

To: Dir. of Tech. Edu.

Bcc: Principals of tech institutions, All faculty members of prominent colleges, Goan print media(100+ members)

Dear members of Goan Technical Education Community,

The success of any educational institution is measured by the productivity of the students in their professional life. This further translates into an efficient country that is driven by good professionals. It is of utmost importance to ensure that core concepts of the profession are absolutely clear in the minds of students graduating from an institution. Students should feel confident of performing their daily activities based on the concepts taught in college. The few years of education have to be productively utilized to lay a strong foundation of theoretical and practical knowledge.

The reality of IT education, as reported by several students of engineering colleges in Goa, is in stark contrast with the objective. The result is that several companies that come for campus recruitment return back with either zero or a handful of recruits. This reflects the failure of all participants in the education process. As responsible professionals, we want to change whatever is not in tune with the current trends and needs of the IT industry.

Absorb only the best students:

Currently there is no cut-off for qualifying for an Engineering seat. A Cut-off should be introduced so that only students who have put in hard work qualify for an engineering seat. If seats remain vacant, so be it. We should not have incompetent students in professional colleges. Also, let only deserving students pass the engineering course. If students realize that getting through the engineering course takes effort from their own side, they will be motivated put in those efforts. Without the notion of competence, we will have incapable students getting into the IT industry which will in turn bring bad reputation to the state.

Assignments should initiate curiosity:

Most assignments seem to make the students copy text from the text book to sheets. Merely copying content does not prove that the student has understood the concepts. There is no effort put in by the student to investigate and learn the practical use of the concept.

The questions or tasks given in an assignment should make the student look up the internet to understand how and where it is used. The questions should make the students apply their knowledge to real world problems.

Give marks based on comprehension:

It has been reported that a couple of students write the assignment and everyone else blindly copies it. When the assignment is submitted, the faculty member should approve it if and only if the student verbally explains the assignment satisfactorily. Today faculty members seem to approve the assignment only if enough pages are written. Assignments should not be a blind copy paste from the internet. The student should prove that he/she has understood it before submitting the assignment.

Programs should be written only on computer:

Many faculty members apparently ask the students to write the entire program and algorithm on paper. It is absolutely shocking to see such a bad practice being followed. Any sensible professional will testify that this practice is pointless. A program that is shown to be working on

a computer should be considered as a completed assignment. The algorithm should be written in short only to prove that the student has understood it.

Assignments should be submitted electronically:

Engineering education is for imparting knowledge and not for improving writing skills. The piles and piles of paper that is used in this process are a sheer waste of resources. Let us wake up to the 21st century where files are no longer made of paper. They are stored digitally as MS Word documents.

Internal Tests:

Continuous evaluation is a good concept. However, this needs to be done through the performance in assignments. The semester exams already evaluate the students based on course content and hence the ITs are redundant. Another method of continuous evaluation is to have programming contests that last a full day. The problems should be defined by the faculty members and given to the teams who will work independently to win credit points.

Project showcase:

Projects that are undertaken by final year students need to be showcased on the college website. This will provide a platform for students to invite venture funding if their project has business potential. It will also prevent copying of projects or repeating projects done in other colleges. Students should be encouraged to take up projects as a startup or with a startup or with Government or to solve a common/social issue. Marks should be given for participation in national level contests.

If any of the above suggestions face a hurdle because of a guideline issued by any governing body, it should be the duty of the educational institution to recommend a change to the governing body and to implement the suggestion. Change has to begin somewhere. Our suggestions are only an indicative set. Changes to the system should also be thought from within the institutions.

This is also a wake-up call for student organizations like CURSOR to keep track of good practices prevalent in foreign colleges and recommend them to the college management. Students should remain updated on technology with the same enthusiasm they have in being updated on the latest games and movies. After all better education will make their careers easier.

We propose to set up a professional IT system in the college with the following features:

- Faculty members and students will have login IDs.
- Teams of students will be defined in the system.
- Faculty members will post assignments on the system. This will generate an automated email that is sent to the students of the class.
- Students will add documents that describe the solution to the problem given in the assignment.
- Students will develop code and store in a common repository.
- Faculty member will mark the assignment as complete.

Several systems exist for the above requirements. Microsoft Sharepoint and Liferay Social are the most commonly used in industry for sharing documents. Moodle is yet another tool widely used for this purpose. GIT or SVN is used as a source code repository. A system such as this

effective the subject was, how well the professor was able to explain concepts etc. After completing the subject, the students are asked to provide their feedback. This is then displayed to the future students in order to help them in choosing their courses and professors. I also feel that these feedbacks motivate the professors to constantly improve their teaching methods which in turn benefits the students.

Teaching Methods

I found that some teaching methods used here benefitted me a lot. Some professors recorded their lectures and made them available on the subject website so that if a student happened to miss a class, he or she could catch it online. Also, in case some students needed to review what was discussed in class, they could watch these lectures. Tools like Piazza and Slack are used for class communication. All students enrolled for that class are added to these forums. Students can post their doubts regarding assignments or any other subject related queries on these forums and either the professor or the teaching assistants or even other students can answer them. Professors don't restrict course material merely to textbooks. Textbooks are just given as a reference. Also, the exam questions are based on lecture contents and not just on the textbooks. This implicitly mandates that students attend all lectures.

Teaching Assistants

From what I remember, there were about 60 - 70 students in my engineering class. Handling a class of such size is not an easy task for one professor. Besides the students too are not able to get personal attention, or sometimes they are too timid to directly approach the professor. To tackle this, a lot of colleges, hire Teaching Assistants. These are senior students who have previously taken the course and have a strong understanding of that course. All the Teaching Assistants conduct tutoring hours spread out over the week. Any students who need clarification on their doubts or having trouble with homework can approach the Tourse Assistant during these hours and have their doubts sorted. This is a very effective system which I feel could benefit GEC.

Assignments

Assignments are not just verbally conveyed in class or passed around via the class coordinator but shared on the subject website along with directions of what is expected in the submission. If any code is to be shared as part of the assignment, it is done using version control tools like GitHub. This helps students familiarize with version control tools which I feel is very important to know before taking up jobs in the IT industry. Also, assignments are submitted on GitHub and students are not expected to write them on paper. Writing assignments on paper is time consuming and definitely should not be expected of Computer Science students. Coding assignments are partly auto-graded using scripts. This helps fasten the process. Students can be notified of their grades immediately so that they can improve on their subsequent assignments.

I sincerely hope my suggestions benefit the future students of Goa College of Engineering. I pride myself on being an alumnus of this institution and hope that my input can help further improve it.

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