

exist in small colleges with few faculty members or in any institution that has been unable to recruit sufficient faculty to teach a larger curriculum.

It is not necessary, of course, to go quite so far in terms of reducing the number of intermediate courses as the compressed model does. Section 8.3 outlines a number of hybrid approaches that adopt some of the strategies from the compressed model to create intermediate course sequences that are intermediate in size between the five-course compressed model and the nine-course traditional model. At the same time, it is important to avoid being too aggressive in seeking to reduce the number of courses. We strongly recommend against trying to pack the required units into the theoretical minimum of seven courses implied by the fact that the core contains 280 hours of material. Overpacking the curriculum creates courses that lack coherent themes and leaves too little time for individual instructors to adapt and enhance the material.

8.2.3 A systems-based approach

Ultimately, the theories and practices of computer science find expression in the development of high-quality computer systems. This section defines a computer science curriculum that uses systems development as a unifying theme. It includes more technical and professional material than the other models, while retaining a reasonable level of coverage of the theoretical topics. Computer science theory remains essential, both as a foundation for understanding practice and to provide students with a lasting base of knowledge that remains valid despite changes in technology.

A minimal implementation of the systems-based approach consists of the following courses beyond the introductory sequence:

- CS120. Introduction to Computer Organization
- CS210s. Algorithm Design and Analysis
- CS220s. Computer Architecture
- CS226s. Operating Systems and Networking
- CS240s. Programming Language Translation
- CS255s. Computer Graphics
- CS260s. Artificial Intelligence
- CS271s. Information Management
- CS291s. Software Development and Systems Programming
- CS490. Capstone Project

Although their titles suggest that these courses focus on single areas, it is important to use the encompassing notion of a system as a unifying theme. This system perspective must permeate all aspects of the curriculum and include a combination of theory, practice, application, and attitudes.

8.2.4 A web-based approach

This model has grown out of a grass-roots demand for curricular structures that focus more attention on the Internet and the World-Wide Web, using these domains to serve as a common foundation for the curriculum as a whole. The following courses represent one attempt to develop such a model:

- CS130. Introduction to the World-Wide Web
- CS210w. Algorithm Design and Analysis
- CS221w. Architecture and Operating Systems
- CS222w. Architectures for Networking and Communication
- CS230w. Net-centric Computing
- CS250w. Human-Computer Interaction