How AP CS A Matches College Courses

Renee L. Ciezki
Estrella Mountain Community College
Glendale, AZ
+1 623-878-4958
renee.ciezki@estrellamountain.edu

Lien Diaz
College Board
Atlanta, GA
+1 678-787-9445
ldiaz@collegeboard.org

Frances E. Hunt
Educational Testing Service
Princeton, NJ 08541
+1 609-243-6602
fhunt@ets.org

Henry M. Walker
Grinnell College
Noyce Science Center
1116 8th Avenue, Grinnell, IA 50112
+1 641-269-4208
walker@cs.grinnell.edu

ABSTRACT

The Advanced Placement (AP) Program provides a framework for high school students to obtain college credit and/or placement for work done in high school. Toward this end, the College Board outlines course descriptions and organizes examinations in several dozen disciplines, including computer science. To meet its goals, each AP course must align with college courses, so students taking an AP course will master needed content Several approaches are used to monitor this connection between AP courses and college-level courses. This session will review these approaches, considering how the AP CS A course matches introductory college computer science courses.

Categories and Subject Descriptors

K.3.2 [**Computer and Information Science Education**]: computer science education, curriculum

General Terms

Algorithms, Design, Experimentation

Keywords

Laboratory exercises, case studies, active learning. computing applications.

1.SUMMARY

The Advanced Placement (AP) Program provides a framework for high school students to obtain college credit and/or placement for work done in high school. Toward this end, the College Board outlines course descriptions and organizes examinations in several dozen disciplines, including computer science. To meet its goals, each AP course must align with college courses, so students taking an AP course will master needed content Several approaches are used to monitor this connection between AP courses and college-level courses, including

- Representation on the course Development Committee

- Curriculum surveys

- Pretesting

- Comparability studies

This session will review these elements, considering how the AP CS A course matches introductory college computer science courses.

2.INTRODUCTION

The content of the Advanced Placement (AP) Computer Science (CS) A course is driven by introductory computer science courses at colleges and universities. A major goal of the AP CS A program is to identify and assess appropriate content, so that students performing well on the AP CS A examination will be able to obtain college credit for their CS work in high school and then be well prepared for the next CS course in college.

With the range of introductory CS courses offered at the college level, achievement of this goal is a significant challenge. Over the years, many sessions at SIGCSE symposia and at other conferences have discussed a wide range of visions for introductory CS at the college level,

Rather than expect complete consensus, the AP CS A course seeks to identify common themes and content --- material that resonates well with a large number of colleges and universities. With such diversity of introductory CS options around the country, it is unreasonable to expect that a single course will fit perfectly with college practices. However, the AP CS A course does strive to reflect widespread practice at the college level.

The AP CS A program uses many tools to identify and articulate common themes and content in introductory CS courses at the college level, This special session will review many of these approaches.

3.SESSION OBJECTIVES

In recent years, the AP CS A course and examination has been the subject of substantial discussion and debate. How should computer science be introduced? What topics should be included? What pedagogy is appropriate? To what extent should programing be involved? Much of this discussion has seemed to miss the underlying motivation for Advanced Placement (AP) courses as a mechanism for students to receive college credit for work they have done in high school. This session seeks to clarify the role of the AP CS A course and examine how the current AP CS A course matches the college courses for which students might receive credit and/or placement. This motivation leads to the following session objectives.

- Clarify the role of the AP Program in general and the purpose of the AP CS A course in particular

- Review the main elements of the current AP CS A course, as a basis for discussion

- Examine some mechanisms used to ensure that the AP CS A course and examination align with introductory CS courses at the college level.

- Outline how feedback from multiple sources leads to refinements in the AP CS A course

- Consider how recent feedback fits within long-term plans to review the alignment of AP CS A with college courses.

4. OUTLINE OF THE SESSION

The following outline envisions questions and discussion during the last 25 minutes of the session. Realistically, some questions may arise during the initial presentations, so the question-answer time may be revised as the session progresses.

- The AP CS A course and examination --- 5 minutes, Diaz

  - Purpose: college credit and/or placement

  - Content overview [2]

- Approaches and tools to help match AP CS A with introductory college courses -- 5 minutes, Hunt

  - Overview, Need for comparability

  - Make-up of the Development Committee (with inclusion of college faculty)

  - Curriculum surveys --- 5 minutes, Ciezki

  - Pretesting --- 5 minutes, Walker

    - Approach

    - Need for involvement from college teachers

  - 2008 Faculty Colloquium [5] --- 7 minutes, Walker

  - 2011 College Curriculum Survey [1] --- 6 minutes, Diaz

  - 2012 Comparability Study [4] --- 7 minutes, Hunt

    - Motivation

    - Some characteristics of college courses

    - Relationship between AP CS A and typical college courses

- Use of feedback results --- 5 minutes, Walker

  - Adjustments in AP CS A coverage [3]

  - On-going elements for both colleges and AP CS A

- Long-term evolution of AP CS A (e.g., review commission, new course description) --- 5 minutes, Ciezki

- Questions, audience feedback, discussion --- 25 minutes

5. EXPECTATIONS

This proposed session will serve several audiences:

- Teachers of introductory computer science who are interested in nation-wide trends and practices regarding their courses.

- Educators and administrators who want to better understand the role and goals of AP CS A.

- Guidance counselors and student advisors who want to guide students in the transition from high school CS courses to college courses.

- Department chairs and deans who are monitoring placement and credit policies regarding AP courses.

- AP CS A teachers who are interested in having their students receive college credit

With the diversity of practices regarding introductory CS at the college level, the results reported in this session will likely generate considerable discussion and debate. Thus, the session will conclude with a 25-minute question-answer-feedback session involving attendees.

6. ACKNOWLEDGMENTS

7. REFERENCES

[1] College Board. 2011. *Advanced Placement Computer Science College Curriculum Study,* June 2011.

[2] College Board. 2010. *The Computer Science A Course Description*, http://apcentral.collegeboard.com/apc/public/repository/ap-computer-science-course-description.pdf

[3] College Board. 2014 (forthcoming). *The Computer Science A Course Description*.

[4] College Board. 2012. *Computer Science College Comparability Study*.

[5] College Board. 2010. *AP Computer Science Faculty Colloquium Results*, December 10, 2008.