

Proposal for combining the courses

TA201A and TA202A

Main points:

- Almost all processes in TA201 lab can be done in TA202 lab
- Combine into 1 course of 9/12 credits
- 2 separate courses wastes time when same material can be done in 1 sem; allows students to take other courses in 4th sem
- Can be a joint course of both ME and CE
- Course structure
 - More focus on computerization - CNC
 - Better projects possible
 - TA202A
 - Lab 1-5 mostly introduction to the processes; involves around 1-1.5 hrs of theory explanation
 - This time can be used instead for the TA 201A 1st 5 labs introduction to Welding, brazing etc.
 - The explanation part of TA202A and TA 201A to be taken up in the extra lecture(s)
- Need to take students' opinion also officially; most agree that 2 TAs are not needed
- Both courses are ICs, not specializations/departmental courses; meant to give an overview/introduction; both courses talk on similar lines
- Courses getting outdated also

This proposal aims to highlight reasons in favour of integrating the courses TA201A and TA202A into a single course TA201A, which is able to retain the important core ideas of both courses while changing or removing some currently unnecessary ones.

Presently, both TA201A and TA202A are offered as Institute Core courses to Undergraduate students in the 3rd and 4th semester templates. The purpose of IC courses is to give an introduction to different engineering fields and impart the basic knowledge that any undergraduate engineer is expected to know. Both courses talk about different manufacturing processes and properties of materials commonly used by engineers. However, quite some of the content taught in the courses is either technologically outdated or not very useful for a majority of Undergraduate students in their further courses. This has caused courses to deviate from their idea of imparting the basic knowledge that an engineer must have. Reviewing both courses so as to keep updated with the outside world, will allow us to have a more useful course. This improved course structure, taken up in a single semester will be able to fulfil both objectives - providing basic knowledge an engineer of today must have as well as give a focused exposure to the field of manufacturing to undergraduate students.

Presently, both courses are 6 credit courses i.e. they have one weekly lecture and one weekly lab. The new TA201A would be a 9 or 12 credit course comprising of one weekly lab and 2 or 3 weekly lectures (depending on how many are felt necessary). The improvised course would be focused on the important topics, allowing the course's theory part to be completed in the allotted time. Both TA201A and TA202A labs (in the non-project weeks) have an introductory session before the actual lab-work. This could be taken up either in one of the lectures itself (as the contents would be concentrated compared to present) or in the 3rd lecture of the week. For lab work in these first few weeks, a student is allotted about 1-1.5 hours each lab, which means that two processes (one from each lab) can be taken up simultaneously in the three-hour lab. During the weeks of the project, the student focuses solely on building their designed project and having a single lab should not have much impact here. Also, allowing processes from both labs to be involved will improve the scope and ultimately lead to more innovative projects being manufactured, a thought that lies at the core of this course.

The new TA201A course could be offered jointly by the ME and MSE departments. Having 2 different labs brings forth the limitation of only some processes being available in each lab and puts a restriction on innovation. Integrating both labs would allow students more freedom in choosing their projects and encourage them to manufacture more challenging designs.

Many students also feel that elective courses are offered very late as per most departments' template. Most departments offer them from the 5th semester onwards, which allows UG students very little opportunity to explore fields other than their department before the internships/research programs start. The integration of the above two courses would open a slot in one semester of the 2nd year of UG students. This slot could be used for an Open Elective, thereby giving students the chance to explore other courses taught at IITK in their 3rd/4th

semester. Such courses would add value to a UG student's profile and be useful for their internships and/or research projects.

Given these, a single course focusing solely and holistically on manufacturing processes would help students develop an appreciation for the field as well as allow students more avenues to explore their interests.

Recommendations regarding the contents of the new course TA201A:

- More focus on computerized techniques - In today's world, computerised manufacturing is the method of the industry. Encouraging more of this in our labs will not only improve the quality of projects, but also be more effective in arousing the students' interest in the subject.