



GIAN COURSE ON MECHANICAL DESIGN FOR PRICE SENSITIVE MARKETS

Indian Institute of Technology Delhi

14 – 18 January 2019

Overview

The growth in mechanical engineering goods are for compact, intelligent, and cost-effective solutions. Successful designs evolve out of frugal specification of the needs and precise formulations. Fundamental machine design theory is augmented in this course to parametrically analyze technologies; bottom-up/top-down design processes; engaging stakeholders in the design process; understanding socioeconomic factors that affect adoption of products; and developing and emerging market dynamics and their effect on the business and technology of new product acceptance. The educational objective of the course is to introduce tools required to understand, tackle, and solve challenging technical problems that have to be overcome for the Make-in-India initiative. The first section introduces the principles of human centric design and their use to evolve minimum specifications of the needs. This is followed by embodiment design, based on degree of freedom, constraint and stiffness analysis. The next section looks at methods to prototype and analyze systems for evaluations, both in-silicon and physically. Finally use of assembly requirements through exact-constrained design methodologies will be deployed to simplify machining and assembly effort to target cost sensitive markets.

Objectives

The primary objectives of the course are as follows: a) exposing participants to the basic tenets of product design for cost-sensitive markets, b) deriving requirements and design specifications, c) embodiment design and evaluation, and d) building confidence and capability among the participants in designing products through case studies.

Dates	14 – 18 January 2019
Host Institution	Indian Institute of Technology Delhi
Who should attend	<ul style="list-style-type: none">▪ Executives, engineers and designers from industries and government organizations including R&D laboratories.▪ Student at all levels (BTech/MSc/MTech/PhD) or Faculty from academic institutions and technical institutions.
Course Registration Fees	<p>The participation fees for the course is as follows:</p> <ul style="list-style-type: none">▪ Research scholars/ Students: Rs. 5,000/-▪ Faculty: Rs. 10,000/-▪ Working professionals: Rs. 20,000/-▪ Participants from abroad : US \$500 <p>The above fees (inclusive of GST) include the use of all instructional materials assigned for the course and laboratory equipment usage charges.</p>



Course details

<i>Jan 14, 2019, Monday, Day 1</i>		
09:30 – 10:30	Lecture 1	Introduction, human-centered design, frugal way
11:00 – 12:00	Lecture 2	Defining design requirements and forming strategies from technical and socioeconomic factors, generating concepts
14:00 – 16:00	Tutorial 1	Case studies from different domains
<i>Jan 15, 2019, Tuesday, Day 2</i>		
09:30 – 10:30	Lecture 3	Frugal innovation
11:00 – 12:00	Lecture 4	Prototype development
14:00 – 16:00	Tutorial 2	Case studies, calculation and analysis
<i>Jan 16, 2019, Wednesday, Day 3</i>		
09:30 – 10:30	Lecture 5	Embodiment design – Kinematics and dynamics
11:00 – 12:00	Lecture 6	Embodiment design – System, sub-system, modules, components
14:00 – 16:00	Tutorial 3	Case studies – system, sub-system, module, component design
<i>Jan 17, 2019, Thursday, Day 4</i>		
09:30 – 10:30	Lecture 7	Degree of freedom and constraints
11:00 – 12:00	Lecture 8	Kinematic Design
14:00 – 16:00	Tutorial 4	Case studies – Design of Mounts, Couplings, Structures, and other mechanical components using Kinematic Design approach
<i>Jan 18, 2019, Friday, Day 5</i>		
09:30 – 10:30	Lecture 9	Stiffness based design
11:00 – 12:00	Lecture 10	Error calculation and budgeting
14:00 – 16:00	Tutorial 5	Case studies – Design of structures, calculation of stiffness and analysis, Error calculation



Registration Process

Step 1: GIAN web Portal Registration: Register in the GIAN portal i.e. <http://www.gian.iitkgp.ac.in/GREGN/index> by paying Rs. 500/- online. Registration to this portal is the one-time affair and will be valid for the lifetime of GIAN. Please note that course fee is separate.

Step 2: Login to the GIAN portal with the registered User ID and Password. Choose for the Course registration option. Select the course titled “Mechanical Design for Price Sensitive Markets” from the list and click the “Save” option. Confirm your registration by clicking the suitable option.

Step 3: Course Shortlisting: Candidates will be intimated through email regarding their selection.

Step 4: Course Fee Remittance: Once you receive the intimation from the Course Coordinator, the fee (as applicable) need to be paid.

Step 5: Mode of payment: The details of fee payment by Electronic Clearing Service/ RTGS/ Demand Draft in the name of “IITD CEP ACCOUNT”. The bank details are as follows:

1	Bank Account No.	36819334799
2	Bank Address	State Bank of India, IIT Delhi, Hauz Khas, New Delhi 110016
3	Beneficiary	IITD CEP Accounts
4	IFSC code	SBIN0001077
5	MICR code	110002156
6	SWIFT code	SBININBB547
7	IITD PAN No.	AAATI0393L
8	Account Type	Savings

The participants are required to send the Demand Draft for the registration fee to the Course Coordinator.

Step 5: Fill up the registration form (**Given in Page no. 5 of this brochure**), by providing details of the bank transaction. Send the scanned copy of registration form to the Course coordinator at jpkhatait@mech.iitd.ac.in before **10th January 2019**.

Course Coordinator

Dr. Jitendra Prasad Khatait, Assistant Professor
Department of Mechanical Engineering, II-354
IIT Delhi, Hauz Khas, New Delhi 110016
Tel: +91 11 26591132 (O)
+91 9818068595
Email: jpkhatait@mech.iitd.ac.in



The Faculty



Prof. AMOS G. WINTER is Ratan N. Tata Professor in the Department of Mechanical Engineering at MIT, USA. He is the Director of the Global Engineering and Research (GEAR) Lab, which focuses on the marriage of mechanical design theory and user-centered product design to create simple, elegant technological solutions for use in highly constrained environments. His research interests include design for emerging markets and developing countries, biomimetic design, fluid/solid/granular mechanics, biomechanics, and the design of ocean systems. Prof. Winter is the principal inventor of the Leveraged Freedom Chair (LFC), an all-terrain wheelchair designed for developing countries that was a winner of a 2010 R&D 100 award and was named one of the Wall Street Journal's top innovations in 2011. Prof. Winter is a founder of Global Research Innovation and Technology (GRIT). He was named one of the 35 Innovators under 35 (TR35) by Technology Review magazine.



Prof. SUDIPTO MUKHERJEE is the Volvo Chair Professor of Design and Manufacturing in the Departments of Mechanical Engineering at IIT Delhi. His areas of interest include Mechanical System Design, Computer Controlled Mechanisms, Dynamics and Biomechanics. Prof. Mukherjee is a recipient of the AICTE Career Award for Young Teachers and Indian National Academy of Engineering Young Engineer Award in 1998. He has to his credit several innovative concepts like the Massively Parallel Binary System, Foldable shipping container (patented in India, China, USA and International application through PCT) AGTRAM for the Delhi Traffic Police (patented and ToT), Design of torque limiting bolt (Patented and ToT to SIP Houston, USA) and the Crossing. He has more than 60 sponsored projects, 7 patents, 60 journal paper and 80 conference papers to his credit.



Dr. JITENDRA PRASAD KHATAIT is an Assistant Professor in the Department of Mechanical Engineering at IIT Delhi. His fields of interest include Precision machine design, Compliant mechanisms, and Medical robotics. Dr. Khatait has worked as a Design Engineer at ASML, Netherlands and as a Research Engineer in Singapore Institute of Manufacturing Technology, Agency for Science, Technology and Research (A*STAR), Singapore. He has wide working experience with different industries, designing and developing mechanical and mechatronic modules and systems for very diverse applications, ranging from consumer products to high end precision motion stages for semiconductor industries and medical robotic systems using flexible instruments.



GIAN COURSE REGISTRATION FORM
(14 – 18 January 2019)

NAME : _____

DESIGNATION: _____

ORGANIZATION: _____

ADDRESS: _____

EMAIL ID: _____

MOBILE NO.: _____

COURSE NAME: _____

Fees payable to "IITD CEP ACCOUNT", SBI, IIT DELHI

TRANSACTION NO. (e-transfer/RTGS/NEFT): _____

DEMAND DRAFT NO.(If paid by Demand Draft): _____

Place: _____

Date: _____

Signature of the Applicant: _____