Computer Science Curricula 2023 (CS2023): The Final Report

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ABSTRACT

A joint task force of the ACM, IEEE-Computer Society, and AAAI has updated the computer science curricular guidelines last published in 2013. Included in the updated guidelines, referred to as CS2023, is a revised knowledge model and a new framework for building a customized competency model of the computer science curriculum. Acknowledging that one size does not fit all, the guidelines provide flexibility for computer science programs to structure their curriculum around the competency area(s) they wish to target. Given the pervasiveness of computing in everyday life, the guidelines emphasize the importance of society, ethics, and issues of the computing profession throughout the curriculum. The role of mathematics has been expanded in the guidelines, particularly in response to the latest developments in artificial intelligence. The curricular guidelines will be accompanied by articles written by experts on curricular issues such as ethics, computing for the social good, and accessibility. In the special session, the CS2023 curricular guidelines will be presented, and feedback solicited on facilitating their adoption and adaptation. The session is aimed at computer science educators, administrators, and professionals interested in computer science education.

CCS CONCEPTS

• **Social and professional topics** → **Computer science education**; **Model curricula**.

KEYWORDS

Computer Science Curricula, Curricular Guidelines, Model Curricula, Knowledge Model, Competency Model, Curricular Practices, Computer Science Education

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1 OVERALL OBJECTIVE OF THE SESSION

CS2023 is the latest in a long line of computer science curricular guidelines published by the Association for Computing Machinery (ACM) in 1968 [2], 1978 [3], 1991 [8], 2001 [7], 2008 [4], and 2013 [1]. IEEE-Computer Society (IEEE-CS) has been collaborating with ACM on these reports starting in 1991. For CS2023, given the increased role of artificial intelligence in undergraduate computer science, the Association for the Advancement of Artificial Intelligence (AAAI) also joined the effort. Together, the three professional bodies set up a steering committee of 17 members led by two co-chairs. The steering committee in turn recruited international disciplinary experts in diverse areas of computer science to form the CS2023 task force.

The tasks undertaken by the CS2023 task force included:

(1) The *knowledge model* of the curriculum, consisting of 17 knowledge areas was updated. The concept of core topics was streamlined. Suggestions were provided for packaging courses from knowledge areas and packaging curricula as aggregations of courses.
(2) A *competency framework* was introduced to enable adopters to build a competency model of the curriculum, which includes a framework for systematically identifying tasks, a format for competency specification, and an algorithm to use the competency framework to build a customized competency model.
(3) Experts were invited to write articles on *curricular practices* including social issues, professional practices, pedagogical concerns, and programmatic considerations. The goal of the articles is to summarize the state of the art, inform educators, and attempt to advance computer science education practices.

The work of the CS2023 task force was first introduced in a special session at SIGCSE 2022 [5]. A progress report was provided in a special session at SIGCSE 2023 [6]. The final version of the report will be presented during the proposed special session. In addition, the process of adopting and adapting the curricular guidelines will be discussed.

2 OUTLINE OF THE SESSION

Table 1 provides an outline of the planned session activities. In addition to the two co-chairs, several members of the steering committee will be on hand to discuss details of the CS2023 curricular guidelines. During the discussion session, the audience of educators, program directors, department chairs, and others interested in the future of computer science education will be invited to provide suggestions for facilitating the adoption and adaptation of the curricular guidelines.

3 EXPECTATIONS

The audience of the special session is undergraduate computer science educators, program directors, department chairs, and others

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Table 1: Session Structure

	Description	Duration
1	CS2023 Overview	5 minutes
2	Knowledge Model	15 minutes
3	Competency Framework	15 minutes
4	Curricular Practices	10 minutes
5	Discussion and Q & A	30 minutes

interested in the future of computer science education. The audience will learn about the latest computer science curricular guidelines, how they have changed since 2013, and how to adopt/adapt them to local needs. Google forms posted on the CS2023 website csed.acm.org will be used to collect feedback from the audience.

4 POST-SESSION COMMUNITY ENGAGEMENT

The work of the task force has been documented and the latest version of the curricular guidelines has been posted at:

https://csed.acm.org

At the site, visitors can also find earlier drafts of curricular content, revision reports, worksheets for using the competency framework, and abstracts of curricular practice articles. The site provides additional opportunities for the community to provide feedback and suggestions.

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