# What is the landscape of CS coursework?

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Illinois Workforce and Education Research Collaborative

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Part 1 of The State of Computer Science in Illinois High Schools Series

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## The State of Computer Science in Illinois High Schools Series
## Part 1 - What is the landscape of CS coursework?

The purpose of **The State of Computer Science in Illinois High Schools Series** is to analyze the landscape, structures, and pathways to and through computer science (CS) education in Illinois and to create a baseline by which to measure the expansion of CS education in the coming years. The series will include five reports, each analyzing a different aspect to CS education: (1) the CS education landscape; (2) the CS student body characteristics; (3) the CS teacher workforce; (4) student outcomes as they relate to CS coursework; and (5) variations in CS course offerings by high school districts.

Throughout **The State of Computer Science in Illinois High Schools Series** we will be assessing equity in Illinois high school CS education using the CAPE framework. The CAPE framework is a lens developed by CS education researchers to assess equity in CS education using four components: capacity for, access to, participation in, and experiences of CS education.[1,2] At the end of each report in the series, we devote a section to what the report's findings suggest about the state of Illinois high school CS through this lens.

## Background

Advancements in computing and technology have changed the shape of the workforce across global economies. Computing and technology jobs are projected to grow at a faster rate than other occupations, all while earnings for these jobs are more than double national median salaries.[3] Additionally, key skills integral to these sectors, such as creative problem-solving, mathematical reasoning, and digital proficiency, are highly adaptable to other professions.[4] With the increased emphasis of computing and technology skills for academic and professional success, the importance of computer science (CS) education has taken center stage in the national conversation.[5,6]

Despite growth in the CS and tech fields, disparities exist in who is represented in both the workforce and classrooms, particularly for historically marginalized groups such as women and Black/African American and Hispanic/Latino individuals.[7–9,a] In response, national efforts to broaden participation in CS and tech fields, spearheaded by organizations such as CSforAll, Code.org, the Computer Science Teachers Association (CSTA), and the Expanding Computing Education Pathways (ECEP) Alliance, place emphasis on increasing equity and diversity while providing resources for state-wide policy changes.[10,11] In 2022, these collective efforts resulted in a landmark achievement with a unanimous commitment from all 50 U.S. governors to expand CS education in their respective states, placing emphasis on offerings, funding, pathways, and equitable access.[12]

[a] IWERC has done an exhaustive literature review on equity and issues relating to historically marginalized groups in CS. This review is beyond the scope of this report, but it is available upon request.

Illinois has been progressively shaping its educational landscape to place greater emphasis on CS within all levels of education. Illinois and Chicago Public Schools (CPS) were at the forefront of the CSforAll initiatives dating back to 2013, which highlighted the importance of K-12 CS instruction.[5,13] CPS maintained momentum by being among the first in the nation to elevate CS to a graduation requirement for all high school students starting with the class of 2020.[14] Since then, several pieces of legislation have laid the groundwork for statewide expansion of CS education.[15–17] One such piece, the Education and Workforce Equity Act (Public Act 101-0654)[15], signed into law March 2021, brought about mandates to aid in said expansion; most notably that (i) the Illinois State Board of Education (ISBE) was to develop rigorous student learning standards for K-12 CS students by the end of 2021 (a goal that was met); and (ii) all districts serving grades 9-12 were required to offer students the opportunity to take at least one CS course beginning in the 2023-2024 school year.[b] Most recently in May 2023, Illinois was inducted into the ECEP Alliance with the goal of creating a statewide strategic plan to broaden participation in computing.[18]

In 2021, researchers from the University of Illinois Urbana-Champaign released a landscape report on K-12 CS education in Illinois highlighting the need for more qualified CS teachers, funding for professional development, further research on the urban/rural divide of CS education, and the disparities in course offerings from district to district.[19] We build upon this previous report by using statewide coursework data from ISBE to understand the evolving patterns and characteristics of CS education. The current report provides a detailed look at the state's landscape of high school CS education, highlighting the areas of progress and identifying where the gaps exist in providing equitable access and outcomes for all students.

## Data & Analysis

Data for this series was provided by ISBE. The dataset consists of student-level data of every Illinois high school student who enrolled in at least one CS course[20] between the school years 2017-2018 (SY 2018) and 2021-2022 (SY 2022). This first landscape report explains the evolving patterns and characteristics of CS course enrollment over this period. The analyses completed are descriptive in nature and are meant to provide an overview of recent statewide trends. Results include tables or graphs showing findings for the statewide sample (labeled as Illinois) then another for the sample excluding CPS (labeled as Illinois w/o CPS). We did this so that we can provide an accurate picture of where the state is in terms of CS education that is not skewed by the largest district in the state, as CPS accounted for 60.4% of the enrollment and happens to have an extensive CS program that includes a graduation requirement.[c]

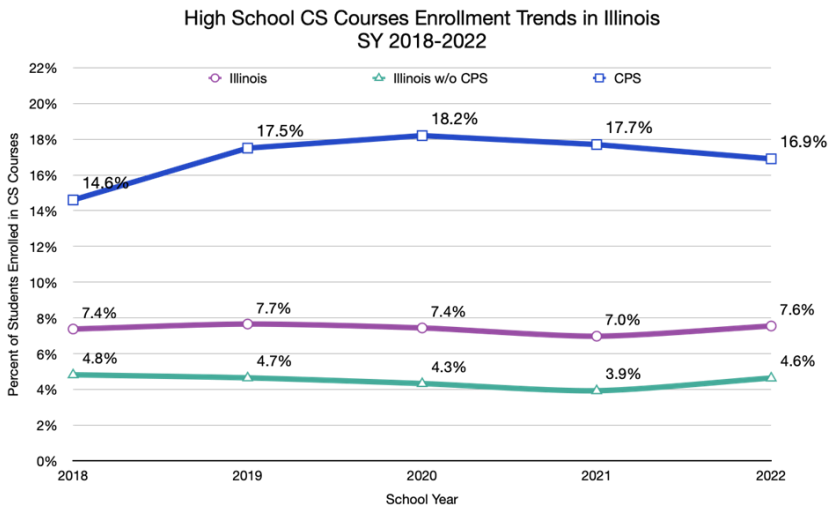
[b] Other mandates from Public Act 101-0654 included AP CS courses counting toward the three-year mathematics graduation requirement and districts being required to include curriculum information for CS courses in their school's report card prepared by ISBE.

[c] The Chicago Alliance for Equity in Computer Science (CAFECS) reports on CPS's CS coursework. See their reports for more information on CPS district-specific findings.

One limitation of this dataset is that it is only as accurate as what districts provide to ISBE. ISBE state course codes are typically broader in their descriptions. Some district course codes are not aligned with state course codes; thus, ISBE state course codes may contain many different district courses. Thus, ISBE state course codes may encompass many different district courses. See the Supplementary Materials for all the state course codes included in this analysis.

## What are the recent enrollment trends in CS courses?

**Figure 1.** Illinois high school CS course enrollment for Illinois (middle line), Illinois without CPS (bottom line), and only CPS (top line) between SY 2018-2022.




**What the data tells us.** On average, approximately 7.4%, or roughly 45,000, of all Illinois high school students enroll in at least one CS course in a given school year (see Figure 1), which is above the national average of 5.8%.[10] If we were to extrapolate the data across four years, we estimate that roughly 30% of Illinois high school students take at least one CS course before graduating.[d] On average, 17.0% of all CPS students enroll in at least one CS course in a given year, highlighting this district's influence on CS enrollment in the state. This is also seen in the percentage of students enrolled in CS for Illinois without CPS, 4.5%.

Trends for Illinois and Illinois without CPS reveal a slight decline in total CS enrollment from SY 2019 to SY 2021 across Illinois, with the downturn beginning a year earlier in SY 2018 when CPS enrollment is excluded. Despite a dip for CS enrollment trends in SY 2021, the data indicates a recovery in SY 2022. CPS experienced a somewhat opposite trend in that their enrollment increased in SY 2019, reached its highest peak in SY 2020, then declined slightly the next two years. These overall changes, though present, are proportionally small and reflect little progress in increasing CS enrollment in the past five years.

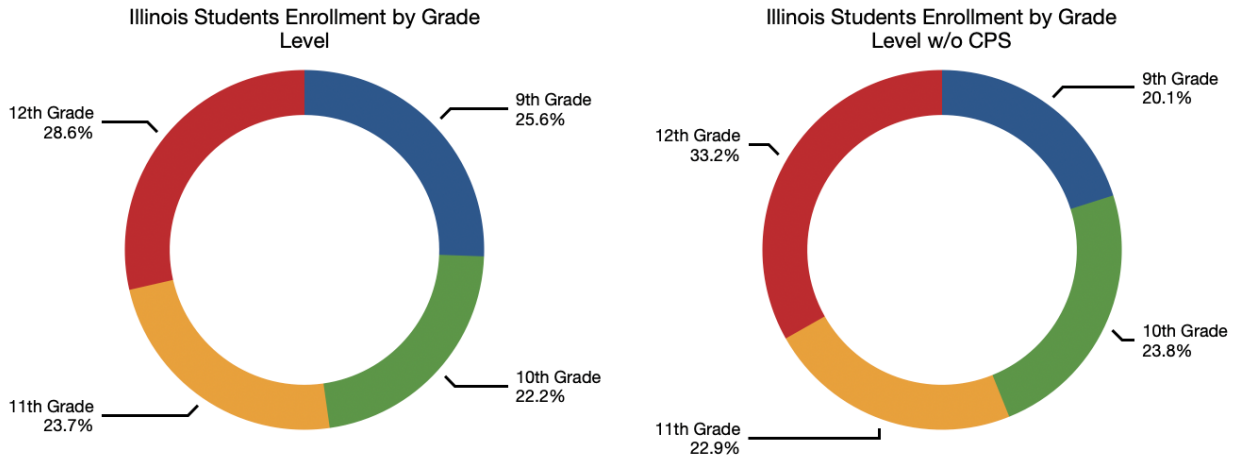
**Implications.** CPS accounts for most of the CS enrollment in the state. Therefore, much of the expansion of CS education in the state will happen outside this district. Outreach, professional development, and research efforts should focus on districts in northern, central, and southern Illinois districts.

[d] The data provided to us does not include cohort data, so this is only an estimate.

## When do students take CS courses?

**What the data tells us.** The largest proportion of students taking CS courses are enrolled in the 12th grade (28.6%; Figure 2 left); however, representation of 12th grade students reaches 33.2% (Figure 2 right) when students from CPS are removed from the analysis. Moreover, when CPS is removed from the analysis, the proportion of 9th grade students shrinks from 25.6% to 20.1%, indicating that CPS's CS student body is largely in 9th grade. Such a disparity could suggest that not all districts integrate CS education into the curriculum at the onset of high school or a lack of room in students' schedules for non-graduation requirements.

**Figure 2.** CS course enrollment by grade level between SY 2018-2022 for Illinois (left) and Illinois without CPS (right).

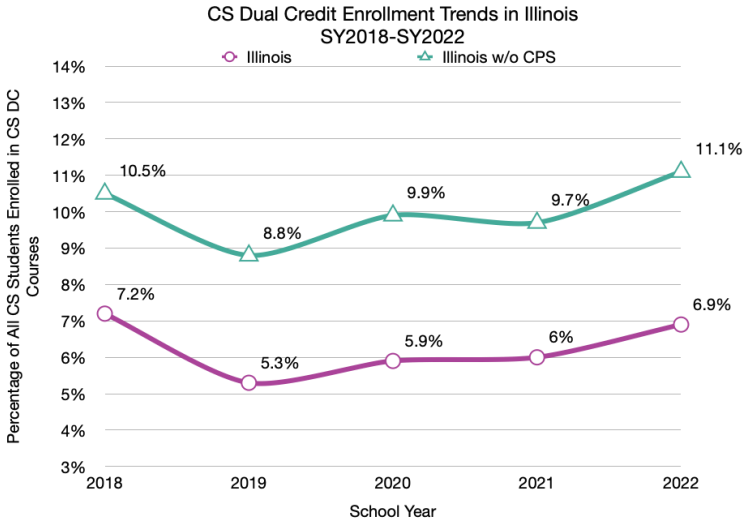



**Implications.** Early engagement in CS is crucial for cultivating a sustained interest and ensuring that students across all districts have equitable opportunities to acquire foundational CS skills.[21,22] These skills are increasingly vital in today's educational and professional environments, and early exposure can significantly impact students' future opportunities and competencies.[23]

## What proportion of students take CS courses as dual credit?

**What the data tells us**. As seen in Figure 3, on average, 6.2% of all CS students are enrolled in CS dual credit (DC) courses. By comparison, 12.1% of all high school students are enrolled in DC courses,[24] indicating a lower enrollment in CS DC courses during that same period. The exclusion of CPS from the data indicates a higher proportion of DC CS enrollment, with the percentage increasing to 10%.

**Figure 3.** CS dual credit enrollment between SY 2018-2022 for Illinois (bottom line) and Illinois without CPS




**Implications.** This suggests that students in the majority of Illinois high school districts may have greater access to, or interest in, CS DC opportunities, compared to students in CPS. Increased access to CS DC courses can provide students with the opportunity to gain college-level CS skills and earn college credit through rigorous coursework.[25]

Out of 51 CS courses, a significant portion, 31 courses, are available as a DC offering (an option which is then offered by some, but certainly not all, districts). This demonstrates a strategic effort by districts across the state to facilitate a pathway for high school students to gain college credit and experience in CS. However, it's important to note that while dual credit options are available for some courses, their distribution is not uniform across the state.[24] Some dual credit CS courses are limited in their availability, with a few being offered by only a single school district.

## What are the modalities of instruction of CS courses?

**What the data tells us.** CS courses are delivered through various modalities (i.e., course setting), with each school or district determining their own categorizations, resulting in courses possibly being listed in multiple settings (Table 1). Predominantly, the Traditional School Day Program stands as the main modality by the number of CS courses denoting such, signaling the integration of CS education into the standard curriculum within regular school hours. Further, upon analyzing instructional modality by student enrollment, over 98% of CS students took their course in a Traditional School Day Program.

**Table 1.** Frequency of CS courses and percent of CS students in each instructional modality.

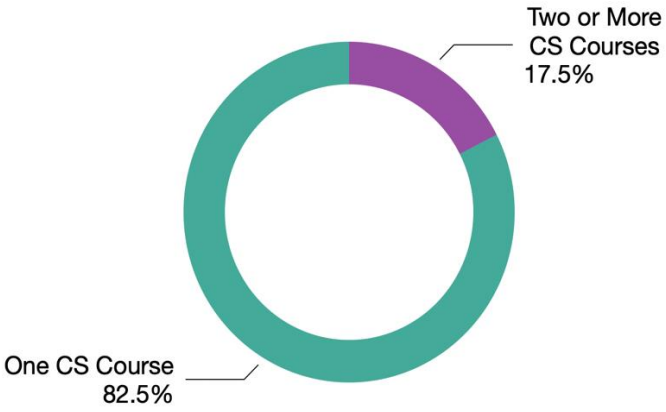
| Instructional Modality | # of CS Courses | % of CS students |
|---|---|---|
| Traditional School Day Program | 23 | 98.2% |
| Online Learning (Internet-based) | 15 | <5.0% |
| Other Educational Setting | 13 | <5.0% |
| Alternative Placement Settings | 12 | <5.0% |
| Night or After School | 10 | <5.0% |
| Distance Learning (non-Internet-based) | 1 | <5.0% |

**Implications.** Surprisingly, very few Illinois CS students took their course online, despite many CS courses being offered in this modality. With advancements in technology and educational platforms, the digital format capitalizes on the discipline characteristics of CS, providing curriculums that enhance students' participation and learning through hands-on practices.[26] The wide variety of instructional modalities illustrates an effort to cater to students with different needs and preferences, highlighting the versatility of CS education delivery.

## What proportion of students take multiple CS courses?

**What the data tells us.** About 1 in 5 (17.5%) of all Illinois CS students take more than one CS course in their high school career (see Figure 4). Interestingly, among those who pursued multiple CS courses, a significant 30.1% enrolled in their first CS course in 9th grade.

**Figure 4.** Proportion of students who took one or multiple CS courses between SY 2018-2022.



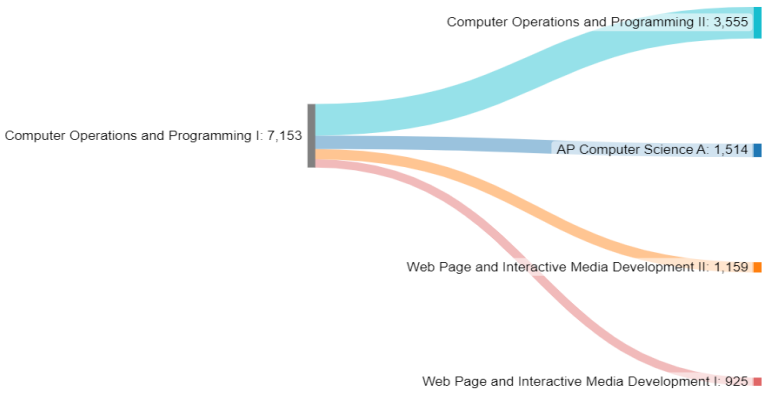

**Implications.** These findings prompt an evaluation of how CS coursework is structured, with an emphasis on the pathways that not only introduce students to CS but also actively foster and maintain their interest and engagement in subsequent CS courses. However, district-level policies and other factors can influence student enrollment in multiple CS courses throughout their high school career.

## What are the most popular CS course sequences?

**What the data tells us.** We analyzed the most popular CS course sequences of the 17.5% of Illinois CS students who took two or more CS courses in their high school career. Over the past five school years, the CS course sequences have predominantly consisted of two- and three-course sequences.

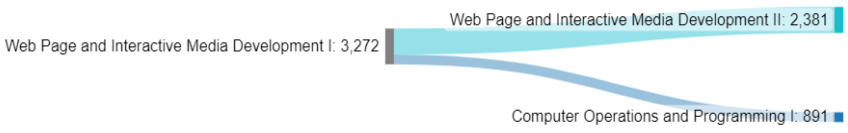
However, enrollment in three-course CS sequences is extremely rare, with approximately only 2% of Illinois CS students taking three CS courses in their high school career. As a result, this report focuses on the widely observed two-course sequences.

**Figure 5.** CS CTE course sequence 1, with students beginning in Computer Operations and Programming I, between SY 2018-2022. Numbers on the left indicate the number of students in that course who proceeded to a second course and not all students who enrolled in that course.




***CTE Course Sequences.*** A sizable portion (10.1%) of students who take two CS courses embark on their CS course-taking pathway with Career and Technical Education (CTE) courses (Figure 5), which prepare students for the workforce by providing opportunities to gain skills and knowledge of various career paths. One of the most common entry points for students is Computer Operations and Programming I, with 7,153 students starting here before moving on to another CS course. The progression from this introductory CS CTE course seems to be effective in developing student interest and providing a solid foundation for further study[27], since it flows students into four different CS courses, three of which are also CTE courses. The inclination of students to stay with the CTE sequence after this introductory course suggests the continuity that the CTE curriculum offers. Additionally, a minor segment of students enrolled in the Advanced Placement (AP) Computer Science A course, which is not a CTE course, after completing this foundational course.

**Figure 6.** CS CTE course sequence 2, with students beginning in Web Page and Interactive Media Development I, between SY 2018-2022. Numbers on the left indicate the number of students in that course who proceeded to a second course and not all students who enrolled in that course.




Another CS CTE sequence (Figure 6; 4.6% of CS students who took two or more courses) starts with Web Page and Interactive Media Development I. While most students continue in the Web Page and Interactive Media Development sequence with its counterpart (Web Page and Interactive Media Development II), many students also continue into Computer Operations and Programming I. The interconnectivity of Computer Operations and Programming I and Web Page and Interactive Media Development I, serving as both introductory and subsequent courses (see Figures 5 and

6), implies a non-linear progression between these CS courses and may indicate the courses' complementary nature or the flexibility of the CS CTE curriculum.

**Figure 7.** CS AP course sequence 1, with students beginning in Computer Programming, between SY 2018-2022. Numbers on the left indicate the number of students in that course who proceeded to a second course and not all students who enrolled in that course.


***AP Course Sequences.*** Figure 7 shows a sequence starting with Computer Programming (7.3% of CS students who took two or more courses). Computer Programming is the predominant channel for students into AP Computer Science A. The notable transition from foundational courses to AP Computer Science A reflects interest in college-level CS education. A small proportion of students in the Computer Programming sequence enroll in Web Page and Interactive Media Development I, a CTE course, that plays an important role in other CS sequences as noted above.

Another AP CS course sequence is the singular pathway from AP Computer Science Principles to AP Computer Science A. This sequence is unique in that AP courses act as the source and target for students. This sequence is beneficial for students seeking college credit or preparing for higher education in computer science, as it provides a comprehensive pathway from foundational concepts (such as basic programming and real-world applications taught in AP CS P) to specialized programming skills (such as advanced programming languages like Java in AP CS A). However, not many students have completed this sequence, with only 936 students (1.3% of CS students who took two or more courses) enrolled in this sequence between SY 2018-2022.

Both these AP CS course sequences suggest a need for increased support and preparation for students taking AP courses. This is because the combined potential of both courses can contribute to sustained engagement and success in the field of CS.[28] Moreover, both AP CS courses count towards the three-year mathematics graduation requirement in the state, which could account for their popularity.

**Implications.** Future research can focus on these source courses and what aspects of these courses are building interest and are motivating to students. This research could inform districts on effective course offerings that introduce students to CS coursework and pathways.

### How have the most enrolled CS courses changed over time?

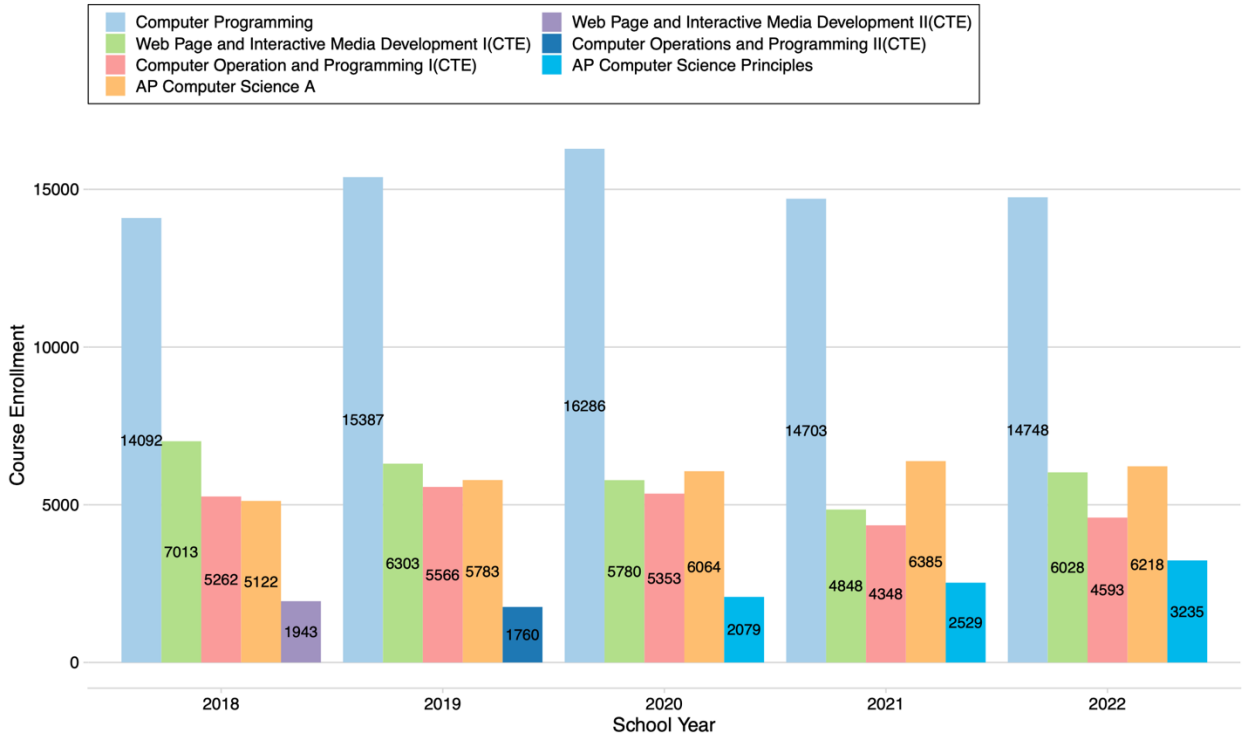
**What the data tells us.** Computer Programming consistently registered the highest student enrollment across all five years, as seen in Figure 8. This course can cover a wide spectrum of CS content ranging from various programming languages to object-oriented programming for multiple platforms according to the course description below.

**Computer Programming (10152A000)**

*Course description:* Computer Programming courses provide students with the knowledge and skills necessary to construct computer programs in one or more languages. Computer coding and program structure are often introduced with the BASIC language, but other computer languages, such as Visual Basic (VB), Java, Pascal, C++, and C#, may be used instead. Students learn to structure, create, document, and debug computer programs. Advanced courses may include instruction in object-oriented programming to help students develop applications for Windows, database, multimedia, games, mobile and/or Web environments. An emphasis is placed on design, style, clarity, and efficiency. In these courses, students apply the skills they learn to relevant authentic applications.

*Source: ISBE Course Catalog*

**Figure 8.** Enrollment of the top 5 CS courses for Illinois between SY 2018-2022.

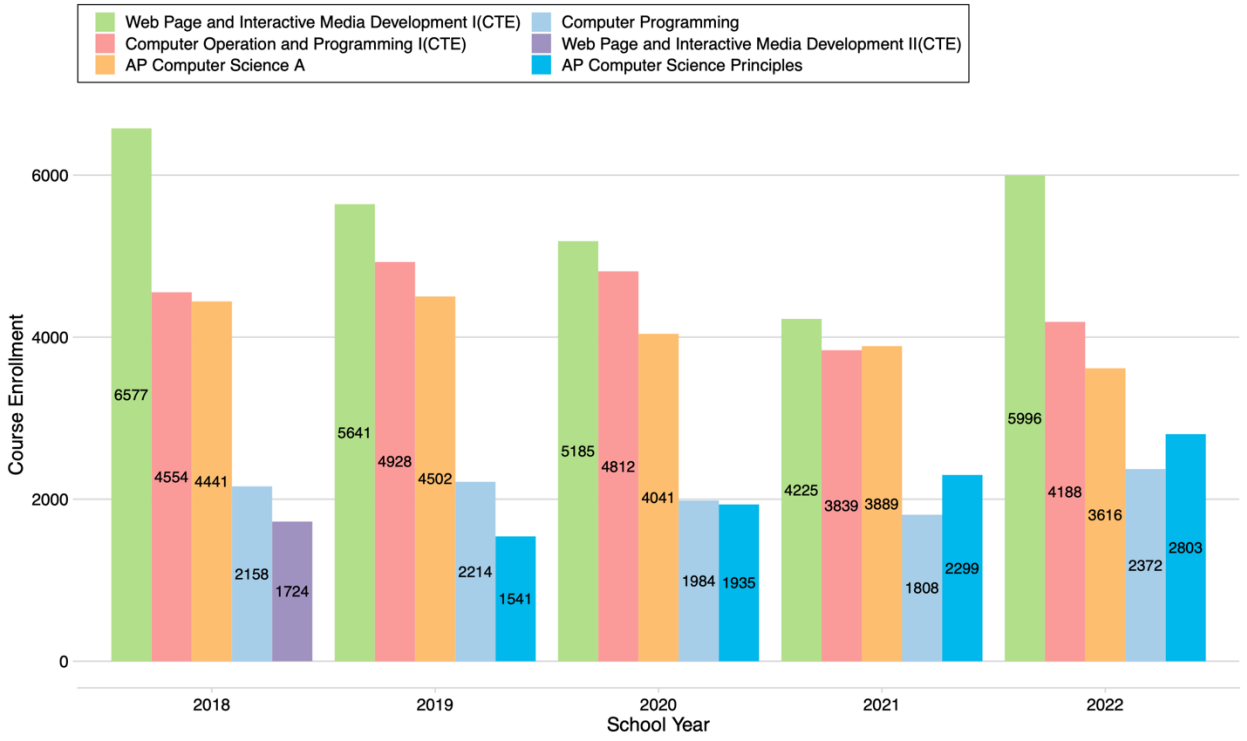



AP courses, specifically AP Computer Science A and AP Computer Science Principles, also figured prominently in student enrollment, with both increasing enrollment in recent years. We also see a persistent trend of CS CTE courses, with Computer Operations and Programming I maintaining a consistent

enrollment, reflecting a continued interest in the CTE pathway. A contrasting trend was observed in the Web Page and Interactive Media Development I course, which, after experiencing a dip in enrollments from SY 2018 to SY 2021, saw an uptick in SY 2022, indicating a possible resurgence in interest or offerings.

The drastic difference in enrollment between Computer Programming and other courses shown in Figure 8 suggested to us that a particular district or curriculum may be influencing these numbers. The removal of CPS from this data shows a different picture, as seen in Figure 9.

**Figure 9.** Enrollment of the top 5 CS courses for Illinois without CPS between SY 2018-2022.




When CPS enrollment is excluded, a drastic decrease in enrollment for Computer Programming is apparent, falling from an average enrollment of 15,043 students per year to only 2,107. For the majority of high school districts in the state, Web Page and Interactive Media Development I, a CTE course, saw the highest enrollment year after year. Though the course saw declines from SY 2018 to SY 2021, it has since rebounded.

**Implications.** In recent years, CTE course enrollments have become an increasingly significant component of the overall CS enrollment, with the majority of the most enrolled courses consisting of CTE courses. The steady enrollments in those CTE courses signals the consistent role of CTE pathways in career-focused CS education for most of the state.

## What are the characteristics of the most enrolled CS courses and what are the demographics of students who take them?

**What the data tells us**. Table 2 tabulates the course characteristics and student demographics of the most enrolled CS courses noted above. Below we highlight key differences between these courses in more detail as organized by the table.

The vast majority of students in each of these courses are enrolled through Traditional School Day Programs, suggesting traditional modalities are still abundant in CS education. In terms of grade-level enrollment, 9th grade students represented the highest proportion of Computer Programming, constituting 43.2% of total enrollment statewide and 37.4% without CPS. Conversely, the AP Computer Science courses, including AP Computer Science A and AP Computer Science Principles, enrolled more 12th grade students than other grades, which could be attributed to students preparing for college-level coursework or restrictions on enrollment by grade level or previous coursework.

The analysis of student demographics in these courses reveals some disparities, particularly in gender representation and across racial groups. Female students were underrepresented across the top five CS courses, with their participation rates ranging from 20.1% in Computer Operations and Programming I to 43.8% in Computer Programming. However, female representation in Computer Programming drops to merely 22.5% once CPS is removed from the dataset. This aligns with 4-year post-secondary enrollment of CS programs in the state where female representation is only at 20%.[29] Neither Black/African American nor Hispanic/Latino students are equitably represented in most CS courses compared to their representation in the statewide student body; one of the exceptions being Computer Programming, which will be discussed in greater detail below. AP Computer Science Principles enrollment is 24.7% Hispanic/Latino students, which meets representation in the statewide student body. English learners (EL) represented less than 5% of the student body in most of the CS courses, with the exception of Computer Programming, almost all of which can be accounted for by CPS enrollment.

The economic status of students varied significantly, with a large number of students in courses like Computer Programming eligible for free or reduced lunch services (66.1% Illinois and 23.3% Illinois without CPS). Students who fall under the Individuals with Disabilities Education Act (IDEA) represent less than 5% of learners in some courses and up to 15.8% in others. Dual credit earners were represented the most in Web Page and Interactive Media Development I (7.8%) and Computer Operation and Programming I (7.4%). The enrollment of students eligible for supplemental educational services and migratory children, along with those identified as homeless, represent less than 5% of the total student body in these courses.

**Implications.** As CS education expands in Illinois, districts need to ensure that all courses are available to all students equitably and do their best to remove any barriers to enrolling in these courses. Those efforts need to create an inclusive environment where every student, regardless of background or circumstance, has the opportunity to engage with and excel in CS.

**Table 2.** Top 5 computer science courses by enrollment aggregated across SY 2018 - SY 2022, their respective course and student characteristics, and state averages for the entire Illinois high school student body.

**Top 5 Computer Science Courses by Enrollment SY 2018 – SY 2022**

| Rank | Course Name (Course State ID) | CTE | Course Modality | Grade Level | Percent of students in the course that identify as… | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Female | Black/ AA | Hispanic/ Latino | English Learners | IDEA | FRL | DC Earners |
| **1** | Computer Programming (10152A000) | No | 98.6% Traditional School Day Program<br><5% Alternative Placement Settings<br><5% Night or After School<br><5% Online Learning (Internet-based) | Grade 9: 43.2%<br>Grade 10: 20.3%<br>Grade 11: 20.1%<br>Grade 12: 16.4% | 43.8% | 27.8% | 45.8% | 11.8% | 15.8% | 66.1% | <5% |
| | Computer Programming (excluding CPS) | No | 99.1% Traditional School Day Program<br><5% Alternative Placement Settings<br><5% Online Learning (Internet-based) | Grade 9: 37.4 %<br>Grade 10: 23.5 %<br>Grade 11: 16.9 %<br>Grade 12: 22.2 % | 22.5% | 6.8% | 14.9% | <5% | 8.0% | 23.3% | <5% |
| **2** | AP Computer Science A (10157A000) | No | 99.9% Traditional School Day Program<br><5% Night or After School<br><5% Online Learning (Internet-based) | Grade 9: 7.2%<br>Grade 10: 22.6%<br>Grade 11: 28.7%<br>Grade 12: 41.5% | 31.0% | 7.4% | 19.8% | <5% | <5% | 27.0% | <5% |
| **3** | Web Page and Interactive Media Development I (10201A001) | Yes | 99.4% Traditional School Day Program<br><5% Other Educational Setting<br><5% Online Learning (Internet-based)<br><5% Night or After School | Grade 9: 21.2%<br>Grade 10: 24.9%<br>Grade 11: 22.9%<br>Grade 12: 31.0% | 30.7% | 10.4% | 18.9% | <5% | 12.1% | 36.9% | 7.8% |
| **4** | Computer Operation and Programming I (10152A001) | Yes | 97.9% Traditional School Day Program<br><5% Alternative Placement Settings<br><5% Online Learning (Internet-based)<br><5% Other Educational Setting<br><5% Night or After School<br><5% Distance Learning (non-Internet-based) | Grade 9: 26.0%<br>Grade 10: 25.2%<br>Grade 11: 23.8%<br>Grade 12: 24.9% | 20.1% | 9.3% | 21.5% | <5% | 10.9% | 33.0% | 7.4% |
| **5** | AP Computer Science Principles (10161A000) | No | 99.5% Traditional School Day Program<br><5% Night or After School | Grade 9: 11.0%<br>Grade 10: 23.5%<br>Grade 11: 23.9%<br>Grade 12: 41.7% | 27.6% | 8.5% | 24.7% | <5% | <5% | 29.0% | <5% |
| **State Average for all Illinois High School Students** | | | | **Grade 9: 25.7%<br>Grade 10: 25.7%<br>Grade 11: 24.1%<br>Grade 12: 24.5%** | **48.6%*** | **15.1%** | **25.6%** | **6.0%** | **12.7%** | **41.9%** | **12.1%** |

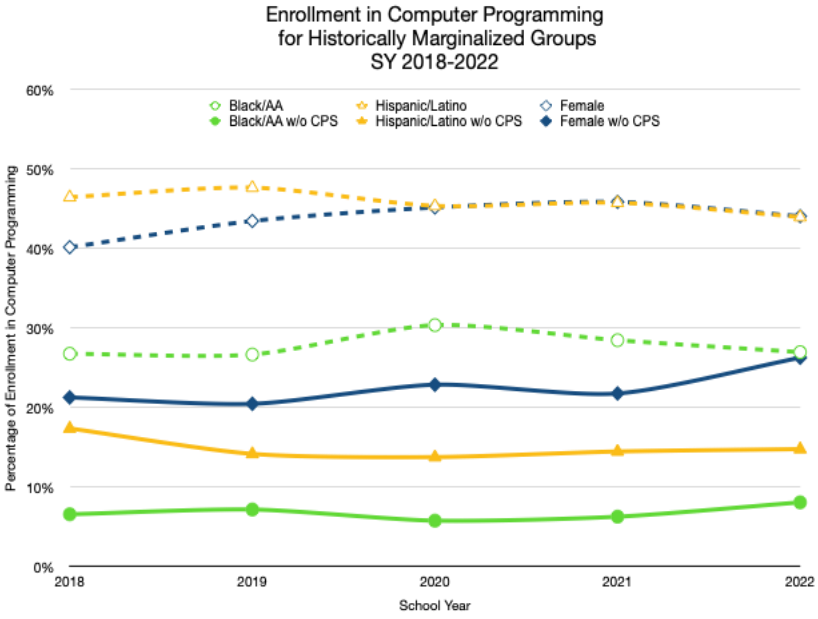
We included enrollment data for Computer Programming for Illinois and Illinois without CPS given its popularity across the state and within CPS.
Students identified as homeless, a migratory child, or in need of supplemental educational services (SES) all represent less than 5% of the student population in each of the courses and state average.
IDEA = Individuals with Disabilities Education Act; FRL = free or reduced lunch; DC = dual credit.
*The percentage of female enrolment is derived from statewide K-12 enrollment data.

## Course Spotlight: Computer Programming

### How are historically marginalized groups represented in the most enrolled CS course?

Because Computer Programming was by far the most enrolled CS course across the past five years, we wanted to dig deeper into the representation of Black/African American, Hispanic/Latino, and female students in this course because these groups are among the most underrepresented in CS coursework and the workforce. Figure 10 displays enrollment trends for these three groups in Illinois and Illinois without CPS.

**Figure 10.** Enrollment in Computer Programming (10152A000) for Black/African American (green), Hispanic/Latino (gold), and female (blue) students between SY 2018-2022 by Illinois (dashed line) and Illinois without CPS (solid line).




**What the data tells us.** Enrollment trends for Black/African American students in the Computer Programming course fluctuated, with a notable peak occurring in SY 2020 at 30.3% of all students enrolled in Computer Programming statewide. Subsequent years witnessed a decrease in representation. However, when CPS is excluded from the dataset, the enrollment rate for Black/African American students showed a steady increase from 5.7% in SY 2020 to 8.0% in SY 2022. This indicates that the representation of Black/African American students is largely accounted for by CPS, but representation of Black/African American students in most Illinois districts may be on an upward trajectory.

The participation of Hispanic/Latino students in the course across the state displayed a general downward trend, hitting the lowest point of 43.9% in SY 2022. Again, when excluding CPS from the data set, the representation of Hispanic/Latino students drops significantly. However, after a decrease from 17.3% in SY 2018 to 13.7% in SY 2020, there was a slight recovery, ending at 14.7% in SY 2022. The modest recovery suggests an emerging, although slight, growth in participation among Hispanic/Latino students in most Illinois districts.

Over the five-year span, female enrollment in the Computer Programming course saw a progressive increase both statewide and when excluding CPS enrollment. Notably, SY 2022 marked a deviation from this trend; while general enrollment for female students declined, data excluding CPS displayed a significant

increase, suggesting that, proportionally, more female students in most Illinois districts chose to enroll in this course.

**Implications.** The overall enrollment figures suggest that CPS plays a crucial role in maintaining or even increasing the statewide racial and gender diversity of the student population enrolled in the Computer Programming course. However, analyses that exclude CPS suggest that the majority of the high school districts in the state are making some progress towards increasing the racial and gender diversity of their Computer Programming courses.

## Can we assess equity in Illinois high school CS education using the CAPE framework?

**Figure 11.** CAPE Framework assessment of Illinois high school CS education.


We believe this first report begins to analyze the **access** and **participation** in CS education component of the CAPE framework. This landscape report provides a high-level overview of recent access and participation trends and indicates that: (1) CS enrollment has been steady across the state; (2) CS CTE courses offer diverse and flexible pathways; and (3) CPS is driving Illinois CS education towards racial and gender parity, and overall, many Illinois districts are improving in these regards in the most popular course. However, many CS courses with high enrollments have not reached equitable participation levels across gender, racial, and/or socio-economic groups. Participation will be further assessed in future reports analyzing the CS student body in Illinois.

## What's coming next?

This was the first report in **The State of Computer Science in Illinois High Schools Series**. The second report will continue to analyze participation in CS education throughout the state by describing the CS student body, their characteristics, and how they fare in CS coursework.

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