



# Indian Institute of Technology Delhi

## TEQIP-III Sponsored Short-Term Course

### Process Scheduling, Optimization, and Control

IIT Delhi Sonipat Campus, Haryana 05<sup>th</sup> – 07<sup>th</sup> December, 2018



#### About IIT Delhi

Established in 1961, IIT Delhi is one of the one of the premier educational institutions in the country and counted among the top institutions in the world, situated in the National Capital. The institute has about 27 academic units on Engineering, Science, Design, Social Science, among others. IIT Delhi has been instrumental in providing solutions to technological and societal problems through innovative academic and research activities. IIT Delhi has been consistently placed among top academic universities around the globe, and as per the recent QS University ranking, the institute stands at 64th in the list of Engineering and Technology domain. Recently, IIT Delhi has been elevated to the status of “Institution of Eminence” by Govt. of India. In order to boost innovation and research, IIT Delhi has opened an extended campus of IIT Delhi at Sonipat in Haryana. Situated at Rajiv Gandhi Education city, the new campus is state-of-the-art convention centre with and located at a distance of around 60 kms from IIT Delhi.

#### Scope of the Course

In the current scenario, process scheduling, optimization and control is extremely important for process industries. Advanced process control in industries has broad levels, (i) time and space scheduling of production;

(ii) optimization of set- points to minimize costs and ensure quality and quantity of production; (iii) dynamic multivariable control of the plant. In this course, process scheduling using mathematical programming, multi-objective optimization using evolutionary algorithms, methods for data driven modelling and control strategies will be covered.

#### Learning Objectives

- ✦ Process scheduling using mathematical programming
- ✦ Multi-objective optimization using evolutionary algorithms such as GA, DE, etc.
- ✦ Data driven modelling of process systems (system identification)
- ✦ Model-based control strategies
- ✦ Industrial case studies on refinery processes
- ✦ Hands on experience on several software packages.

#### Learning Outcomes

- ✦ Understand the basics of process scheduling, evolutionary optimization, data-driven modelling and model based control.
- ✦ The tools taught in the course will enable the participants to use these in teaching, research and industrial applications.



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#### Course Contents

Discrete- and continuous-time scheduling models, Mathematical Programming, Multi-objective Optimization, Genetic Algorithm, Differential Evolution, on-line optimizing control, control relevant models, basics of system identification, state estimation, model predictive control, glimpse of process monitoring, Applications of these in refinery operations such as crude oil scheduling, hydro-cracking, hand-on session on software packages etc.

#### Course Faculty

The following faculties will deliver lecture during the course:

**Dr. Hariprasad Kodamana.**,  
Department of Chemical Engineering, IIT Delhi

**Dr. Manojkumar C Ramteke.**,  
Department of Chemical Engineering, IIT Delhi

**Dr. Munawar A Shaik.**,  
Department of Chemical Engineering, IIT Delhi

#### Target Audience

The course is designed for the faculty members in TEQIP-III institutes, which are under IIT Delhi zone. Selection of 30 candidates will be done on first-come, first-served basis after shortlisting candidates based on their background and interest in the subject.

#### Accommodation

Boarding and lodging will be arranged for the selected candidates, as per TEQIP-III norms, at Sonipat campus on twin-sharing basis. All rooms are air-conditioned and equipped with required basic amenities. Participants who need onsite accommodation are requested to indicate in the application form. The allotment of rooms will be on first-come, first-served basis.

#### Important Dates

The last date for the receipt of duly filled registration form is **01/11/2018** and the selected candidates will be intimated on **07/11/2018**.

#### Course co-ordinators

##### **Dr. Hariprasad Kodamana**

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##### **Dr. Manojkumar C Ramteke**

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#### Contact Details

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For further information related to the course or for accommodation enquiries, please contact the project officer or email us at [kodamana@chemical.iitd.ac.in](mailto:kodamana@chemical.iitd.ac.in) and [mcramteke@chemical.iitd.ac.in](mailto:mcramteke@chemical.iitd.ac.in)