INTRODUCTION
An intensive course on Fundamentals and applications of Metamaterials will be conducted between 06 to 10 April 2015, sponsored by the Continuing Education Program of IIT Kanpur. The program will be specifically useful for persons who are concerned with Microwave and Optical properties of structured composite materials, also called Metamaterials, in Research and Industry as well as training/teaching of students/ personnel. Although IIT Kanpur’s expertise in this area is internationally recognized, there is a large-scale dearth of appropriately trained technical personnel in India, who are knowledgeable about metamaterials. The course is designed to cater to the needs of teachers from Science & Engineering Institutions, scientists from R & D labs and practicing engineers from industry. It aims to equip the participants with an essential knowledge of the area so as to enable them start working with metamaterials in their research & applications.

OBJECTIVE
Metamaterials have captured the public imagination due to the exceptionally attractive applications that were claimed for them, such as perfect lenses, invisibility cloaks, perfect absorbers, miniaturized antennas and waveguides with enhanced performance etc. After intense research in the last decade, the field of metamaterials has now become quite mature and several commercial products and applications are now coming out of these concepts. Emphasis will be placed on understanding the basic physical principles. The course will give an exposure to the computational design and simulations of metamaterials. The primary objective of imparting working knowledge in the above mentioned areas will be achieved through lectures, tutorials and problem solving sessions, demonstrations of computer simulations and laboratory visits.

COURSE CONTENTS
Lectures will be delivered by experts working at IIT Kanpur and other reputed institutions on:
- Review of Electromagnetic Theory
- Introduction to Metamaterials
- Homogenization of Structured Materials
- Modeling of Electromagnetic/Photonic Structures using Computer Simulations
- Metamaterial Microwave Antennas and Absorbers
- Infra-red and Optical Metamaterials
- Electromagnetic Cloaking by Metamaterials
- Photonic Bandgap Materials
- Nanostructured Plasmonic Surfaces
- Micro and Nanofabrication Techniques
- Microwave Characterization Techniques
- Optical Characterization and Spectroscopy

COURSE FEE
UNIVERSITY / ACADEMIC INSTITUTIONS
There is no course fee for engineering/science teachers from Universities / AICTE recognised Colleges/Academic Institutions. Participants will be paid to and fro train fare (3rd AC Rail) via shortest route (strictly on the production of ticket) as well as free boarding and lodging in the guest house/hostels at IIT Kanpur. The applications should reach the course coordinators latest by 15 March 2015, giving the required information in the registration form. The Participants are required to get their applications duly recommended by the Head of the Institution/Department. The teachers should have M.E./M.Tech./M.Sc. degrees in Electronics/Electrical/Material Science/Instrumentation/Photonics/Physics. Candidates with Ph.D. and/or UGC/CSIR Lectureship will be preferred. The selected candidates will be required to send a refundable caution deposit of ₹ 1000 to ensure their commitment for participation in the course. This amount will be refunded only to those candidates who attend the course (Please do not send the demand Draft until you receive a confirmation of your selection by email).

PARTICIPANTS FROM INDUSTRY/ R & D LABS
Private and public sector companies and other organizations are welcome to depute their executives, managers, researchers and engineers to participate. The sponsoring organizations are required to pay a course fee of ₹ 10000 per participant. The participants will have to make their own arrangements for travel. Boarding and lodging can be arranged on payment basis in the guest house/hostels at IIT Kanpur based upon prior request and availability.

In all cases, the scanned registration form duly recommended should be sent first by email and the hardcopy should be sent by post.

The list of selected candidates will be displayed on the web-page [home.iitk.ac.in/~kvs/meta2015.htm](http://home.iitk.ac.in/~kvs/meta2015.htm)

MODE OF PAYMENT
The registration fee or caution deposit should be sent by demand draft payable at the “State Bank of India, IIT Kanpur Branch and drawn in favor of “METAMATERIALS - 2015”.

IMPORTANT DATES
Receipt of Application: 15 March 2015
List of selected Candidates: 17 March 2015
Receipt of Demand Draft: 25 March 2015

ADDRESS FOR CORRESPONDENCE
Course Email: meta2015.iitk@gmail.com
Course Website: [http://home.iitk.ac.in/~kvs/meta2015.htm](http://home.iitk.ac.in/~kvs/meta2015.htm)

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Short course on
Fundamentals and Applications of
METAMATERIALS
06 to 10 April 2015
for teachers, practicing engineers and scientists

Sponsored by
All India Council for Technical Education, New Delhi
(Under the Continuing Education Program, IIT Kanpur)

Coordinators
Prof. S. Anantha Ramakrishna
Prof. Kumar Vaibhav Srivastava

Department of Physics
&
Department of Electrical Engineering

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