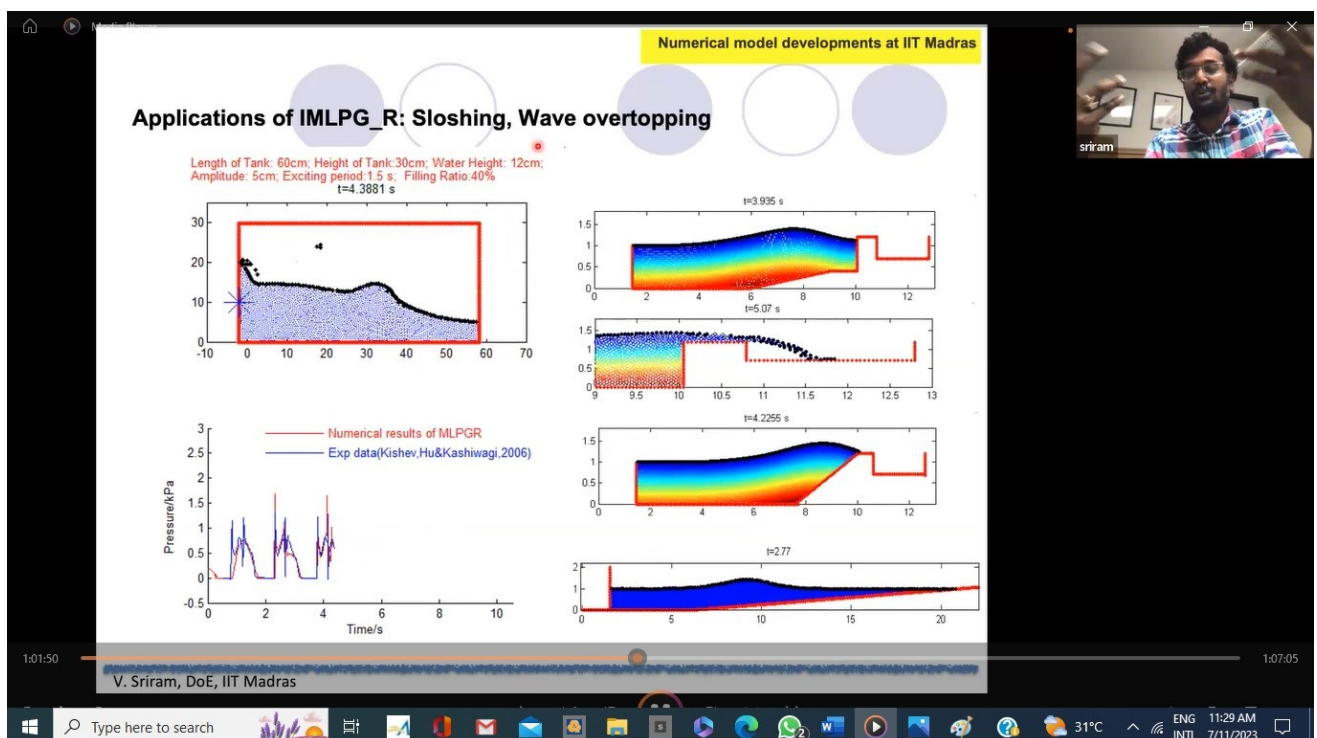
Figure 2.6 Numerical results on instantaneous wave heights and pressure measured by applying the IMLPG numerical method on a domain of a tank having 60 cm length, 30 cm

height, and 12 cm height of water at initial conditions and for the following operating conditions: amplitude of wave = 5 cm, exciting period = 1.5 s, and filling ratio = 40%.
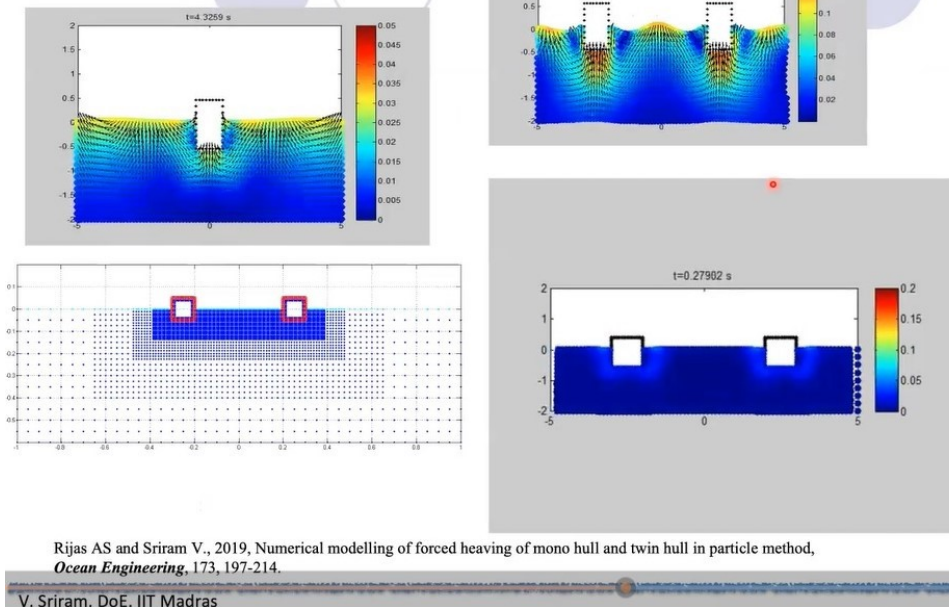
Figure 2.7 Numerical results on instantaneous wave heights and forced heaving of the mono hull and twin hull measured by applying IMLPG numerical method
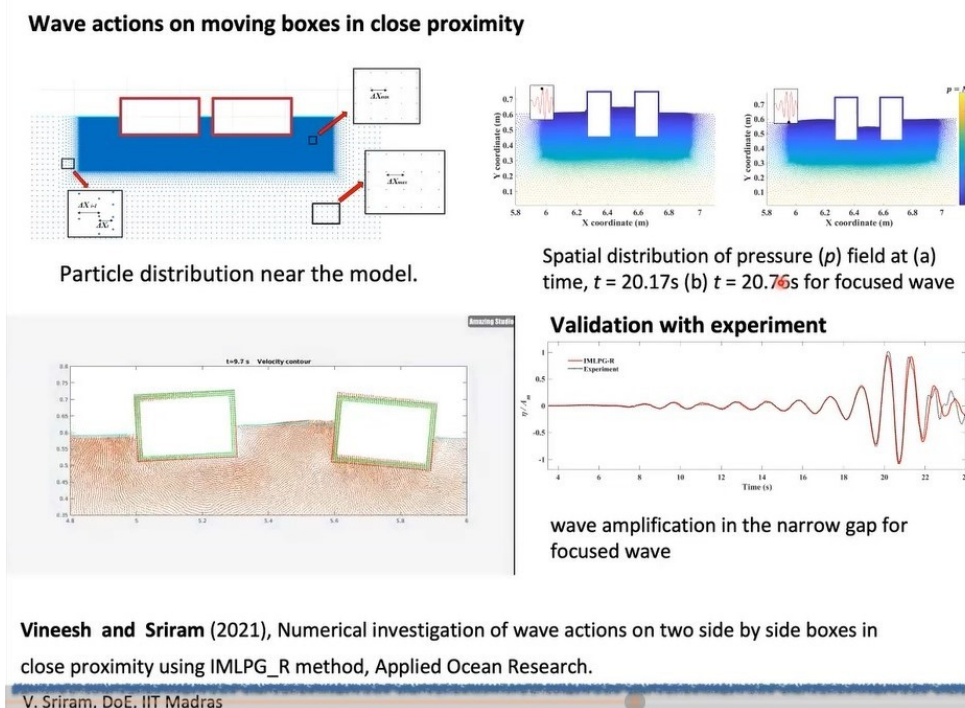
Figure 2.8 Numerical results on wave action on two side-by-side boxes (for example, two vessels containing liquified natural gas nearby each other) by applying IMLPG numerical method

Day 2   **27.06.2021, Tuesday**

Session 3   **10:00-12:00 Hrs.**

CFD Applications in Ocean Engineering

Dr. Hari V. Warrior
Professor, Department of Ocean Engineering and Naval Architecture, Indian Institute of Technology (IIT) Kharagpur, Kharagpur – 721 302.

Dr. Hari V. Warrior, Professor, Department of Ocean Engineering and Naval Architecture, IIT Kharagpur, delivered an expert lecture on *CFD Applications in Ocean Engineering*. He explained the physical conditions of turbulent flow (see Figures 3.1, 3.2, and 3.3) with reference to Reynolds number (Re). Flow is in laminar conditions for $Re < 2200$. Flow becomes turbulent for $Re > 2200$. Flow is in a transition state (i.e., alternating laminar and turbulent flow conditions) at $Re = 2200$. Turbulent flow is an unsteady flow with aperiodic motion.
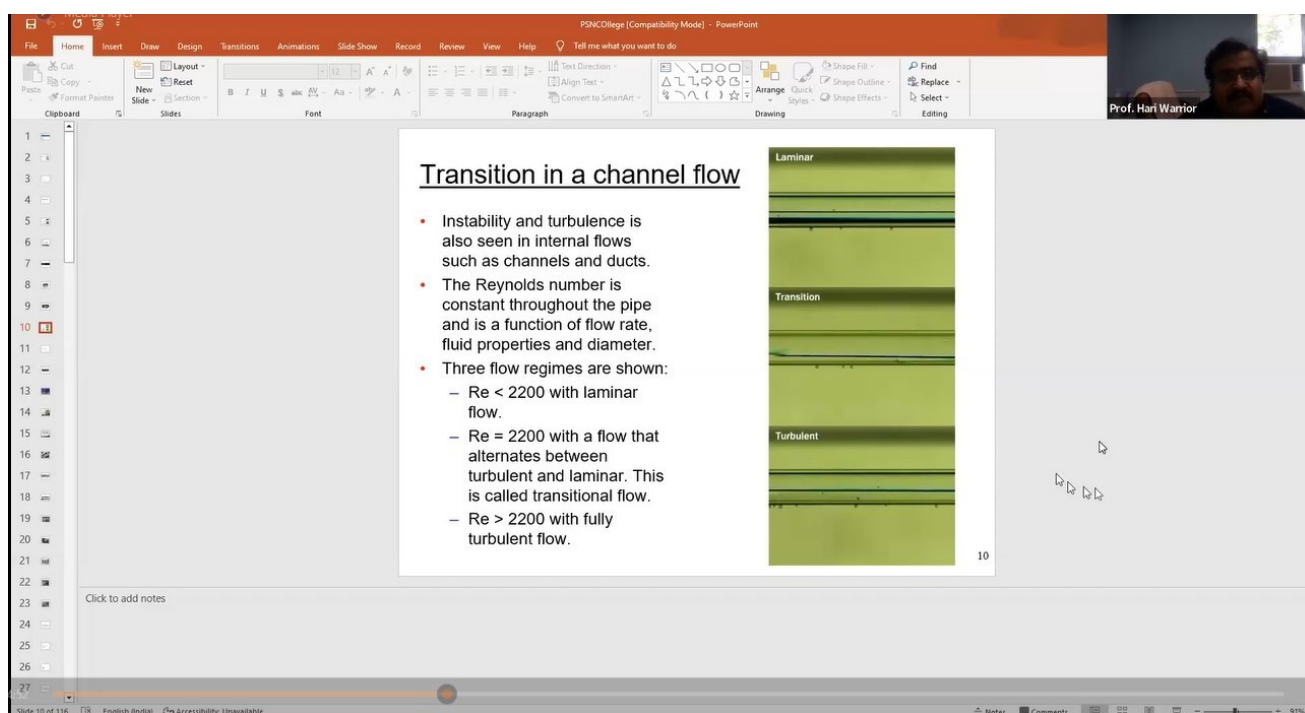
Figure 3.1 Three regimes of fluid flow through a channel: laminar, transition, and turbulent regimes

In a turbulent flow, the flow properties, such as velocity, pressure, and temperature, fluctuate with time (see Figure 3.4). The fluctuations in flow properties are due to the mixing of mass, momentum, and energy. The objective of turbulence modelling is to develop equations that will predict time-averaged velocity, pressure, and temperature. In computing the time-averaged properties, the time interval must be more than the scale of the slowest turbulent fluctuations. He explained about the

Transition in boundary layer flow over flat plate
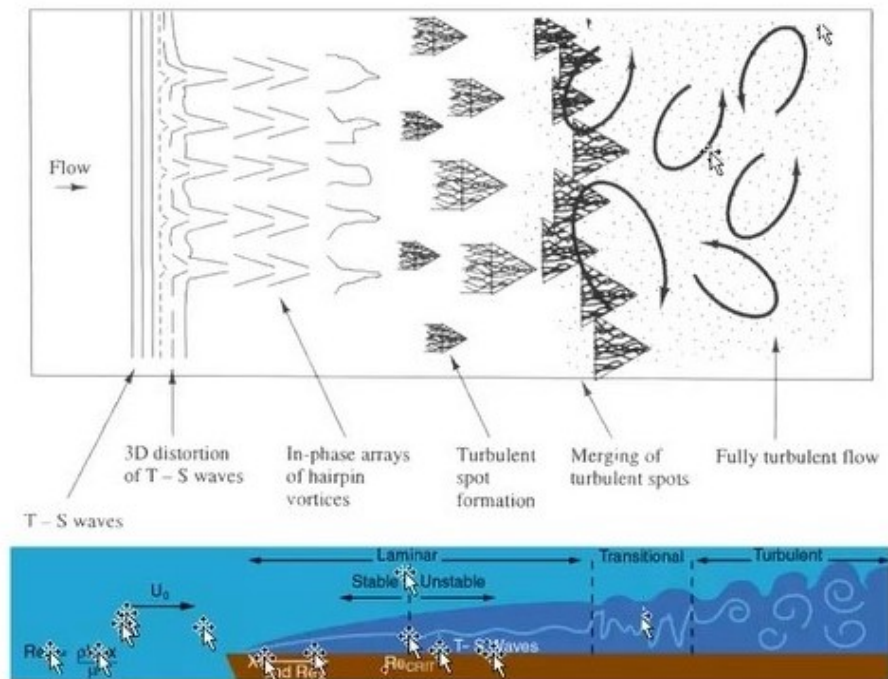
Figure 3.2 Three regimes of fluid flow over a flat plate: laminar, transition, and turbulent regimes

Flow transitions around a cylinder

- For flow around a cylinder, the flow starts separating at Re = 5. For Re below 30, the flow is stable. Oscillations appear for higher Re.
- The separation point moves upstream, increasing drag up to Re = 2000.
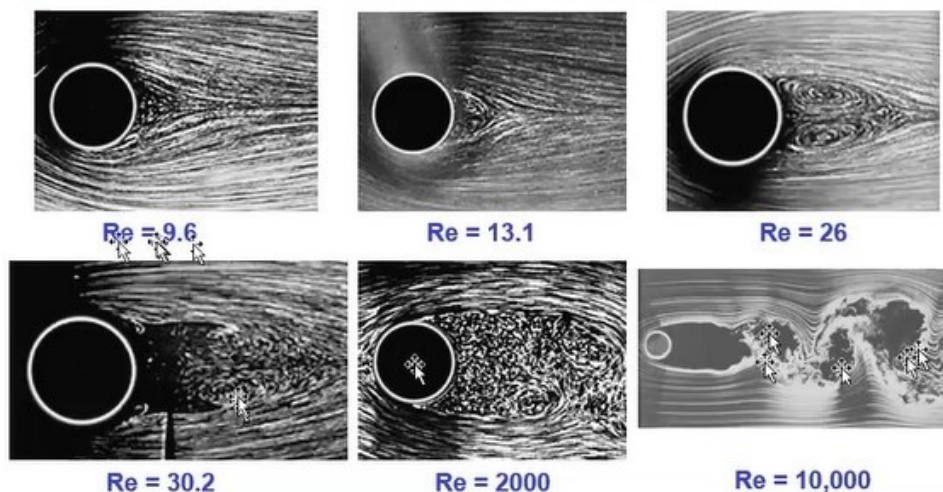
Figure 3.3 Three regimes of fluid flow over a cylinder: laminar, transition, and turbulent regimes

following Reynolds-averaged Navier-Stokes turbulence models: Boussinesq model, mixing length model (zero equation), Spalart-Almaras (one equation) model, k-ε (two equations) model, and Reynolds stress (seven equations) model. In a k-ε model, k represents the instantaneous kinetic energy per unit mass and ε represents the dissipation rate of k. Reynolds averaged Navier-Stokes equations (RANS) method of predicting turbulent flow requires the least computing power, whereas direct numerical simulation (DNS) requires the most computing power (see Figure 3.5). In DNS, large-scale eddies, as well as small-scale eddies, are taken into consideration, whereas in RANS, only large-scale eddies are considered.

What is turbulence?

- Unsteady, aperiodic motion in which all three velocity components fluctuate, mixing matter, momentum, and energy.
- Decompose velocity into mean and fluctuating parts:

$$U_i(t) \equiv U_i + u_i(t).$$

Time
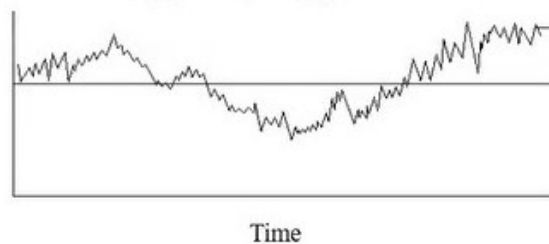
- Similar fluctuations for pressure, temperature, and species concentration values.

4

Figure 3.4 Turbulence in fluid flow

Computational Fluid Dynamics (CFD) finds the following applications in Naval Architecture: (a) detection of ships from its wake characteristics, (b) reverse calculations of ships from its wake signature, (c) detection of Bernoulli hump and its magnitude for submarines, (d) determination of free surface features for submarines plying beneath, (e) reverse calculations on getting sub marine particulars, (f) machine learning as a tool for submarine detection, and (g) detection of torpedoes over seasons. By analyzing the Kelvin wake characteristics, the motion of ships and submarines can be studied during wide-area surveillance (see Figure 3.6). He explained the importance of the grid convergence test (see Figure 3.7).

Prediction Methods
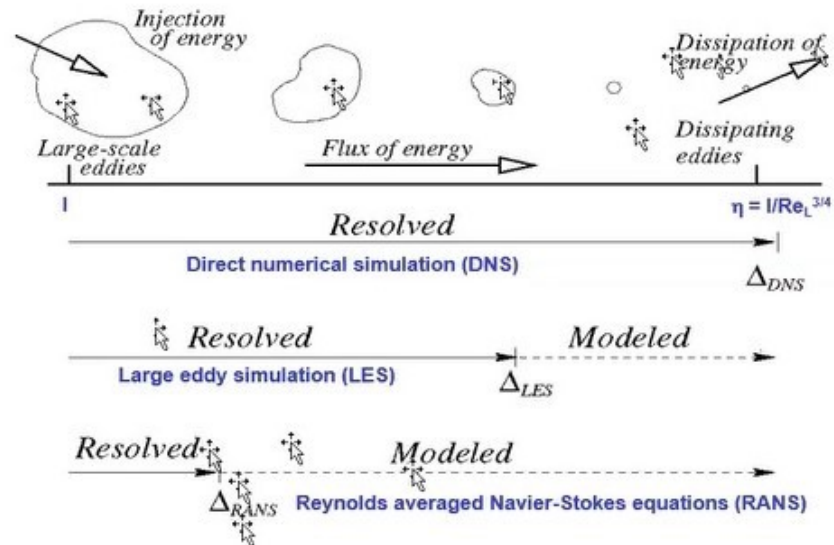
Figure 3.5 Turbulent flow prediction methods
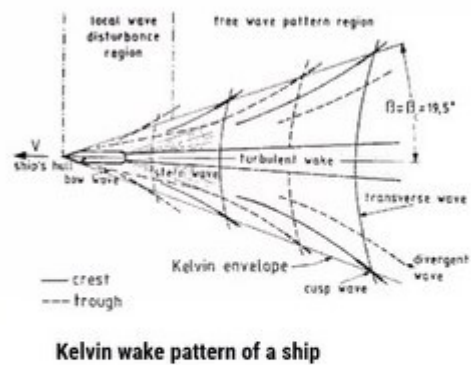
Figure 3.6 Wide area surveillance

Figure 3.7 Grid convergence study in CFD analysis

By studying the characteristics of wakes, the exterior dimensions of ships, submarines, and torpedoes can be estimated. During CFD simulation, by measuring the widths of wakes at various distances behind the ship, one can estimate the width of the ship (see Figure 3.8). For further details, the reader is suggested to listen to the recordings of this session.
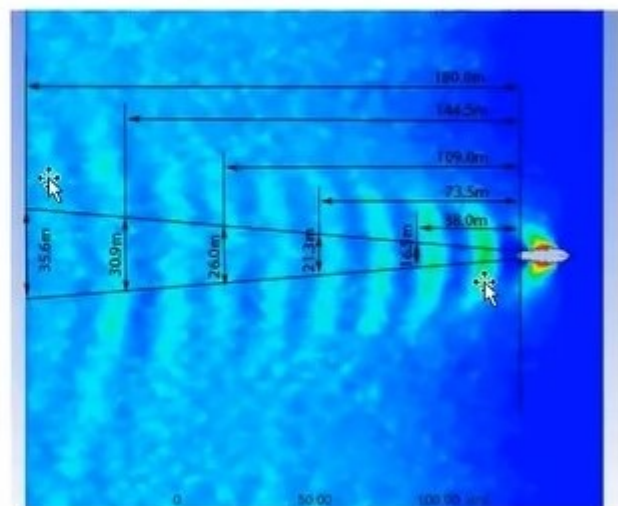
Figure 3.8 Estimation of the width of a ship using CFD analysis

Day 3   **28.06.2021, Wednesday**

Session 5   **10:00-12:00 Hrs.**

Marine Propulsion

Dr. Anirban Bhattacharyya
Assistant Professor, Department of Ocean Engineering and Naval Architecture, Indian Institute of Technology (IIT) Kharagpur, Kharagpur – 721 302.

Dr. Anirban Bhattacharyya, Assistant Professor, Department of Ocean Engineering and Naval Architecture, IIT Kharagpur, delivered an expert lecture on *Marine Propulsion*. In the field of naval architecture, the study of marine propulsion power calculations follows the study of ship resistance calculations. The contents of his lecture are about the following: (a) Introduction to marine propulsion, (b) Screw propeller geometry, (c) Propeller theories, (d) Propeller in open water, (e) Propeller behind ship hull, (f) Propulsion model tests, (g) Propeller design parameters, and (h) Different propulsor types. The propulsion system provides thrust for marine vessels to move at the desired speed. The most popular device used for marine propulsion is a screw propeller, as shown in Figure 5.1. Diesel engine is the most common machinery used for driving the propeller in ships.

Figure 5.1 Screw propeller

Figure 5.2 shows (i) parts, (ii) the nomenclature of a blade, and (iii) the operating conditions of a screw propeller. The parts of a screw propeller are (a) the propeller shaft, (b) the boss or hub, (c) the blades, and (d) the boss cap. The nomenclature of a screw propeller blade consists of (1) propeller axis, (2) face, (3) back, (4) tip, (5) leading edge, and (6) trailing edge. Figure 5.3 shows the nomenclature of

Propeller Geometry
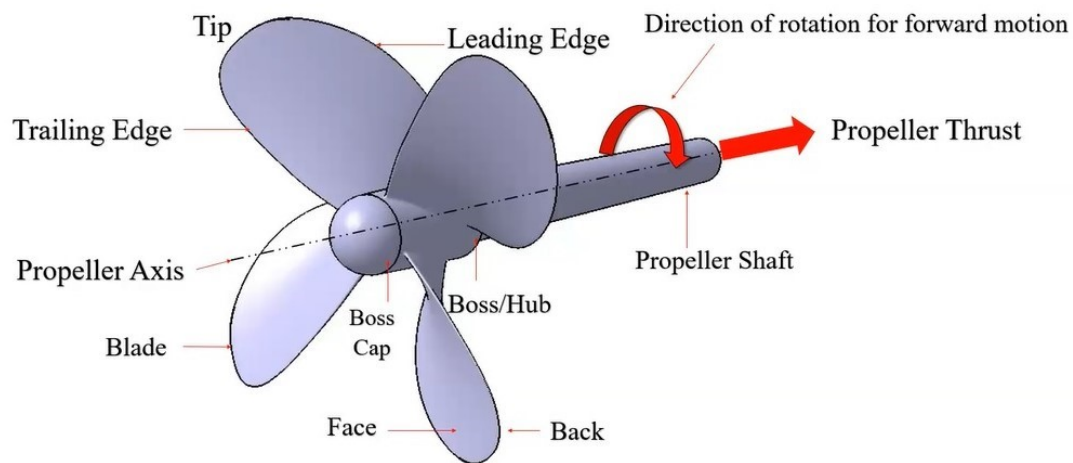
Figure 5.2 Screw propeller geometry and operating conditions

Blade Section
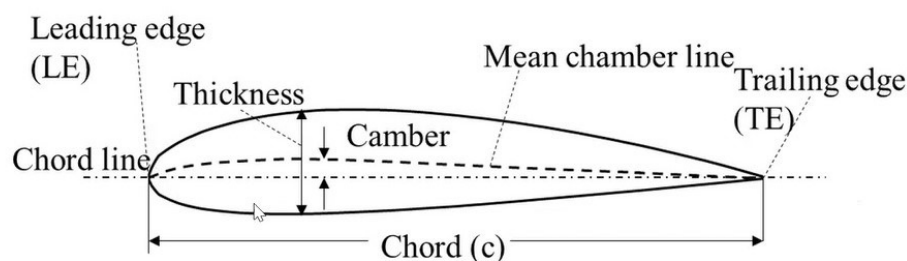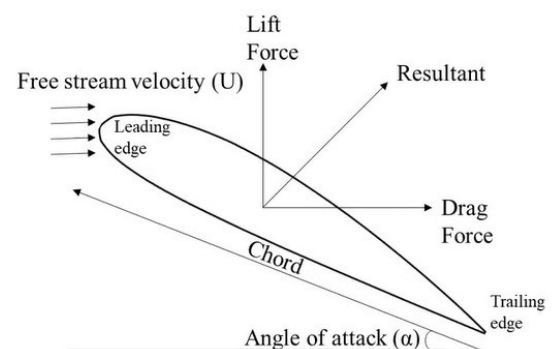
Figure 5.3 Nomenclature of a blade section of screw propeller geometry

a blade section of a screw propeller geometry where the following geometrical parameters can be identified: chord length of blade section, *c*, blade thickness distribution along the chord, and camber. A propeller is regarded as an actuator disc imparting sudden pressure increase to the fluid. The propeller produces thrust by inducing axial velocity uniformly over the disc without rotation of the slipstream. The propeller blade is regarded as a series of blade elements, each producing hydrodynamic forces
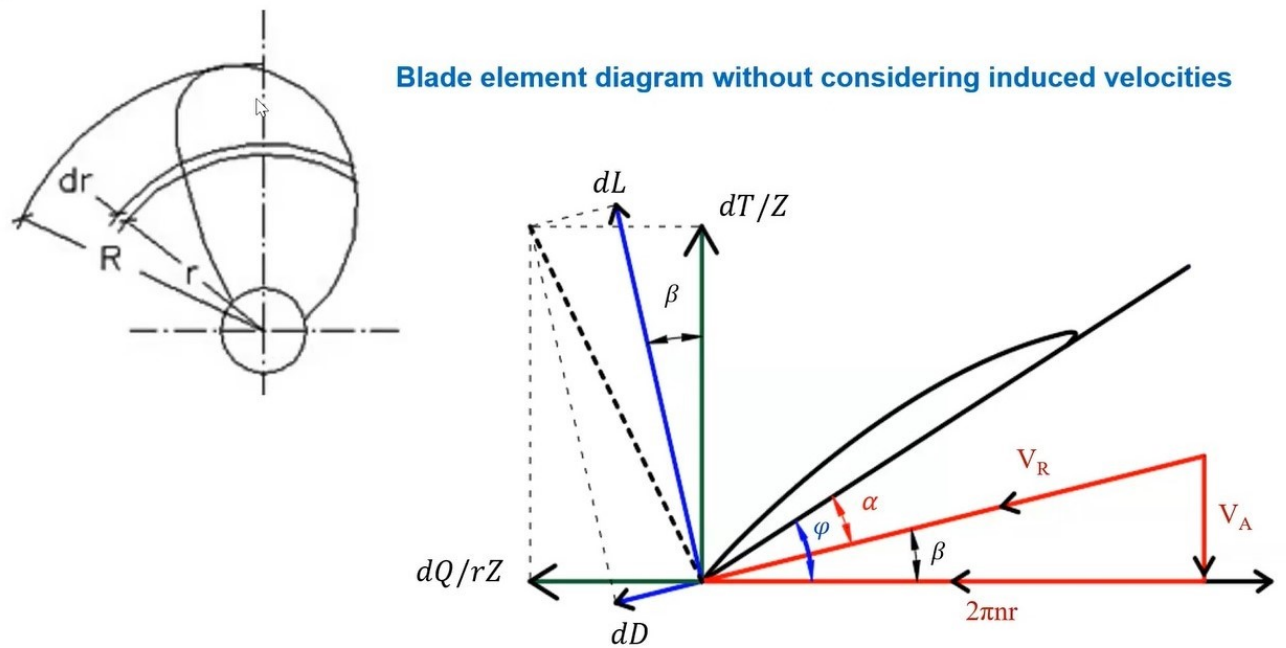
Figure 5.4 Screw propeller blade velocity and force diagrams

based on inflow conditions. The thrust of the propeller is obtained by the integration of elemental thrust at different radii (see Figure 5.4) for all blades. The following methods are used to compute the thrust of the propeller: lifting line and lifting surface methods, panel methods, and computational fluid dynamics approaches. Figure 5.4 shows the components of velocity and force for a blade section at a radius r from the propeller axis where propeller tip radius $= R$. In the velocity diagram, $V_A =$ forward velocity, $2\pi nr = V_T =$ tangential velocity, $V_R =$ resultant velocity, $n =$ rotational speed of propeller in revolutions per second, $\beta =$ hydrodynamic inflow angle and $\varphi =$ pitch angle. The angle of attack α of a blade section, at a radial location r from the propeller axis, is determined from β and φ, using velocity diagram. In the force diagram, $dD =$ elemental drag, $dL =$ elemental lift, $dT =$ elemental thrust, $dQ =$ elemental torque, and $Z =$ number of blades. dT and dQ of a blade section, at a radial location r from the propeller axis, is determined from dL, dD, α and β, using force diagram.

Design of a propeller involves determining the geometry of the propeller (i.e., c, blade thickness distribution along the chord, camber, φ, R, propeller hub radius, Z, etc.) for a set of given operating conditions such as velocity/circulation distribution. Analysis of a given propeller (i.e., the geometry of the propeller is known) involves determining the velocity and the pressure distributions. Using the velocity and the pressure distributions, the thrust and the torque characteristics can be arrived at.

Due to the very large size of ships, it is not possible to carry out full-scale experiments. Hence,

in naval architecture, ship model testing is done. i.e., The size of the ship is to be scaled down to make a model of the ship and the testing is done on this model. The model test results are extrapolated to estimate the performance of the full-scale ship. The size of a model is chosen based on the accessible testing facilities. The larger the size of the model chosen, the smaller will be the level of uncertainties when extrapolating the model test results to the full-scale ship. To get comparable results from full-scale ships, certain conditions are required to be satisfied. These conditions are known as laws of similarity. The following laws of similarity need to be satisfied for a model to be a better representation of the full-scale ship: geometric similarity, kinematic similarity, and dynamic similarity. For example, the geometric similarity is satisfied when $L_M / L_S = W_M / W_S = D_M / D_S$, where L = length, W = width, D = depth, $_M$ represents the model and $_S$ represents the ship (see Figure 5.5 for another example of geometric similarity). Similarly, when the ratios of velocity components of the model and ship are equal then the kinematic similarity is satisfied. From Figures 5.4 and 5.6, it is inferred that $\beta_M = \beta_S$ when kinematic similarity is satisfied with $V_{A,M} / V_{A,S} = V_{T,M} / V_{T,S}$. i.e., The advance coefficient of the ship and the advance coefficient of the model are the same. The advance coefficient of the ship is considered to be an important performance parameter. When the ratio of force components of the model and ship are equal then the dynamic similarity is satisfied.

Using the open water characteristics of a propeller, the thrust of the propeller at the bollard pull condition or any other operating condition can be determined. The performance of a propeller when it is installed behind the ship will be affected by the following factors. 1. Due to the wake generated by

Laws of Similarity   **Geometric Similarity**
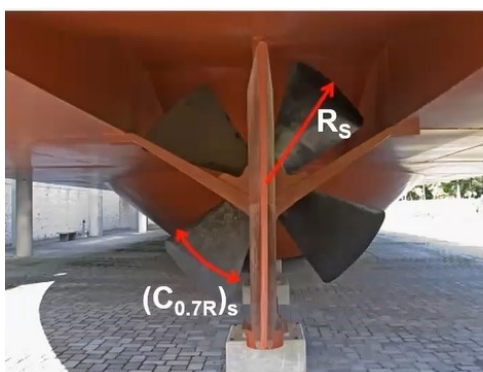
Ka-series Propeller
(Source: Wikimedia Commons)
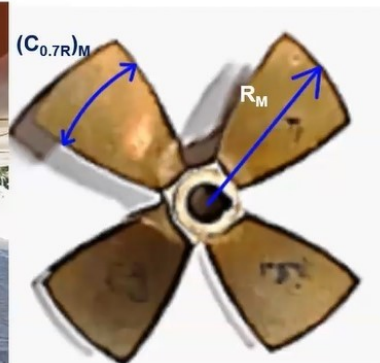
Ka-series Propeller Model.

$$\frac{D_S}{D_M} = \frac{(C_{0.7R})_S}{(C_{0.7R})_M} = Scale\ Ratio(\lambda)$$

Figure 5.5 Geometric similarity between a propeller model and a ship propeller

Blade element diagram of ship and model propellers, neglecting induced velocity
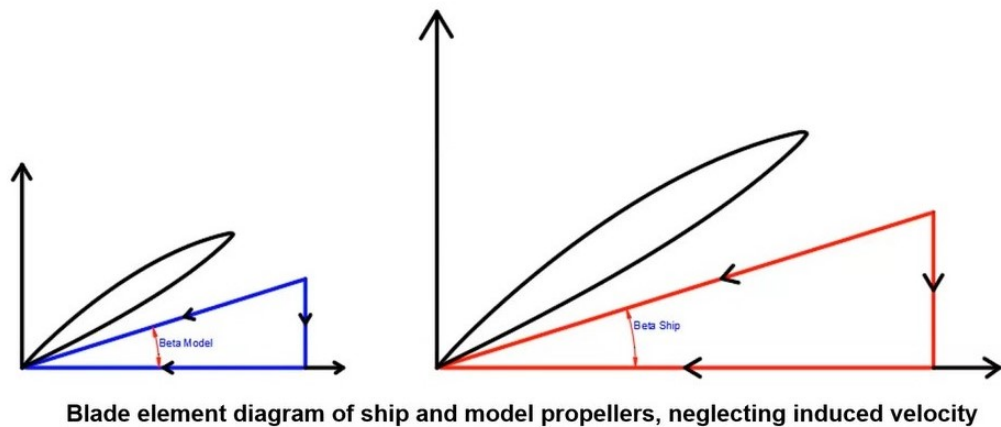
Figure 5.6 Kinematic similarity between a model propeller blade section and a blade section of a ship propeller

a ship, the inflow velocity into the propeller will be different compared to the ship speed. 2. Due to the propeller action, the water is accelerated at the stern. As a result, the resistance gets augmented and is now more compared to the bare hull resistance. The efficiency of a propeller working in uniform inflow (no ship or open water) and non-uniform inflows (behind a ship) are different.

An engine drives the propeller. A thrust bearing as shown in Figure 5.7 transmits the thrust from the propeller to the ship. A reduction gear is required when the speed of the engine differs from the speed of the propeller. In Figure 5.7, P_B = brake power of the engine, P_D = power delivered to the propeller, and P_E = effective power of the ship. For additional details, the reader is suggested to listen to the recordings of this session.
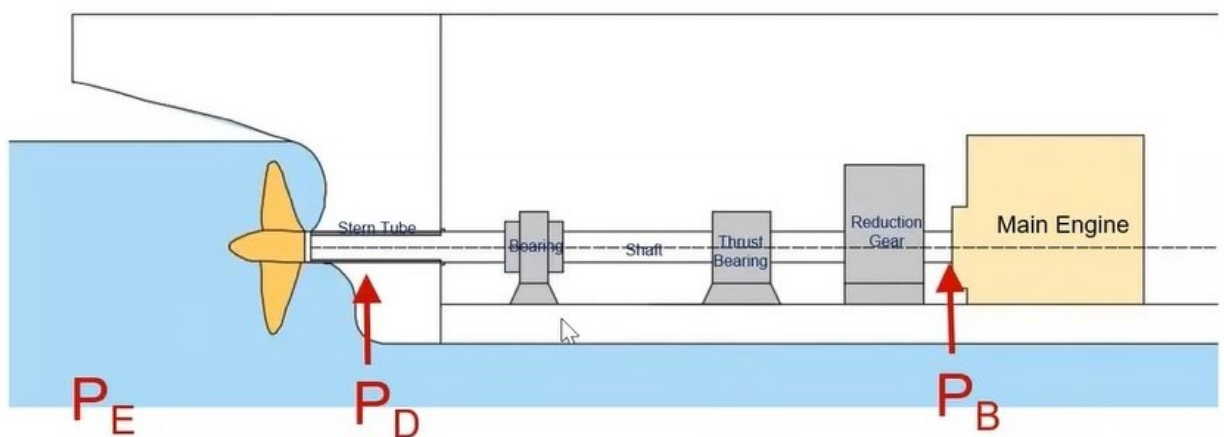
Figure 5.7 Power transmission from the engine to the propeller of a ship

Day 3   28.06.2021, Wednesday

Session 6   14:00-16:00 Hrs.

Optimize Ship Performance through Integrated Simulation

Dr. Om Prakash Sha
Professor, Department of Ocean Engineering and Naval Architecture, Indian Institute of Technology (IIT) Kharagpur, Kharagpur – 721 302.

Dr. Om Prakash Sha, Professor, Department of Ocean Engineering and Naval Architecture, IIT Kharagpur, delivered an expert lecture on *Optimize Ship Performance through Integrated Simulation*. The contents of his lecture are an introduction, concept design, resistance and hull form, associative geometric modelling techniques, parametric modelling using CAESES®, case study 1 – fully parametric model – fast hull form design, case study 2 – partial parametric model – asymmetric stern design, case study 3 – bulbous bow optimization, case study 4 – bow form design, and conclusions.
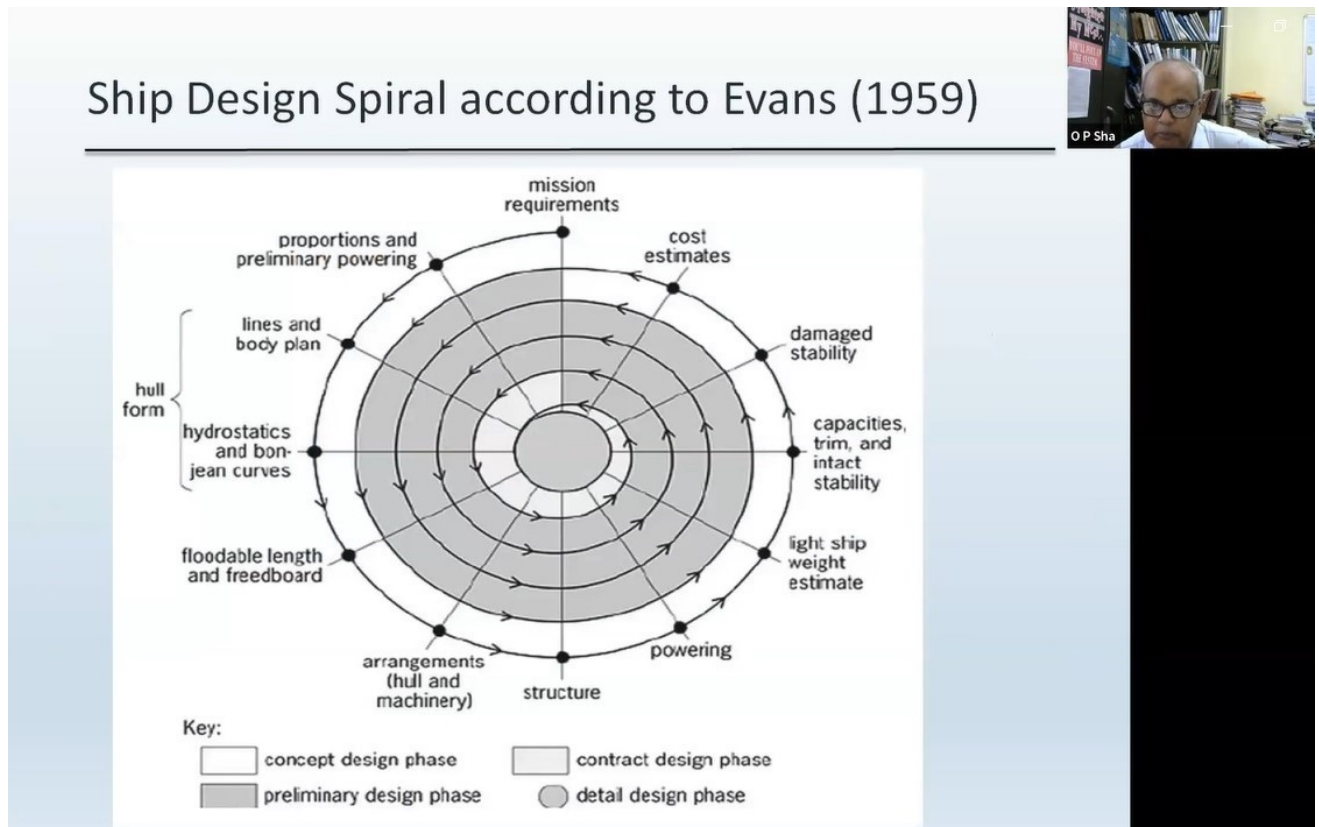
Figure 6.1 Ship design spiral

In the past, the design of a ship was dependent on intuitive reasoning from previous knowledge and experience of a naval architect. The design process was carried out through iterative trials and errors. Design optimization was done by selecting the best design out of a few feasible solutions. This

design process was illustrated as a ship design spiral (see Figure 6.1).

Since (i) there is an ever-changing nature of seaborne trade, (ii) a naval architect needs to adapt to new safety regulations laid down by Indian Maritime Organization (IMO), and (iii) a naval architect needs to adapt to increased energy awareness such as energy efficiency design index (EEDI), there is a need for holistic, efficient, and easy to use ship design procedures and software systems. Figure 6.2 shows the measures taken by IMO towards increasing energy efficiency and decreasing greenhouse gas emissions. See Figure 6.3 to know more details about EEDI. During the conceptual design phase, the following activities take place: computer-aided engineering (CAE), computer-aided design (CAD), computational fluid dynamics (CFD), and optimization. During the concept design stage, the main dimensions of a ship (see Figure 6.4) such as beam, length, and draft are arrived at. These dimensions should satisfy the conflicting design optimization requirements of a maximum capacity of cargo, minimum weight of the ship, maximum speed of the ship, and minimum installed power in the ship. Figure 6.5 shows the activities in the concept design phase of modern naval architecture.

Figure 6.2 Measures taken by IMO to increase energy efficiency and reduce GHG

Figure 6.3 Concept design phase at modern Naval architecture
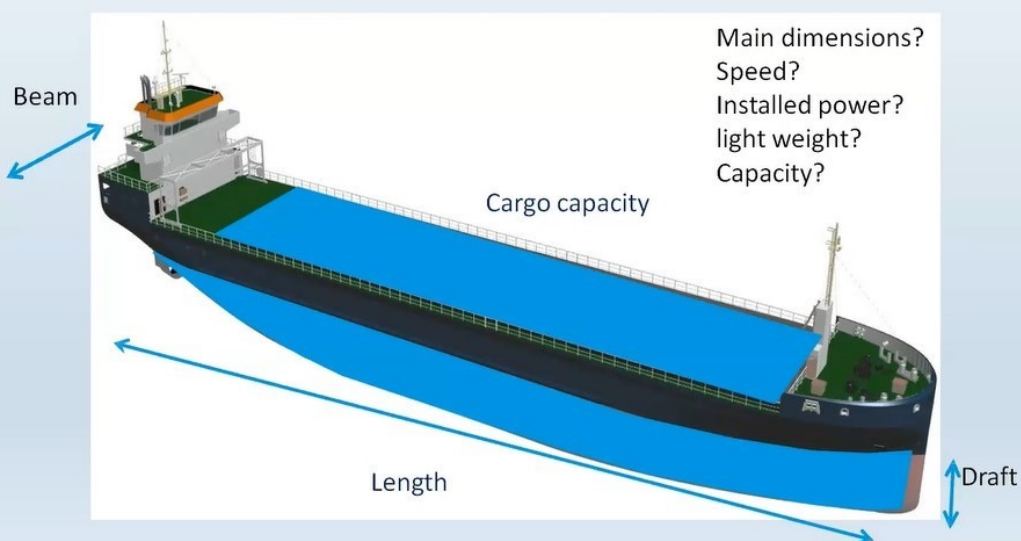
Figure 6.4 Concept design phase
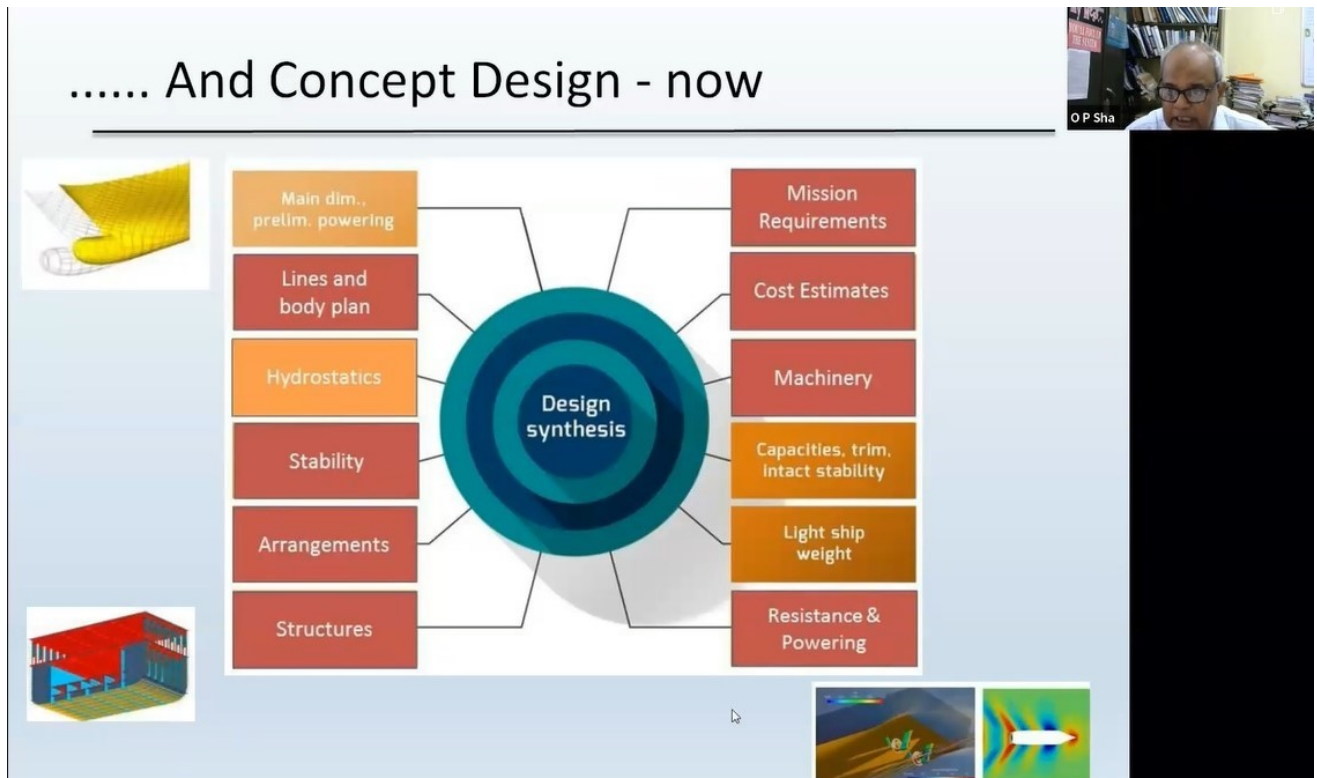
Figure 6.5 Concept design phase in modern naval architecture

In building a new ship, the hull form development must be considered carefully at the design stage. The hull form is set to minimize resistance / delivered power within the limits set by the ship's intended operation. Wave-making resistance is a more important parameter where the ship has a high speed-length ratio (Froude number). Therefore, the smaller and faster a ship is, the more critical the hull design is to achieve fuel savings. In addition to optimizing hull form, the hull-propeller-rudder interaction should also be examined and the propeller wake field optimized. i.e., The selection of the propeller and development of the hull shape should be done simultaneously. Associative geometric modelling ensures that when some elements in the model are changed, the generative relationship updates the related elements. In ship design, the potential of gaining a benefit by changing the hull form is highest when undertaken early in the process at the concept design stage. One of the types of associative geometric modelling is parametric modelling. In fully-parametric modeling, the entire shape is defined using parameters. In a partially-parametric modeling, an initial shape is taken and changes are defined by parameters that then modify the initial shape. For further details regarding fully parametric modelling using Computer Aided Engineering System Empowering Simulation (CAESES, see Figures 6.6 and 6.7), the reader is suggested to listen to the recordings of this session.
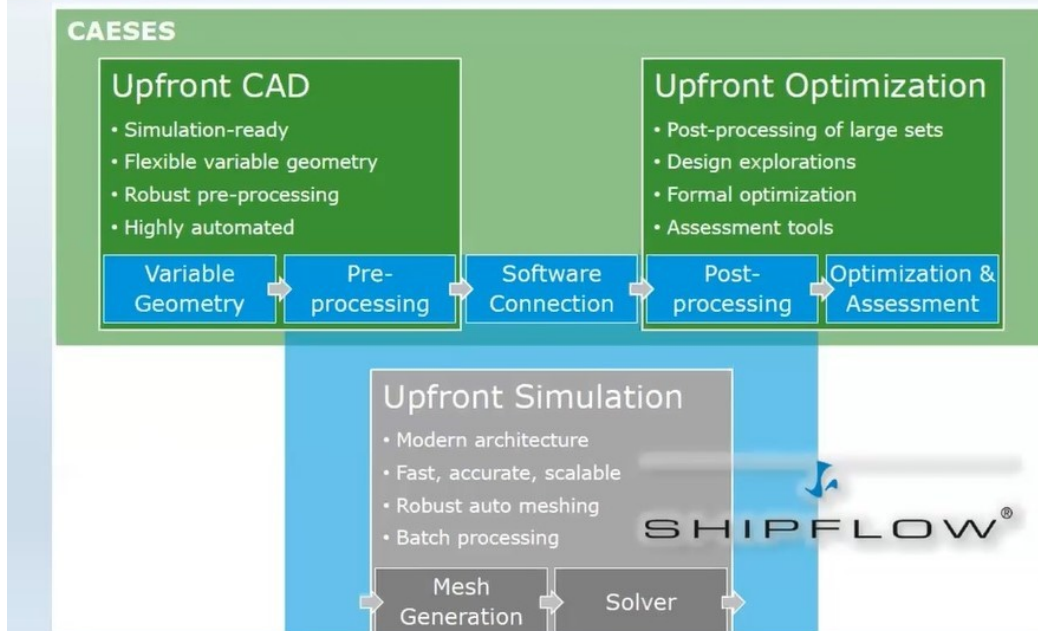
Figure 6.6 Computer-Aided Engineering System Empowering Simulation (CAESES)
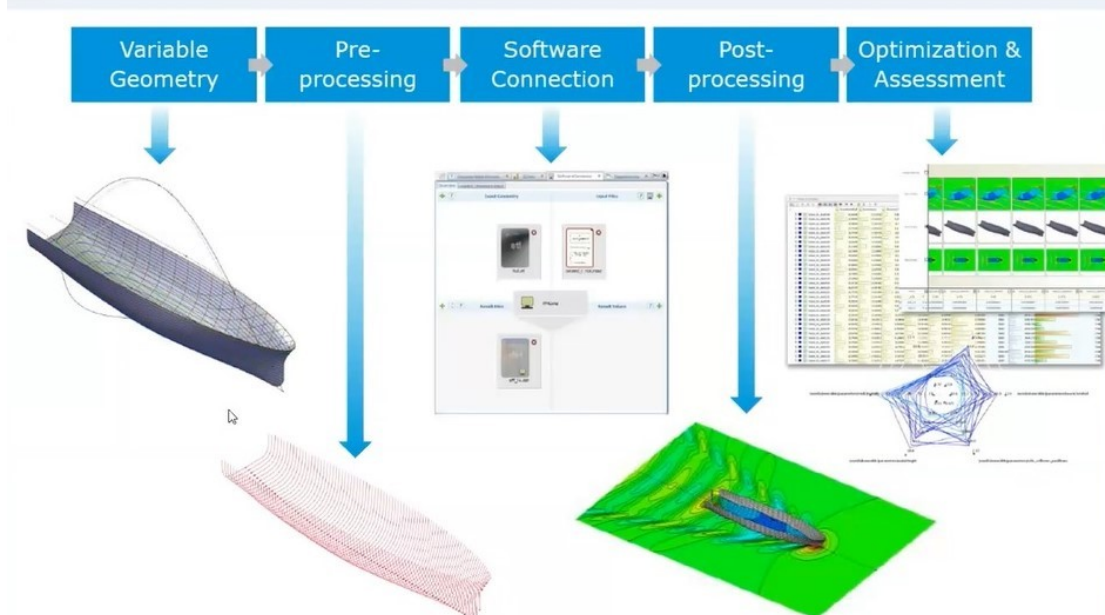
Figure 6.7 Process workflow in CAESES

Day 4   **29.06.2021, Thursday**

Session 7   **10:00-12:00 Hrs.**

Ship Intact and Damage Stability: Recent Developments

Dr. Vishwanath Nagarajan
Professor and Head, Department of Ocean Engineering and Naval Architecture, Indian Institute of Technology (IIT) Kharagpur, Kharagpur – 721 302.

Dr. Vishwanath Nagarajan, Professor and Head, Department of Ocean Engineering and Naval Architecture, IIT Kharagpur, delivered an expert lecture on *Ship Intact and Damage Stability: Recent Developments*. In the field of ship building, it is mandatory to carry out testing of a ship model to ensure that all the statutory regulations are complied with by the design. The station markings are done on a model ship as shown in the top left-hand side corner of Figure 7.1. There are two sets of propellers and rudders in the model ship as shown in the bottom right-hand side corner of Figure 7.1. The sheer plan, body plan, and half-breadth plan define the complete shape of the ship. These plans are shown in Figure 7.2. The ship's intact / damage stability is influenced by the geometric characteristics of this volume.

Figure 7.1 A model ship

Figure 7.2 Lines plan of a ship

Figure 7.3 Sections of a ship in different planes

Whereas Figure 7.2 shows the exterior details of a ship, Figure 7.3 shows the interior details of the ship. The sections of a ship in the transverse plane, middle line plane, and water plane dictate the hydrodynamic characteristics of a ship. Figure 7.4 shows the nomenclature of a ship. The forward end of the hull of a ship is known as the stem and the rearward end of the hull is called as stern. As seen from the stern side, the left side of the hull is known as a port and the right side of the hull is known as starboard. The top side and the bottom side of the hull are called deck and keel respectively. As shown in Figure 7.5, forward sheer is greater than after sheer to drain the water that enters by waves onto the deck.

For a stationary loaded ship in calm water conditions, the gross weight of the ship (i.e., the sum of tare weight and the cargo weight) is balanced by the buoyant force, which is the weight of water whose volume is equal to the volume of the draught portion (submerged portion, see Figure 7.6) of the ship. When the loaded ship moves in wavy water conditions, the gross weight of the ship is balanced
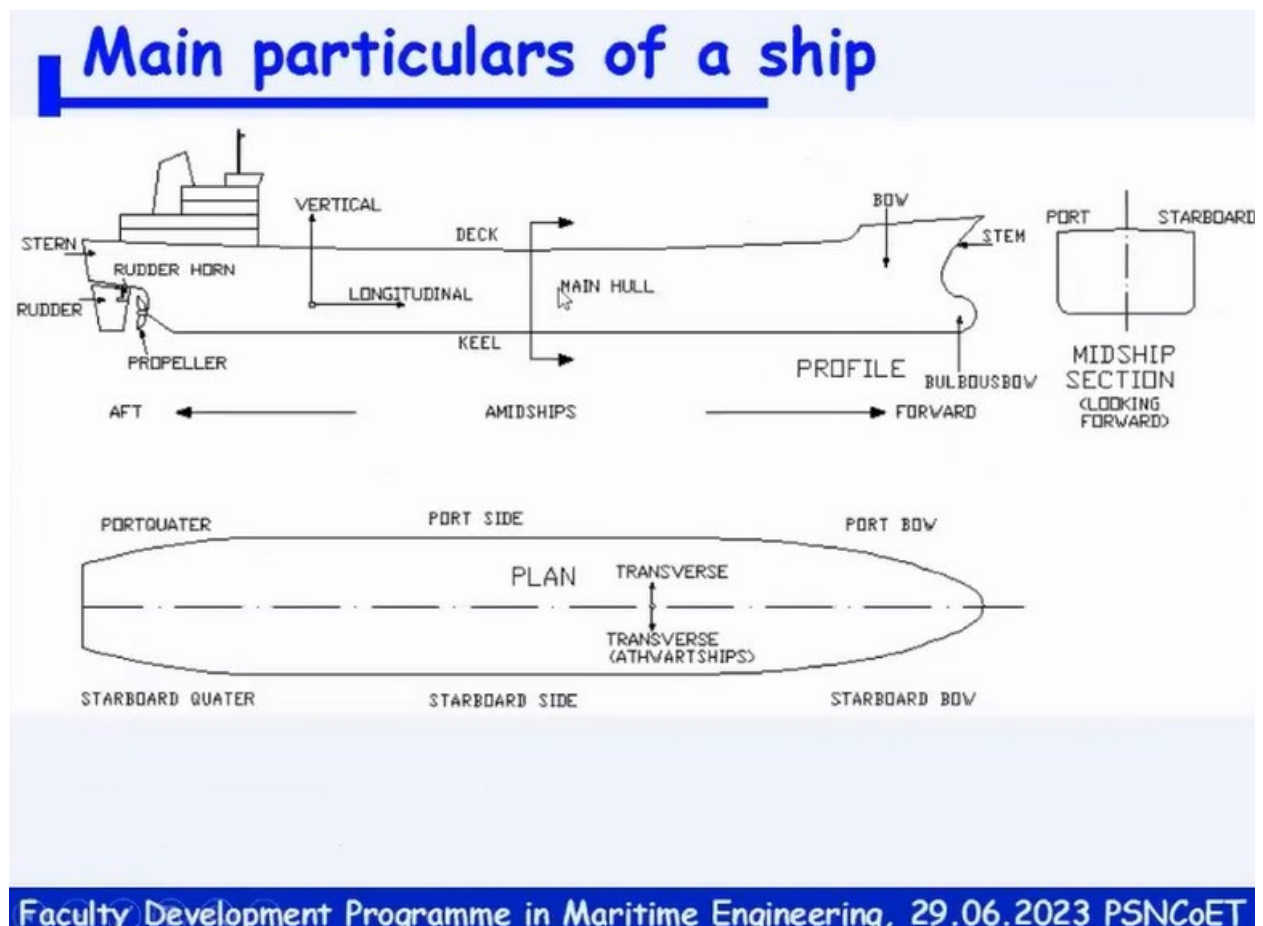
Figure 7.4 Nomenclature of a ship
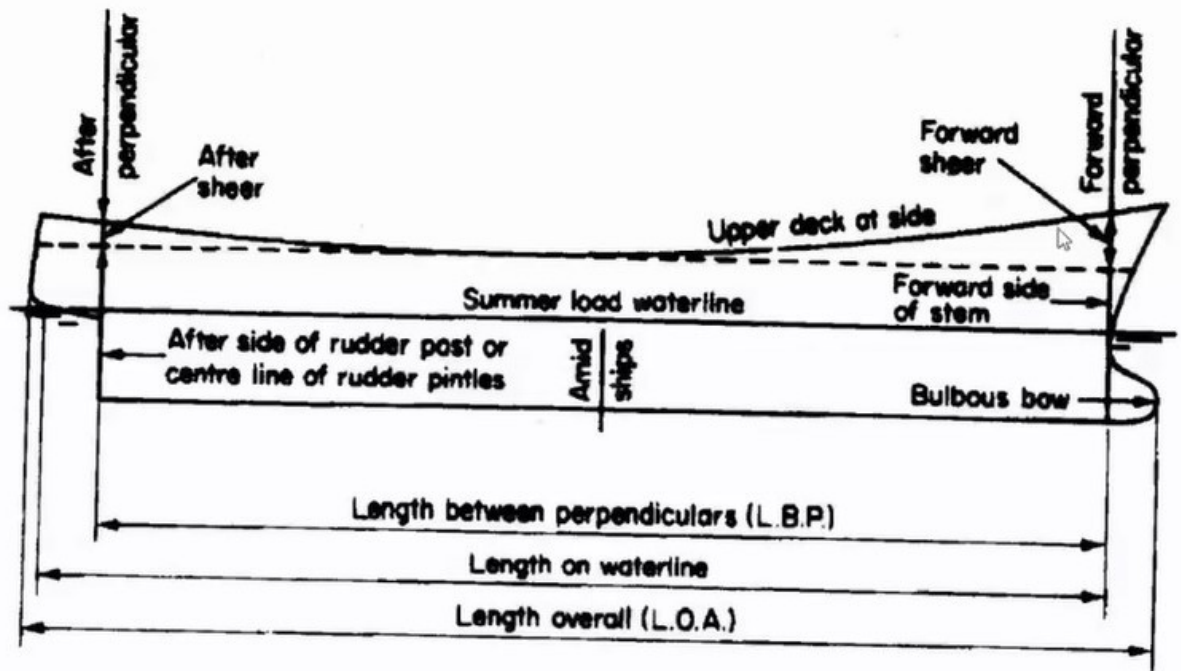
Figure 7.5 Nomenclature of a ship
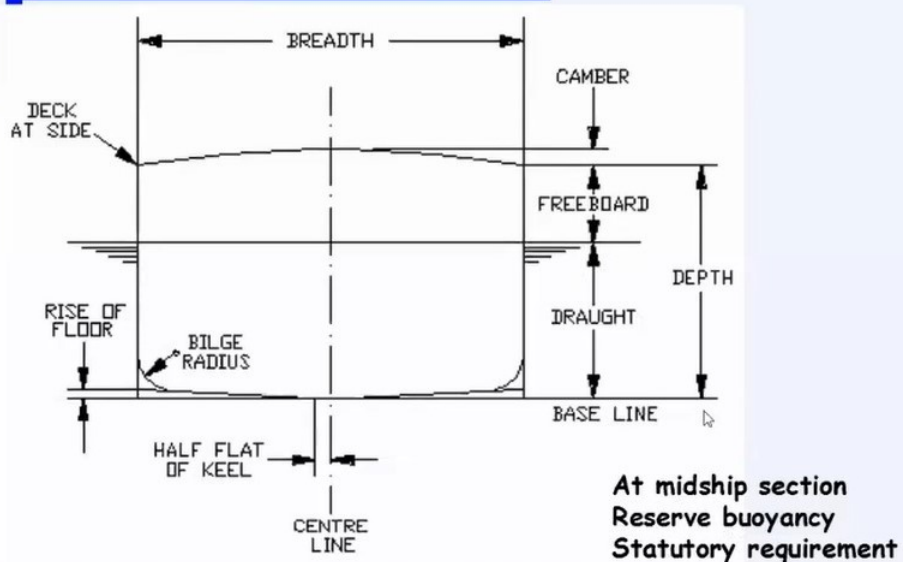
Figure 7.6 Necessity of a freeboard in the hull of a ship

by an additional variable buoyant force due to the variable weight of water displaced by the hull whose maximum volume is equal to the volume of the freeboard portion (the portion of the hull above the free surface of the water) of the ship. Thus, the freeboard portion of the hull provides a reserve buoyancy to maintain the upright position of the ship (i.e., stability) under dynamic wave conditions where the position of the waterline changes. Thus, the freeboard is a statutory requirement in the hull design.

An angle of repose, which is smaller than the angle of repose of the cargo material, is provided in the bulkhead (interior upper side of the shell) of a bulk carrier to prevent the formation of air gaps. Formation of air gaps alters the buoyancy force and leads to the instability of the ship. A double bottom in the shell of a bulk carrier ship is provided to prevent instability of the ship during the grounding of the ship. Longitudinal bulkheads are provided in oil tankers to safeguard against the instability of the ship caused by the violent sloshing of oil and its consequent free surface effect. In a container ship, the corner casting method of loading is followed as against the methods of uniform loading in the bulk carrier and oil tanker ships. Spherical gas carriers are used to minimize the heat gain (for example to maintain the liquified natural gas at low temperature) and to maximize the volume for a given surface area. Membrane tanks are more efficient in underwater volume utilization than spherical tanks.

The International Maritime Organization (IMO) is currently in the process of developing performance-based criteria (intact stability criteria) for assessing the following dynamic stability failure modes in waves: dead ship condition, excessive acceleration, pure loss of stability, parametric rolling, and surf-riding/broaching. The physics for these stability failure modes need to be well understood and the evaluation methods need to be developed.

The damage stability criterion stipulates that for a certain extent of damage, the ship should remain stable. There are two methods of damage stability calculations: 1. Deterministic method and 2. Probabilistic method. In any cargo tank that is in the damaged location, the entire oil/gas of that tank is assumed to flow out into the sea. This means that the location of center of gravity (CG) is changed after damage. The new location of CG is computed for stable operation of the ship in damaged condition. An oil tanker ship of more than 225 m in length should be assumed to sustain damage anywhere in its length whereas a gas carrier ship of more than 150 m in length should be assumed to sustain damage anywhere in its length. This shows that the lightship longitudinal centre of gravity of a gas carrier is relatively forward as compared to that of an oil tanker of the same length. For more details of stability requirements in the intact condition as well as the damaged condition of a ship, it is suggested to listen to the recordings of this session.

Day 4   **29.06.2021, Thursday**

Session 8   **14:00-16:00 Hrs.**

Theoretical and Experimental Perspectives on Structural Dynamics with Application to Ships and Floating Structures

Dr. Kiran Vijayan
Assistant Professor, Department of Ocean Engineering and Naval Architecture, Indian Institute of Technology (IIT) Kharagpur, Kharagpur – 721 302.

Dr. Kiran Vijayan, Assistant Professor, Department of Ocean Engineering and Naval Architecture, IIT Kharagpur, delivered an expert lecture on *Theoretical and Experimental Perspectives on Structural Dynamics with Application to Ships and Floating Structures*. Hammer, shaker, and ambient are actuators which excite a vibration system. Vibrations are measured either by a contact type of device such as an accelerometer or by a non-contact type of device such as a LASER vibrometer. Figure 8.1 shows a modal test setup (a stiffened plate suspended by strings at both of its ends) where an impact hammer is used to excite the system and an accelerometer is used to measure the vibration. The force sensor is fixed to the impact hammer to measure the excitation force. Ocean waves that cause the vibration of an offshore structure are an example of an ambient actuator. A LASER vibrometer uses the Doppler shift in the reflected light to measure the velocity.
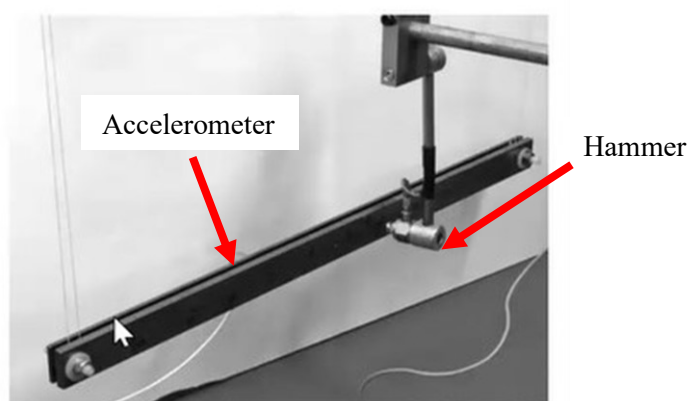
Figure 8.1 Modal test setup

The following modal parameters are tested: natural frequency, damping, mode shapes, and transfer function. These parameters are the measures of vibration. Figure 8.2 shows the modal testing procedure. Impulse excitation force ($F(t)$) of the impact hammer, measured by the force sensor for time t, and acceleration response ($X(t)$) of the stiffened plate, measured by the accelerometer are fed through a data acquisition system (DAQ) into a computer. The Fourier transforms (FFT) of $F(t)$ and $X(t)$ are computed. A frequency response function (FRF, $H(i\omega)$) is arrived at. $H(i\omega)$ is the ratio of
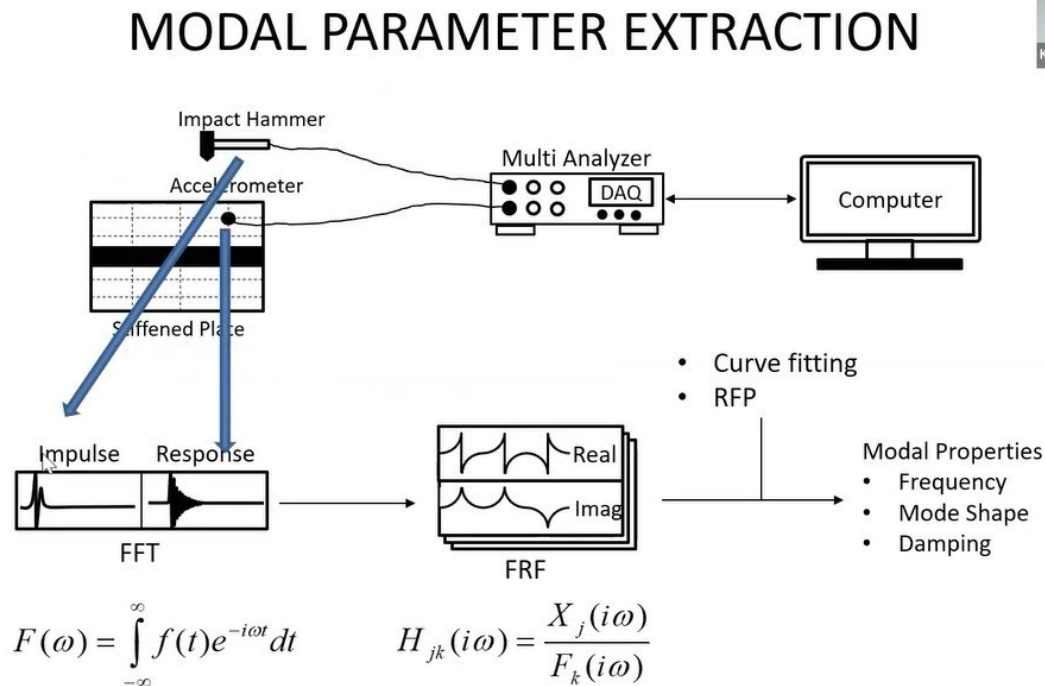
Figure 8.2 Modal testing procedure

$X(i\omega)$ and $F(i\omega)$ where $X(i\omega)$ and $F(i\omega)$ are the FFT of $X(t)$ and $F(t)$, respectively. Figure 8.3 shows the FRF or accelerance versus frequency. The points of frequency at which the accelerance is maximum are known as natural frequencies. These peak points are indicated by blue-colored circles. The vibration measurements are done to monitor the health of a structural system. The results of vibration measurements are used to validate the vibration theory. Also, the damping parameters of a structural system can be measured. Vibration measurements can be used for passive control and active control of a system.

A test rig for measuring vibration is shown in Figures 8.4 and 8.5. The rotor consists of a shaft with discs 1 and 2. Discs 1 and 2 have slotted holes at various radii for varying the unbalance in the rotor. The rotor is supported on bearings 1 and 2. An electric motor drives the rotor using a flexible coupling. An accelerometer measures the vibrations in bearing 1.

When the rotational direction of the rotor and the orbiting direction of the center of gravity (CG) of the rotor are the same, it is said that a forward whirl occurs (see Figure 8.6). If the direction of rotation of the rotor and the direction of orbital motion of the CG of the rotor are opposite then a backward whirl is said to occur.

FRF (Accelerance)
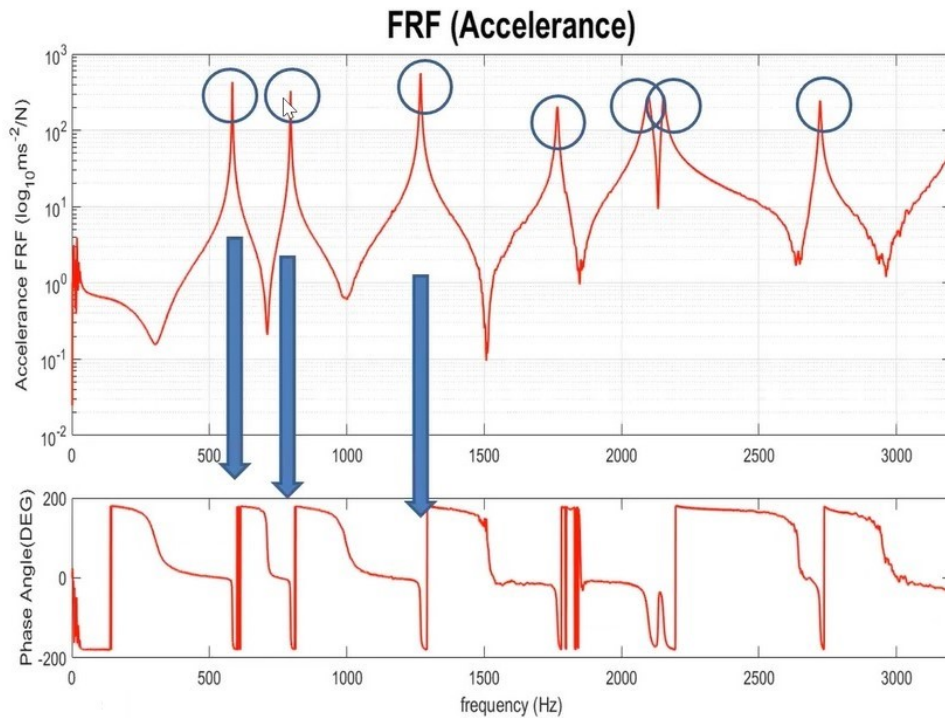
Figure 8.3 Frequency response function

Research problem
Understand instability due to modal interaction
in rotating structure like propeller shaft.
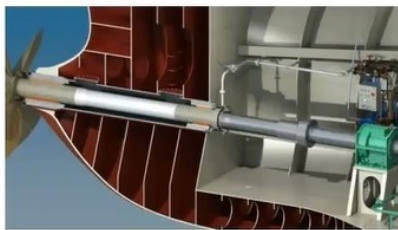
Test rig of shaft supported on hydrodynamic bearing

Figure 8.4 Test rig for measuring the frequency response function

Figure 8.7 shows the mathematical model of the conceptual rotor bearing system shown in Figures 8.4 and 8.5. The unbalanced masses in discs 1 and 2, m_1 and m_2, are the constituents of **M**.

Conceptual model
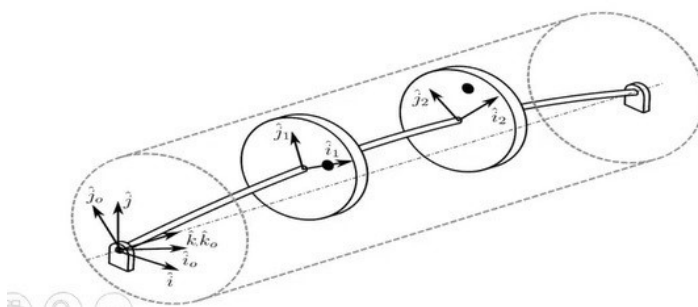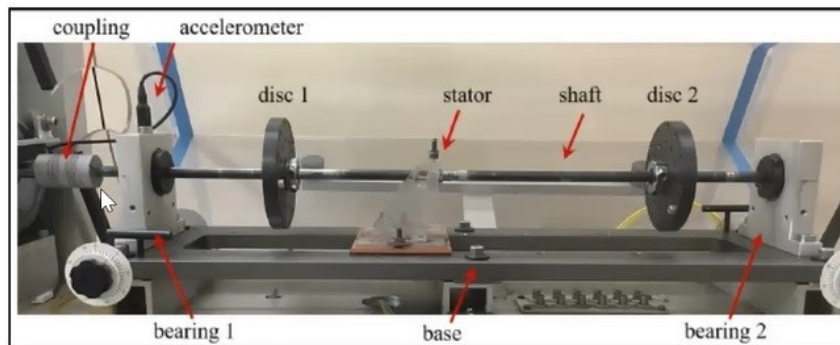
Figure 8.5 Test rig is a conceptual model of a ship propeller

Observed phenomenon in Rotor

Forward whirl   Intermittent whirl   Backward whirl
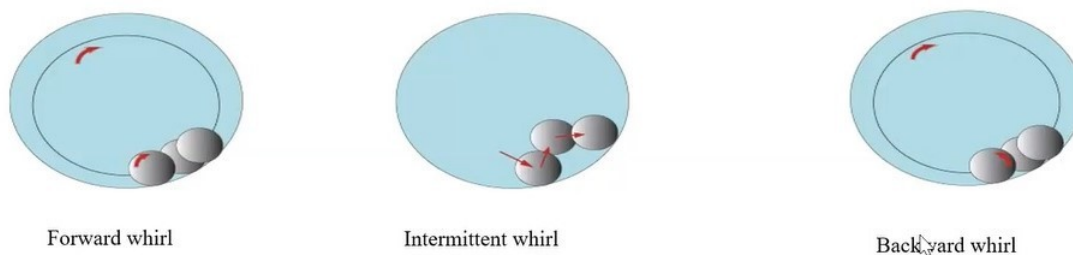
Figure 8.6 Rotor whirls

The stiffness coefficients of bearing 1 along x and y coordinates are $K_{1,x}$ and $K_{1,y}$, respectively. Similarly, the stiffness coefficients of bearing 2 along x and y coordinates are $K_{2,x}$ and $K_{2,y}$, respectively.
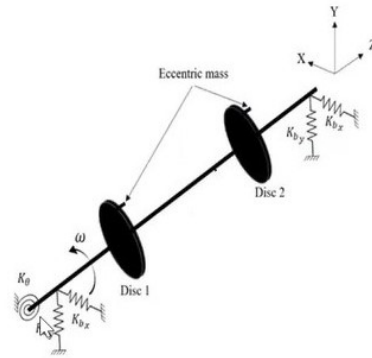
where M, C, G, K are the mass, damping, gyroscopic, stiffness matrix respectively, F is the force vector and Ω is the rotational speed.

Figure 8.7 Mathematical model of rotor bearing system

These four stiffness coefficients form the constituents of **K**. Similarly, damping coefficient **C** can be arrived at. Using **M**, **K**, **C**, gyroscopic constant **G**, angular velocity **Ω**, force **F**, and displacement **X**, the following mathematical model of the conceptual rotor bearing system is arrived at: $\mathbf{M\ddot{X} + (C - \Omega G)\dot{X} + KX = F}$. By solving the mathematical model, the frequency of response ν corresponding to each angular velocity ω can be computed. A diagram of ν versus ω is plotted as shown below. This diagram is called the Campbell diagram. The red line corresponds to the forward whirl and the green line corresponds to the backward whirl. A synchronous frequency (ν versus ω) line (shown in blue) is drawn. The points of intersection of the blue line with the green line and red line indicate the critical speeds at backward whirl condition and forward whirl condition, respectively. For further details, the reader is suggested to listen to the recordings of this session.
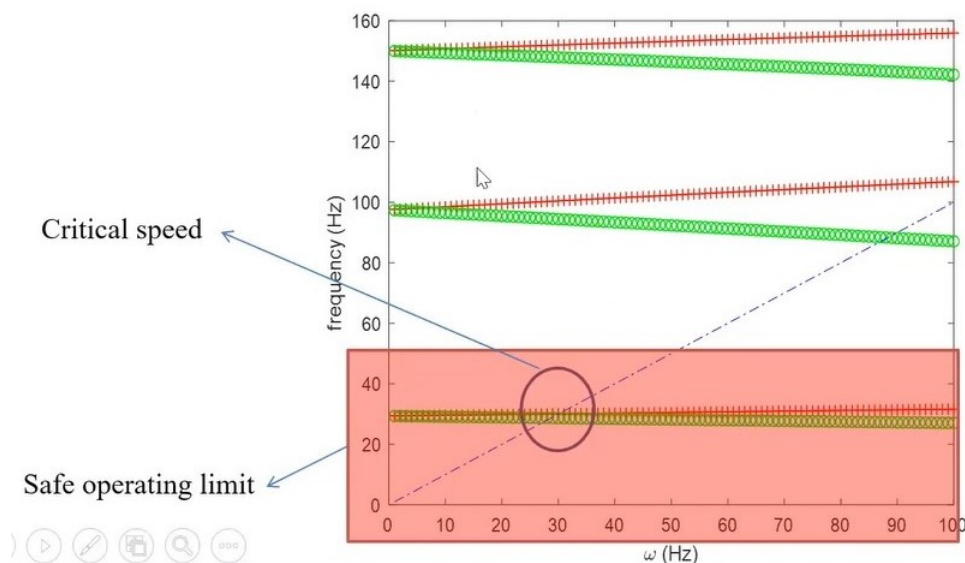
Figure 8.8 Campbell diagram of rotor bearing system

Day 5   **30.06.2021, Friday**

Session 10   **14:00-16:00 Hrs.**

Recent Advances in Drag Reduction

Dr. Rajiv Sharma
Professor, Department of Ocean Engineering, Indian Institute of Technology (IIT) Madras, Chennai – 600 036.

Dr. Rajiv Sharma, Professor, Department of Ocean Engineering, IIT Madras, delivered an expert lecture on *Recent Advances in Drag Reduction*. Aerodynamics is the study of the properties of moving air and the interaction between the air and solid bodies moving through it. The forces that are generated over a body moving in a viscous air are aerodynamic forces. All bodies that are moving in the air experience aerodynamic forces. Aerodynamics has played an important role in car racing since the late 1960s when the introduction of the first inverted wings appeared in some formulas. After that time, improved wing systems taken from the aeronautic technology made leaps forward, improving consistently lap times, increasing cornering speeds and vehicle stability. With the introduction of the ground effect a few years later, the vehicles used a third element (the underbody) to produce downforce, and hence improve the performances. For stable operation of a ship, the distance between the center of buoyancy and the center of gravity is to be minimized. Figure 10.1 shows the aerodynamic forces on a car. The term downforce describes the downward pressure created by the aerodynamic characteristics of a car that allows it to travel faster through a corner by holding the car to the track or
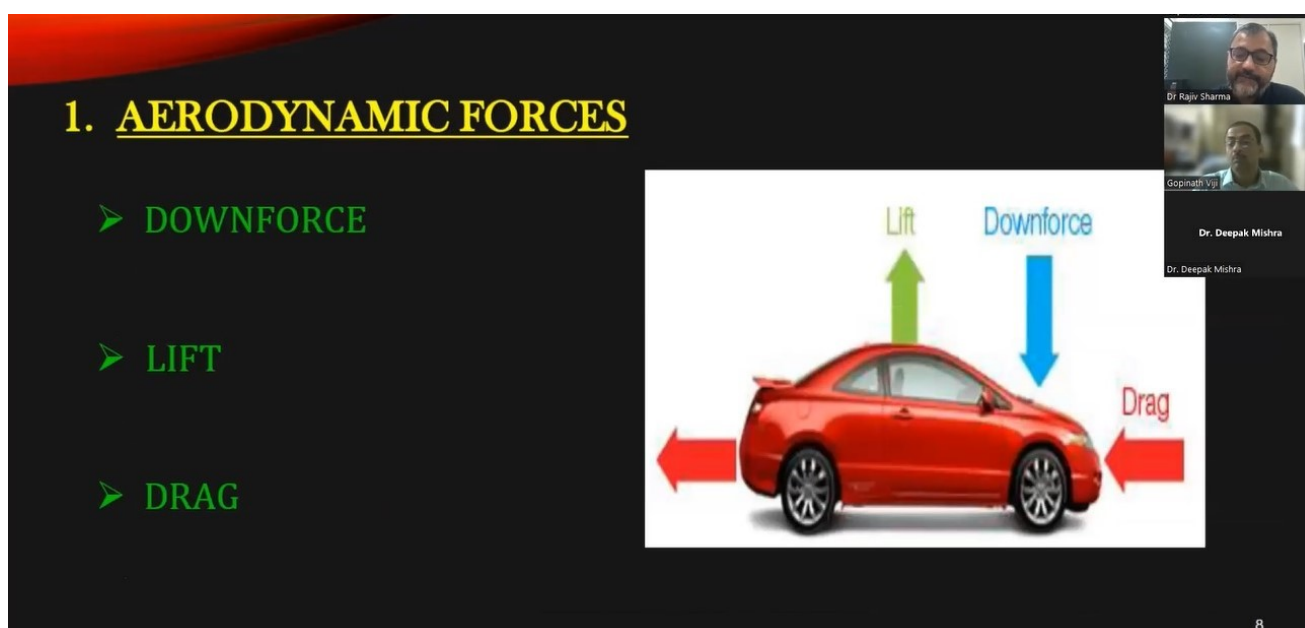
Figure 10.1 Aerodynamic forces

road surface. It is a force which arises due to the airflow over and below the car, which acts vertically downward on the car. Also, it increases friction between the tires and the road surface. Thus, it decreases maximum velocity. The various aerodynamic designs on a car to increase the downforce are shown in Figure 10.2. Lift is the upward force that acts on the car, generating the tendency to lift the
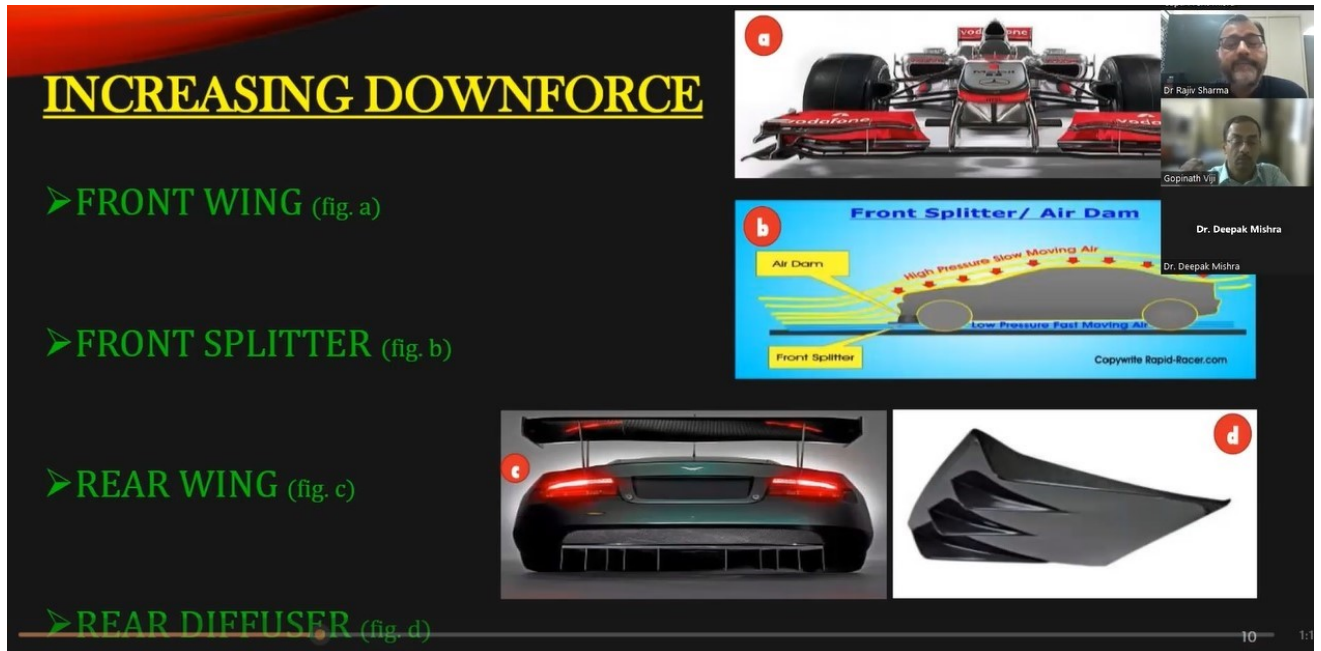
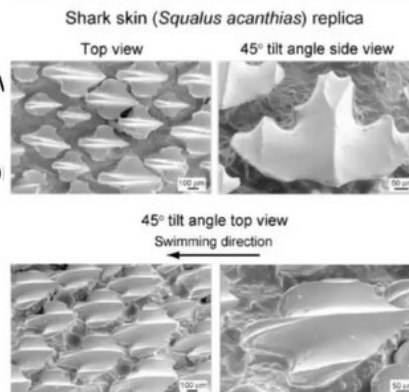

Figure 10.2 Aerodynamic designs in a car to increase the downward force

Figure 10.3 Effects of lift on a car

car from the road. See the effects of lift on the car in Figure 10.3. Drag is the air resistance that is caused by the movement of the car. Drag reduces the speed of the car. The drag can be reduced by streamlining the body and reducing the coefficients of drag (C_d). $C_d = 2D / (A\rho V^2)$ where D = drag in N, A = surface area in m^2, ρ = density of air in kg m^{-3}, and V = velocity of the body in m s^{-1}. D can be reduced by: 1. reducing C_d, 2. reducing A, 3. reducing ρ, and 4. reducing V.

Figure 10.4 Micro-structured surface of the body of a shark skin
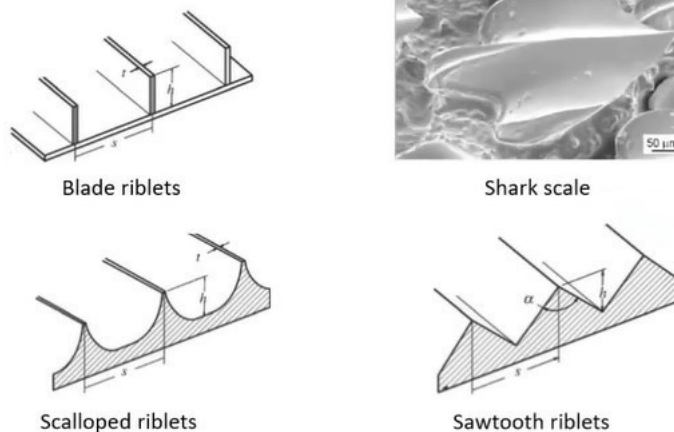
Figure 10.5 Riblet geometries

In nature, the surface of the body of a fish has micro-structured scales which aid in reducing the drag. See Figure 10.4 where the micro-structured surface of the body of shark skin is shown. Figure 10.5 shows the riblet geometries. Riblets are grooves aligned with the flow to reduce the drag. The geometries of riblet were derived from the nature of the surface of a shark body. Riblets reduce streamwise vortices. Vinyl-film riblets are implemented in racing yachts.

Figure 10.6 Superhydrophobic surfaces

The following techniques have been tried to reduce the drag on a ship: polymer injection, large eddy breakup devices, superhydrophobic surfaces, and air lubrication. The concept of superhydrophobic surfaces (see Figure 10.6) has been derived from the nature of the surface in microscale and nanoscale of a lotus leaf. Superhydrophobic surfaces are manufactured using micro- and nano-structures. There is a significant reduction in drag over a few microns slip length of superhydrophobic surfaces.

Figure 10.7 shows a drag reduction technique known as air lubrication. The objective is to introduce an air layer between the bottom of the ship hull and the top surface of the water in the ocean. Air can be introduced either as bubbles, a gas, or a gas cavity. Experimental results using the gas cavity drag reduction technique show that there is a 95% drag reduction over the cavity extent. In the air layer drag reduction (ALDR) technique, the air layer thickness is smaller than the boundary layer thickness. The ALDR technique is cost-effective for ships with flat bottom sides.
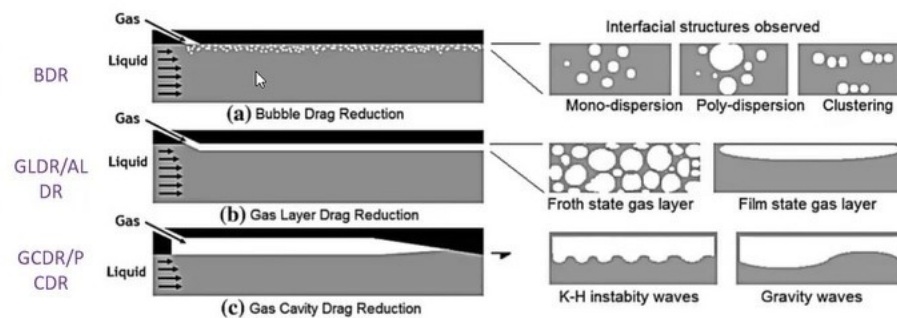
Figure 10.7 Air lubrication
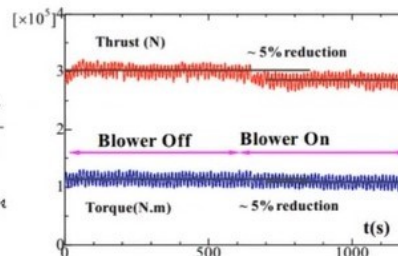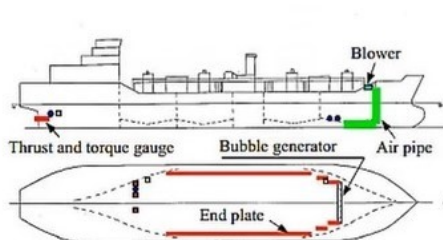
Figure 10.8 Full-scale tests using air lubrication

Figure 10.8 shows the results of full-scale air lubrication tests carried out on a ship having 120 m length, 21.4 m breadth, 4 m draft, and 12.4 kt speed. Tests under ballast conditions show that there is a drag reduction of 11% and a drag reduction of 6% under full-load conditions. Hence, there are energy savings of 7% and 4% under ballast conditions and full-load conditions respectively. For further details on ship drag reduction techniques, the writer suggests the reader listen to the recordings of this session.

Analysis of Feedback Received from FDP Participants

The Virtual Faculty Development Programme (FDP) on Maritime Engineering was conducted for one week from 26th June 2023 to 02nd July 2023. About 60 candidates from various institutions all over India registered for FDP. Feedbacks were received from twenty-six participants of FDP. An analysis of feedback received from the participants was done based on the following four heads: 1. Objectives and Contents of FDP, 2. Coordination and Faculty of FDP, 3. Suggestions for improving the course, and 4. Any other comments? In each of the heads 1 and 2, the following five levels of performance were chosen: Excellent-5, Very Good-4, Good-3, Fair-2, and Unsatisfactory-1.

Under the head 1, the following criteria were included:

(1.1) How well did the programme meet your expectations?

(1.2) How well were the stated objectives of the course achieved?

(1.3) Depth of coverage

(1.4) Pace of programme

(1.5) Overall usefulness of the course

Under the head 2, the following criteria were included:

(2.1) Presentation skill

(2.2) Response to participants

(2.3) Management of the course
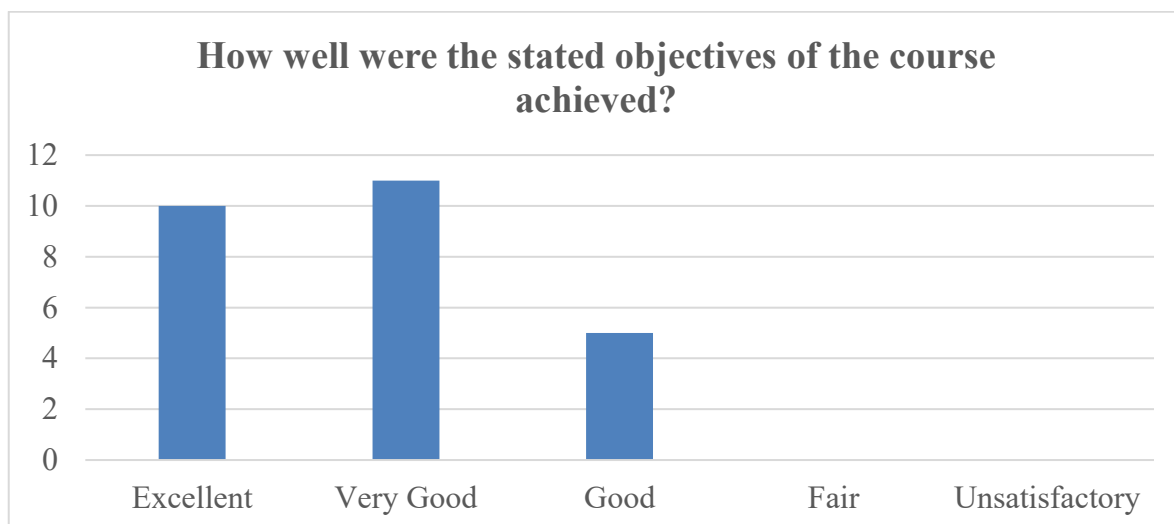
(2.4) Audio-visual resources used (if any)

The results of feedback analysis about the above-mentioned criteria are given below.
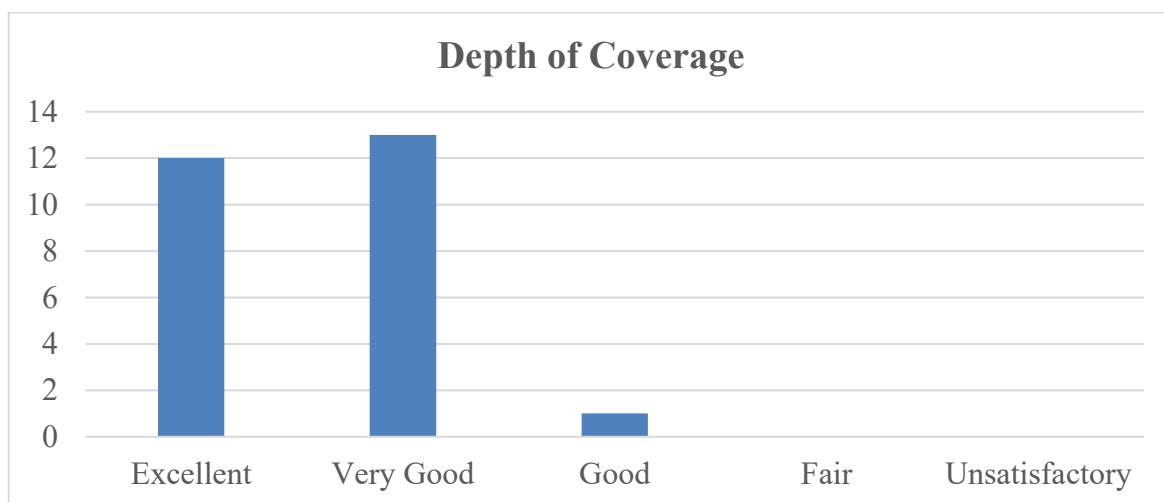
1. Objectives and Contents of FDP
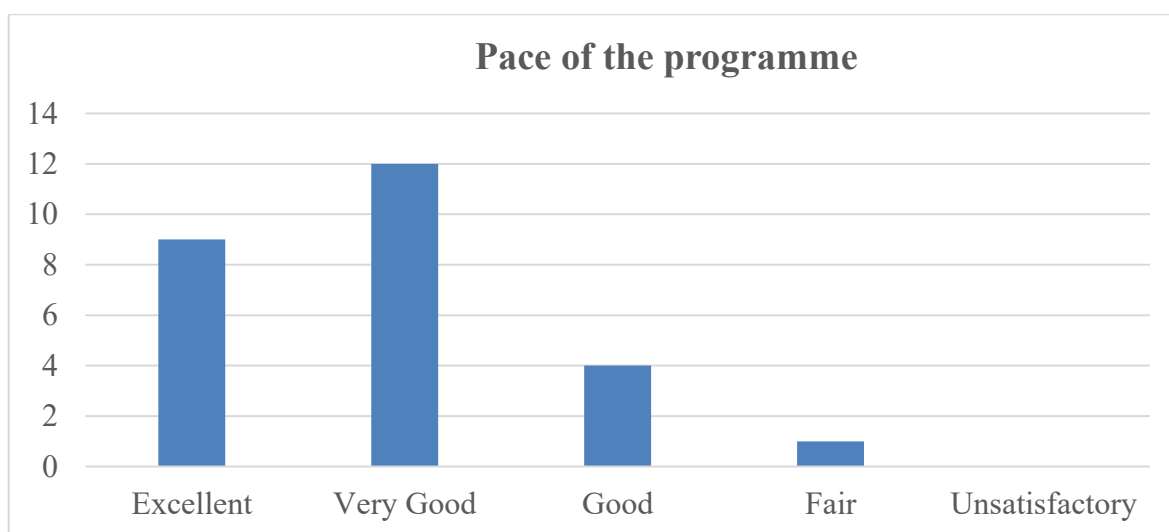

Feedbacks given by 26 participants for Criteria 1.1

How well were the stated objectives of the course achieved?

Feedbacks given by 26 participants for Criteria 1.2

Depth of Coverage

Feedbacks given by 26 participants for Criteria 1.3

Pace of the programme

Feedbacks given by 26 participants for Criteria 1.4

Overall useful of the course
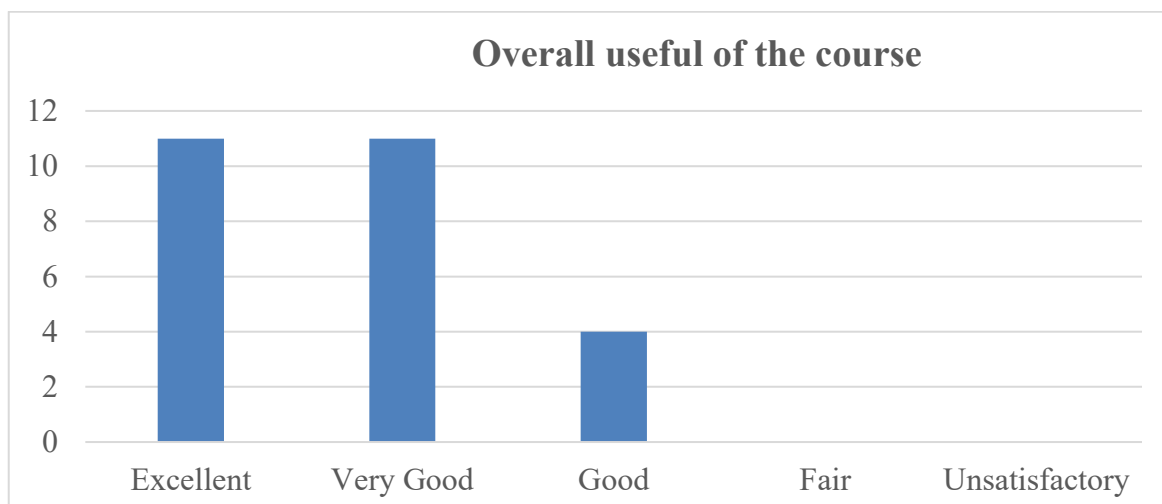
Feedbacks given by 26 participants for Criteria 1.5

2. Coordination and Faculty of FDP
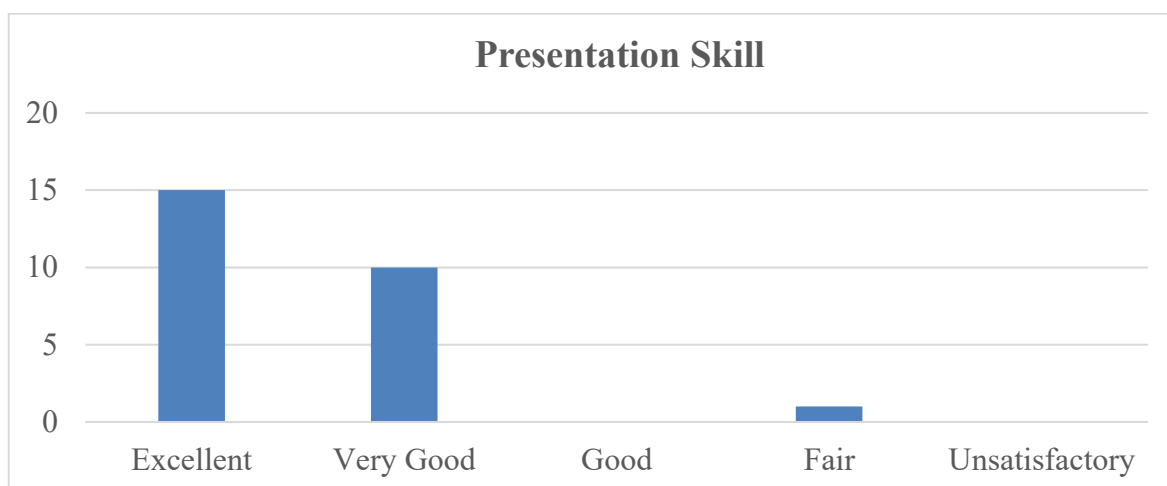
Presentation Skill

Feedbacks given by 26 participants for Criteria 2.1
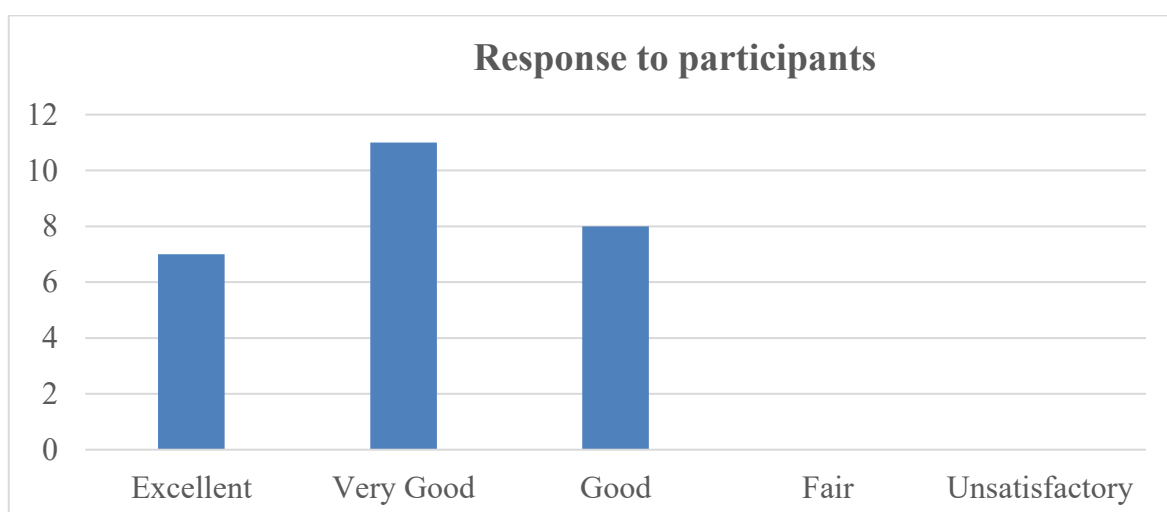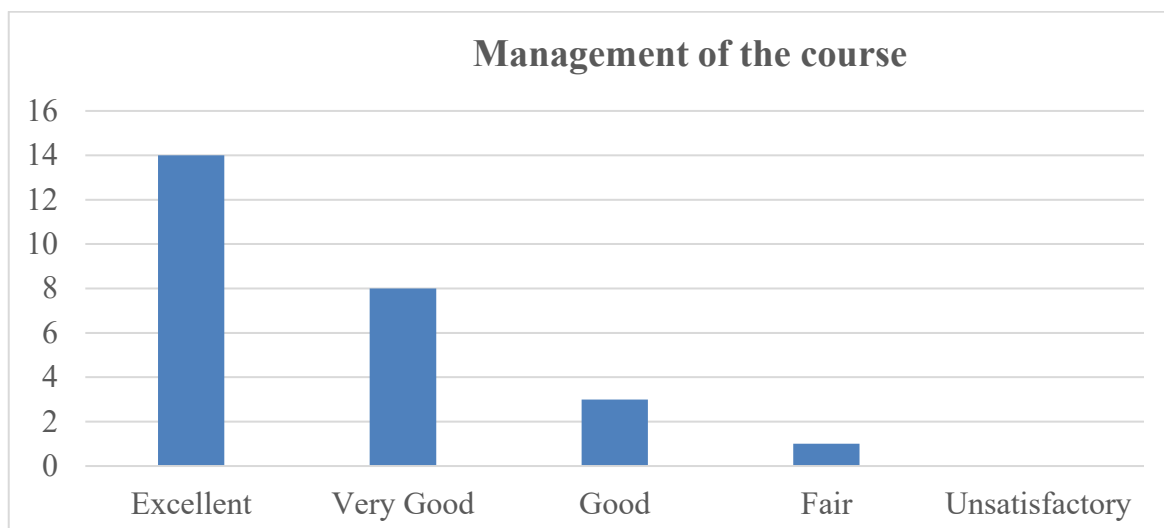
Response to participants

Feedbacks given by 26 participants for Criteria 2.2

Management of the course

Feedbacks given by 26 participants for Criteria 2.3

Audio Visual Resources used (if any)
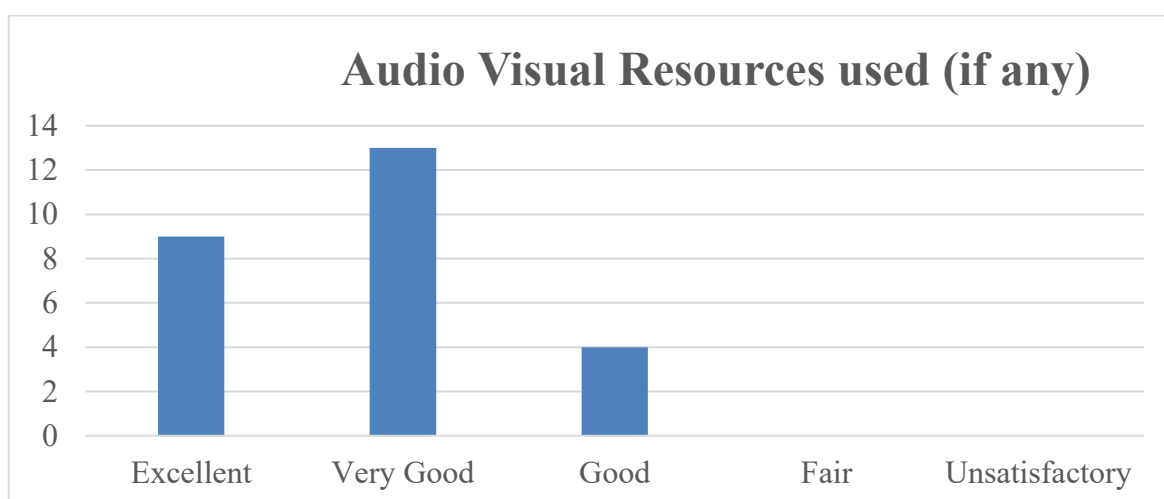
Feedbacks given by 26 participants for Criteria 2.4

Overall Performance
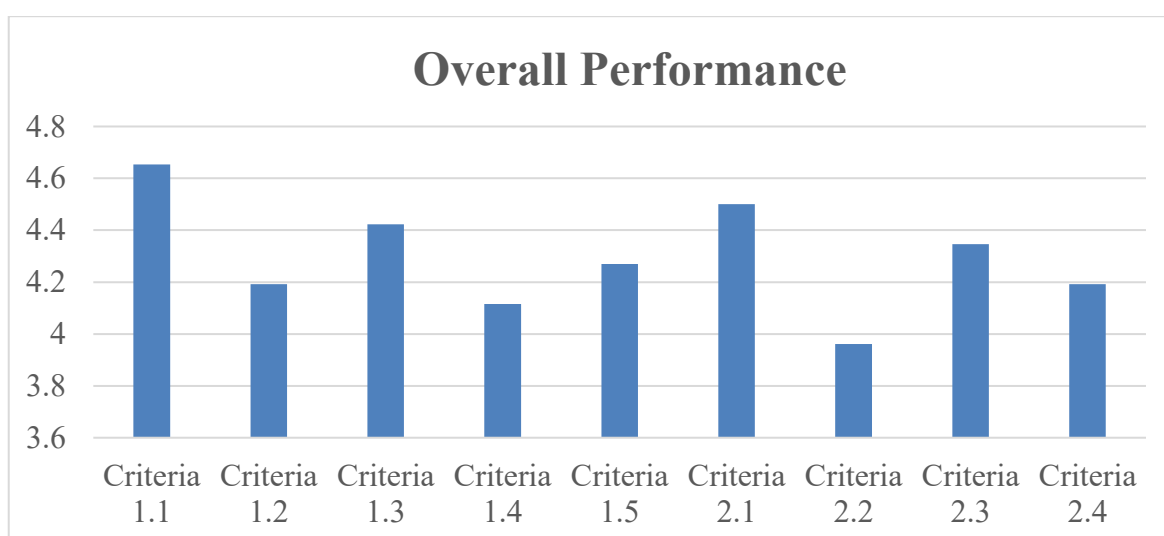
Overall Performance on a Scale of 1-5 for Criteria 1.1-1.5 and 2.1-2.4

3. Suggestions for improving the course

1. Felt that the slides shown during the lectures were not sufficiently big enough to be visible, especially the diagrams.

2. Topics related to shipping should be elaborated more.

3. Excellent course.

4. As it is an FDP, sessions on course delivery, teaching skill development, assessment and evaluation, new teaching methods evolving, etc. also can be included.

5. A session on new technologies like Chapt GPT, AI, Machine Learning, Open book exams, Online courses, etc. can be included.

6. Both the virtual mode and the direct mode of the programme shall be more beneficial in future.

7. The presentations from the resource persons were very useful. Kindly share the presentations.

8. Subjects from Marine Engineering may be selected so that faculty handling that subject can update their knowledge.

9. Everything was organized well.

10. Need some hands-on training.

11. Need more discussions and studies about the zero-emission system.

12. A particular course on marine engineering may be concentrated, for example, ship propulsion.

13. If the Programme content is related to more Case Studies and Real-Life Applications rather than an Analytical base, it could have been more interesting.

14. As per the current trend in the shipping industry, topics on green fuel are indeed a valuable addition to the course.

15. Very good presentation.

16. Very good hard work.

17. Overall course content and delivery were excellent and no suggestions.

18. A particular course on marine machinery may be concentrated, for example, fuel oil systems, etc.

19. The number of video animations may be increased during PowerPoint presentations.

20. Schedule to be maintained.

21. More topics on new regulations and technology can be included matching the decarbonization and digitalization goals of the shipping industry.

22. A few topics on the development of the Indian coastline and port facility can also be included.

23. Include artificial intelligence.

24. Include fuel technology and emission control.

25. Organized well.

26. If possible, kindly share the presentations.

27. Conduct online FDP once in Six Months.

4. Any other Comments?

1. Thank you very much Dr. Muruganandam Sir for your interest and enthusiasm in organizing such a nice FDP. I was quite happy and learned many new things.

2. Please conduct more such Courses.

3. I Thank PSN college authorities and the FDP coordinators for the excellent conduct of the program. The faculty who did the presentations were excellent and best in their field.

4. More number of faculty development programmes can be conducted.

5. Organized well with pre-planned online class link arrangements and experienced experts.

6. Sir, I thank the coordinator Dr.Muruganandham for organizing the best FDP I had in the marine engineering field. I hope for an opportunity to be there offline next to them so that it will help them all. Hats off to the management of this FDP. It was more than my expectation.

7. Better teaching and understanding presentation.

8. Due to time constraints, limited topics were covered, however, the guest lecturers did an excellent job.

9. All the course objectives are met and all topics are covered in depth

10. Thanks for the courses.

11. A good program with value addition.

12. Presentation slides can be shared among the participants for future reference.

13. We should have a similar session once in 6 months.

14. Thank you for conducting the Faculty Development Program in Marine. In the future add the topic mentioned above which is helpful for updation.

15. The information shared by the speakers covered the topics very nicely. At times we were unaware of the basics of some of the topics. But the speakers started from the basics and then went on to share the in-depth lecture which was very useful.

16. The overall arrangement of organizing FDP was excellent.