

# Optimization for Innovation in Research and Practice

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## Overview

Optimization is a subject that attempts to find best possible solution(s) for a problem. Although optimization is practiced for more than a century, its real application advantage was witnessed during World War II for optimal allocation of resources. Since then, optimization methods have been formalized and non-linear versions have been developed particularly in solving engineering design, control and management problems. Despite all-around development, both academic researchers and practitioners use the word “optimization” in their activities to indicate a comparative study of a few solutions and to come up with the best solution of them. Optimization methods are potential for improving existing solutions and practices from economic, productivity and environmental considerations, particularly if they were not originally obtained this way. Recent multi-objective optimization methods enable researchers and practitioners to find solutions from a triple bottom-line consideration, thereby achieving a more holistic, pragmatic and meaningful solution than a single-objective optimization method would do. Moreover, recent studies have shown that an analysis of optimal solutions can unveil innovative design principles, thereby providing vital underlying knowledge about a problem that can provide the much-needed leadership to researchers and industries.

In this course, starting with basic principles of optimization, methodologies from classical and recent literature and in-depth application studies will be discussed. This course will cover the fundamental aspects as well as state-of-the-art techniques of optimization and is intended towards academic researchers of any disciplines, students, engineers, scientists and managers.

<b>Module</b>	<b>Dates: June 27–July 8, 2016</b> <b>Number of participants for the course will be limited to fifty (50). Apply early for a secured position in the course.</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ you are a researcher, engineer or scientist or manager interested in design, modeling, control systems, machine learning, robotics, inverse problems, scheduling and planning, prediction, and in problem solving, in general</li> <li>▪ you are a student or faculty from an academic institution interested in above topics</li> <li>▪ you are a practicing engineer, researcher or manager interested in improving products and managing work place and gather key knowledge about your day-to-day problems</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:</p> <p><b>Participants from Abroad :USD 500</b>  <b>Industry/ Research Organizations : INR 30,000</b>  <b>Academic Institutions : INR 10,000</b>  <b>Students with valid ID : No Fee</b></p> <p>The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr. free internet facility. The participants will be provided with accommodation at IIT Kharagpur campus on payment basis.</p>

## The Faculty



**Prof. Kalyanmoy Deb** is Koenig Endowed Chair Professor at Michigan State University in USA. Prof. Deb's research interests are in evolutionary computation and their application in optimization, modeling, and machine learning. He is well-known for his pioneering studies in multi-objective optimization. He was awarded Infosys Prize, TWAS Prize in Engineering Sciences, CajAsturMamdani Prize, Distinguished Alumni Award from IIT Kharagpur, Edgeworth-Pareto award, Shanti SwarupBhatnagar Prize in Engineering Sciences, and Bessel Research award from Germany. He is fellow of IEEE, ASME, and three Indian science and engineering academies. He has published over 410 research papers with Google Scholar citation of 75,000 with h-index 91. He is in the editorial board on 20 major international journals. More information about his research contribution can be found from <http://www.egr.msu.edu/~kdeb>.



**Prof. Dilip Kumar Pratihar** is Professor at Mechanical Engineering Department at Indian Institute of Technology Kharagpur. He received University Gold Medal, A.M. Das Memorial Medal, Institution of Engineers' (I) Medal, and others. He completed his post-doctoral studies in Japan and then in Germany under the Alexander von Humboldt Fellowship program. His research areas include robotics, soft computing and manufacturing science. He has published more than 190 papers, mostly in various international journals. He has written a textbook on "Soft Computing" and co-authored another textbook on "Analytical Engineering Mechanics. Recently, he has published another textbook named "Soft Computing: Fundamentals and Applications". He is in editorial board of 15 International Journals. He has been elected as FIE and MIEEE. More about his achievements can be found from [http://www.iitkgp.ac.in/fac-profiles/showprofile.php?empcode=bUmdQ&depts\\_name=ME](http://www.iitkgp.ac.in/fac-profiles/showprofile.php?empcode=bUmdQ&depts_name=ME)

## Course Co-ordinator

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