Graduate Attributes for AICTE Model CSE Curriculum

Curriculum of a program is finally a network of credit units – courses (core, disciplinary core, disciplinary elective, open), internships, practice, projects, etc. which help achieve program goals. ***Program goals can be stated as attributes the students should possess on graduation, i.e. statements about the learning, values, capabilities etc. of graduates. These are called Graduate Attributes (GAs)***. A program typically has:

- General GAs: which are often common across many similar programs (e.g. BTechs) and focus on generalized skills and capabilities in the graduate.
- Discipline GAs: are discipline specific attributes, which focus on understanding of different concepts and systems related to the discipline, and on competencies and skills in that discipline.

Together the GAs define the goals of the program. The aim of curriculum design is to evolve a curriculum that can develop in students the stated graduate attributes. While specifying the GAs and designing a curriculum for it, we must keep a ***basic constraint in mind: A program has 8 semesters, each with about 5 full courses. GAs should specify only what can be taught and absorbed in this timebox (i.e. we cannot push more simply by adding more***.)

Desired Graduate Attributes for the CSE program are given below. The CSE curriculum design will focus more on delivering the discipline GAs, while strengthening the general GAs, where possible. (GAs should be read by adding this at the start of each: *At graduation time, a student should have:*

General Graduate Attributes	**Discipline Graduate Attributes (for CSE)**
G1 Ability to identify a problem, analyze using design thinking techniques, and evolve innovative approaches for solving it	CS1 Proficiency in writing in at least two dissimilar programming languages programs of modest complexity which are: readable, tested for correctness, efficient, and secure
G2 Ability to apply mathematical concepts and techniques in problem solving	CS2 Ability to design and apply appropriate algorithms and data structures for evolving efficient computing based solutions for new problems
G3 Ability to function effectively in multi-cultural teams to accomplish a common goal	CS3 Understanding of computing systems at computer architecture, operating systems, and distributed-computing levels, and how they affect the performance of software applications
G4 Ability to communicate effectively with a wide range of audience	CS4 Understanding of theoretical foundations, fundamental principles, and limits of computing
G5 Ability to self-learn and engage in life-long learning and upgrade technical skills	CS5 Ability to analyse large volumes of data employing a variety of techniques for learning, better prediction, decision making, etc.
G6 An understanding of professional and ethical responsibility	CS6 Ability to design, implement, and evaluate computer based system or application to meet the desired needs using modern tools and methodologies
G7 Ability to undertake small research tasks and projects	CS7 Ability to develop full stack applications using one commonly used tech-stack and modern tools
G8 An entrepreneurial mindset for opportunities using technology and innovations	CS8 Understanding of and ability to use advanced techniques and tools in a few different domain areas (e.g. parallel processing, image processing, IR, …)
G9 An understanding of impact of solutions on economic, societal, and environment context	CS9 Exposure to emerging technologies such as Cloud Computing, IoT, etc
G10 Strong emotional intelligence, human and cultural values	