

AMITY INSTITUTE OF AEROSPACE ENGINEERING

Guest Lecture Report

A lecture session was organized on 23rd October 2020. The details of the session are given below: -

Topic: “**IMPORTANT ASPECTS OF AIRCRAFT STABILITY**”

Date: 23rd October 2020

Place: Online Mode (M.S Team)

Time: 11:15am – 12:15ppm.

Speaker: Dr. Rakesh Kumar.

About the Speaker: Dr. Rakesh Kumar is the M. Tech and Ph. D in Aerospace Engineering from IIT Kanpur. He is currently serving as a professor at Department of Aerospace Engineering, Punjab Engineering College, Chandigarh. His area of interest includes Flight Mechanics, Aerodynamics, Artificial Neural Networks.

Major points covered during the talk: He has covered wide area of Aircraft Stability. Broad areas of his discussions are: -

- Important aspects of Aircraft Stability.
- 6-DOF Model & Sign Convention.
- Static Stability Criteria.
- Summary of Equations of Motion.
- Stability & Control Derivatives.
- Importance of Damping.
- Conditions for Stability, Static Stability and Unstability.

Students of following batch attended the lecture: Total 40 Students.

1. B. Tech
 - 2017-21 Batch
 - 2018-22 Batch
 - 2019-23 Batch
 - 2020-24 Batch

2. B. Tech+M.Tech
2017-22 Batch
2020-25 Batch
3. M.Tech
2020-22 Batch

Following faculty member also attended the lecture:

1. Dr. Sanjay Singh (Director)
2. Dr. Basant Agarwal
3. Dr. Sharbari Banerjee
4. Mr. Jayanta Sinha
5. Mr. Saquib Reza
6. Prof. J. K. Jain
7. Ms. Soni Gupta
8. Faculty members of other Departments.

Event Objectives:

- To disseminate the knowledge of the Important aspects of Aircraft Stability.
- To introduce the students with the challenges in the field of Aircraft Stability, Design and Performance.

Expected Outcomes:

- Students of B. Tech 3rd, 4th year and M. Tech would get new topic for their research and major projects related to Aircraft Stability.
- A knowledge pool will be created in the field of Aircraft Stability and control.
- Publications in the field of Airplane Stability can be anticipated.
- Students will be able to understand full concepts of 6-DOF Model & Sign Convention, Static Stability Criteria, Summary of Equations of Motion, Stability & Control Derivatives and Importance of Damping.
- Students will be able to understand full concepts of Conditions for Stability, Static Stability and Unstability.

Some pics of Guest Lecture

Meeting in "General"

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IMPORTANT ASPECTS OF AIRPLANE STABILITY & CONTROL

Dr. Rakesh Kumar
(BE(PEC), M.Tech.(ITK), Ph.D(ITK))
Professor
Aerospace Engineering Department
Punjab Engineering College (Deemed to be University)
Sector 12, Chandigarh - 160012

LECTURE IN WEBINAR ON OCCASION OF 'INNOVATION DAY' (23.10.2020)
AMITY INSTITUTE OF AEROSPACE ENGG., AMITY UNIVERSITY, NOIDA

Participants

Type a name

In this meeting (13) Mute all

- Dr. Sanjay Singh Organizer
- ABHISHEK SAXENA
- amanrana1404 (Guest)
- AYUSH GAIROLA
- Dr. Shashi Bhushan Gupta
- Gaurav Gulera Outside your organization
- Jai Kumar Jain
- NAMRATA BERA
- P SAM NINAD VARDHAN

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ENG 11:15 AM IN 10/23/2020

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Dismiss

As $C_{m\alpha} = \frac{\partial C_m}{\partial \alpha} = \frac{\partial C_m}{\partial C_L} \frac{\partial C_L}{\partial \alpha} = \frac{\partial C_m}{\partial C_L} C_{L\alpha}$

Participants

Type a name

- Dr. Sharbari Banerjee
- QA Quality Assurance & Enhancement
- Dr. Shashi Bhushan Gupta
- Gaurav Gulera Outside your organization
- HARSH MATHUR
- Jai Kumar Jain
- Jayanta Sinha
- MAY MARYAM MUSTAFFA
- mk9996621176 (Guest)
- mswag077 (Guest)
- NAMRATA BERA

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STATIC STABILITY (LONGITUDINAL)

Participants

- Dr. Sharbari Banerjee
- Quality Assurance & Enhancement
- Dr. Shashi Bhushan Gupta
- Gaurav Guleria (Outside your organization)
- HARSH MATHUR
- Jai Kumar Jain
- Jayanta Sinha
- KUMARI ARPITA DUTTA
- MARYAM MUSTAFFA
- mk9996621176 (Guest)

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Meeting in "General"

Stability & Control Derivatives

Longitudinal Derivatives

$$-M_x \Delta u - \left(M_w \frac{d}{dt} + M_z \right) \Delta w + \left(\frac{d^2}{dt^2} - M_q \frac{d}{dt} \right) \Delta \theta = M_w \Delta \delta_r + M_q \Delta \delta_r$$

$$M_u = C_{mq} \frac{(QSE)}{u_0 I_y} \left(\frac{1}{ft, s} \right) \text{ or } \left(\frac{1}{m, s} \right)$$

$$M_w = C_{mq} \frac{(QSE)}{u_0 I_y} \left(\frac{1}{ft, s} \right) \text{ or } \left(\frac{1}{m, s} \right) \quad M_x = u_0 M_w (s^{-2})$$

$$M_{\dot{w}} = C_{mq} \frac{\epsilon}{2u_0} \frac{QSE}{I_y} (ft^{-1}) \quad M_{\dot{\theta}} = u_0 M_w (s^{-1})$$

$$M_q = C_{mq} \frac{\epsilon}{2u_0} (QSE) / I_y (s^{-1})$$

$$M_{\dot{\theta}} = C_{mq} (QSE) / I_y (s^{-2})$$

Suhani

Dr. Sanjay Singh

Suhani

12:06 PM 10/23/2020

