

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

Participants

The teachers of the institutes approved under TEQIP-III can participate in this short course. The number of participants are limited to 50. For the details about the list of approved institutions please visit <http://cepqip.iitd.ac.in/teqip.php>

Registration Deadline

The last date to register for the course is December 2, 2020. The registration can be done on [this link](#) with payment of refundable security deposit of Rs. 1000.

The link will not accept any response after the deadline. We will send an intimation to the confirmed 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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Assistant Professor

Department of Mathematics

Indian Institute of Technology Delhi

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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. Sonia Singh (IIM Lucknow)
5. Prof. Vidyottama Jain (Central University of Rajasthan)