## INTRODUCTION

Sustainable development by balancing the long-term economic, environmental and societal objectives is one of the most challenging goals for the scientific and business communities. Businesses and industries, especially process industries, need to increasingly incorporate these aspects in strategy and decision making. In addition to making businesses more competitive and resilient in the long run, sustainability driven practices also ensure improved shareholder perception and better market acceptance. However, decision making for sustainability is highly complex, and it becomes essential use new methods and tools. The course will discuss some of the important tools available to the decision maker to achieve this objective. After discussing the basics of sustainability and the challenges in sustainable development, different sustainability quantification methods along with their applications will be discussed. The course will then focus extensively on life cycle assessment (LCA) method. Novel design concepts such as biomimicry and industrial ecology will be discussed. The concepts will be explained using applications and case studies in the domain of energy, water, and municipal solid waste management.

## COURSE OUTLINE

1. **Sustainability: Introduction and quantification (4.5 hours)**
   - Sustainability definition, dimensions and trade-offs
   - Challenges in sustainable engineering design and practice
   - Sustainability indicators and indices
2. **Life Cycle Assessment (LCA) (4.5 hours)**
   - LCA: Need and advantages
   - Goal and scope, life cycle inventory, and impact assessment
   - Software and databases with industrial problems/examples
   - Additional topics in LCA
   - Hands on session on using LCA software
3. **Case studies in sustainable engineering (4.5 hours)**
   - Renewable energy systems
   - Municipal solid waste management
   - Domestic and industrial water management
4. **Design approaches (4.5 hours)**
   - Biomimicry and industrial ecology
   - Principles of green engineering
   - Resiliency and uncertainty

## COURSE FORMAT

The course will be highly interactive consisting of the following specific components:

- Introductory lectures on selected topics
- Case study and illustrative examples
- Software demonstration / practice sessions
- Tutorial / hands-on training sessions
- Short field visit; discussion and debate

## LEARNING OUTCOMES:

At the completion of the course, the participants would be able to:

- Understand sustainability concept and its multi-disciplinary nature
- Identify and frame sustainability trade-offs of domain specific problems
- Identify appropriate indicators and indices for domain specific problems
- Formulate and set-up simple problems for performing LCA
- Use open source packages to develop LCA models
- Analyze LCA results to draw conclusions and provide recommendations
- Explore different design approaches for practical problems

## WHO MAY BENEFIT

This course is intended for professionals and academics (faculty, graduate students and researchers) interested in sustainability of engineering activities.

## VENUE FOR CLASSES

Course will be held at the Guest House Conference Room, IIT Bombay.

## FACULTY

The teaching faculty constitutes Prof. Yogendra Shastri, Department of Chemical Engineering, IIT Bombay and Prof. Bhavik Bakshi, Department of Chemical and Biomolecular Engineering, The Ohio State University, USA. The course will also feature guest speakers on specific topics.

## IMPORTANT DATES

Last date for receipt of registration form: **Nov 30 , 2017**
Notification of acceptance: **Dec 2 , 2017**

**Note:** Incomplete application forms will not be considered. For additional copies of the registration form, please use a photocopy or type in the format given.

## REGISTRATION

Per participant

- Rs. 16,000/- inclusive of service tax for industry participants
- Rs. 12,000/- inclusive of service tax for participants from academic and non-profit institutions
- Rs. 8,000/- inclusive of service tax from students

The demand draft should be drawn in favour of **"The Registrar, IIT Bombay- CEP Account"** payable at Mumbai. For online payments, please click here for Bank Details.

No income tax is to be deducted at source from the course fee, as IIT Bombay is exempt from the same. The course fee includes course material, lunch and coffee/tea.

A Certificate of participation will be awarded to all the participants of the course.

**Completed registration forms should be sent to the course coordinator at the following address:**

Prof. Yogendra Shastri,
Course Coordinator,
Department of Chemical Engineering,
Indian Institute of Technology Bombay,
Powai, Mumbai – 400 076.
Phone : (022) – 2576 7203
Fax : (022) – 2572 6895
Email : yshastri@iitb.ac.in

CEP Short Term Course on

# Sustainable Engineering: Theory and Practice

## December 11-15, 2017

Coordinator

**Prof. Yogendra Shastri**
Department of Chemical Engineering

Office of
Continuing Education & Quality Improvement Programme

**Indian Institute of Technology Bombay**
**Powai, Mumbai – 400 076**

# R E G I S T R A T I O N  F O R M

Five - day CEP Course on

**Sustainable Engineering: Theory and Practice**

December 11-15, 2017

NAME (BLOCK LETTERS) : _____

_____ Gender: M / F

DESIGNATION : _____

ORGANIZATION: _____

MAILING ADDRESS : _____

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TELEPHONE : _____ (O) _____ (R)

FAX: _____ MOBILE: _____

EMAIL : _____

QUALIFICATIONS : _____ EXPERIENCE : _____ Yrs.

PAYMENT: D.D. No.: Dt. Rs.

**[Demand draft should be drawn in favour of "Registrar, IIT Bombay (CEP A/c)"].**

Date: Signature of Applicant

(PHOTOCOPY ADDITIONAL COPIES OF THIS FORM, IF NEEDED)

# ON-LINE PAYMENT TRANSACTION DETAILS

Kindly arrange to provide the following transaction details, if the course fee is paid on-line:

1. Name of the Course Participant
2. Transaction No.
3. Date of Transaction
4. Amount
5. Bank & Branch Name from where transfer is done