



## REFRESHER COURSE IN EXPERIMENTAL PHYSICS

With

### SCIENCE ACADEMIES' KIT

#### Introduction:

A low cost kit has been developed for the Indian Academy of Sciences, Bengaluru for conducting about forty experiments, some at the B.Sc, some at M.Sc (Physics) and a few at the post-M.Sc level by Professor R. Srinivasan. This kit is being manufactured by M/s Ajay Sensors and Instruments, Bengaluru, since December 2008. More than 125 kits have so far been sold to many colleges, universities and institutions. Sixty two Refresher Courses in Experimental Physics have so far been conducted till July 2014 and several more are in the pipeline. Eighty institutions including more than twenty universities have accepted some of the experiments in their curriculum.

#### Details about the Refresher Course

1. Duration of the Refresher Course will be fourteen working days **not counting intervening Sundays and holidays**. The first four days will be devoted to lectures on the circuits and experiments and the participants will spend 18 laboratory sessions of three hours each carrying out all the experiments.
2. Participants will mainly be faculty members from colleges and a few students in the III B.Sc/I M.Sc (Physics) classes.
3. The Course Director will be Dr C.S. Sundar, Fellow of all the three Academies (IASc, INSA, NASI).
4. The Academy has built a laboratory in their Jalahalli premises in Bengaluru and this laboratory will be available for conducting the Course from January to April and September to end of December. During the other months, Courses can be conducted away from Bengaluru at the request of a host institution.
5. In case the Course is held away from Bengaluru, there will be a local organizer from the host institution who will be the Course Coordinator (CC). The responsibilities of the CC are given below:
  - (a) CC must send circulars to various colleges informing the faculty and students about the Course at least two months in advance, call for applications and select the participants.
  - (b) If the announcement of the Course is sent at least three months in advance to the Academy, the Course can be advertised in **Current Science** and **Resonance** to invite applications from interested participants. The Course Director may select about six participants from such applicants and inform the CC.

- (c) CC will be responsible for making suitable arrangements for lectures and laboratory programmes. CC will also arrange for six computers loaded with Microsoft Office and Origin programs for use by participants during the Course.
  - (d) The host institution should provide campus accommodation for all participants, and if possible also for all Resource Persons. Lecture hall with audiovisual facilities, uninterrupted power supply, areas for serving tea/coffee etc should also be provided **free of charge**.
  - (e) CC must procure whatever materials are required for the Course. These will be specified in advance by the Course Director.
  - (f) CC will make available a CD containing the Course manual for distribution to the participants.
6. The Course Director will arrange for Resource Persons to assist him during the Course. In case such Resource Persons are not available, the host institution will be requested to send four of its faculty in advance to Courses on Experimental Physics run by the Panel in Bengaluru or other locations so that the faculty from the host institution trained in these Courses can act as Resource Persons during the Course. The Course Director will also arrange enough number of kits to reach the host institution in advance of the Course. He will send a zipped folder of the manual to the CC from which CD can be made. He will inform the CC in advance the materials required for the Course. He will prepare the time table for the Course.
  7. Travel expenses for all participants (three-tier AC train fare) will be met by the Panel. In the case of Resource Persons, travel expenses by two-tier AC fare (or 1 AC where available) or in unavoidable circumstances by air availing concessional fares with prior approval will be met by IASc. Where air travel as approved by the Panel is involved, the CC should request IASc to book the e-tickets to be sent to the Resource Persons.
  8. It would be preferable if all the participants, including the local participants, are given campus accommodation so that there is greater interaction among participants and the schedule of lectures/experiments can start on time. When this is not possible, local participants may be paid a daily conveyance (bus fare not exceeding Rs 100/- per day).
  9. Local hospitality — transport, accommodation, food — for all participants and Resource Persons will be met by the Panel.
  10. In all publicity material such as programme sheet, invitation cards, etc. the names of the three Academies should be given prominence comparable to that given to the host institution. **The Course should be called “Science Academies’ Refresher Course in Experimental Physics”**. Only names of the Course Director and Course Coordinator should be included in such material. Names of members of management, organizing committees, patrons etc should be strictly avoided.

### **How to apply for such a Course**

1. Institutions desirous of having such a Course should first consult Dr C.S. Sundar and fix suitable dates for the Course.
2. CC should then send a proposal for holding such a Course through the Head of the Local Institution to Dr T.D. Mahabaleswara, Co-ordinator, Science Education Panel, Indian Academy of Sciences, C.V. Raman Avenue, Sadashivanagar, Bengaluru 560 080 in a format, a model for which is appended. An advance copy of the application may be sent by email to Dr T.D. Mahabaleswara at [sep@ias.ac.in](mailto:sep@ias.ac.in).
3. The proposal should contain a budget prepared according to approved rates enclosed.
4. Of the total amount budgetted for the Course, the host institution must agree to provide **at least** Rs 50,000 (Rupees Fifty Thousand) for the conduct of the Course. The rest of the funds required will be provided by the Panel.
5. At the conclusion of the Course, the Panel will gift one basic kit consisting of 28 items costing about Rs 65,000/- to the host institution.
6. The host institution must give an assurance that some of the experiments will be included in the curriculum in the courses conducted by the host institution within two years.
7. The Panel will consider the proposal. If it approves the proposal, the CC will be informed of this decision within a reasonable time (about a month) from the date the proposal is received.
8. CC has to open a separate bank account in the name "Refresher Course on ..." and inform IASc regarding the details (name of account holder, name of bank, name of branch and the account number. For non-SBI accounts, IFS code also needs to be provided). This will enable electronic transfer of funds. The Academy will transfer the funds in two or more instalments to this account.
9. Within a month of the conclusion of the Course, the CC will submit to Dr T.D. Mahabaleswara
  - (a) a report on the Course (soft and hard copy)
  - (b) a list of participants with their names, institutions of affiliation, complete local postal addresses (with pin code) and email addresses (soft and hard copy)
  - (c) a statement of audited accounts with copies of all vouchers and receipts and a bank statement (soft and hard copy)
  - (d) a group photograph of the participants and Resource Persons etc (soft and hard copy)
  - (e) feedback forms about the Course from the participants (sample copy will be provided) and
  - (f) refund any unspent balance in the account.

**ADDRESS FOR CORRESPONDENCE:**

THE CO-ORDINATOR  
22661201/22661210

Ph: 080-

JOINT SCIENCE EDUCATION PANEL  
[sep@ias.ac.in](mailto:sep@ias.ac.in)  
 INDIAN ACADEMY OF SCIENCES  
 C.V. RAMAN AVENUE  
 POST BOX NO. 8005  
 SADASHIVANAGAR POST  
 BENGALURU 560 080

Email:

**APPROVED RATES FOR TWO-WEEK REFRESHER COURSES  
 (Experimental Physics)**

**(for 25 outstation teachers, 10 local teachers, 5 resource persons and 5 supporting staff)**

<p><b>1.</b></p>	<p><b>Travel expenses</b>          a. TA to Course Director &amp; Four to Five Resource Persons          b. TA for six outstation participants including minor incidental expenses          c. TA to 10 registered local participants          d. Excursion</p>	<p>Two-tier AC or I AC (where available) or economy air fare with prior Academy approval          Actual 3-tier AC train fare + Rs 400/- for the round trip towards incidental expenses          Rs 100/- per person per day          Rs 15,000/-</p>
<p><b>2.</b></p>	<p><b>Boarding and lodging:</b>          a. Lodging for registered participants          b. Lodging for resource persons including breakfast and dinner (at Guest House provided by host institution).          c. Breakfast/dinner for outstation participants          d. Working lunch, two servings coffee/tea (for</p>	<p>Up to Rs 400/- per day (excess to be met by host institution)          Up to Rs 2000/- per person per day; rates beyond Rs 2000/- (for example, hotel charges) to be met by host institution, or the Coordinator to write to Academy for instructions.          Rs 250/- per person per day</p>

	45 persons)	Rs 200/- per person per day
<b>3. Honorarium:</b>		
a. Resource Persons:		Rs 2,000/- per lecture including special lecture
b. Supervision of Experimental Sessions:		Rs 1,000/- per day
c. Course Director:		Rs 4,000/-
d. Coordinator:		Rs 3,000/-
e. Supporting staff (not more than 4 persons):		Rs 7,000/- (total) (Rs 1,750/- each)
<b>4.</b>	Cost of materials required for experiments	Rs 50,000/-
<b>5. Other items:</b>		
a. Publicity:		Rs 6,000/-
b. Registration material : (Bag, note book, <i>pen</i> , <i>CD of study material</i> , <i>instruction manual</i> )		Rs 12,000/-
d. Contingency ( <i>stationery, photocopying, postage, photography</i> )		Rs 15,000/-
e. Local transportation		Rs 10,000/-

Of this amount the contribution from (the name of the host institution) will be Rs. \_\_\_\_\_ . The balance of Rs \_\_\_\_\_ is sought from the Panel.

Date  
Signature of CC  
Place

**MODEL PROPOSAL**

**REFRESHER COURSE IN EXPERIMENTAL PHYSICS  
PROPOSAL  
(NAME AND ADDRESS OF THE HOST INSTITUTION)**

**INTRODUCTION:**

**(A few lines about the host institution, the courses run by the institution and how the Refresher Course will benefit the institution).**

**COURSE DIRECTOR AND LOCAL ORGANIZER (COURSE CO-ORDINATOR)**

The Course Director will be Dr C.S. Sundar, FNA, FNASc, FASc. (Give the name, postal and email addresses of the Course Coordinator – CC)

**DATES OF THE COURSE**

After consultation with Dr C.S. Sundar, it is proposed to hold the Course from (the starting date) to (the ending date).

**RESPONSIBILITIES OF THE COURSE DIRECTOR**

Dr C.S. Sundar will arrange

1. to find the necessary Resource Persons from other institutions to assist him during the Course. (If he is unable to find such Resource Persons he will arrange for the faculty members to participate in other Refresher Courses in Experimental Physics he will be conducting so that they will be in a position to assist him as Resource Persons).
2. for the delivery of the necessary kits to the (name of the host institution) in advance of the Course.
3. to send a zipped folder of the manual, a list of material to be procured and a draft time table for the Course in advance and
4. to intimate the names of not more six participants selected from applications received by the Academy in response to its announcement in **Current Science and Resonance**.

**The Course Coordinator will**

1. send announcements about the Course at least two months in advance to local colleges and invite applications from teachers and students in colleges (both science and engineering)
2. to form a suitable selection committee consisting of faculty members to select about thirty faculty and student participants and prepare a waiting list at least three weeks in advance of the Course and inform the selected participants by email

3. procure all the materials required for the conduct of the Course, prepare hard copies of the manual and time table for distribution to the participants at the commencement of the Course
  4. to arrange suitable accommodation for the Resource Persons and outstation participants
  5. Course Co-ordinator has to open a separate bank account in the name "Refresher Course on ..." and inform IASc regarding the details (name of account holder, name of bank, name of branch and the account number. For non-SBI accounts, IFS code also needs to be provided). This will enable electronic transfer of funds.
  6. to make all arrangements for the conduct of the Refresher Course.
  7. give a certificate signed by the Course Director (format to be provided by IASc)
- and
8. to provide a report, a statement of accounts etc as per the guidelines that will be sent by Dr T.D. Mahabaleswara at the time of approval of the Course

#### **Request for a kit**

It is requested that the Panel gift a basic kit to the (name of the institution) at the conclusion of the Course.

#### **Contribution of the host institution**

The (name of the institution) agrees to contribute a sum of Rupees (specify the amount not less than Fifty Thousand rupees) towards the conduct of the Course.

#### **Assurance of the host institution**

(Name of the host institution) gives an assurance that some of these experiments will be included in the (indicate the name of the course/courses) within the next two years.

#### **Budget**

The proposed budget is attached. The total budget estimate is Rs (specify the amount). Of this the Institution's contribution will be Rupees \_\_\_\_\_. The balance of Rs \_\_\_\_\_ should be provided by the three National Academies of Sciences.

The Indian Academy of Sciences is kindly requested to sanction the proposal as soon as possible.

**Place  
Date**

**Signature of the  
Course Coordinator**

**Forwarded by**

**Place  
Head/Director  
Date**

**Signature of  
of the Institution**

**Official Seal**

*Updated 07 March 2018*