TEQIP-III sponsored short-term (30 hours) online course on "Operations Research and its Applications"

(December 7 – December 11, 2020)

Organized by
Department of Mathematics,
Indian Institute of Technology Delhi
Hauz Khas, New Delhi, 110016

Objective of the Course

The main objective of this online short-term course is to cover some basic topics in linear optimization and stochastic processes at introductory level. These topics are very useful in many industrial applications. This is one of the reason many universities/institutes have introduced operations research related courses at U.G./P.G level. This short course will provide an opportunity to college teachers to enhance their knowledge to teach the courses related to these topics. We plan to invite experts from other institutions in order to make programme more diverse.

Course Contents

Module 1: Theory of linear programming

- Linear programming formulation of real world problems
- Graphical methods to solve linear programs
- Simplex method to solve linear programs
- Duality theory
- Dual simplex method for linear programming problems
- Sensitivity Analysis
- Linear programming formulation of Zero-sum Matrix game

Module 2: Integer linear programming (ILP)

- Introduction and Importance of ILP
- Methods: Gomory's cutting plane method, Branch and Bound Method
- Applications of ILP

Module 3: Transportation and Assignment Problems

- Linear programming formulation
- Simplex method for transportation problems
- North-West corner method, least cost method, Vogel approximation method

Module 4: Network flow problems

- Introduction to Networks: Basic definitions and Network flow problems
- Minimum spanning tree problem (Examples and algorithms)
- Shortest path problem (Examples and algorithms)
- Maximum flow problem (Examples and algorithms)

Module 5: Stochastic Models and their Applications

- Basic stochastic processes
- Application of queuing models

Module 6: Classifications Problems

- Convex surrogate loss functions
- Support vector machines

Participants

The teachers of the institutes approved under TEQIP-III can participate in this short course. The number of participants are limited to 50. There is no registration fee for TEQIP-III participant. But, a refundable security deposit of Rs. 1000 is mandatory to complete the registration process. For the details about the list of approved institutions please visit http://cepqip.iitd.ac.in/teqip.php

The mandatory registration fee for non-TEQIP-III participants is as follows:

• Rs. 3,000/- + 18% GST – Research Scholars

• Rs. 5,000/- + 18% GST – Faculty

• Rs. 10,000/- + 18% GST – Industry participants

The payment of Fee/Security money can be done online into IIT Delhi CEP account using the following link

http://cepqip.iitd.ac.in/payment.php

Registration Deadline

The last date to register for the course is December 2, 2020 and it is on first come first served basis. The registration can be done on this link with payment of security deposit/registration fee.

The link will not accept any response after the deadline. We will send an intimation to the confirm participants on December 4, 2020. We will process the reimbursement of refundable deposit for the declined participants.

Contact

For any query related to registration and course content, please send an email to ORiitdelhi@gmail.com

Course Coordinator

Vikas Vikram Singh
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Indian Institute of Technology Delhi
Hauz Khas, New Delhi, 110016.

Faculty Members

The following faculty members from different institutions will be involved during this short-term course:

1. Prof. Vikas Vikram Singh (IIT Delhi)
2. Prof. S. Dharmaraja (IIT Delhi)
3. Prof. Aparna Mehra (IIT Delhi)
4. Prof. N. Hemachandra (IIT Bombay)
5. Prof. Sonia Singh (IIM Lucknow)
6. Prof. Vidyottama Jain (Central University of Rajasthan)