# AICTE Model CSE Curriculum Revision

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## **AICTE CSE Curriculum Revision**



- AICTE appointed P. Jalote as Chair of the committee to revise the curriculum
  - In May 2021; CSEDU was already in advanced stages of planning with expert groups for most of the subjects
- This opened an opportunity the experts for different subjects can design the curriculum and then train the teachers on how to teach it
  - Requested CSEDU expert groups for syllabus revision of courses (formed new groups for other courses)
- Curriculum development is a separate activity with a different goal – but many common experts
  - https://iiitd.ac.in/aictecse

## **AICTE Committee (Extended)**



- Pankaj Jalote (Chair)
- Manoj Singh Gaur, IIT Jammu
- Nutan Limaye, IIT Bombay
- Ramkumar, Pro VC, Krea University
- Dheeraj Sanghi, VC, JKLU
- NASSCOM rep
- Kishore Kothapalli, IIIT Hyderabad
- Sudeshna Sarkar, IIT Karaghpur
- Sukumar Nandi, IIT Gauhati
- Suchismita Roy, NIT Durgapur
- Ashalatha Nayak, Manipal Institute of Technology

- RBV Subramanyam, NIT Warangal
- Sanjiva Prasad, IIT Delhi
- Venkatesh R, TCS Pune
- Viraj Kumar, ACM India Education Committee
- Vishram Thatte, Amazon India
- Vinnie Jauhari, Microsoft India
- R Latha, IBM India
- Gaurav Aggarwal, Google India
- Vinayaka Ram Gururajan, TCS
- Thirumala and Sundar K S, Infosys
- P.B. Kotur, Wipro
- Ishvinder Singh, Cisco Systems, Inc.
- Rahul Suresh Ghali, accenture





- The primary target audience of curriculum will be Tier II/III institutes, i.e. the vast majority, rather than the top institutions
- The goal is to help improve CS education in these
- The committee may also suggest:
  - Some Maths courses, and electives in humanities and social science to support CS education
  - How online resources can be leveraged
  - Approaches for assessment and teaching
  - Some "outside the curriculum" activities (e.g. clubs, hackathons, etc.) to support student learning

## Approach



- Provide flexibility. Even within the large Tier II/III, some have more capability than others; one curriculum cannot fit the needs of all institutions
  - For each course, the learning outcomes will be grouped in two – essential, and desired/advanced.
  - The core courses will be identified as essential and desired/advanced.
- Multiple Pathways. For supporting specializations, honors for advanced students, advanced learning, etc
- Multiple Exits. Develop skills early, and not take the theory-first approach
  - Eliminate separation of theory and labs –both should be taught together in an integrated manner.
  - Introduce discipline courses early, so disciplinary skills can be developed early

#### Graduate Attributes (CSE)



- Proficiency in writing in at least two dissimilar programming languages programs of modest complexity which are: readable, tested for correctness, efficient, and secure
- Ability to design and apply appropriate algorithms and data structures for evolving efficient computing based solutions for new problems
- Understanding of computing systems at computer architecture, operating systems, and distributed-computing levels, and how they affect the performance of software applications
- Understanding of theoretical foundations, fundamental principles, and limits of computing
- Ability to analyse large volumes of data employing a variety of techniques for learning, better prediction, decision making, etc.

## Graduate Attributes (CSE)...



- Ability to design, implement, and evaluate computer based system or application to meet the desired needs using modern tools and methodologies
- Ability to develop full stack applications using one commonly used tech-stack and modern tools
- Understanding of and ability to use advanced techniques and tools in a few different domain areas (e.g. parallel processing, image processing, IR, ...)
- Exposure to emerging technologies such as Cloud Computing, IoT, etc



	Professional Core Courses (Essential)
2 <sup>nd</sup> year	Data structures and Algorithms
2 <sup>nd</sup> year	Discrete Mathematics
2 <sup>nd</sup> year	Computer Organization and Architecture
2 <sup>nd</sup> year	Advanced Programming (in lieu of OO programming)
3 <sup>rd</sup> year	Operating Systems
3 <sup>rd</sup> year	Design and Analysis of Algorithms
3 <sup>rd</sup> year	Database Systems
3 <sup>rd</sup> /4 <sup>th</sup> year	Computer Networks
3 <sup>rd</sup> year	Machine Learning (New)
3 <sup>rd</sup> year	Security (New)

## **Extended Core / Electives**



	Extended Professional Core (Desirable)
3 <sup>rd</sup> /4 <sup>th</sup> year	Compiler Design
3 <sup>rd</sup> /4 <sup>th</sup> year	Formal Languages and Automata Theory
	Highly Desirable Electives
3 <sup>rd</sup> /4 <sup>th</sup> year	Software Engineering using Open Source

## **Template for Course Design**



- Learning Outcomes of the course
  - Essential (<=6)
  - Desirable/Advanced (<= 3)</li>
- Syllabus is a table giving
  - Module and its duration
  - Topics in the module
  - Pedagogy suggestions for the module
  - Nature of lab / assignment
- Suggested text book
- Suggested online resources
- Suggested reference books







- Curriculum revision is ongoing should conclude in a few months
- Curriculum recommendations are complete in themselves and stand alone
- Is used as basis of "what to teach" in CSEDU
- Expert groups defining the syllabus for each course
- URL: https://iiitd.ac.in/aictecse