

GIAN Program on
Application of Finite Element Methods in Design and Development of
Mechanical Components

Overview

Gearing is one of the most critical components in a mechanical power transmission system and in most industrial rotating machinery. It is possible that gears will predominate as the most effective means of transmitting power in future machines due to their high degree of reliability and compactness. In the latter period of 20th century, Industrial robots were successfully developed using great ratio gears with strain wave gearing devices and trochoidal gear reducers as robot joints for factory automation in order to satisfy the mass production and to minimize product cost. Today, countless strain wave gearing devices and trochoidal gear reducers are made every day, and they are used not only in robots, but also in many other high-performance machines, such as semi-conduct devices, aircraft and space-exploring machines as well as critical power transmission devices.

This course emphasis on the latest research results on design, performance, strength and vibration analyses of mechanical components especially the great ratio gears used in industrial robot joints, contact analysis of the rolling bearings and the thin-rimmed gears used in helicopter transmissions.

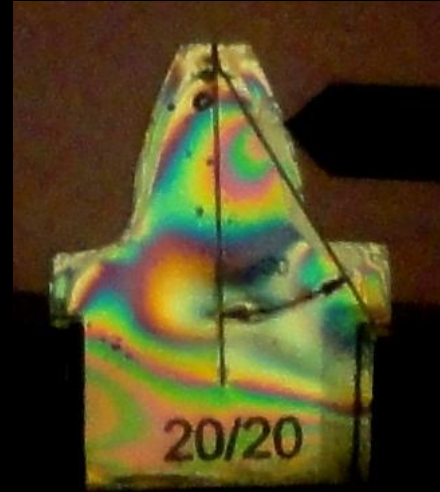
In order to solve the above problems, special methods and software are developed based on the finite element methods. Further, FEA procedures are validated using experimental devices. Finally, the future tendencies of the gear design and applications of the finite element method in design of mechanical components are predicted.

Objectives

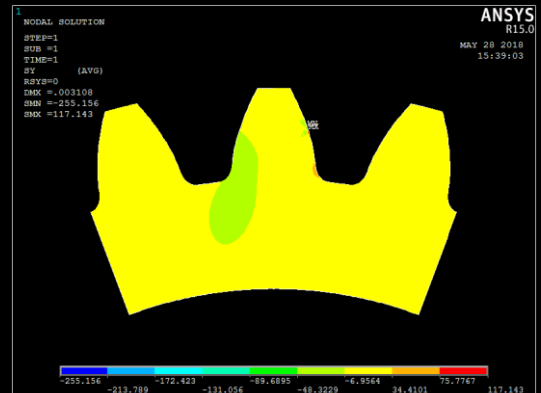
The primary objectives of the course are as follows:

- To impart basic knowledge in machine elements and their design.
- To understand the static and dynamic forces acting on the thin-rimmed gear during power transmission in robot joints.
- Understanding the basic problems of rolling bearings and learning the latest FEM technologies developed for the rolling bearings
- Understanding how to use the finite element method for performance, strength and vibration analyses of machine elements

Dates	<ul style="list-style-type: none"> • July 16th to July 27th, 2018 • Number of participants will be limited to FIFTY. • Registration is on a first come, first serve basis and space is limited.
You Should Attend If...	<ul style="list-style-type: none"> • Mechanical, Civil, Industrial & Production, Industrial Engineering & Management and Automobile Engineers. • Executives, engineers and researchers from university, Consulting companies, applied Mathematicians, Researchers from Government Organizations, R&D laboratories. • Students at all levels (B.E/B. Tech. /M.Sc. Engg/M.Tech. /Ph.D.) and Faculty from reputed academic and technical institutions. • Any others interested in expanding their qualifications/knowledge related to mechanical design and finite element analyses.
Pre-Requisite	<ul style="list-style-type: none"> • No special prerequisites. • However, candidates must be interested in expanding their qualifications/knowledge related to mechanical design, gear design, FEM and material science
Fees	<p>The participation fees for the course is as follows: Participants from:</p> <ul style="list-style-type: none"> • Abroad: US \$100 • Students / Industry / Academic Institutions/Research Organization: Rs. 2000.00 • Participants from host Institute: Rs.1000.00 • The above fee includes training program, Wi-Fi connectivity and computer use for tutorials, assignments etc.
General Information	<ul style="list-style-type: none"> • Participants are encouraged to bring their own laptop. • Participants are expected to make their own arrangements for food and accommodation.



Photoelasticity



Finite Element Analysis

Course Coordinator

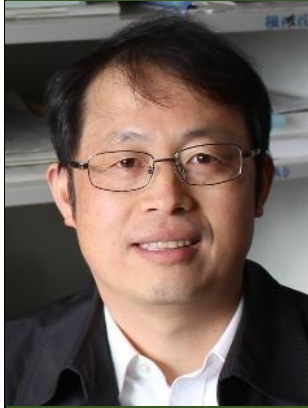
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Dr. Shuting Li, is an Associate Professor in Department of Mechanical, Electrical and Electronic Engineering, Shimane University, Japan. He received his Ph.D. in Machine Design Engineering from Yamaguchi University in 1998. Dr. Shuting Li, research interests are machine design, static and dynamic behaviour of a geared mechanical system, strength, vibration and noise analyses of the aeronautic gears, harmonic drive and cycloidal gear reducer applications of the finite element methods in mechanical design and contact analysis of a complex mechanical systems. He has authored more than 75 articles published in “*Trans. ASME, Journal of Mechanical Design*” and “*Mechanism and Machine Theory*”. His articles were cited by many researchers specially from NASA, Ministry of Defence (USA), GM, Ohio State University, University of Illinois at Chicago, Indian Institutes of Technology, INSA-Lyon et al. He has 9 patents to his credits. He is a reviewer for renowned journals such as *Trans. ASME, Journal of Mechanical Design; Trans. ASME, Journal of Vibration and Acoustics; Mechanism and Machine Theory; Proceedings of the Institution of Mechanical Engineers, Part C, Journal of Mechanical Engineering Science; International Journal of Mechanical Sciences; Applied Mathematical Modelling; Meccanica; Engineering Structures; Journal of the Brazilian Society of Mechanical Sciences and Engineering; Journal of Sound and Vibration; Measurement et al.* He is currently the deputy director of Education Promotion Centre of Industry, Academia and Government Cooperation attached to Graduate School of Natural Science and Technology, Shimane University. He has also been an active member of Administration Committee, JSME Machine Design & Tribology Division since 2014.



Dr. G. Mallesh obtained his B.E. degree in Mechanical Engineering from University of Mysore, M.Tech. in Design Engineering from Visvesvaraya Technological University, Belgaum and Ph.D. in Mechanical Engineering Sciences from Visvesvaraya Technological University, Belgaum. He has teaching & research experience of more than 20 years. At present he is an Associate Professor in the Department of Mechanical Engineering, Sri Jayachamarajendra College of Engineering, Mysuru, Karnataka, India. He has published more than 30 research papers in International and National Journals and conferences. His research interest includes Gear design, Finite element analyses, Fiber Reinforced and Metal matrix composites, Micro structure based finite element analyses.