

S D M COLLEGE OF ENGINEERING AND TECHNOLOGY, DHARWAD – 580 002

Department of Electrical & Electronics Engineering
(Professional competence with positive attitude)



Novel Practices

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1. Best practices in Teaching Learning

- Activity based Teaching –Learning –Theory
- Teaching model development –Theory
- Activity based Laboratory practices
- Hobby projects

Activity/Project based Teaching and Learning

Objective of the Practice: To adopt learner centric teaching by giving exposure to work with practical systems and thus ensuring the effective learning to happen.

Rationale: The contents taught in class room will help acquiring the knowledge and developing intellectual base. Few courses like Renewable energy sources etc. are included in the curriculum which is to enable the students after their graduation to deal with real time / practical systems. A better insight can be had if the students are made to learn the contents along with implementation/analysis of real time systems by carrying out an activity.

Methodology: The course teacher will teach 90% of the contents in detail and about 10 % of the contents will given to the students with fairly reasonable introduction to the topics to carry out an activity. The students are expected to carry out the activity by locating the necessary learning resources and collecting information like specifications of solar panels, wind mills, different methods of tracking the solar panel etc. and will develop analytical and/or practical models to validate the theoretical contents studied in class room. The whole class is divided into number of groups with maximum of 8-10 students per group and activity will be defined. The students are required to document the progress of the activity for final consolidation in to a report which will also serve as learning material for them at the time of examination to answer questions pertaining to the topics.

Resources required: Prototype RES components, metering equipments, computers, power electronic devices etc.

Outcome of the practice:

* The students will be able to answer the questions on these topics unambiguously because of having worked out independently.

* Since the students have carried out the activity on their own, by choice they select the questions to answer confidently.

* The students present their activity before their classmates which in turn will be an educative program and also trigger some students to identify their field of interest thereby can select the major project to be done at higher semesters.

For further details Contact: **Prof. Dr. M. R. Kappali**

Dept. of E&E, SDMCET,

Dharwad.

Phone: 9448661981

Email:mrkappali@rediffmail.com

Activity based Teaching and Learning

Objective of the Practice: To support effective learning and ensure providing skill sets so as to take up the assignment after the graduation without post recruitment training.

Rationale: In principle most of the courses taught in engineering are to be supported by laboratories. Due to certain constraints while designing the curricula, many courses, though require laboratory support are not being provided, which is especially true with elective courses. Under such circumstances to increase the effectiveness of teaching, an activity is given to the students to validate the contents studied in theory by developing codes. An attempt is made here for a course on Digital system design using VHDL for VI semester E&E students. It is a 4 credit course with 52 contact hours. Of the 52 hours, 40 hours class room teaching is done and the remaining 12 hours is used to write the code and test the same.

Methodology: The course teacher will teach 100% of the contents in the class. The contents learnt need to be validated by writing the code. The students are given with a practical small system design and are expected to design the system and confirm the functionality by writing a code using VHDL. and simulate the same. Each student will write codes for minimum 10 systems and document in the form of report along with the simulation results. The students' performance will be monitored continuously by the course instructor and report will be evaluated to award marks under Course Teacher's Assessment.

Resources required: Computers, laptops, printer etc.

Outcome of the practice:

- * It is observed that the students will be able to design the system on their own by developing the code.
- * It is observed that the students will be able to locate the open softwares available for simulation
- * It is observed that the students will be able to circumvent the problems in respect of syntax, semantics, sparse errors etc.
- * It is observed that the students answer the questions pertaining to development of code more confidently in the examination.
- * With little fine tuning they are able to take up the assignment.

For further details Contact: **Prof.Dr.R.L.Chakrasali**
Dept.of E&E, SDMCET,
Dharwad.
Phone:98454 77797
Email: pratisatu@yahoo.co.in

An Activity to augment Learning

Objective of the Practice: To motivate the students to locate the state of the art subject contents and instill lifelong learning desire.

Rationale: Every course in any program invariably serves as a prerequisite and thus provide link for higher/advanced learning in that domain. It is necessary to create awareness among the students regarding the significance of the course along with the course leading to further studies. An attempt is made here for VII semester E&E students in the course Computer Communication Networks. The course is taught covering the entire syllabus. The students are expected to choose a topic and present before the entire class for the benefit of self and other students

Methodology: When the topic teaching is in progress, the students were asked to locate the concepts/contents that could be extension of the topic that they are studying. Each student will find/gather information on different topics by referring to books, journal papers, internet etc. The students are expected to study, understand and analyze the concepts and accordingly prepare a brief write up on the topic. Further, the students present the same before the whole class. The topics presented by the students will be submitted to the course teacher both in hard and soft form. This material will be brought out in the form of a CD which will be distributed to all the students in the class for ready reference. A hard copy in bound form is also brought out and will be deposited in the department. The students' performance and submitted report will be evaluated by the course instructor to award marks under Course Teacher's Assessment.

Resources required: Computers, laptops, printer, knowledge resources like books, indexed journals, etc.

Outcome of the practice:

- * It is observed that the students will be able to locate the relevant extension of the topics.
- * It is observed that the students will be able develop self learning and analysis capability.
- * It is observed that the students will be able to prepare write up on technical topics.
- * It is observed that the students will gain confidence of presenting the information to the audience and communication skills.
- * All the students are exposed to the advanced topics pertaining to that course and is as good as undergoing a course on advanced version of the course.

For further details Contact: **Prof.Dr.R.L.Chakrasali**
Dept.of E&E, SDMCET,
Dharwad.
Phone:98454 77797
Email: pratisatu@yahoo.co.in

Teaching Model Development using simulation softwares

Objective of the Practice: To develop teaching models using simulation packages of device or systems, to give visual physical interpretation of fictitious quantities in the class to understand the concepts, which otherwise difficult to show in stipulated time / cannot be seen at all.

Rationale: In the field of Electrical Engineering, electrical quantities, magnetic field and their interaction cannot be observed though their effect can be experienced. In understanding most of the subjects in this field, it is necessary to give insight into the subject by developing models of the device or systems using simulation packages. One such model is developed using MATLAB to show how the rotating magnetic field is produced in 3-phase induction motors when its stator windings are supplied with 3-phase voltage.

Methodology: The course teacher will teach the subject by traditional methods and select the topics in the subject, which cannot be understood easily. For such topics simulation package like MATLAB is used to create a model considering all the all possible operating conditions and thus helps in knowing the concept involved. This is developed for AC machines using the simulation package which is unique in nature. While teaching the subject along with the analytical explanation, the model gives visual feeling making the concept clear.

Resources required: MATLAB software or any other familiar simulation software loaded computer and Projector.

Outcome of the practice:

- The students will be able to understand the concept without any ambiguity.
- Students will be introduced to simulation softwares and their abilities.
- Students may try learning other difficult concepts in this way.
- It will create interest in the students for lifelong learning.

For further details contact: **Prof: V R Sheelavant**

Dept. of E&E, SDMCET, Dharwad.

Phone:9480553975

Email:sheel125@gmail.com

Activity based learning

Objective of the Practice: To improve analytical, technical and logical reasoning skills of students.

Rationale: Today's requirement is industry ready graduates who can be directly put on to the job/task. When a theory course is taught, the exposure to validation through practice will enhance the skill sets of the students. If the theory course is not supported with practical in curriculum, it can be achieved through such exercises. This practice is followed for VII Semester of E&E studying VLSI course.

Methodology:

- Students groups are formed subject to maximum of 4, thus 18 groups are formed.
- Twelve problems based on basics of digital design and VLSI circuits were defined.
- Groups were allocated **two problems each** and they are supposed design/ rig up and implement them using any suitable simulation software.
- Before the end of semester students asked to demonstrate the results and working.
- Evaluation of the work was done based on demonstration, knowledge acquired by students and quantum of work done.(Questions were asked for the work put up and skills acquired / developed were observed).

Resources Required: Technical guidance, simulation tools, computers, digital boards etc.

Outcome of the practice:

*Students acquired knowledge of usage of modern simulation tools.

*The concept of digital design were better understood and thus increased their confidence level in attempting any new digital design required for VLSI design.

*The concepts of fundamentals of VLSI design is well understood thus, notion of thinking, analyzing ability is improved.

For further details Contact: **Prof. Sunil Joshi**
Dept. of E&E, SDMCET,
Dharwad-580 002
Phone: 9663212825
Email: sunilj2005@yahoo.in

Enhanced learning through hobby Project

Objective of the Practice: To adopt learner centric teaching by giving exposure to work with practical systems

Rationale: This is an attempt to make the students of III semester to understand the small electronic circuit and make connections on bread board. This inculcates in the students the circuit connection, analysing ability. A better insight can be had, if the students are made to learn the contents along with implementation/analysis of real time systems by carrying out an activity.

Methodology: Students are making a team of two and search for a project pertaining to their field of interest. Further, they carry out required literature survey, purchase of components, rig up the circuit/system and verify the working. This helps them while doing mini projects about the aspects of connections on breadboard. Students write about the topic and are required to document the progress of the activity. They also present the finance management of the hobby project.

Resources required: Bread board, electronic components, etc.

Outcome of the practice:

- * The students present their activity before their classmates which inturn will be an educative program and also trigger some students to identify their field of interest thereby can select the major project to be done at higher semesters.
- * The students make an exhibition of their work and all the faculty, students asks about their work. Since, the students have carried out the activity on their own, they answer questions confidently.
- * It will be a guideline for them to choose the mini and major project work to be done at higher semesters.

For further details Contact: **Dr.G. D. Kamalapur**
Dept. of E&E, SDMCET,
Dharwad-580 002
Email: gdkpur9@gmail.com

2. Best practices in Governance

Late Prof. R. G. Desai Memorial Free Access Library

Objective of the Practice:

The free access library is started in fond remembrance of founder HOD of EE Dept., Late Prof. R.G.Desai who was a great source of inspiration for all academic activities and also concerned always towards the all round personality development of the students.

Rationale:

The education is incomplete without learning happening in affective domain. The aim of affective learning is bring about behavioural change. Creating an environment where in the students become more responsible by inculcating positive attitude is essential. To ensure the affective domain learning, the library is made as open access library which is nobody's and everybody's property.

Methodology:

The books are donated by the students, faculty and other professionals. These books are kept in two cupboards without lock in the laboratory. The students are permitted to take the books, refer and keep it back. Many students read books during their free time and also make immediate reference when they are conducting laboratories, if need arises. Over 19 years of its existence, only 10 to 12 books are missing, which an indication of the positive attitude of the students. Further, no student will take the book out of the premises. Every year the stock verification is done along with removal of obsolescence.

Resources required:

cupboards, few tables, chairs and books

Outcome of the practice:

- * Students are more responsible
- * Students developed positive attitude and belongingness with the department

For further details Contact: Faculty & Staff
Dept. of E&E, SDMCET,
Dharwad-580 002
Phone:0836 2447465 Extn:8322,8323
Email: sdmcet.eee@gmail.com

Documentation of students' Seminars, Mini Projects and Major projects Reports for reference

Objective of the Practice: To make provision and keep track of reference material for study through proper documentation.

Rationale:

All the students are expected to undertake mini and major project work and also give seminar on technical topics. The students need to be given with information about these activities and also the topics already covered by their seniors. This will help them to know about the procedural aspects of carrying out these activities besides avoiding selection of topics which have been already dealt with by their seniors.

Methodology:

One copy of the report of seminar and project report is collected from the all students and entered in a separate register maintained which contains the details of the students, guide, batch, title of the work etc. The department has all the project reports of all the passed out batches since its inception.

Resources required:

Space for safe storage, register, involvement of staff.

Outcomes of the practice:

- * Improvement down the lane can be known
- * Students refer to the reports
- * Validation of the process in place

For further details Contact: Faculty & Staff
Dept. of E&E, SDMCET,
Dharwad-580 002
Phone:0836 2447465 Extn:8322,8323
Email: sdmeed@yahoo.co.in

3. Best practices in any other

- News- letter for a semester
- Practice Aptitude test and Group discussions
- Community Services

Bringing out Department NEWSLETTER

Objective of the Practice: To record and disseminate information about the activities and achievements of students, faculty and staff.

Rationale: Newsletter plays an instrumental role in providing a greater exposure of the achievements accomplished by the students, faculty and staff.

Methodology: All the information of events happened in the department like conference, talks, seminars, extracurricular activities during the semester were collected. The information collected is published in Newsletter format. Newsletter is an amalgamation of all the events held in the department. The editorial board consists of both staff and students who will take the responsibility of collecting the news and publishing after suitable editing work.

Resources required: Internet, reports of events, activities record book etc.

Outcome of the practice:

- * Helps in recording and documentation
- * Helps in providing the statistics about the activities
- * Showcases the department
- * Motivation to others to participate in large number

For further details Contact: **Prof. Pradeep Vibhuti**

Dept. of E&E, SDMCET,

Dharwad.

Phone: 9611828528

Email:pradeepvibhuti@sdmcet.ac.in

Practice Aptitude Test

Objective of the Practice: To enable pre-final year students to start preparation for placement.

Rationale: The students are expected to have reasonable knowledge in technical and aptitude skills. It is observed that the students though good and technically strong were failed to clear aptitude test. In this regard, proper initial triggering is required. The students in their third year of study are given with series of practice aptitude test well before the start of placement activities which will boost their confidence. Three to four practice tests are conducted for pre-final year students.

Methodology: The tests are conducted at the department level. The question paper of relevant standard consisting of 30 questions will be framed. The question paper pattern is similar to one which is followed by the recruitment companies. Each question carry 1 mark. The evaluation will be done by all the students of the same class on mutual exchange basis after the test. These practice tests are followed by, mock-interview conducted by the placed students of final year.

Resources required: Office stationary, LCD, involvement of faculty, students and staff

Outcome of the practice:

- * Reduced fear in the students regarding the test during placement
- * Increase in number of Students clearing the aptitude test.
- * Increase in placement.

For further details Contact : **Prof. Nandakumara C, Prof. Tejaswi Timsani, Prof. Pradeep V
Prof. Praveen P. K. Prof. Sanjeet A**
Dept.of E&E, SDMCET, Dharwad.
Phone:9916541079
Email: cananda1010@gmail.com

Community Oriented Activates

Objective of the Practice:

To create awareness about the electrical energy related issues like safety, safe practices, conservation, quality power and community participation in energy management etc.

Rationale: The educational institution and the professional students coming out of these institutions have an obligation to the society. The technical guidance and services are to be rendered to the society by the way of organizing the community related programs. The department always moves towards extending the benefits to the community in the vicinity.

Methodology:

Every year minimum one community related program will be organized by the department like giving awareness to farmers about operation of irrigation pumps , awareness to village women regarding the operation and safety of house hold appliances, awareness to school children about the energy conservation, training to electricians on safe practices etc. The human resource and infrastructure of the department is used for these programs. A faculty incharge will identify the service activity to be conducted which will endorsed by the department after in length discussion about its aims and uses.

Resources required: Laptops, Related material, handouts, safety devices, human resources etc.

Outcome of the practice:

- Students develop positive attitude towards the society.
- Students learn about the professionals interaction with the society.

For further details Contact: **Dr. M. R. Kappali, Prof. V. R. Sheelavant**
Dept. of E&E, SDMCET,
Dharwad-580 002
Phone: 9448661981 , 9480553975
Email: mrkappali@rediffmail.com, sheel125@gmail.com

Many more such practices as listed below are followed in the department.

- **Interaction with placed students, mock interview by placed students to juniors**
- **Interaction with Alumni**
- **Guest lecture on Technical topics**
- **Bringing out Students magazine for a semester-“AGNOSCO”**
- **Befitting use of Department Library like issuing one book to all the students and also one book to semester toppers**
- **Organizing National Conference/workshop etc.**

Gate Awareness Program

Objective of the practice: To enable Pre-final year students and final year students to start preparation for placement.

Rationale: The students are expected to get well-versed with GATE exam. It is observed that many of the students are unaware of GATE exam and they don't apply for it, because of lack of guidance. Even though some students know about the GATE exam they fail to prepare for it, so in this regard proper guidance is required. For doing Masters and Doctoral at IIT and NITs GATE exam is mandatory also from the past five to six years more than 50 Public Sector Undertakings are requiring their candidates through GATE. Even one can pursue Master or Ph.D from foreign universities through GATE only. Looking at the present scenario its is must that students should start preparing for GATE in early semesters. In this regard it help them to prepare for upcoming GATE exam.

Methodology : Through PPTs students are given lecture on GATE 2020 exam which will be conducted on 1st , 2nd 8th, and 9th February 2020 by IIT Delhi. The contents of the discussion were What is GATE ?, Why GATE?, Overview of GATE 2020, Eligibility criteria and Benefits of gate exam. Students got the knowledge about How to apply for gate exam, how to upload the documents to the website in the given format, what is exam pattern and complete Syllabus for Electrical engineering.

Resources required: Office stationary, LCD, involvement of faculty and students.

Outcome of the practice:

Reduced fear in the students regarding GATE exam.

Increase the number of students applying to the Gate exam..

To increase the number of GATE exam

For the further details contact: Prof. **Praveen P. Kuralupe, Prof. Sanjeet A**

EEE Dept. SDMCET Dharwad

Mobile no. 8123642361E

praveenpkuralupe16@sdmcet.ac.in, sanjeethpa5153@gmail.com