

Candidates should complete the enclosed registration form, and send it by mail, email or fax to the Course Coordinator.

### DATE AND TIME OF REGISTRATION

May 09, 2016, 09.00 A.M. at course venue, IIT Bombay.

**Completed registration form should be sent to the following address:**

**Prof. Anil K. Singh**

**Course Coordinator**

Department of Chemistry

Indian Institute of Technology Bombay

Powai, Mumbai – 400 076

Phone: (022) 2576 7167 / 8167

Fax: (022) 2572 3480

Email: [retinal@chem.iitb.ac.in](mailto:retinal@chem.iitb.ac.in)

### LAST DATE for APPLICATION: April 28, 2016

- Notification of acceptance: April 28, 2016
- Incomplete application forms will not be entertained.
- For additional copies of the registration form, please xerox or type in the format given.

Confirmation of eligible candidates will be on a first come first served basis up to a maximum of 30 candidates.

The completed registration forms should be received by the Coordinator latest by **April 28, 2016**.

For any further information regarding QIP programs at IIT Bombay, please contact:

**Professor-In-Charge, CE & QIP**

Indian Institute of Technology Bombay

Powai, Mumbai – 400 076

Phone: (022) 2576 7006

Email: [qip@iitb.ac.in](mailto:qip@iitb.ac.in)

**For further details, please visit:**

<http://www.iitb.ac.in/~cep>

### COURSE DATE AND VENUE

The course will be conducted during May 09 – 14, 2016 at Seminar Hall, Second Floor, Jal vihar Guest House.

### FACULTY

The Faculty constitutes Professor Anil K. Singh (Coordinator), Department of Chemistry, IIT Bombay and other Faculty from IIT Bombay other nearby Institutions.

### ELIGIBILITY

Faculty members of degree level engineering colleges recognized by AICTE are eligible to attend the course. Faculty member should have exposure to Physics, Chemistry, Life Sciences and Mathematics at 10+2 level.

### TRANSPORT, BOARDING AND LODGING

Participants are entitled for Second Class (Sleeper Class) or III AC railway fare to and fro by the shortest route from college to IIT Bombay. All participants will be given auto fare from Kanjurmarg/ Andheri Railway Station to IIT Powai on the dates of arrival and departure. Local participants will be paid second class railway fare or BEST Bus fare. **Boarding and lodging will also be provided free of cost in the students Hostels only for participants.**

### REGISTRATION

All short-listed candidates are required to confirm their participation by sending a **Demand Draft of Rs. 1,000/- in the name of "Registrar IIT Bombay"**. The above amount will be refunded to the participant if he / she attends the course. In case a participant does not attend the course, the above amount will be forfeited.

### WHO MAY BENEFIT

The course would benefit many across various disciplines of science and technology. It is of interest to PG and doctoral students, serving teachers and researchers, laboratory scientists, planners and policy makers both in academia and industry. Practitioners in the areas of chemical and biological sciences, physics, agriculture, biotechnology, medical and pharmaceutical sciences, health care, radiation biology, assisting, earth and space sciences, materials science, opto-electronics, energy and environment, etc will find this course useful.



## QIP Short Term Course on PHOTOBIOLOGY – CONCEPTS AND APPLICATIONS

**May 09 - 14, 2016**

Coordinator

**Prof. A.K. Singh**  
Department of Chemistry

Office of  
Continuing Education & Quality Improvement  
Programmes

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

## INTRODUCTION

Photobiology – the science of light and life – is an exciting and challenging field. It involves scientific study of the effects of light energy on organisms and ecosystems. It is a large, multidisciplinary subject in which topics like photosynthesis, vision, phototaxis, photoperiodism, photomorphogenesis, bioluminescence, photomedicine, environmental photobiology, ultraviolet radiation effects, photo-technology, etc. are commonly studied,

As is well-known, solar radiation sustains almost all biological activity on Earth (“नूनं जनाः सूर्येण प्रसूताः।”(*All that exists was born from the Sun - Brhad-devata*). Scientific knowledge of the effect of solar radiation on different organisms and ecosystems has been the concern of many as it is pivotal to develop scientific understanding of the functioning of Nature, and further to develop alternate, more efficient light-mediated technologies for various human needs. Researchers have been able to develop molecular level understanding of many photobiological processes. Such knowledge in turn has significantly influenced new developments in many areas of science and technology. Some of these include: Agriculture (e.g. efficient photosynthesis, aquaculture, plant genomic research), human health (photomedicine, photoimmunology, light-activable prodrugs, cellular physiology, photodynamic therapy), electronics and communication (e.g. opto-electronic devices and photo-responsive biomaterials, bioluminescence), energy (e.g. solar and related energy research), global climate and environmental changes (environmental photobiology, UV radiation effects, ozone depletion, ultraviolet radiation increase, carbon dioxide emissions, and temperature), sensory biology (e.g. vision, non-visual photoreception, photomovement, etc.) energy-transduction (e.g. ion-transport), etc.

This course intends to provide the participants an overview of basic principles and major concepts involved in studying the effects of light energy on living organisms, ecosystems and aims to highlight various possible applications of photobiological concepts.

## COURSE OUTLINE

- The course intends to cover the following topics.
- Basic aspects of interaction of light with biological systems. Common tools and techniques of photobiology
- Photosensitization, mechanism and applications.
- Photoreceptors and light-sensing mechanisms, vision, non-visual photoreception, ion-transport mechanism, structural dynamics and functional mechanisms.
- Photomedicine, UV radiation effects on molecules, DNA damage, photocarcinogenesis, photodynamic therapy, photo and fluorescence diagnosis, photoimmunology, photo-vaccines, UV and vitamin D synthesis, UVA signalling, photosensitizing drugs, photodermatology, risks and new developments, and applications of light in dermatology, light-controlled targeted drug delivery, photodegradation of drugs.
- Photoecology and environmental photobiology, effects of solar radiation on terrestrial and aquatic organisms and ecosystems, UV radiation and environmental impacts. Biofuels production, algal and cyanobacterial photobiological systems.
- Photomovement, molecular mechanisms of photomorphogenesis, phototaxis, photoperiodism, chronobiology.
- Photosynthesis, mechanism, recent advances and applications.
- Bioluminescence - mechanism of manufacture and processing of biological light emission by organisms;
- Technical applications of photobiological receptors, design of nature-inspired new light-sensing molecules/ photoswitches and phototriggers.[for](#)

Lecture notes / presentations will be made available to participants at the end of lecture/ presentation. Successful participants would be awarded 'Course Completion Certificate'

## REGISTRATION FORM

### QIP Short Term Course on

### PHOTOBIOLOGY – CONCEPTS AND APPLICATIONS May 09 - 14, 2016

Name\* (in block letters):

Gender:

M/F

Designation\*:

Organization\*:

Mailing Address\*:

Telephone Number :

(O) (R)

FAX :

Mobile Number\* :

Email\*:

Educational

Qualifications\*:

Discipline/Specialization\*:

Accommodation Required\*: YES / NO

Signature of Applicant\*:

**Sponsorship and Signature of Head of the College / Institute (with date and seal)\***

