

## Background to the Project

Over 6 years ago, IIT Bombay started conducting ISTE training programmes for empowering teachers of engineering colleges. We started to engage 1,000 teachers at a time, in subject specific training workshops of two week duration. In 2013 we scaled this program further, to train up to 10,000 teachers at a time (T10KT), using 353 established remote centers across India. Together with IIT Kharagpur- a partner Institution in this project, we have a mandate through a funded project from the National Mission on Education using ICT (NME-ICT) of MHRD, to train 1,50,000 teachers in 15 such workshops.

Since December 2009, we have conducted several two-week ISTE workshops on various engineering subjects. We have reached out to more than 100,000 teachers and assisted them to enhance their teaching skills in these subjects.

In order to deliver these Short Term Training Programmes (STTP) at the selected remote centers, we invite expert faculty from such remote centers to a One Week Coordinators' training programme, which is held in IIT Bombay. These faculty members then act as Workshop Coordinators in their respective remote centers during the delivery of the training programme for the 10,000 teachers. All the lectures and tutorial sessions are recorded. The final edited audio-visual content, along with other course material, are released in Open Source. The content can be freely used later by all teachers, students and other learners.

Given the success of such STTPs, we now announce a two-week ISTE STTP on Engineering Physics, to be held from 8th to 18th December, 2015.

## Teaching Faculty

**Prof. Shiva Prasad**, Dept. of Physics, IIT Bombay  
**Prof. Dipan K. Ghosh**, Dept. of Physics, IIT Bombay  
**Prof. K.G. Suresh**, Dept. of Physics, IIT Bombay

## Course Contents

The topics to be covered in this STTP are:

**Relativity-** Frames of reference, Michelson-Morley experiment, Lorentz transformation, Mass-Energy Relationship.

**Quantum Mechanics-** Compton effect, Uncertainty Principle, Schrödinger Equation, Postulates of Quantum Mechanics, Particle in a box, Potential barrier, tunneling.

**Electromagnetic Theory** - Maxwell's Equations, Electromagnetic Waves, Poynting Theorem.

**Optics:** Interference, Diffraction and Polarization Elements of Fiber optic communication.

**Elements of Solid State Physics :** Bravais lattice and crystal structure, Miller indices, Bragg's law and Laue condition, Free electron models, Bloch's Law, Bands in solids .

**Magnetism** in solids, dia, para and ferromagnetic material, applications to magnetically ordered materials.

**Superconductivity:** phenomenology, London Equations, Thermodynamics of superconductors, Qualitative treatment of BCS Theory, High temperature superconductors.

## Who Should Attend

Faculty colleagues who are presently teaching Physics in Engineering Colleges, Polytechnics and Degree Colleges are eligible to attend this training programme. The participants must have an M.Sc. degree in Physics.

**This workshop is only for Faculty.** Students are not entitled to attend the course.

## Duration and Venue

The duration of the STTP is 2 weeks (10 days). It commences on Tuesday, 08th December, 2015 at 9:30 hrs and ends at 16:30 hrs on Friday, 18th December, 2015 with a one day break on Sunday, 13th December, 2015. Participants will be expected to carry out some additional assignments in the two weeks following the completion of the course.

Further details and enrolment link are available at: <http://www.it.iitb.ac.in/nmeict/>

Remote centers would be functioning as venues.

## Note

Please note that this STTP is conducted by the e-Outreach project of IIT Bombay, under the National Mission on Education through ICT. Live recording of the course and other created contents will be released under Open Source through a portal. The recorded CD/DVD of the course lectures will be available for distribution at cost, to any individual/institution. All participants are required to sign an authorization for such release of contents contributed by them during and after the workshop. Recognition and citation will be made for all contributors.

## Mandatory requirement:

**It is mandatory that while registering for the STTP, the participants should submit a scanned copy of a letter from the Principal/Head of the Institute. Format of this is available on the website. Registration without this letter will not be confirmed.**

## Course Fee

Since the STTP is partly funded by the National Mission on Education through ICT (MHRD, Government of India), there is no fee for participation in the course.

