

## AICTE Model Curriculum for CSE Revision

### Scope

- The focus will be the 4 yr BE/BTech program in CSE, while providing flexibilities which can be used by universities to support different pathways and multiple exits.
- The primary target audience of curriculum will be the vast majority of universities/institutions (rather than the top institutions) and goal is to help improve CS education in these.
- While the focus will be the CSE curriculum, the committee may also suggest:
  - Some Maths etc in the common curriculum, and open electives and electives in humanities and social science to support CS education
  - How online resources can be leveraged (e.g. to support multiple pathways.)
  - Approaches for proper assessment, and for teaching various courses
  - Some "outside the curriculum" activities (e.g. clubs, hackathons, etc.) to support student learning
- The current CSE curriculum of AICTE will be the starting point. We can also use knowledge from ACM/IEEE CS Curriculum recommendations for this effort.

### Approach for Curriculum Design

- We will assume a credit system, and follow the global best practices of specifying course learning outcomes for each course and of identifying the desired graduates attributes (GAs) of CSE graduates.
- We will take feedback from Indian IT industry to understand the market opportunity, and from colleges to understand their challenges and their inputs on the program.
- **Providing flexibility.** Even within the large education system which it the primary target, some have better infrastructure and capability, and so one curriculum cannot fit the needs and capacity of all institutions. To provide flexibility, we propose:
  - For each course, the learning outcomes will be grouped in two – essential, and desired/advanced.
  - The core courses will also be identified as essential and desired/advanced.
  - For a course specify minimal prerequisites

This simple framework of grouping outcomes and courses as essential and desired at all levels provides flexibility to institutions to design their curriculum depending on their capabilities, resources, goals, etc, while still providing guidance for a sound curriculum. The flexibility can be leveraged easily by institutions to provide different pathways to students, including the possibility of Honors, and multiple exits.

- **Multiple Exits.** To support more than one exits, it is important to develop employability skills early, and not take the approach of first focusing on foundations and then develop practical skills. We propose:
  - Eliminate separation of theory and labs into separate courses – instead design courses topic or theme wise with both basic theory and skills being taught together in an integrated manner. For courses where practice components are important, they must be clearly specified.
  - In the first year, have an Engineering design course where a project to build a system for some purpose is the main goal for students, and lectures support the project.
  - Introduce discipline courses early, so disciplinary skills can be developed early. For this it is desirable to allow some discipline courses in first year itself – this will also help students in getting internships / part-time jobs in summer.
- **Multiple Pathways.** For supporting multiple pathways, provide for specializations through thematic course streams, honors for advanced students with more credits or advanced learning outcomes, etc
- **Expert groups for each course design.** For each course identified by the committee, a small group of experts will be requested to design the course syllabus, following the guidelines evolved.