

Degree College Teachers Training programme

in

Chemistry

23rd November to 13th December, 2016



Center of Excellence in Science and
Mathematics Education

Indian Institute of Science

at its

Challakere Campus, Chtradurga-577536

Under

Pandit Madan Mohan Malaviya National
Mission on Teachers and Training
(PMMNMTT), MHRD, Govt. of India.



The IISc at Challakere Campus offers a great opportunity for degree college chemistry teachers. This is a three week (21 days) residential training program equivalent to UGC refresher courses approved by MHRD, Govt. of India. There will be **80 hours of lecture and 100 hours of experiments**

on the following topics covering entire BSC Chemistry subjects per the UGC guidelines:

- Electronic structure of atoms, molecules, chemical bonding, valence, oxidation state, photoelectron spectroscopy.
- Gases, liquids and thermodynamics.
- Solutions- chemical equilibrium.
- Electrochemistry.
- Inorganic Chemistry – s, p, d and f block elements and the periodic table, coordination chemistry, organo-metallic and nuclear chemistry.
- Solids – Solid state chemistry, adsorption, kinetics of reactions, catalysis and photochemistry.
- Spectroscopy – organic and inorganic molecules.

Lectures are given by IISc Professors. Learning theory by doing experiments is the specialty of this new program. New experiments to understand theory have been designed and teachers will be doing these experiments individually.

First three days will be devoted to essential mathematics and Electronics for Chemistry teachers. Teachers will learn to plot various functions including s, p, d, f orbitals employing a PC and show how the shapes emerge.

We have designed over 80 experiments on the above topics to learn theory. Each day, teachers will be doing 3 to 5 experiments. Experiments include: Resistance vs Temperature for metals and semiconductors (SC), measurement of band gap; Digital thermometers and temperature measurements from 77 to 1000 K; black body radiation-Planck's equation verification, atomic spectra of H, He, Na, Li, and term symbols determination, Rydberg constant, electromagnetic spectrum; atomic and molecular orbitals from Quantum Mechanical (DFT) calculations, plots of s, p, d and f orbitals, Boyles' law, Charles' law, absolute zero, Cp/Cv, determination universal gas constant- R, specific heat of metals; elevation of boiling point, depression of freezing point, vapor pressure of liquids and Clausius -Clapeyron equation, heat of vaporization,

Raoult's law, osmotic pressure, reverse osmosis; pKa, pKb, buffers, determination of electrode potentials, cyclic voltammetry, Avogadro number determination, photoelectric effect, molecular spectra, charge transfer spectra, determination of 10 Dq, complementary colours, X-ray diffraction, determination of lattice parameters and Miller Indices, Langmuir adsorption, vacuum techniques, gas-solid reaction kinetics, CO oxidation, NO reduction, temperature programmed reduction, gas chromatography and separation of inorganic and organic molecules, synthesis of organic compounds along with IR, UV and NMR spectroscopy.

Applications are invited from Indian Citizens who teach Chemistry for BSC students from any part of India. Those who have attended two UGC refresher courses can also apply. Promising Contract Lecturers can also apply.

Send your application mentioning

- Name, Address, E-mail & Phone No.
- Date of Birth
- Qualification with affiliating Institution/college
- Place of work & Experience and specialization
- Endorsement by Principal/Head of Institute.

**Last date to receive application:
October 31, 2016**

Send your application to

**Professor M S Hegde, Convener
TDC, IISc Kudapura – 577536**

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**For more details please visit-
tdc.iisc.ernet.in**