EFFECTIVE WAY OF CONDUCTING LABORATORY CLASSES FOR ENGINEERING STUDENTS

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1. INTRODUCTION

The purpose of including laboratory classes in the engineering curriculum is to supplement as well as to verify and extend the knowledge obtained from the theory classes. Engineering students must have confidence and skill to develop engineering products which cannot be built up without laboratory classes and hence laboratory classes have some added importance compared to the theory classes. But unfortunately most of the time, these laboratory classes are either neglected [1] or suffer due to some problems. The author, here, points out some of these problems and presents a systematic approach to conduct laboratory classes, especially for the students of Electronics Engineering.

2. DIFFERENT PHASES OF CONDUCTING LABORATORY CLASSES

The whole process of conducting laboratory classes can be divided into following three phases :

A. Planning and Preparatory phase.

B. Interaction phase.

C. Evaluation and Improvement phase.

A. Planning and Preparatory phase

Following steps must be implemented during this phase.

(i) Generally, there is no fixed syllabus available for the laboratory works. So it becomes the responsibility of the teacher concerned to analyse the theory course and select appropriate experiments whose sequence must be logically consistent.

(ii) Now the teacher should collect relevant materials for the experiments and prepare instruction/assignment sheets for the students as well as for his own reference. Chattopadhya et al [2] have suggested that extra classes should be organized for laboratory instruction instead of supplying instruction sheets. But experience shows that within the tight schedule of a semester, it is not possible to organize extra classes regularly and supplying instruction/assignment sheet motivates the students for further study required to understand the experiment.

(iii) Arrangement should be made to procure components, tools, instruments etc. required for the experiments. These days, there is a tendency to buy readymade experimental kits/modules - this should be avoided/minimised as far as possible.

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(iv) Next, the teacher should perform/ test all the experiments as specified in the instruction/assignment sheets. This will give him further insight into the experiments, prepare him for the laboratory classes and enable him to correct or improve the instruction sheets. Other teachers or laboratory assistants who will accompany him during the actual class hours can also take part at this stage.

B. Interaction phase

Laboratory class is the most appropriate occasion for fruitful interaction between a teacher and a student.

(i) Generally in the begining of a semester/ session, few laboratory classes are not held due to insufficient progress in theory classes. This problem can be solved in two ways.

- Teacher can use these time slots to teach theory and make some progress which will help him to start the laboratory classes very soon.

- Students may be asked to familiarise themselves with the components, instruments, equipments and any other device which will be used in the forthcoming experiments.

(ii) In a particular laboratory class, teacher should ask the students

- to submit laboratory records of the experiments performed in the last class.

- to show the circuit diagram, design calculations etc. related to the experiments to be performed in that class.

- to get their circuit connections checked and guide them to perform the experiments properly.

(iii) It is found that sometimes students are asked to perform advanced experiment at some earlier stage when the relevant theory is not yet taught in the class and hence, they are not in a position to appreciate the same. If the infrastructure of the laboratory permits, it is better to assign the same experiment to all the students. It is convenient to both the students as well as the teacher.

(iv) One point must be clarified to the students from the very begining that the experimental results cannot match exactly to its theoritical counterpart. Rather they may be encouraged to find out the reason behind this difference.

C. Evaluation and Improvement phase

The duty of a teacher is not over, even after the laboratory class.

(i) He must evaluate the students immediately after the class according to their performance in the laboratory.

(ii) He should note down any new points observed during the laboratory class and hence modify instruction/assignment sheets accordingly.

3. CONCLUSION

A step by step procedure is discussed for conducting laboratory classes which may be useful for teachers who join this profession afresh. Few suggestions are also included to improve over the traditional methods.

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