



RAMCO INSTITUTE OF TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University

Accredited by NAAC & An ISO 9001: 2015 Certified Institution

NBA Accredited UG Programs: CSE, EEE, ECE and MECH

Academic Year 2022-23 (Odd Semester)

Details of Programme Organized

SL.NO	Contents	Details
1.	Title of the programme	MECHANICS 2.0: INTRODUCING PYTHON COMPUTATION IN MECHANICS TEACHING
2.	Programme Theme	Innovative Teaching
3.	Programme Type	Webinar
4.	Details of Resource Person	Dr. Abhijit Sarkar, Professor, Department of Mechanical Engineering, Indian Institute of Technology, Madras
5.	Mode & Venue / Platform	Google Meet http://meet.google.com/vbn-dizu-zkh
6.	Date & Duration	20.12.2022 & 1 hour 15 minutes
7.	No. of Student Participants	44
8.	No. of Faculty Participants	17
9.	No. of External Participants	69
10.	Expenditure Amount (if any)	Nil
11.	Registration Link	https://tinyurl.com/Python-Computation-Mechanical

12. Objective of the Programme:

- To enhance the knowledge in Python programming applied in Mechanical Engineering.
- To use Python to solve and analyze engineering problem
- To use Python for Data Analysis
- To use of Python in Simulation Softwares.

13. Detail Description of the activity:

Extramural lecture series (ELS)- NT009- Online webinar titled **"MECHANICS 2.0: INTRODUCING PYTHON COMPUTATION IN MECHANICS TEACHING"** was organized by Department of Mechanical Engineering, Ramco Institute of Technology, Rajapalayam on **20.12.2022 (Tuesday)**. The main objective of these ELS is to impart knowledge about Python programming to solve and analyze engineering problem.

Dr. Abhijit Sarkar, Professor, Department of Mechanical Engineering, Indian Institute of Technology, Madras acted as a resource person for this programme.

Mr.R.Prabhakaran, AP/Mech delivered welcome address and Mr.J.Jerold John Britto, AP(SG)/Mech introduced the resource person of this event. He detailed about the schedule of event.

The resource person explained the following Concept

- Classical Mechanics 2.0
- Glorious past vs challenging Present
- Flavour of the session
- Computation in Mechanical Engineering
- Advantages of Jupyter
- Beyond FEM & CFD

The Resource person demonstrated the computational approach for teaching mechanics, Python through Jupyter Notebook and how the students get attracted by the tools and enhance their employability. He conclude his session with through a detailed calculation, it can be checked that there are two dominant frequencies conforming to the two natural frequencies. At the end of the session participants clarified their doubts. Mr.L.Karthikeyan, AP/Mech acted as a moderator for the session and Dr.V.Sivakumar, ASCP/ Mech, delivered vote of thanks for this program. Mr.R,Venkatesh, Mr.M.Ramar and Mr. S.Kathiravan acted as a coordinators.

Totally, there are 162 registrations are received across all major cities of our state and few are from other states also. Out of which 130 participants from various engineering college faculties, Research Scholar and Students actively participated in this programme via Google Meet Platform. All the Participants received their certificate after they completed all procedures

14. Banner / Flyer of the Programme:



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Department of Mechanical Engineering
EXTRAMURAL LECTURE SERIES(ELS) - NT009

**MECHANICS 2.0: INTRODUCING PYTHON COMPUTATION IN
MECHANICS TEACHING**

Registration Link
<https://tinyurl.com/Python-Computation-Mechanical>

<http://meet.google.com/vbn-dizu-zkh>

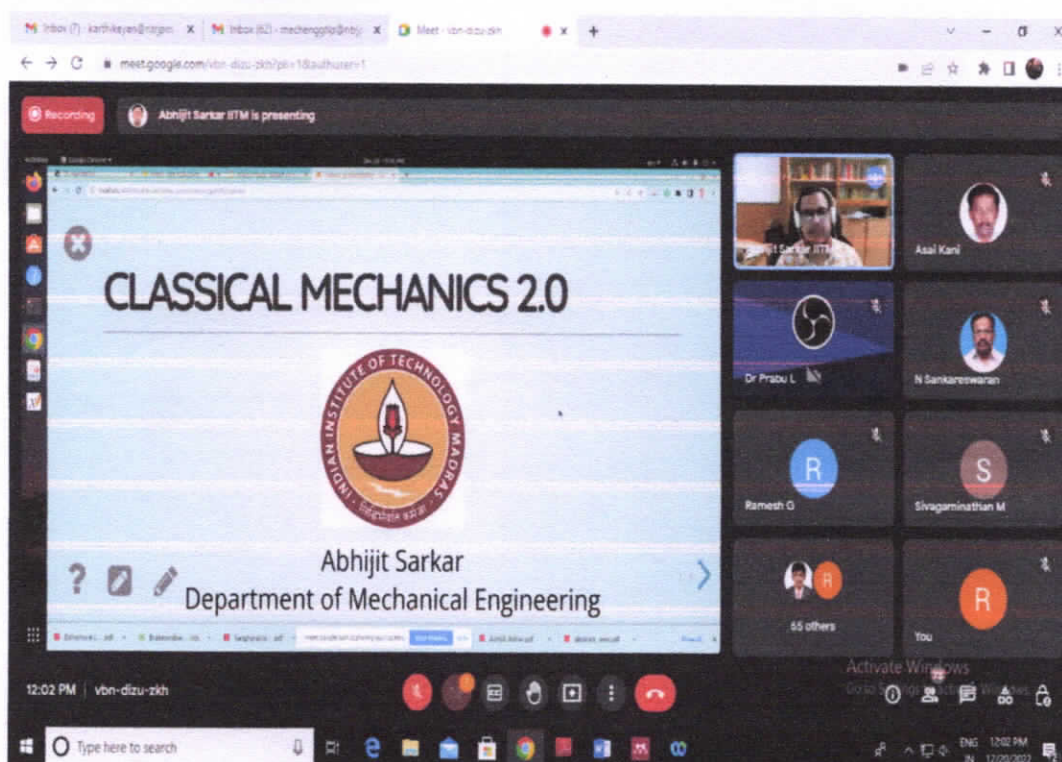


Dr. Abhijit Sarkar
Professor
Department of Mechanical Engineering
Indian Institute of Technology, Madras

Date :December 20, 2022
(Tuesday)
IST: 12.00 Noon to
01.00 P.M

COORDINATOR Mr.R.PRABHAKARAN ASST. PROF./MECH	CONVENER Dr.P.SURESHKUMAR ASSOC. PROF./MECH	PATRON Dr.S.RAJAKARUNAKARAN VICE PRINCIPAL & HEAD /MECH	CHIEF PATRON Dr.L.GANESAN PRINCIPAL
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15. Programme Photographs:



Recording Abhijit Sankar IITM is presenting

GLORIOUS PAST VS CHALLENGING PRESENT

- Classical mechanics is a subject with a rich history
- Mech. Engg. has its lineage with classical mechanics
- Since the industrial revolution has been responsible for rapid societal development

12:03 PM | vbn-dizu-zkh

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ENG 12:03 PM 12/26/2022

Recording Abhijit Sankar IITM is presenting

NEED OF THE HOUR

- Attrition in Mechanical Engineering has to be arrested
- We need to pass on the flag/torch to our students
- The rare DNAs of Aristotle, Newton, Euler, Lagrange, Hamilton, ... need to be preserved & propagated

12:10 PM | vbn-dizu-zkh

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ENG 12:10 PM 12/26/2022

Recording Abhijit Sankar IITM is presenting

BEYOND FEM & CFD

- FEM/CFD are meant for large problems
- Traditional courses - Vibration, Mechanisms, Fluid Mechanics, Thermodynamics, etc. have remained the same
- These still involve **pen-paper-calculator** based problem solving

12:14 PM | vbn-dizu-zkh

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ENG 12:14 PM 12/26/2022

mechancis

- **Tools Used** Python through Jupyter Notebook
- **Advantages**
 - Students get attracted by the tool
 - Python skills enhance their employability
 - **Learn the core concepts better**
 - Plots help visualization
 - Retain & Cultivate interest in mechanics

12:23 PM | vbn-dizu-zkh

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Abhijit Sarkar ITM is presenting

Recording

MECHANICS

12:23 PM

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ENG 12:23 PM
IN 12/29/2022

Abhijit Sarkar ITM

MATHAN KUMAR S

KALIDASS K

KARUPPASAMY G

ISRAEL PAULSON R

sunesh kumar

123 others

You

mechancis

```
In [10]: tvec2 = np.linspace(0, 15, 256)
ic3 = np.array([1, 2, 0, 0])
sol = integrate.odeint(f, ic3, tvec2)
x1 = sol[:, 0]
x2 = sol[:, 1]
fig, ax = plt.subplots()
ax.plot(tvec2, x1, label="x1")
ax.plot(tvec2, x2, 'r', label="x2")
ax.legend()
ax.grid()
plt.xlabel('Time')
junk = 0
```

PRABHU M has left the meeting

12:45 PM | vbn-dizu-zkh

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Abhijit Sarkar ITM is presenting

Recording

MECHANICS

12:45 PM

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ENG 12:45 PM
IN 12/29/2022

Abhijit Sarkar ITM

Jenold John Britto J

KALIDASS K

KARUPPASAMY G

Ramesh G

SAKTHIVEL D

124 others

You

the governing equations of motion

$$[M]\{\ddot{x}\} + [K]\{x\} = \{0\}$$

Transform the equation to modal coordinates by using $\{x\} = [\phi]\{y\}$.

Finally, pre-multiply by $[\phi^T]$ to obtain

$$[\phi^T][M][\phi]\{\ddot{y}\} + [\phi^T][K][\phi]\{y\} = \{0\}$$

Both the above matrices will diagonalize and can thus be solved as individual equation

16. Sample Certificate:



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W3PU08-CE000102

Certificate of Participation

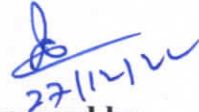
This is to certify that **M.Ramar**, Assistant professor of RAMCO INSTITUTE OF TECHNOLOGY has actively participated in the Extramural Lecture Series - NT009 **"Incorporating Python Computation in classroom teaching for Mechanical Engineering subjects"** conducted on 20.12.2022 by Department of Mechanical Engineering, Ramco Institute of Technology, Rajapalayam-626117.

"We wish you success in all your future endeavours"

This is an electronically generated certificate hence does not require signature

Made for free with Certify'em


 Prepared by
(M.Ramar, AP/Mech)


 Approved by
(HOD/Mech)