

**Registration Form for Short Term Course on  
“Mathematical Modelling and Software  
Applications”  
(April 22-26, 2019)**

Name (block letters): .....

Designation & pay scale: .....

Organization: .....

Address for communication: .....

.....

Pin code: ..... Ph. No.: .....

E-mail: .....

Highest academic qualification: .....

Specialization: .....

Experience (in years) :

(a) Teaching ..... (b) Industrial .....

Accommodation required (Yes/ No):

DD No. & Date:

Bank :

Amount :

Please register me for the CEP short term course on  
“Mathematical Modelling and Software Applications” to be held  
at IIT (BHU) Varanasi.

Place :

Date : Signature of the applicant

**Sponsorship**

Prof./Dr./Mr./Ms./Mrs./ \_\_\_\_\_

an employee of our institute, is hereby sponsored for the course.  
The applicant will be permitted to attend the CEP short term  
course on “Mathematical Modelling and Software Applications”  
at IIT (BHU), Varanasi, to be held during 22-26 April, 2019, if  
selected.

Signature with date of Sponsoring Authority:

Designation :

Official Seal :

**Registration procedure**

The registration fee is to be paid in the form of a Bank DD in  
favor of “**Registrar, IIT (BHU), Varanasi**” payable at  
Varanasi or by NEFT to **A/C # 32778803937** with **State Bank  
of India**, (Name of the account: IIT (BHU) – Main Account  
(Special fund)), at **IT-BHU Branch, Varanasi, (IFSC Code:  
SBIN0011445)**. The fee along with completed application  
form is to be sent to The Coordinator, CEP short-term  
course on “Mathematical modelling and Software  
Applications”, Department of Mechanical Engineering, IIT  
(BHU) Varanasi-221005, U.P., India. Also, send a scanned  
copy of the Registration form and the DD/NEFT details  
through an email to [ajinkya.mec@iitbhu.ac.in](mailto:ajinkya.mec@iitbhu.ac.in) and also to  
[coordinator.qip@iitbhu.ac.in](mailto:coordinator.qip@iitbhu.ac.in).

**How to reach**

The city of Varanasi is well connected by road, rail and air  
with all the important cities of India. Regular flights are  
there from Varanasi to Delhi, Mumbai, Chennai, Hyderabad,  
Bangalore, Kolkata, Khajuraho and Lucknow. The IIT (BHU)  
campus is about 10 Km away from Varanasi Cantt Railway  
Station and 20 Km from Mughalsarai Railway Station and 35  
Km from the Babatpur (Varanasi) airport.

**About Varanasi**

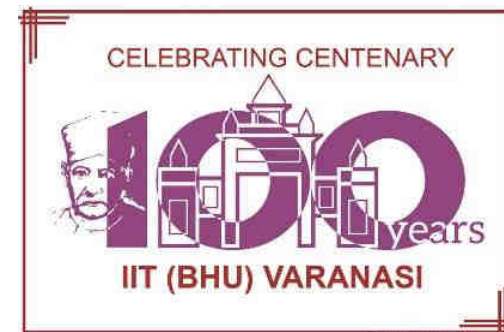
The holy city Varanasi is the oldest living city in the world. It  
is also known as the capital of the spiritualistic world. The  
city has a great historical and cultural importance. This  
religious and cultural capital of India is situated at the bank  
of the holy river Ganges and is famous for temples of Lord  
Shiva, Buddha (at Sarnath), Sankat Mochan etc. Varanasi is  
the premiere most place of oriental learning. It  
simultaneously keeps pace with modern advanced  
knowledge. This vibrant city with multiple dimensions of  
knowledge and liberation has a magnetic attraction for  
people from all over the world.

**Important dates**

Last dates for

- receiving the registration form April 1, 2019
- for sending acceptance of participation April 10, 2019

Confirmation for the participation shall be communicated  
on first-come first-served basis to facilitate the participants  
to book the reservation in time. Since the number of seats  
is limited, the participants are advised not to wait for the  
last moment.



**CEP Short Term Course  
on  
“MATHEMATICAL MODELLING  
AND SOFTWARE APPLICATIONS”**

April 22-26, 2019



**Organised by:**

Department of Mechanical Engineering  
Indian Institute of Technology (BHU)  
VARANASI-221005

**Coordinators:**

**Prof. A.K. Agrawal**  
**Prof. P. Bhardwaj**  
**Dr. Ajinkya Nandkumar Tanksale**

**Contact:**

[ajinkya.mec@iitbhu.ac.in](mailto:ajinkya.mec@iitbhu.ac.in)  
M: 9434198067, 8881764775



## Introduction

Managerial decision making in a complex system is a challenging task which calls for a scientific approach for the selection of a best alternative. This scientific approach typically involves use of mathematical models which is mathematical representation of the actual situation. There are numerous industrial and practical application areas such as production, manufacturing, inventory management, supply chain management, finance, project management, health care, environment, energy, sustainability, military, airline, education and information technology which find the role of mathematical modelling in decision making. Although, mathematical modelling can be mastered through practice, developing a well-built model is an art. To divulge the art of mathematical modelling is the first objective of this workshop.

Owing to the complexity of the practical situation which it is depicting, the resulting mathematical models are also complex and difficult to solve. However, due to ability of modern computers and the development of the state of the art mathematical programming solvers, it is relatively easy to obtain an optimal or near-optimal solution of the complex models. There are several optimization packages such as Excel solver, LINGO, AMPL, CPLEX, XPRESS and Gurobi are available for educational and commercial purposes. To explore the various optimization packages with their intricacies and to demonstrate their use for several research oriented problem classes is the second objective of this workshop.

The workshop will be conducted through class room discussion for the basics of mathematical models and hands on practice for demonstration of variety of solvers. Basic knowledge of Operations Research, any math programming solver and a programming language is a plus (although not compulsory) for this workshop.

## Topics to be covered

- **Background:** Operations Research, Basics of Linear Programming, Network flow models, Integer programming, Combinatorial Optimization, Quadratic programming
- **Hands on practice for a variety of Problem classes including:** Classical LP problems, production planning, facility location, supply chain network design, vehicle routing, Combinatorial optimization problems such as Knapsack, Bin-packing, Travelling salesman problem, Quadratic Programming
- **Learning Optimization packages:** Exploring optimization package, Syntax, data structure, defining sets, variables, constraints, Different APIs (C, C++, Java, Python), data input and output, interpretation of results, parameter tuning.

## Registration Fee

| Participants                           | Registration Fee         |
|--|--------------------------|
| Students (including Research Scholars) | Rs.5000/-<br>+ 18% GST   |
| Others                                 | Rs.10,000/-<br>+ 18% GST |

## Accommodation

Boarding and Lodging will be provided on paid basis at the IIT guest house upon request from participants. Efforts will be made to accommodate in the guest house on twin sharing basis on receipt of request from the participants. Please note that no family accommodation is available.

## Department of Mechanical Engineering IIT (BHU)

The Department of Mechanical Engineering came into existence in 1919 under the leadership of Professor Charles A. King, the first Head of the Department and Principal of the erstwhile Benaras Engineering College (BENCO). Over the last century, the department has grown multi fold to become the largest department of the Institute. The post-graduate and doctoral programmes in the department are well-established and infrastructural facilities exist for studies and research in a range of specialization as mentioned below.

|   |            |
|---|------------|
| Machine Design  | since 1964 |
| Thermal and Fluid Engineering<br>(Previously, Heat Power) | since 1966 |
| Production Engineering                                    | since 1977 |
| Industrial Management                                     | since 1979 |

The faculty is well qualified with vast experience in various fields of Mechanical Engineering. The department has executed several research projects with funding from agencies such as BRNS, DST, AICTE, DRDO etc. Faculty members have collaborations with some leading Universities/Laboratories/Institutes around the globe.

## Venue

All the sessions will be held at CIMS Lab and Quality Engineering Lab, Department of Mechanical Engineering IIT (BHU), Varanasi.

