

Date of Event	19th February 2022
Name and Type of Event	Expert talk on “Simple Trusses – Introduction and Analysis” by Dr. Vishesh Ranjan Kar, NIT Jamshedpur
Conducted by	Dr. Padmaja Tripathy
Number of Participants	110

The Resource person **Dr. Vishesh Ranjan Kar** is presently working as an Assistant Professor in the Department of Mechanical Engineering, National Institute of Technology Jamshedpur, India, since 2018.

He completed his doctoral program under Prof. S. K. Panda, Department of Mechanical Engineering at NIT Rourkela in 2015 as a full-time research scholar in the field of Computational Solid Mechanics.

His research interests are Nonlinear Finite Element Method, Advanced Composite Structures, Computational Mechanics and Shape Optimization. He authored (and co-authored) over 60 research articles in peer-reviewed journals, books and conferences in the field of modeling and analysis of composite structures. He is also the Editorial Board Member of Journal of the Mechanical Behavior of Materials (De Gruyter). Currently, he is handling various research projects as Principal Investigator (and Co-PI) funded by government agencies. Presently, he is supervising 06 PhD students in the area of advanced composite structures.

He is the recipient of Research Award 2016 from VIT University, India; Early Career Research Award 2017 from DST, Government of India; Young Scientist 2019 from Venus International Foundation, India; and Preeminent Researcher Award 2019 from International Institute of Organized Research, India in association with Western Sydney University, Australia. He is a recognized reviewer of many reputed international journals of his domain. He is a lifetime member of Indian Society for Applied Mechanics. The speaker gave informative and illuminating lecture with valuable content.

The session was very valuable for B.Tech. Students. The introduction about the simple trusses was explained very efficiently. A truss is a structure composed of slender members joined together at their end points. A simple truss is a planar truss which begins with a triangular element and can be expanded by adding two members and a joint. For these trusses, the number of members (M) and the number of joints (J) are related by the equation $M = 2J - 3$. A truss is made up of a framework consisting of many small triangles. The basic triangle in a truss consists of three beams connected in the corners by three joints. A triangle on its own could be considered a simple truss, but most trusses are comprised of many triangles, connected by a series of chords. An upper chord and lower chord will span the length of the truss, with at least two triangles along the chord. Brace chords will span the triangles vertically from the apex to the base. Once connected, the triangles within the chords combine with them to create several smaller triangles within, each

dispersing and sharing in the weight, pressure and tension.

Trusses can be seen in many different building designs. Most commonly, they can be seen in bridge designs. Just about any wooden or steel bridge created in the last several hundred years employs some type of truss design. More intricate trusses are actually comprised with simple trusses working together for added strength. Home construction is made possible with trusses. Trusses can now be easily purchased assembled in a variety of sizes and strengths to more easily facilitate building homes.

The analysis of the trusses was also explained with both joint and section method. Some numerical were also solved in the lecture for better understanding of the students. This has helped the students for better understanding of the topic simple trusses, its introduction and how to do the analysis of the reaction forces generated due to application of forces.

Topic of Expert Lecture: “Simple Trusses – Introduction and Analysis”

Speaker: Dr. Vishesh Ranjan Kar, NIT Jamshedpur

Date: 19th Feb 2022

Coordinator: Dr. Padmaja Tripathy

About the Speaker:-

Dr. Vishesh Ranjan Kar is presently working as an Assistant Professor in the Department of Mechanical Engineering, National Institute of Technology Jamshedpur, India, since 2018. He completed his doctoral program under Prof. S. K. Panda, Department of Mechanical Engineering at NIT Rourkela in 2015 as a full-time research scholar in the field of Computational Solid Mechanics. His research interests are Nonlinear Finite Element Method, Advanced Composite Structures, Computational Mechanics and Shape Optimization. He authored (and co-authored) over 60 research articles in peer-reviewed journals, books and conferences in the field of modeling and analysis of composite structures. He is also the Editorial Board Member of Journal of the Mechanical Behavior of Materials (De Gruyter). Currently, he is handling various research projects as Principal Investigator (and Co-PI) funded by government agencies. Presently, he is supervising 06 PhD students in the area of advanced composite structures. He is the recipient of Research Award 2016 from VIT University, India; Early Career Research Award 2017 from DST, Government of India; Young Scientist 2019 from Venus International Foundation, India; and Preeminent Researcher Award 2019 from International Institute of Organized Research, India in association with Western Sydney University, Australia. He is a recognized reviewer of many reputed international journals of his domain. He is a lifetime member of Indian Society for Applied Mechanics.

Venue and Participants:-

The Lecture was conducted on google Meet. **Total participants attended were 99 from first year students of B.Tech.** Total numbers of attendees were 110.

Event Poster

The poster is a vertical rectangular graphic with a white background and a grey border. It features a large yellow house-shaped graphic on the right side. The text is arranged as follows:

- Expert Talk on** (in a dark green rounded rectangle)
- Simple Trusses** (in large red font)
- Introduction and Analysis** (in blue font)
- Speaker** (in a dark green rounded rectangle)
- Dr. Vishesh Ranjan Kar** (in yellow font)
- Assistant Professor, National Institute of Technology, Jamshedpur (in blue font)
- JGI** (in a blue circle)
- ARKA JAIN University** (in blue font)
- Jharkhand (Jamshedpur) (in blue font)
- Organised by:** (in a dark green rounded rectangle)
- School of Engineering & IT** (in blue font)
- For: First Year B.Tech Students** (in a red rounded rectangle)
- Date: 19 Feb 2022** (in red font)
- Time: 9:00-10:00 AM.** (in red font)
- Contact: Dr. Padmaja Tripathy | Call: 8280265185 | Email: dr.padmaja@arkajainuniversity.ac.in (in white font on a red background bar at the bottom)

