



Curriculum Design for Excellence

Every university has to design a curriculum for each academic programme that it offers. First a group of experts in that field is created. Then a curriculum workshop is held, whose recommendations are sent to a “Board of Studies.” Everyone has ideas on what needs to be added to the curriculum, and no one knows what can be cut.

This has led to a situation where it is common to have seven courses, besides labs, in any given semester. This does not help students, universities or the industry. Students have no time to grasp the material, or to be creative. They resort to memorising answers of previous years’ question papers.

Fewer is Better

When it comes to a curriculum designed for excellence, “Small is beautiful” is the mantra. The best universities (like MIT of USA) have only 32-35 courses as the graduation requirement for a typical 4-year undergraduate programme (with about 40 lectures per course). The IITs have about 40-45 courses. NITs have about 45-50 courses, and most affiliating universities have more than 50 courses.

Having fewer courses allows students the freedom to do self-study, creative projects, and research while attending lectures. Yes, a few students will while away their time, but the curriculum designed for excellence should ignore those who have no motivation for the programme they are pursuing. I strongly recommend that there be no more than 40 courses in a 4-year undergraduate programme.

More Hands On

A student entering an undergraduate programme this year will retire about 50 years from now. There is no point in teaching her technologies, which will be obsolete in a few years. Undergraduate education has to prepare students for challenges that they are likely to face in their last job. So the curriculum focus has to be on learning how to learn. “Do it Yourself” components like labs, projects and research should be included and terms papers and presentations should also feature in all courses.

The undergraduate education should be “broad based,” preparing students for uncertainties of the future, and enabling them to change their career. Top universities typically require 20 to 25 percent of the content in the curriculum for a science or engineering degree, to be humanities and social sciences (HSS). Unfortunately, the trend in India is towards more depth and HSS content gets reduced to just 10 percent. This 10 percent content usually consists of communication skills and management, rather than psychology, sociology, economics or philosophy.

Electives Should be Encouraged

While designing curriculum for excellence, one also has to understand that students have different aspirations, career goals and interests, even when they are doing the same programme. These

differences must be accommodated in the curriculum through “elective” courses. While most universities do have elective courses, often the number is inadequate. Also, many universities assume that the slot named “elective” in the curriculum is meant for giving them freedom in offering the course, and not giving freedom to students in choosing the course. As a result, only one course is offered in that elective slot.

Having several electives in the curriculum also settles the debate of “breadth versus depth” in an undergraduate programme. A student studying engineering but planning to do management later on could use those electives for breadth, while another student planning to go for a technical career could choose more depth.

For the elective content, the curriculum should offer “Flexible Credits.” It is not necessary that all courses be fixed 40-lecture courses spread throughout the semester. It should be possible for a student to replace a 40-lecture course by two 20-lecture courses, or four 10-lecture courses. Having such short courses allow greater personalisation of the degree by students. It also enables

The traditional way in India has been to offer an “honours” degree for the best students. Some universities allow students to get two degrees in compressed time format, while some others allow students to do a “minor” programme along with the regular degree. But such programmes are uncommon outside the traditional universities, particularly in technical education.

Challenging the Best

While I strongly encourage universities to have flexibility in terms of honours, double degree, and minor programmes, one needs to understand that they are directed towards imparting education in more topics, and not encouraging greater depth in any topic. Recently, I came to know about another way to challenge the best. This was to have two versions of the same course, one of them conducted at a much faster pace, involving more assignments and projects. The course could be called “special” or “honours” to distinguish it. In each programme, the best students should be able to take at least one “honours” course. In universities, where there are many sections for each course,

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universities to invite outside experts for short courses on state-of-the-art topics. There are many in the industry, who may be able to take leave for a couple of weeks, and teach a 10-lecture course. This will improve industry-academia interaction, and expose students to what is happening in the industry.

Promoting Excellence

One of the common problems in universities across the world is keeping the interest of its best students alive in a programme. Typically, curriculum is designed keeping in view the average student. Weaker students are encouraged to do less courses than average, and either do extra courses in the summer term, or spend some extra time in the programme. There is nothing special for the top 10 to 15 percent of the students. It is important that the curriculum includes elements that “challenge the best” students in the class.

this is easy to implement. One of the sections could be the “honours” section and it would not require additional faculty. In smaller universities, it may be difficult to support such a programme.

We also need flexibility in terms of “sequencing of courses.” A good curriculum should only suggest the graduation requirements and not specify which course should be done in which semester. A university should then announce, in which semester (first or second), each compulsory course will be offered, along with the pre-requisites of the courses. Based on this information, a student should be able to decide the sequence in which she wants to complete all the courses.

Having a curriculum designed for excellence, does not require additional resources. On the contrary, having less courses, more breadth and more electives, can save precious faculty resource, particularly in the areas where faculty shortages are the most severe. **EDU**

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