The Advanced Placement Program and Educational Inequality

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Abstract

The Advanced Placement (AP) program is widely offered in American high schools and has been touted as a way to close racial and socioeconomic gaps in educational outcomes. Using administrative data from Michigan, I exploit variation within high schools across time in AP course offerings to identify the relationship between AP course availability, AP participation, and postsecondary outcomes. I find that higher income students, white and Asian students, and higher-achieving students are more likely to take advantage of additional AP courses when they are offered, thus widening existing gaps in course-taking. I find little evidence that additional AP availability is related to improved college outcomes for any students, with the exception of the most academically prepared students. Expanding access to AP courses without additional incentives or support for disadvantaged students to succeed is unlikely to address educational inequality.

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1 Introduction

Since its introduction in 1952, the Advanced Placement (AP) program, which provides an opportunity for high school students to take college-level courses and possibly obtain college credit or placement out of introductory college courses, has grown dramatically and is now offered in the majority of American high schools. However, the AP program originally served an extremely elite set of high schools, and disparities in access remain today. Recent policy efforts have called for expanded access of AP courses to an even wider set of students and schools (Tugend, 2017; Burnett and Burkander, 2021). Despite the popularity of AP and the perception that participation improves college preparation, increases chances of admission to selective colleges, and accelerates degree attainment, there is little convincing causal evidence on how taking AP courses affects human capital investment and later outcomes. It is also not clear if further expanding AP curricula would address existing educational inequality or exacerbate it by primarily serving and benefiting already advantaged students.

In this paper, I study two key aspects of AP. First, I investigate which types of students take advantage of additional AP courses when whey become available. Second, I study whether and how Advanced Placement courses are related to college enrollment and degree receipt. I use administrative data from the state of Michigan and exploit variation within high schools across time in how many AP courses are offered to identify a plausibly causal effect of AP course availability. Although there is obvious selection into which types of schools offer more AP courses, the fixed effects strategy eliminates any bias stemming from fixed characteristics of schools (such as size, geographic location, or a high baseline level of parent involvement) and compares *changes* in course offerings to *changes* in outcomes.

I find that when a high school offers an additional AP course, there is a small increase in participation. The proportion of students taking any AP increases by 1.1 percentage point. The average number number of AP courses taken increases by 0.032, which translates into fewer than 10 enrollments in the typical high school. Participation

in AP exams increases by less: 0.4 percentage points on the extensive margin and a statistically insignificant 0.011 exams on the intensive margin. Taking the exam and receiving a sufficiently high score are required for college credit or placement, and selective colleges use AP scores to evaluate applicants, so the changes (or lack thereof) to exam-taking are important for understanding downstream effects.

Not only do expanded AP offerings serve few students, they serve students unequally. Although students of different socioeconomic background and race see similar increases in the probability of taking any AP course (around 1 percentage point), only higher-income (those not eligible for subsidized school meals) and white and Asian students increase their average number of AP courses. These patterns persist even conditional on prior achievement. I find the strongest effects on AP course- and exam-taking for students with the highest levels of academic preparation (measured by performance on a standardized math test in middle school). The results suggest that additional AP courses are mostly taken by students already taking other APs.

I find little evidence that a school offering an additional AP course improves students' outcomes, with the exception of the highest-achieving students. I find precisely estimated null effects of AP course availability on college enrollment, college selectivity, and degree attainment, and no differential effects by family income or race. Students who enter high school with strong academic preparation are the only ones who experience positive benefits of additional course offerings. I estimate that for a student whose middle school math performance puts them in the top 25 percent of my sample, having an an additional AP course available increases their likelihood of enrolling in a four-year college by 0.5 percentage points, of enrolling in a competitive college by 0.5 percentage points, and of earning a bachelor's degree in four years by 0.7 percentage points. However, these effects are not robust to two-way fixed effects bias corrections or to all alternate specifications. With this caveat in mind, a two-stage least squares approach suggests that for a high-achieving student induced to take an additional AP course, doing so increases their chance of enrolling in a competitive college by over 6 percentage points, and their chance of on-time BA completion by 10 percentage points.

Taken as a whole, the results suggest that at best, expanding AP programs may benefit already high-achieving students but do little to close achievement gaps. At worst, increasing AP course offerings may exacerbate socioeconomic and racial inequalities in access to advanced coursework.

The paper proceeds as follows: Section 2 provides history and background on the AP program; Section 3 reviews prior related work; Section 4 describes the methodological approach and data; Section 5 presents findings about the effect of AP course availability on course-taking and exam-taking, as well as on college outcomes; Section 6 discusses threats to identification and presents robustness checks; and Section 7 concludes.

2 Background

The Advanced Placement (AP) program traces its origins to just after World War II, when the Ford Foundation created the Fund for the Advancement of Education and concluded that better coordination between secondary and postsecondary schools would help increase the number of college entrants and graduates in the United States and serve national security interests (Schneider, 2009; College Board, 2003; Rothschild, 1999). A committee was formed "to develop high school course descriptions and assessments that colleges would find rigorous enough to use as a basis for granting credit" and a pilot program in 11 subject areas was launched in 1952 (College Board, 2003, p. 1). Since 1955, the AP program has been run by the College Board, the same non-profit organization responsible for the SAT college entrance exam.

Participation has grown dramatically since the program's inception, from 1,229 students at 104 schools nationwide in the 1955-56 academic year (the first year data are available from the College Board) to 2.5 million students and nearly 23,000 schools in 2021 (College Board, 2021a). In 2012, 74 percent of all public high schools offered AP courses (Malkus, 2016), and these schools serve even more students as a proportion of all public high school students (Theokas and Saaris, 2013). In the 2015-16 school

year, 85 percent of public high school students attended schools offering at least one AP course (Chatterji et al., 2021). However, access is unequal across students and schools. Smaller and rural schools are less likely to offer AP, and Black and Indigenous students are underrepresented in schools that offer high numbers of AP courses. Even at schools with the same number of course offerings, Black, Latinx, and Indigenous students are less likely to enroll (Chatterji et al., 2021).

A non-trivial amount of federal, state, and local public funds are dedicated to subsidizing AP teacher training, exam fees, and performance incentives (Klopfenstein, 2010). The U.S. Department of Education created Advanced Placement Incentive Program grants in the late 1990s to increase AP participation among low-income students and reduce achievement gaps; this program was expanded under No Child Left Behind in 2001 (Klopfenstein, 2010). In 2016, the Department of Education awarded over $28 million to subsidize exam fees for low-income students in 41 states (including $560,000 to Michigan) plus the District of Columbia (U.S. Department of Education, 2016). A number of large school districts, including New York City and Washington, D.C., have adopted policies mandating a minimum number of AP offerings per school (Tugend, 2017). Some schools in Washington, D.C. require all students to enroll in at least one AP course (Burnett and Burkander, 2021). These policies stem from a belief that expanding access to AP can narrow racial and socioeconomic gaps in educational outcomes (Tugend, 2017; Quinton, 2015; Schneider, 2009).

The AP program serves several ostensible purposes. The College Board describes it as a way to "[enable] willing and academically prepared students to pursue college-level studies—with the opportunity to earn college credit, advanced placement or both—while still in high school" (Rodriguez et al., 2013, p.1). The College Board also touts participation as beneficial to college admission and performance, saying that "Taking AP courses demonstrates to college admission officers that students have sought the most rigorous curriculum available to them, and research indicates that students who score a 3 or higher on an AP Exam typically experience greater academic success in college and are more likely to earn a college degree than non-AP students"

(Rodriguez et al., 2013, p. 1). As summarized by Klopfenstein and Thomas (2010), "while the College Board generally makes no explicit statements that AP experience is a cause of college success, their promotional literature readily leads readers to such a conclusion" (p. 170).

As of 2023, the College Board offers 38 AP courses in six subject areas: science, math and computer science, history and social sciences, English, world languages and cultures, and arts. In 2021, the most popular subjects (by exams taken) were English Language and Composition, U.S. History, English Literature and Composition, World History, Psychology, and U.S. Government (College Board, 2021b).

3 Related Literature

The current study fits within a number of overlapping literatures. One way to conceptualize the AP program is as a high-ability track within a high school. There is a large literature on ability and achievement tracking that informs theory about the effects of AP participation, particularly differential effects by student type (see Betts, 2011, for a review). Theoretically, tracking systems may involve an efficiency-equity tradeoff. Proponents argue that grouping students by ability allows teachers to tailor content and approach, while opponents assert "that it condemns students placed into the lower tracks to lower educational attainment, and [...] aggravates economic inequality and perpetuates economic disadvantage across generations" (Betts, 2011, p. 343). The empirical evidence on within-school tracking is mixed (Betts, 2011). For example, an experiment by Duflo et al. (2011) found that students of all ability levels performed better when sorted into ability-based classrooms. On the other hand, Marascuilo and McSweeney (1972) is an example of a tracking experiment that decreased student learning overall, and for medium- and low-ability students in particular. Others see AP as a type of or alternative to dual enrollment programs (see, for example, Klopfenstein and Lively, 2012), which have the explicit goal of reducing the financial and time cost of postsecondary education.

A substantial body of work has focused on inequities in access to AP, and the role of advanced coursework in maintaining educational segregation and inequality by race and income. The program originated in partnership with elite private preparatory schools serving overwhelmingly wealthy, white students (Schneider, 2009). Even as participation increased, it was concentrated among white students in affluent private and suburban public schools, and "some people [began to] regard the program as touched with ... 'institutional racism'" (Hochman, 1970, p.17, quoted in Schneider, 2009). Even as education reformers advocated for expanding AP access to underserved students, schools serving low-income and minority populations faced constraints in the form of proper teacher training, academic preparation, and low expectations about student ability (Schneider, 2009). This history of structural inequity may prevent low-income and underrepresented minority students from accessing advanced classes, as well as contribute to lower levels of academic preparation that hinder participation and success in AP courses.

Research by historians, sociologists, and education researchers has argued that the AP program, like many other examples of educational resources, benefits already privileged students and systematically excludes the already marginalized, thus perpetuating inequities even within schools (Lewis and Diamond, 2015; Schneider, 2009). One framework is race- and class-based opportunity hoarding, wherein a dominant group "gains access to a valuable and renewable resource and precludes others from benefiting from said resource" (Rodriguez and McGuire, 2019, p. 650). This could come in the form of privileged parents parents advocating for their own children, and school staff steering students of color away from advanced courses. Rodriguez and McGuire (2019) use cross-sectional national data and instrument for AP availability with per-pupil school expenditures and find that when schools introduce additional AP courses, the Black-white gap in AP course-taking widens. They argue that their results imply opportunity hoarding by white students and families. Course-taking disparities could also stem from students of color opting out due to not feeling welcome in predominantly white classrooms or doubting

the quality of programs in underresourced schools (Rodriguez and McGuire, 2019). Solorzano and Ornelas (2002) show that Chicana and Latina students in one California district are underrepresented in AP courses, even in schools with strong AP programs; they argue that "school structures, processes, and discourses help maintain racial/ethnic/gender/class discrimination in access to AP/Honors classes" (p. 219). Some argue that racial and income-based disparities in AP course-taking are due to different levels of academic preparation—differences that are are a result of lower access to educational resources. Conger et al. (2009) find that the Black-white and Hispanic-white gaps in advanced course-taking in Florida reverse once middle school test scores are accounted for; this finding remains with the inclusion of school fixed-effects.

There are several key mechanisms by which we might expect participation in AP courses and exams to affect educational choices and outcomes. AP courses are generally considered more rigorous than standard high school classes, so that the experience of taking an AP course and preparing for the exam may directly increase students' knowledge, skills, and college readiness. AP participation can serve as a signal of student ability, motivation, and college readiness, as well as a signal of school quality, which are used by admissions committees at selective colleges in evaluating applicants. Students earning sufficiently high scores on AP exams (a three on a five-point scale, in most cases, though policies vary by institution) can earn college credit and/or placement out of introductory-level college courses, thus shortening time to graduation.

The predicted effects of AP participation are not unambiguously positive. Performance in AP courses and particularly on AP exams may serve as a signal to students that causes them to re-asses their own academic ability and potential for college success; depending on performance, students could revise their self-assessment upwards or downwards.[1] The effort required and stress induced by rigorous AP courses

[1]For evidence that grades and standardized test scores can lead to this type of belief updating, see Jacob and Wilder (2010); Goodman (2016); Gonzalez (2017); and Avery and Goodman (2022).

could crowd out effort in other academic and non-academic tasks, depending on the degree of complementarity between the various tasks. This is particularly important in considering policies that subsidize or incentivize AP participation in some way, as they may induce some students to take more than the socially optimal number of AP courses or exams.

Rigorous causal evidence on the effect of AP is fairly limited. Jackson (2010) evaluates the Advanced Placement Incentive Program in Texas, which paid students and teachers for passing AP exams and provided training to teachers. He exploits exogenous variation in when schools implemented the program and finds that it increased participation in AP courses and exams, the number of students scoring highly on the SAT or ACT, and college matriculation. In a longer-term follow up, Jackson (2014) shows positive effects on degree attainment and earnings.

In the only experimental work to date, Conger et al. (2021) randomly assigned high school students into a treatment that included the option to enroll in newly introduced AP Biology or Chemistry course in their schools. Taking an AP science course resulted in a higher self-reported level of course rigor and a higher level of science skill. However, in a longer-term follow-up, Conger et al. (2023) find no effect on SAT or ACT performance, no change in students' self-reported portfolio of college applications, and no ultimate effect on selective college enrollment. They also find suggestive evidence that competitive college enrollment may have *decreased*. These somewhat discouraging findings point to the importance of considering who the marginal students are when expanding access. In a world where nearly all schools have AP courses available, the marginal student may be less prepared and unlikely to benefit.

A related series of studies exploit cutoffs in continuous AP exam scores that translate into the 1-5 integer scores reported to students and colleges. Smith et al. (2017) find that receiving a credit-granting score (a three in most cases) on an AP exam positively affects on-time college graduation. Avery et al. (2018) use the same regression discontinuity design as Smith et al. (2017) and find that receiving a higher

score on an AP exam significantly increases the likelihood that a student will major in that subject in college; they argue that "a substantial portion of the overall effect is driven by behavioral responses to the positive signal of receiving a higher score" (p. 918). Gurantz (2021) uses a similar regression discontinuity strategy to examine college course-taking by subject, finding that women who earn credit from AP exams in STEM subjects take more STEM courses.

It is important to note that receiving credit or placement is contingent on taking and passing an AP exam. A significant proportion of students who take an AP course do not take the associated exam; Fazlul et al. (2021) find that 15 percent of AP course enrollments (in four metro Atlanta school districts) do not result in an exam. Even among those who take an exam, many do not receive a passing score. These numbers are likely even higher for schools and students on the margin of offering and taking AP. In the setting of Conger et al. (2023)—schools that had not previously offered AP science—40 percent of treated students opted out of the exams, and 85 percent of those who did take the exams did not pass.

The current study represents, to my knowledge, the first plausibly causal evidence on the long-term effects of AP course offerings on college outcomes. Although Conger et al. (2023) examine effects on enrollment, they do not yet have results on college persistence and graduation. Given the possibility that AP affects college readiness (in ways that may or may not be reflected in standardized test scores), long-term effects may emerge even in the absence of shorter-term ones. Furthermore, I use naturally occurring changes to AP course offerings across a number of subjects, whereas Conger et al. (2023) focus on AP science only. Although advanced science courses are an important part of the curriculum to study, my findings are relevant to a larger set of schools. Jackson (2014) studies college completion, but for a program that financially incentivizes students and teachers to pass exams, paired with teacher training. It is unclear whether his positive findings translate to a program with fewer resources and with less emphasis on exams. Smith et al. (2017) look at on-time college graduation as an outcome, but only for students who take an AP exam and are close to

passing. As mentioned above, this population is a small subset of the overall population of students on the margin of taking AP. While the small portion of students who take and pass an AP exam may benefit, a full accounting of the effects of AP must consider any effects (or lack thereof) on a larger population. Thus, the findings of the current paper will be useful to educators making the highly relevant decision of whether to offer an additional AP course or hire or reallocate an additional AP teacher.

4 Method and Data

4.1 Empirical Specification

Simply comparing students or schools with different levels of AP courses will likely give an upwardly biased estimate of the effect on educational outcomes, since students taking AP and schools offering AP tend to be higher-achieving to begin with. For example, in my sample, students who took at least one AP course have average middle school test scores that are a full standard deviation higher than students who never took AP. At the school level, the number of AP courses offered is highly correlated with the prior achievement level of the school's students.

To account for underlying differences in the types of schools (and students attending them) that have more robust AP programs, I exploit time variation in how many AP courses a high school offered each year. I use panel data covering the graduating classes of 2005 through 2012 in a sample of Michigan public high schools. My strategy is similar to that of Darolia et al. (2020), who use what they argue is "plausibly exogenous variation in course offerings within high schools over time" (p. 22) to study the effect of STEM course availability on postsecondary STEM enrollment and degree attainment in Missouri. My identification strategy, like theirs, hinges on year-to-year differences in course offerings within a school being (conditionally) exogenous. This would be the case if the variation is due to things like unrelated changes in teaching staff (due to, e.g., retirement or parental leave) and rules governing

class size.

By controlling for school fixed effects, I compare a cohort of high school seniors to another cohort from the same school, where one cohort had a higher number of AP courses available to them. School fixed effects account for any fixed (i.e., unchanging over time) underlying characteristics of schools that are related to both AP availability and student outcomes. For example, if more rural schools are both less able to offer AP and send fewer students to college, the school fixed effects would eliminate the omitted variable bias associated with rural/urban status. The fixed effects estimator also controls for underlying school-level differences in school and family resources. The same would be true of harder-to-measure fixed characteristics, such as parental involvement, an underlying college-oriented school culture, or a strong college counseling program—as long as those characteristics don't change along with AP offerings.

I also include year fixed effects to account for the general upward trend in both AP and college outcomes. I include school-specific linear time trends to account for the possibility that schools on an especially steep trajectory in terms of outcomes differentially select into offering more APs. The relationship between AP offerings and outcomes thus captures deviations from trends: in years when a school has a larger change in AP offerings, do student outcomes experience a correspondingly large change?

I start by examining the effect of additional AP course offerings on students' participation in AP courses and exams, by estimating:

$$\mathrm{D}_{ijt,t-1} = \alpha_0 + \alpha_1(\#\text{ AP courses available})_{jt,t-1} + \delta_j + \lambda_t + \tau_j t + \varepsilon_{jt} \qquad (1)$$

where i refers to a student, j to a high school, and t to year of high school graduation. The treatment is the count variable $(\#\text{ AP courses available})_{jt,t-1}$: the number of AP

subjects available to cohort t at school j during their junior and senior year.[2,3] D refers to four different measures of AP participation: an indicator for taking any AP courses; the number of AP courses taken; an indicator for taking any AP exams; and the number of AP exams taken. As with course availability, I measure AP courses and exams taken in a student's junior and senior year. δ_j are school fixed effects; λ_t are cohort fixed effects; and τ_j are school-specific linear time trends. I estimate all equations with ordinary least squares and cluster standard errors at the school level. The parameter α_1 identifies within-school changes in AP participation when the number of courses offered changes.

A focus of the analysis is not just whether increasing AP offerings increases access, but for whom. To test for heterogeneity by socioeconomic status, I subset the data and estimate Equation 1 separately for students who are and are not eligible for free or reduced-price lunch (FRPL) in 12th grade.[4] To test for heterogeneity by race, I estimate separate regressions for underrepresented minority (URM) students (i.e., Black, Hispanic, or Native) and non-URM (white or Asian).

To test for heterogeneity by academic preparation, I use students' standardized score on the statewide math test students take in middle school (which I describe in more detail in Section 4.2 and Appendix B). For the heterogeneity analysis by test score, students missing test scores are omitted. I test for prior achievement heterogeneity in two ways. The first is with an interaction term between the number of available AP courses and standardized score on the Michigan math test in middle school:

[2]As an example, if school j offered AP Biology and U.S. History in 2006 and Biology and U.S. Government in 2007, $AP_{j,2007,2006}$ would equal 3. This variable can take values between 0 and 26 AP subjects. I collapsed a number of subjects that the transcript data didn't allow me to distinguish between. For example, microeconomics and macroeconomics are two distinct subjects, but many schools just listed "AP economics." Appendix Figure B1 summarizes these decisions.

[3]By focusing on AP courses offered and taken junior and senior year rather than all four years of high school, I am able to include more cohorts. At the course level, 91 percent of AP courses in the sample are taken by juniors or seniors. 81 percent of students who take AP take all of their AP courses in junior or senior year.

[4]In Michigan, the threshold for subsidized lunch is family income up to 185 percent of the federal poverty line. In 2019, this was equivalent to $47,638 for a family of four.

$$D_{ijt,t-1} = \eta_0 + \eta_1 AP_{jt,t-1} + \eta_2 Math_i + \eta_3 AP_{jt,t-1} \cdot Math_i + \delta_j + \lambda_t + \tau_j t + \varepsilon_{ijt} \quad (2)$$

In Equation 2, I've abbreviated the treatment variable—number of AP courses available—to $AP_{jt,t-1}$. Here, η_1 is the effect for a student with an average middle school math score, and $\eta_1 + \eta_3$ is the effect for a student with a math score one standard deviation above the mean. (Scores are standardized among the full population of test takers, within subject, year, and grade.) As a second approach to academic preparation heterogeneity, I sort students by their math score, subset the bottom 75 percent from the top 25 percent of performers, and run separate regressions. These percentiles are based on the analysis sample, not the original sample of middle school test takers.

After reporting how increasing AP offerings increases access, I examine the effects of AP course availability on college outcomes, using:

$$Y_{ijt} = \beta_0 + \beta_1 (\#\text{ AP courses available})_{jt,t-1} + \delta_j + \lambda_t + \tau_j t + \varepsilon_{ijt} \quad (3)$$

where Y_{ijt} is the outcome of interest for student i graduating from school j in year t. The college outcomes I measure are (1) whether a student enrolled in any postsecondary institution within one year of high school graduation; (2) whether they enrolled at a two-year institution; (3) whether they enrolled at a four-year institution; (4) whether they enrolled at a college that is classified as competitive or higher by the Barron's selectivity index; (5) whether they earned a bachelor's degree within four years of graduating high school; and (6) whether they earned a bachelor's degree within six years. All college outcomes are unconditional on initial enrollment, so that students not attending college are assigned zeroes for all outcomes. I test for heterogeneity in changes to college outcomes with separate regressions by income, race, and prior test score (bottom 75 vs. top 25 percent). β_1 in Equation 3 represents the intent-to-treat effect of AP course availability, which is a policy-relevant parameter for schools and

districts considering introducing or expanding an AP program.

Another relevant treatment effect parameter would be the effect of an additional AP course for the students who actually take the course (the treatment effect on the treated). This suggests an instrumental variables strategy using course availability as an instrument for course-taking. However, the validity of the IV estimates relies on the exclusion restriction that the presence of AP courses at a school affects students only so far as it encourages them to take more AP courses and exams. This would be violated in the presence of within-school spillovers, such as positive spillovers of AP content and a more college-oriented culture, or negative spillovers due to diversion of resources. The direction of the bias here is theoretically ambiguous. For this reason, I consider the intent-to-treat effects more internally valid. Furthermore, as I show below, the first stage is on the margin of being considered too weak for valid IV estimation. With these caveats in mind, I implement a two-stage least squares (2SLS) strategy, described in more detail in section 5.5, for the overall sample as well as for the students with the strongest first stage.

4.2 Data

The data I use are provided by the Michigan Department of Education and accessed through the Michigan Educational Data Center (MEDC). The Data Appendix (Appendix B) describes the various data sources, key variables, sample restrictions, and coding of transcript data in more detail.

My first data source is the Michigan High School Transcript Study (MTS), which attempted to collect longitudinal transcript data from a random sample of 150 Michigan public high schools. At the time I received access to the data (February 2017), the MTS research team had received data from 138 schools, but only 87 of those had provided the identifying information (name and birthdate) required to match students to the unique ID variable used in all other MEDC data sources. As I show in Section 5.1 and Table 1, the analytic sample of schools are somewhat larger, more urban, and higher-achieving than the state as a whole. The MTS dataset includes, for each school

in the sample, every course taken by students at that school in a given year.

In order to measure the treatment I am interested in—AP courses available by school and AP courses taken by student—I systematically identified which courses were AP based on course title in the transcript data. The way in which schools list courses is not standardized across schools. Flagging courses as AP was an iterative process that started with more obvious course titles (e.g. "AP Calculus" or "Advanced Placement Biology") and continued by searching for other phrases associated with AP and with one of the recognized AP subjects (e.g. "AP CMP GOV" for comparative government and politics). While some courses were obviously AP, others were more ambiguous. If I wasn't reasonably sure a course was AP, I erred on the more conservative side and did not classify it as AP.[5] I assign course availability at the school level and course-taking at the student level, counting by number of subjects.

For a subset of the students for whom I have course-taking data, I can also observe how many AP exams they took. MEDC has access to all AP exams taken by Michigan students between 2006 and 2013; these data come directly from the College Board. Since most students take AP in their junior and senior years, I can count AP exams for the classes of 2007 onward.[6]

To identify cohorts of high school seniors by school, I use demographic and enrollment data from the Michigan Student Data System (MSDS). This student-by-year panel dataset contains demographic information (including race and free and reduced-price lunch eligibility) as well as the school and district each student attends each year. I limit my sample to students who appear in both the MTS and MSDS.

For heterogeneity analysis by prior student achievement, I use K-12 student assessment data containing standardized test scores. I use a student's eighth grade math test score if it is available, and their seventh grade score if not. Test scores are

[5] I provide a full list of AP course titles in Appendix B, and test sensitivity to classifying ambiguous courses as AP in Appendix Tables B4 and B5.

[6] As is standard in the education literature, years refer to the spring of the academic year. For example, 2006 refers to the 2005-2006 school year.

not available for all students; they would be missing if the student attended middle school in a different state or at a private school, or if they were exempt from the test. The grades in which the state of Michigan tests students by subject have changed over time. I use math scores because the other subject tests were not offered in the relevant years for the full sample. These scores are standardized within subject (math), year, and grade. See the Data Appendix for more detail on test score data.

Information on college outcomes comes from the National Student Clearinghouse (NSC). The NSC provides information on college enrollment at and degrees awarded by any four- or two-year school in the country (with a few exceptions), by date of enrollment and institution. As of 2011, the NSC covered 95 percent of postsecondary institutions in Michigan (Dynarski et al., 2015); it currently covers 98 percent of all students in U.S. institutions (National Student Clearinghouse, 2023).[7]

My final sample includes 173,151 students at who were seniors at 87 public Michigan high schools between 2005 and 2012.

5 Results

5.1 Descriptive Results

I begin with descriptive statistics about the students and schools in the sample, summarized in Table 1. Roughly half of the students are female. The majority, 75 percent, are white, 17 percent are Black, four percent are Asian, three percent are Hispanic, and fewer than one percent are Native (a category which includes American Indian, Alaska Native, Native Hawaiian, and Pacific Islander students). Given historical racial/ethnic differences in advanced course-taking and college attainment, for analyses by race and ethnicity I collapse the categories into underrepresented minority (URM) students (Black, Hispanic, and Native) and non-URM (white and Asian). Around a quarter of students in the sample are eligible for free or reduced-price lunch, which I use as a proxy for family income. At the school-cohort level, the average

[7]For a detailed description of the NSC and its coverage, see Dynarski et al. (2015).

school in the panel enrolls around 1,400 students, has a student-to-teacher ratio of 21, spends $6,300 per student, and has a local unemployment rate of 9 percent.

As shown in the final column of Table 1, these means generally resemble the full population of Michigan students and high schools during this time. However, the students and schools in my sample are somewhat more advantaged than the state average. They are five percentage points less likely to be eligible for subsidized meals, and have middle school test scores 0.17 standard deviations higher than the state average. My sample of schools have higher average test scores, enroll more students, are less rural, and are in areas with lower unemployment than the average Michigan high school. There were 1,251 unique public high schools and 973,383 public high school seniors in Michigan over the 2005 to 2012 period; the schools and students in my sample are 7 percent and 18 percent of the statewide population, respectively. In any given year between 2005 and 2012, there are between 699 and 1,008 Michigan public high schools. The 87 schools in my sample represent 9 to 12 percent of high schools in a given year.

The average student in the sample has just under ten AP courses available to them during their junior and senior year, takes 0.79 courses, and takes 0.74 exams. The average school offers 8.56 AP courses to a cohort. I provide more detail on the variation in AP course offerings by school and across time, as well as AP course- and exam-taking, in Appendix Table B1 and Appendix Figures A1 through A9. Over time, the most common AP course offerings are English, Calculus, U.S. History, Biology, and Chemistry (see Appendix Table B1). The most common courses taken are English, Calculus, U.S. Government, Biology, and Psychology; and the most popular exams are English, Calculus, U.S. History, U.S. Government, and Biology.[8]

While the vast majority of schools offered at least one AP course to their juniors and seniors over the entire period, there is considerable variation in the number

[8]Recall that English and Calculus are each actually two separate courses: English Literature and Composition and English Language and Composition, and Calculus AB and BC. (See Appendix Figure B1.) Still, the hierarchy in Table B1 corresponds to national and Michigan AP exam data from the College Board.

offered. The number of AP courses varies both across and within schools over time (see Appendix Figures A2, A3, and A4), and the changes go in both directions. My identifying variation comes from within-school increases and decreases in AP course offerings. These changes are driven by particular courses. The most common subjects to be introduced are Psychology, World History, Economics, Biology, and Statistics; the most likely to be taken away are Psychology, U.S. History, European History, Computer Science, and World History. The most marginal subjects—meaning those that experience the most changes in both directions—are Psychology, World History, and Economics. Appendix Table B2 lists the number of course changes by subject.

5.2 Effect of AP Course Availability on AP Course- and Exam-Taking

To explore whether and how students take advantage of expanded AP curricula, I estimate Equation 1 on the sample of seniors in Michigan public high schools. Table 2 shows the effect of AP course availability on both the extensive margin (probability of taking any AP course or exam) and the intensive margin (number of AP courses or exams taken). The point estimates suggest that an additional AP course offering increases the probability of a student taking any AP course by one percentage point, and the number of AP courses the average student takes by 0.032. There is a small, 0.4 percentage point increase on the extensive margin of exam-taking, but no detectable effect on the number of exams.

To put these magnitudes in context, the average student in my sample takes 0.79 AP courses, so the 0.032 effect on number of courses taken represents an increase in course-taking of four percent. Put differently, the average senior class has around 250 students, so these numbers translate into roughly eight additional AP course enrollments. The effect on the extensive margin (one percentage point) implies between 2 and 3 additional students taking AP who didn't previously; together, these effects mean that the additional courses are mostly taken by students already taking AP. It

is notable that the effects on exams are smaller than the effects on courses, implying that many students induced into an additional AP course do not take the associated exam. Taking the point estimates at face value, the effect on number of exams (0.011) divided by the effect on courses (0.032) imply that fewer than 40 percent of marginal courses convert to exams.[9]

5.3 Heterogeneity in the Effect of AP Course Availability on AP Course- and Exam-Taking

Given documented inequities in the availability of AP by race and income (Rodriguez and McGuire, 2019; Solorzano and Ornelas, 2002) as well as tracking systems that segregate students within schools (Lewis and Diamond, 2015), it is crucial to understand which types of students take advantage of expanded AP course offerings. As I show below, in Michigan there are large gaps in AP participation by income, race, and academic preparation. For example, low-income students are half as likely to take any AP courses compared to their lower-income peers, and the typical low-income student has an AP courseload a third the size of their higher-income peer (see the group means in Table 3). The sizes of the gaps between URM and white and Asian students are very similar to the gaps by income (see Table 4). In this section, I investigate whether a school offering more AP courses widens or shrinks gaps in participation.

Tables 3, 4, and 5 show effects on course- and exam-taking estimated by family income, race, and prior academic achievement. The estimates in Table 3 suggest that for both low- and higher-income students, an additional course offering increases the probability of taking any AP courses by around one percentage point. However, for low-income students (those eligible for subsidized school meals), there is no detectable effect on the number of courses taken, and no effect on exam-taking. In contrast, higher-income students increase their average number of AP courses significantly (0.038

[9]Recall that the measures of AP courses and exams come from different data sources (high school transcripts for courses and College Board exam data for exams; see the Data Appendix for more detail). Courses are likely measured with more error than exams. This "conversion rate" is intended as a rough back-of-the-envelope calculation.

courses), as well as the extensive and intensive margin of exam taking (0.5 percentage point increase in any AP exam, and 0.018 increase in number of exams). Together, these results imply that most of the overall increases in Table 2 are due to higher-income students moving on the intensive margin of course-taking. Low-income students have much lower rates of AP participation (reflected in the lower group means in Table 3), so these results imply a widening of the income-based gap in the number of AP courses and exams.

The patterns by race in Table 4 are similar to the patterns by income. While both URM and non-URM students increase their probability of taking any AP courses by around one percentage point when an additional one becomes available, only white and Asian students significantly increase their average number of AP courses (by 0.036) and probability of taking an AP exam (by 0.4 percentage points). Since white and Asian students take more AP courses and exams, these results again imply a widening gap in AP participation.

Finally, Table 5 indicates that higher-achieving students are more likely to take advantage of additional AP courses. I show this with two alternative specifications. First, I estimate an interaction term between AP course availability and a student's middle school math test score (Panel A). For all four outcomes, the interaction is positive and significant, suggesting that more academically prepared students increase their course- and exam-taking more than their less prepared peers when additional AP courses are offered. Second, I split the sample into the bottom 75 versus top 25 percent of prior achievement (Panel B). (These percentiles are based on the analysis sample, not the original sample of middle school test takers.) Regardless of achievement, students increase the extensive margin of AP course taking by approximately one percentage point. However, effects on the other outcomes diverge by prior achievement. While the bottom three-quarters of students do increase the number of AP courses they take by 0.023, the highest performing quarter of students increase the number of courses by more than three times as much, 0.074. The effect on the probability of taking any AP exam is also higher for higher achieving students (0.8 vs. 0.3 percentage points), as is

the effect on the number of AP exams (0.048 for the top 25 percent and an insignificant 0.002 for the bottom 75 percent). The conversion rate from courses to exams is also much higher for this group: 0.048/0.074 = 65 percent.

The above results show that students—especially those from more advantaged groups—increase both their likelihood of any AP and the number that they take when more become available. Since the more advantaged, higher-achieving students have higher rates of AP participation to begin with, expanding AP offerings may primarily add one more AP to the transcripts of students already taking multiple, which may have a minimal marginal return. To investigate this further, I estimate a version of Equation 1 where, rather than looking at the number of AP courses students take, the left-hand side variables are indicators for exhaustive and mutually exclusive bins of AP courses taken: 0, 1-2, 3-4, and 5 or more. Appendix Table A1 reports the results, for all students and disaggregated by prior achievement (bottom 75 versus top 25 percent of middle school test scores). Panel A shows that overall, students are less likely to take no APs (this is the same as the positive "any AP" results above), and more likely to be in all of the positive categories, suggesting students are increasing across the distribution of courses taken. However, the results by prior achievement in Panel B shows that while lower-achieving students become more likely to take 1-2 or 3-4 AP courses (by 0.9 and 0.3 percentage points, respectively), for higher-achieving students only the increase in the top bin of 5 or more APs is significant (1 percentage point). The null effects on 1-2 and 3-4 courses for high achievers could mean some students shift into while others shift out of those bins, for no net change. On net, this implies that additional AP availability causes higher achieving students to add APs to an already high AP courseload. A correlational study by Beard et al. (2019) found a pattern consistent with diminishing marginal returns to AP, with no additional association between number of exams and BA attainment beyond 4-6 exams. If this is true in my sample, the results in Appendix Table A1 might lead us to expect an equalizing effect on later outcomes; I investigate this in the next section.

In a complementary analysis, I investigate the extent to which additional AP

availability induces students already taking AP to shift *between* AP courses rather than take additional courses. If this is happening, then the above results are underestimating how much students react to newly available courses. I identify AP courses that are marginal or newly available to a given cohort of students within a high school (that is, offered to them but not the cohort prior) as opposed to inframarginal (also available to the prior cohort). I then regress the number of both marginal and inframarginal AP courses a student takes on the count of newly available AP courses. In this exercise, the treatment is newly available AP courses; the outcomes are the number of new and old AP courses a student takes. The results, in Appendix Table A2, find a very small negative and statistically insignificant decrease (-0.008 courses) in the number of inframarginal AP courses a student takes. This suggests that new AP courses do not simply lead students to shift which AP courses they take; rather, they strictly increase their AP course load.

Together, these results suggest that additional AP course availability does induce a small proportion (about one percentage point) of students of all backgrounds to cross the extensive margin of AP participation. However, the students who were already taking the most APs—higher-income, white and Asian, and higher-achieving students—increase their total number of AP courses and exams more, thus widening gaps.

5.4 Effect of AP Course Availability on College Enrollment and Graduation

How do the changes to AP course-taking affect students' longer-term educational attainment? To measure the effect of AP course availability on longer-term college outcomes, I estimate Equation 3. The estimates appear in Table 6. On average, there is no effect of an additional AP course offering on any of the outcomes; all of the treatment coefficients are close to zero, none are significant, and they are estimated precisely. For example, the effect on enrolling in any college is 0.2 percentage points,

with a standard error of 0.2 percentage points. The effects on four-year and six-year BA attainment are both a statistically insignificant 0.1 percentage points. For all outcomes, I can rule out (with 95 percent confidence) effects greater in magnitude than a single percentage point.[10]

There is reason to believe that the effects of AP vary by student type. As I showed above, certain types of students are more likely to take AP in the first place. Even conditional on participation, more academically prepared students might be more likely to reap the benefits of a college-level curriculum. Less prepared students might have more to gain from more rigorous courses; on the other hand, they could fall further behind their peers if they're pushed into courses beyond their preparation level, or might be harmed by the diversion of resources towards AP students and teachers. The structural inequities discussed above may prevent low-income and underrepresented minority students from accessing advanced classes, as well as contribute to their lower levels of academic preparation. To test this, I estimate effects of AP course availability on college outcomes, this time estimating effects by family income, student race, and academic performance in middle school.

Table 7 displays the effect of AP availability by family income, which I proxy by eligibility for subsidized school meals. The group means (in square brackets for each group) indicate that lower income students have lower rates of all college outcomes. Compared to non-low-income students, they are much less likely to attend college at all (gap of 19 percentage points) or a four-year college in particular (gap of 21 points). Low-income students are slightly more likely (by 2 percentage points) to attend a two-year institution. They are also half as likely to attend a selective college (23 vs. 45 percent) and a third as likely to earn a BA in six years (13 vs. 38 percent).

There is no evidence that additional AP course offering improve college

[10]In an attempt to limit the number of outcomes, I collapsed institutions considered competitive, very competitive, highly competitive, and most competitive into the category of "competitive+." In Appendix Table A3, I estimate effects on each of the six Barron's categories (which include the four just listed, as well as non-competitive and less competitive.) All point estimates are small, between -0.1 and 0.2 percentage points. The effect on competitive enrollment, 0.2 percentage points, is significant at the 10 percent level, as is the effect on very competitive enrollment, -0.2 percentage points.

enrollment or graduation for low- or higher-income students. All of the effects are close to zero, precisely estimated, and statistically insignificant. Even if we took the point estimates at face value, they would translate into not even one additional low- or higher-income student per school enrolling in college. (The average cohort has 61 low-income students and 192 non-low-income students in its senior class.) Examining heterogeneity by race (Table 8) suggests a similar story. All estimated effects are small (less than half of a percentage point) and statistically insignificant.

I also examine heterogeneity by prior academic achievement, which I measure using standardized scores on the state middle school math test. Table 9 summarizes the effect of AP course availability on college outcomes by prior test scores, where I have again split the sample into the bottom 75 and top 25 percent of test scores. Here, there is some evidence of positive effects for the most academically prepared students. While all of the effects on the bottom 75 percent of test takers are null, with an additional available AP course the highest achieving students increase their probability of enrolling in a four-year college by 0.5 percentage points and the probability of enrolling in a competitive or higher college by the same magnitude. They also increase their chances of earning a BA in four years by 0.7 percentage points. The effect on six-year graduation is a statistically insignificant 0.4 percentage points, implying that more AP courses allowed some high-achieving students to decrease their time to degree if not change their ultimate educational attainment.

The above analyses imply that expanding AP course availability has little discernible effect on student outcomes for most students. The exception is a small but significant effect on enrollment and graduation outcomes for students who enter high school with the strongest academic preparation; though there may be small positive effects for these students, it would come at the expense of widening existing achievement gaps.

5.5 Two-Stage Least Squares Analysis: Effect of AP Course-Taking on College Enrollment and Graduation

In section 5.4, I found that when schools offer more AP courses, the postsecondary outcomes (enrollment and graduation) of only the highest-achieving students improve. These are also the students who increased their course-taking the most. In this section, I use an instrumental variables (IV) or two-stage least squares (2SLS) approach to estimate the effect of an additional AP course for the high-achieving students induced to increase their AP courseload when it becomes available at their school. I also explore different ways to define "high-achieving" with alternative cuts of the test score distribution; doing so provides further evidence on which students take advantage of AP and which ones benefit the most from doing so.

Interpreting 2SLS estimates causally requires the standard assumptions. The exclusion restriction requires that the presence of AP courses at a school affects students only so far as it encourages them to take more AP courses and exams. If changes to AP courses are not due to exogenous factors such as teacher retirements and are instead due to underlying changes to students and families in a school, this would be violated. Spillovers within a school that affect students not taking AP, such as changes to college-going culture or diversion of resources, would also violate the exclusion restriction. Interpreting the parameter as a local average treatment effect (LATE) on students induced to take an additional AP course further requires that there are no defiers: students who take *fewer* AP courses when an additional one is offered. Violations of these assumptions are theoretically possible but untestable. Thus, I consider the results in this section to be suggestive rather than definitive.

Table 10 shows the results of the 2SLS analysis. Each column includes estimates for a different sample: the entire sample, then different top X percents of the sample by test score, where $X = 50$, 25, 10, and 5. Panel A reveals how the first stage, i.e., take-up of expanded AP availability, varies by prior achievement. The more selective the sample (e.g., looking at the top quarter of students compared to the top half), the

stronger the change to AP course-taking. As we saw in Table 2, an additional AP course available within a school leads the typical student to increase their AP courseload by 0.032 courses. An above-average (top 50 percent) student increases by 0.048 courses; a student in the top quarter, by 0.74 courses; a student in the top 10 percent, by 0.117 courses; and a student in the top five percent by a similar 0.108 courses.

IV analysis also requires that the instrument—in this case, AP availability—have sufficiently strong correlation with the treatment (in this case, AP course-taking). For a model with one endogenous regressor and one instrument, the critical value for a weak instrument test with a 5 percent significance level and a test of 10 percent maximal size is 16.38; for a 15 percent maximal size, the critical value is 8.96 (Stock and Yogo, 2005).[11]. The older rule of thumb proposed by Staiger and Stock (1997) is an F-statistic of at least ten. Thus, depending on the tolerable level of false rejection, the first stage is sufficiently strong for the overall sample, the top 25 percent, and top 10 percent, which have F-statistics above ten.

The reduced form and LATE effects in Panels B and C of Table 10 show a different pattern by achievement than the first stage. The reduced form effects—i.e., the effect of additional available courses on college outcomes—are largest and only statistically significant for students in the top 25 and 10 percent of test scores. (Note that the reduced form effects on all students and the top 25 percent are identical to those reported in Tables 6 and 9.) The top 25 percent of students increase their four-year college enrollment by 0.5 percentage points, competitive enrollment by 0.5 percentage points, and four-year BA attainment by 0.7 percentage points for each additional available course. For the top ten percent, they increase their six-year BA attainment by 0.6 percentage points for each additional available course. (The reduced form effects for the top five percent sample are similar to or larger than those for the top ten percent, but the smaller sample means none are statistically significant.)

[11] As summarized by Baum et al. (2007), the maximal size refers to the false rejection rate of a hypothesis test that a researcher is willing to tolerate: "Under weak identification, the Wald test rejects too often. The test statistic is based on the rejection rate r (10%, 20%, etc.) that the researcher is willing to tolerate if the true rejection rate should be the standard 5%. Weak instruments are defined as instruments that will lead to a rejection rate of r when the true rejection rate is 5%."

Correspondingly, the estimated LATEs—i.e., the effect of *taking* an additional available course—are significant only for these groups, as well. For a student in the top quarter of the test score distribution who was induced to take an additional AP course, doing so increases their probability of enrolling in a four year college by 6.9 percentage points, and in enrolling in a competitive or higher institution by a similar magnitude (6.4). The effect on earning a BA in four years is 10 percentage points. For a student in the top ten percent, taking an additional AP increases their chances of four-year BA receipt by 6.2 percentage points and their chances of six-year BA receipt by 5.6 percentage points. Again, the effects for the top five percent are similar but less precise.

These results suggest that not only do the highest-achieving (top quarter) of students take more APs when they become available, but they are also more likely to benefit when they do. Although I don't find any effects on the extensive margin of college enrollment, additional AP courses seem to shift high-acheiving students into higher quality colleges, speed up time to degree, and possibly increase ultimate (six-year) BA receipt. However, given the weaker first stage effects for the full and top 50 percent samples, I cannot say for certain whether lower-achieving students would benefit if they could be induced into taking more AP courses.

5.6 Additional Heterogeneity Analyses

In this section, I explore two different dimensions of AP course offerings. The first is school-level heterogeneity in the initial strength of the AP program. It is not clear ex-ante whether schools with an initially weaker or more robust AP program would experience larger changes from further expansion. If there are diminishing returns to AP, the former set of schools may benefit more; on the other hand, the latter set of schools might have infrastructure and experience that make additional APs more successful. To test this, I characterize schools by whether they offered fewer than five versus five or more AP courses in the first year of the panel. I then estimate Equations 1 and 3 separately for students in the two groups of schools. Appendix

Table A4 shows the effects on course- and exam-taking, and Appendix Table A5 shows the effects on college outcomes. Appendix Table A4 reveals a similar pattern as the student-level heterogeneity in Section 5.3. Students in both types of schools cross the extensive margin of AP course-taking when the number of available courses increases. However, in the schools with initially robust AP programs and higher AP participation, the number of AP courses students take increase more, thus widening participation gaps. The effects on college outcomes by initial AP availability in Appendix Table A5 are generally null for both groups. The exception is a positive 1.2 percentage point increase in any college enrollment for students in schools with a low initial number of APs. It appears that additional AP course offerings may make more of a difference in preparing students for college (academically or mentally) in schools that historically offer fewer APs and send fewer students to college.

In all of the above analysis, I have grouped all types of AP courses together. The AP curriculum spans over 30 subjects, ranging from studio art to languages to computer science. It is possible that different subjects affect students' outcomes differently. This could be because performance in different subjects provide different signals to students and colleges about a student's college readiness, or because different subjects are more likely to earn college credit. To test this, I disaggregate the AP course offering variable (number of AP courses available in a student's junior and senior year) into STEM courses (which include all math, science, and computer science subjects) and non-STEM. I then estimate a version of Equation 3 with two treatment variables:

$$\begin{aligned} \mathrm{Y}_{ijt} = \beta_0 &+ \beta_1(\#\text{ AP STEM courses available})_{jt,t-1} \\ &+ \beta_2(\#\text{ AP non-STEM courses available})_{jt,t-1} + \delta_j + \lambda_t + \tau_j t + \varepsilon_{jt} \end{aligned} \tag{4}$$

The results appear in Appendix Table A6. The effects of both STEM and non-STEM AP offerings are generally small and statistically insignificant, and similar to each other. Out of 12 hypothesis tests (two subject groups times six outcomes), I find one effect that is significant at the 10 percent level: a 0.2 percentage point increase in four-year BA attainment for an additional non-STEM AP.

I further disaggregate courses into the six groupings used by the College Board: English, science, math and computer science, history and social sciences, languages, and arts. For this, I estimate a version of Equation 4 with six AP availability variables, one for each subject group (number of AP art courses available, number of AP English, number of AP languages, etc.). The results are in Appendix Table A7. In general, none of the subject-specific effects on college outcomes are statistically significant; the exception is a 0.8 percentage point effect of language APs on four-year college enrollment and a 0.6 percentage point effect of art APs on four-year graduation. Both are significant only at the $\alpha = 0.10$ level. Given the number of tests (six outcomes times six subjects = 36) in Appendix Table A7, I do not put much weight on these differences.

6 Threats to Identification and Robustness Checks

Because I am not able to randomly assign schools to offer AP courses, I have to worry about whether my results are picking up a true causal effect or are driven by some spurious correlation. There are several main threats to identification. Perhaps both AP participation and gaps in college enrollment are growing over time, but the former is not causing the latter. My empirical strategy addresses this in several ways: first, I include year fixed effects to allow for a time trend in college outcomes, and capture deviations from trends: in years when a school has a larger change in AP offerings, do student outcomes experience a correspondingly large change? Second, as I show in Appendix Figure A4, while there is an upward trend in number of AP courses at most schools, it is by no means strictly monotonic, meaning I am identifying off of changes in AP offerings in both directions. A related issue of confounding endogeneity is that it is possible that longer-term, systematic changes to the student population and the demand for AP courses are occurring, and that these are correlated with student

outcomes. This would be the case if, for example, schools offer more AP courses in order to attract higher-achieving students. I test for this type of endogeneity in two ways.

First, I re-estimate all effects on course- and exam-taking and college outcomes with additional controls for student- and school-level characteristics. Student characteristics include sex, race (indicators for white, Asian, Black, Hispanic, and Native), free or reduced-price lunch eligibility in 12th grade, and standardized score on the middle school math test. I also add time-varying school characteristics: average middle school math test score, school size, student-to-teacher ratio, per-student spending, and local unemployment; these are measured in the student's sophomore year so that they are unaffected by the treatment. The sample means of all additional control variables are reported in Table 1. Versions of Tables 2 through 9 estimated with additional student- and school-level controls are included as Appendix Tables A8 through A15. The results are nearly identical. Of course, time-varying unobservable factors could still be driving the relationship between AP availability and student outcomes, and the results might change if I were able to control for all relevant factors not picked up by school fixed effects. Nevertheless, it is reassuring that the results are insensitive to a rich set of student and school controls. Furthermore, most of the effects on college outcomes that I estimate are null, while most plausible stories about selection (such as a new school principal who changes parent and student attitudes about college) would imply an upward bias.

As a further check, I estimate effects on course- and exam-taking by income and race using a single regression where I interact course availability with an indicator for either low-income or URM status, and include all of the student- and school-level controls. This specification, shown in Appendix Tables A16 and A17, leads to the same conclusion: higher-income and white and Asian students increase their AP participation more when new courses become available, even accounting for academic preparation. This result differs from Conger et al. (2009), who find that gaps in advanced course-taking reverse in sign after conditioning on eighth grade test scores.

I further test for the sensitivity of results to alternate specifications, by including or excluding various combinations of student controls, school controls, and school-specific time trends. Appendix Table A18 shows estimates of overall effects on college outcomes using alternative specifications; Appendix Table A19 does so only on the highest-achieving 25 percent of the sample, since this is the subgroup with the strongest results. Appendix Table A18 shows that the overall effects on college outcomes (competitive enrollment and four- and six-year BA attainment) are similar for any combination of controls, i.e., small in magnitude and statistically insignificant. However, specifications with no school-specific time trends and no other controls result in positive, significant effects on competitive enrollment (0.4 percentage points) and four-year degree receipt (0.2 percentage points). The fact that these effects disappear with any additional controls suggests, first, that there may be some bias not captured by school fixed effects alone, which school-specific time trends and/or additional controls account for; and second, that controlling for school-specific time trends is sufficient, since additional controls don't further change the estimates. Appendix A19 repeats this robustness check, limiting to the highest-achieving 25 percent of students. The positive, significant effect on competitive college enrollment for this group holds up under almost all sets of controls and school-specific time trends (or lack thereof). While the effect is not statistically significant with the full set of controls and school-specific time trends, (specification (4)), the point estimate is nearly identical to the other specifications. The positive effect on four-year BA receipt for this high-achieving group is significant only when school-specific linear time trends are included (with and without other controls). While my preferred specification is Equation 3, the sensitivity of these results to controls warrants some caution.

As another robustness check, I directly test for positive selection of students into schools with more AP courses by estimating a version of Equation 3 where the left-hand-side variable is the average middle school test score of the senior class:

$$(\text{Average middle school test score})_{jt} = \alpha + \sum_{k=-2}^{2} \beta_k AP_{j,t+k} + \delta_j + \lambda_t + \tau_j t + \varepsilon_{jt} \quad (5)$$

Note this is done at the school-year level. Positive β_k's, particularly for $k \leq 0$, would suggest that a stronger AP curriculum attracts higher-achieving students, and would cause me to worry that my findings are driven by students with better outcomes coming into schools with more AP rather than more AP causing improved outcomes. Figure 1 graphically depicts the estimated β_k coefficients. There is no evidence that higher-achieving students are positively selecting into schools with more AP courses.

6.1 Corrections for Two-Way Fixed Effects Estimates

Several recent papers have highlighted potential issues with linear regressions that estimate policy treatment effects using time and group fixed effects (two-way fixed effects, or TWFE), such as Equation 3 above (see de Chaisemartin and D'Haultfoeuille (forthcoming) and Roth et al. (2022) for reviews). TWFE approaches may, unless researchers are willing to make implausibly strong assumptions, produce estimates that are misleading or hard to interpret. The key problem in extending the canonical two-period difference-in-difference design with a binary treatment to an equation more like Equation 3 comes from what both sets of authors refer to as "forbidden comparisons." A treatment parameter from a TWFE model is a weighted average of all possible comparisons of groups experiencing different changes to the treatment, including comparing groups whose treatment (e.g., number of AP courses available) change more relative to those who change less. If the lower-treated group has a larger per-unit treatment effect, such comparisons can result in a negative effect, even if the effect of the treatment is positive for both groups.

de Chaisemartin and d'Haultfoeuille (2020) propose an alternative estimator, which they call DID_M, which eliminates "forbidden comparisons" and averages, across groups and time, all comparisons of groups whose treatment changes to groups whose treatment doesn't change. More specifically, DID_M is the "weighted average of DID terms comparing the evolution of the outcome in groups whose treatment went from d to d' between $t-1$ and t and in groups with a treatment of d at both dates, across all possible values of d, d', and t" (de Chaisemartin and d'Haultfoeuille, 2020, p. 2981).

For example,"switcher" schools that went from offering 5 to 6 AP courses from 2007 to 2008 would be compared to schools that offered 5 APs in both years ("stayers"). In this approach, switchers (i.e., schools going from d to d' AP offerings between a given $t-1$ and t) without a corresponding stayer (a school with d APs in both $t-1$ and t) are not used in estimation (and vice versa). Fewer comparisons means that DID_M estimates tend to be less precise than TWFE ones.

I re-estimate the effects in Tables 2 through 5 (effects of course availability on course- and exam-taking) and Tables 6 through 9 (effects of course availability on college outcomes) using the DID_M approach, implemented with the did_multiplegt Stata command (de Chaisemartin et al., 2019). The results of this alternative approach are included as Appendix Tables A20 through A23 (effects on course-taking) and Appendix Tables A24 through A27 (effects on college outcomes). Because they leverage fewer comparisons, the DID_M estimates are substantially noisier than the TWFE estimates. However, the magnitudes lead to similar conclusions.

Although all of the first stage results using the approach of de Chaisemartin and d'Haultfoeuille (2020) (Appendix Tables A20 through A23) are noisier than the TWFE estimates, the magnitudes are similar and again suggest that higher income, non-underrepresented minority, and higher-achieving students are more likely to take advantage of newly offered AP courses. The strongest and only statistically significant DID_M estimate is the effect on the top 25 percent by middle school test score (in Appendix Table A23), who increase their number of AP courses by 0.077 when an additional one becomes available. This is similar to the TWFE estimate of 0.074 reported in Table 5.

The estimates of DID_M for college outcome effects are consistent with the TWFE estimates, but ultimately too imprecise to provide additional evidence that additional AP courses improve outcomes overall or for specific subgroups. Like the majority of the TWFE estimates, none of the DID_M effects in Appendix Tables A24 through A27 are statistically significant. The positive effects found with TWFE estimates for the highest achieving students—increases to four-year and competitive

college enrollment and on-time BA receipt—are the same sign but no longer significant using DID_M. The TWFE estimates on four-year enrollment, competitive enrollment, and four-year BA receipt were 0.5, 0.5, and 0.7 percentage points, respectively (Table 9); the DID_M estimates are 0.9, 1.1, and 0.3 percentage points (Appendix Table A27). However, the confidence intervals around the DID_M estimates all contain the equivalent TWFE estimates, so I cannot reject that they are the same.

7 Conclusion

Using administrative data from the state of Michigan and exploiting within-school, across-time variation in AP course offerings, I have shown that introducing more AP courses fails to close gaps in access and outcomes. When schools increase the number of AP courses available, a small proportion (one percent) of students of all backgrounds cross the extensive margin of AP participation. However, the more advantaged students—higher income, higher achieving, and non-URM—increase their already higher average AP courseload by more than their disadvantaged peers. This finding is consistent with work by historians, sociologists, and education researchers arguing that the AP program, like many other examples of educational resources, benefits already privileged students and systematically excludes the already marginalized, thus perpetuating inequities (Rodriguez and McGuire, 2019; Lewis and Diamond, 2015; Schneider, 2009; Solorzano and Ornelas, 2002). These studies, as well as the current analysis, suggest that without a concerted effort to ensure equal access for all students, expanding AP offerings will most likely only worsen educational inequality.

Even if students were granted truly equal access to AP courses, it is not obvious that college outcome gaps would close. I find very limited evidence that access to additional advanced courses improves college enrollment, college quality, or postsecondary attainment. Although my primary results suggest that the most academically prepared students may benefit from AP in terms of quality of initial

college enrollment and on-time BA receipt, this finding doesn't hold under all alternative estimation approaches. Even if there is a benefit for high-achieving students, it would only serve to widen existing gaps.

Despite a push by some policymakers to use AP courses as a tool for combating inequality and improving college readiness, the current study complements recent research (Conger et al., 2023) showing that expanding AP access is unlikely to do so, at least not without additional incentives or supports. In both my setting—Michigan schools making year-to-year adjustments in AP offerings—and that of Conger et al. (2023)—a national set of schools that had never offered AP science adding it to the curriculum—the program largely failed to improve the outcomes its proponents espouse.

The causal evidence on the AP program is not universally negative. Jackson (2010, 2014) found positive achievement and college completion effects of paying students to pass AP exams; Smith et al. (2017) found that passing an AP exam improved on-time college graduation. However, the positive effects in these cases are tied to students taking and passing exams, not simply enrolling in AP courses. This is consistent with the positive effects on four-year graduation that I find for the highest-achieving students only, who are also much more likely to take AP exams. (Smith et al. (2017) also find no heterogeneity in graduation effects by income or race, which is consistent with my own results.) In settings where a school or student on the margin of offering or taking AP is relatively disadvantaged, most students are unlikely to benefit without an additional push to take and succeed on the exams.

The policy implications from the current as well as previous work are similar: putting financial and legal resources towards expanding AP access is, by itself, unlikely to achieve the goal of closing gaps in educational outcomes. If educators and policymakers strive to address educational inequality, additional resources focused on AP exams are likely necessary, and may be best targeted more explicitly at disadvantaged students. In the longer term, policies to address earlier differences in academic achievement may also allow more students to benefit from AP curricula.

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Table 1: Sample Descriptive Statistics

	Analysis Sample			Michigan	
	Mean	Std dev	N non-missing	Mean	N non-missing
A. Student level characteristics					
Female	0.51	0.50	173,077	0.50	973,383
White	0.75	0.44	173,151	0.76	973,910
Black	0.17	0.38	173,151	0.17	973,910
Asian	0.04	0.20	173,151	0.02	973,910
Hispanic	0.03	0.18	173,151	0.04	973,910
Native	0.01	0.09	173,151	0.01	973,910
Eligible for free or reduced-price lunch	0.24	0.43	173,151	0.29	971,772
Middle school math test score (std.)	0.27	1.01	154,549	0.10	841,906
AP courses available junior & senior year	9.79	4.57	173,151	-	-
AP courses taken junior & senior year	0.79	1.38	173,151	-	-
AP tests taken	0.74	1.59	135,272	-	-
B. School-cohort level characteristics					
Average middle school math test score	0.08	0.43	687	-0.18	6,144
School enrollment	1377	500	689	685	5,780
Town or rural location	0.23	0.42	689	0.48	5,798
Pupil-to-teacher ratio	21.41	10.97	686	21.58	5,566
Per pupil instructional spending	6360	1783	686	6433	5,357
Local unemployment rate	8.87	4.61	689	9.50	5,798
AP courses available year t and $t-1$	8.56	4.64	689	-	-

Notes: In Panel A, the unit of observation is a single student. In Panel B, the unit of observation is a school-by-cohort. "Native" includes American Indian, Alaska Native, Native Hawaiian, and other Pacific Islander students. Middle school math test score is measured as a standardized scale score, standardized on the full population of test takers within year, grade, and subject. I use eighth grade test score if available and seventh grade score if not. School-year characteristics are all measured in year $t-2$, except for AP course availability. AP course availability is measured as the number of unique AP subjects offered over two years; if a subject is offered both years, it is counted once. The full population of Michigan seniors is based on administrative enrollment data. The full population of public Michigan high schools is based on the Common Core of Data.

Table 2: Effect of AP Course Availability on AP Course- and Exam-Taking

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
# of AP courses available at school in junior and senior year	0.011*** (0.003)	0.032*** (0.009)	0.004** (0.002)	0.011 (0.008)
Mean of outcome variable	[0.351]	[0.786]	[0.274]	[0.736]
Kleibergen-Paap Wald F statistic	15.48	11.65	3.99	2.18
Observations	173,151	173,151	135,272	135,272
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimate of α_1 in Equation 1, which regresses student-level course- and exam-taking on AP course availability. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses.

Table 3: Effect of AP Course Availability on AP Course- and Exam-Taking, by Family Income

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Low-income students	0.009**	0.010	0.000	-0.008
	(0.004)	(0.008)	(0.003)	(0.007)
Group mean	[0.196]	[0.364]	[0.139]	[0.297]
Observations	41,974	41,974	35,378	35,378
Non-low-income students	0.011***	0.038***	0.005**	0.018**
	(0.003)	(0.011)	(0.002)	(0.009)
Group mean	[0.401]	[0.921]	[0.322]	[0.892]
Observations	131,177	131,177	99,894	99,894
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Effects by income are estimated with separate estimations of Equation 1 by FRPL status. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. Group-level means of the course- and exam-taking variables are in brackets.

Table 4: Effect of AP Course Availability on AP Course- and Exam-Taking, by Race and Ethnicity

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Black, Hispanic, & Native students	0.012**	0.012	0.002	0.003
	(0.005)	(0.011)	(0.003)	(0.008)
Group mean	[0.202]	[0.362]	[0.125]	[0.248]
Observations	37,018	37,018	29,041	29,041
White & Asian students	0.010***	0.036***	0.004**	0.014
	(0.003)	(0.011)	(0.002)	(0.009)
Group mean	[0.392]	[0.901]	[0.315]	[0.870]
Observations	136,133	136,133	106,231	106,231
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $*p < 0.1$, $**p < 0.05$, $***p < 0.01$. Effects by race are estimated with separate estimations of Equation 1 by underrepresented minority status. Underrepresented minority includes students who identify as Black, Hispanic, American Indian, Native Hawaiian, or Pacific Islander. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. Group-level means of the course- and exam-taking variables are in brackets.

Table 5: Effect of AP Course Availability on AP Course- and Exam-Taking, by Prior Achievement

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
A. Linear Test Score Interaction				
# AP courses available at school	0.010***	0.023**	0.002	-0.006
in junior & senior year	(0.003)	(0.011)	(0.002)	(0.009)
Middle school math test score	0.166***	0.222***	0.124***	0.051
	(0.017)	(0.055)	(0.016)	(0.069)
# of AP courses available * math score	0.005***	0.046***	0.008***	0.070***
	(0.001)	(0.005)	(0.001)	(0.007)
Observations	154,549	154,549	123,003	123,003
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012
B. Top 25 vs. Bottom 75 Percent of Test Scores				
Effect of # available AP courses for:				
Bottom 75% of test score distribution	0.012***	0.023**	0.003*	0.002
	(0.003)	(0.009)	(0.002)	(0.005)
Group mean	[0.250]	[0.442]	[0.170]	[0.330]
Observations	116,319	116,319	92,564	92,564
Top 25%	0.012***	0.074***	0.008*	0.048*
	(0.004)	(0.022)	(0.005)	(0.026)
Group mean	[0.706]	[1.941]	[0.625]	[2.062]
Observations	38,230	38,230	30,439	30,439
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Middle school math test score is measured as a standardized scale score, standardized on the full population of test takers within year, grade, and subject. I use eighth grade test score if available and seventh grade score if not. Students missing a test score are not included in this analysis. In Panel A, effects by academic preparation are estimated using a single equation (Equation 2), where course availability is interacted with the continuous measure of test score. In Panel B, effects by academic preparation are estimated with separate estimations of Equation 1 by test score group. All regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. Group-level means of the course- and exam-taking variables are in brackets.

Table 6: Effect of AP Course Availability on College Outcomes

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
# AP courses available junior and senior year	0.002 (0.002)	-0.001 (0.002)	0.002 (0.002)	0.002 (0.002)	0.001 (0.001)	0.001 (0.002)
Mean of outcome variable	[0.700]	[0.288]	[0.430]	[0.394]	[0.158]	[0.320]
Observations	173,151					
Cohorts	2005-2012					

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of β_1 from Equation 3, which regresses student-level college outcomes on AP course availability. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. All college outcomes are unconditional on initial enrollment.

Table 7: Effect of AP Course Availability on College Outcomes, by Family Income

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Low-income students	0.005	0.002	0.002	0.002	0.000	-0.000
	(0.004)	(0.003)	(0.003)	(0.003)	(0.001)	(0.002)
	[0.558]	[0.300]	[0.271]	[0.229]	[0.045]	[0.132]
Observations			41,974			
Non-low-income students	0.000	-0.002	0.001	0.001	0.001	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
	[0.745]	[0.284]	[0.480]	[0.446]	[0.194]	[0.380]
Observations			131,177			

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Effects by income are estimated with separate estimations of Equation 3 by FRPL status. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. Group-level means of the outcome variables are in brackets. All college outcomes are unconditional on initial enrollment.

Table 8: Effect of AP Course Availability on College Outcomes, by Race and Ethnicity

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Black, Hispanic,	0.006	0.003	0.004	0.005	0.002	0.004
& Native students	(0.004)	(0.003)	(0.004)	(0.004)	(0.002)	(0.003)
	[0.589]	[0.274]	[0.330]	[0.284]	[0.054]	[0.147]
Observations			37,018			
White & Asian students	0.000	-0.002	0.001	0.001	0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
	[0.730]	[0.292]	[0.457]	[0.423]	[0.186]	[0.367]
Observations			136,133			

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Effects by race are estimated with separate estimations of Equation 3 by underrepresented minority status. Underrepresented minority includes students who identify as Black, Hispanic, American Indian, Native Hawaiian, or Pacific Islander. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. Group-level means of the outcome variables are in brackets. All college outcomes are unconditional on initial enrollment.

Table 9: Effect of AP Course Availability on College Outcomes, by Prior Achievement

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Bottom 75% of test	0.002	-0.001	0.002	0.002	-0.001	-0.000
score distribution	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
	[0.678]	[0.339]	[0.358]	[0.318]	[0.096]	[0.245]
Observations			116,319			
Top 25%	0.003	-0.002	0.005**	0.005*	0.007***	0.004
	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
	[0.857]	[0.159]	[0.717]	[0.686]	[0.367]	[0.601]
Observations			38,230			

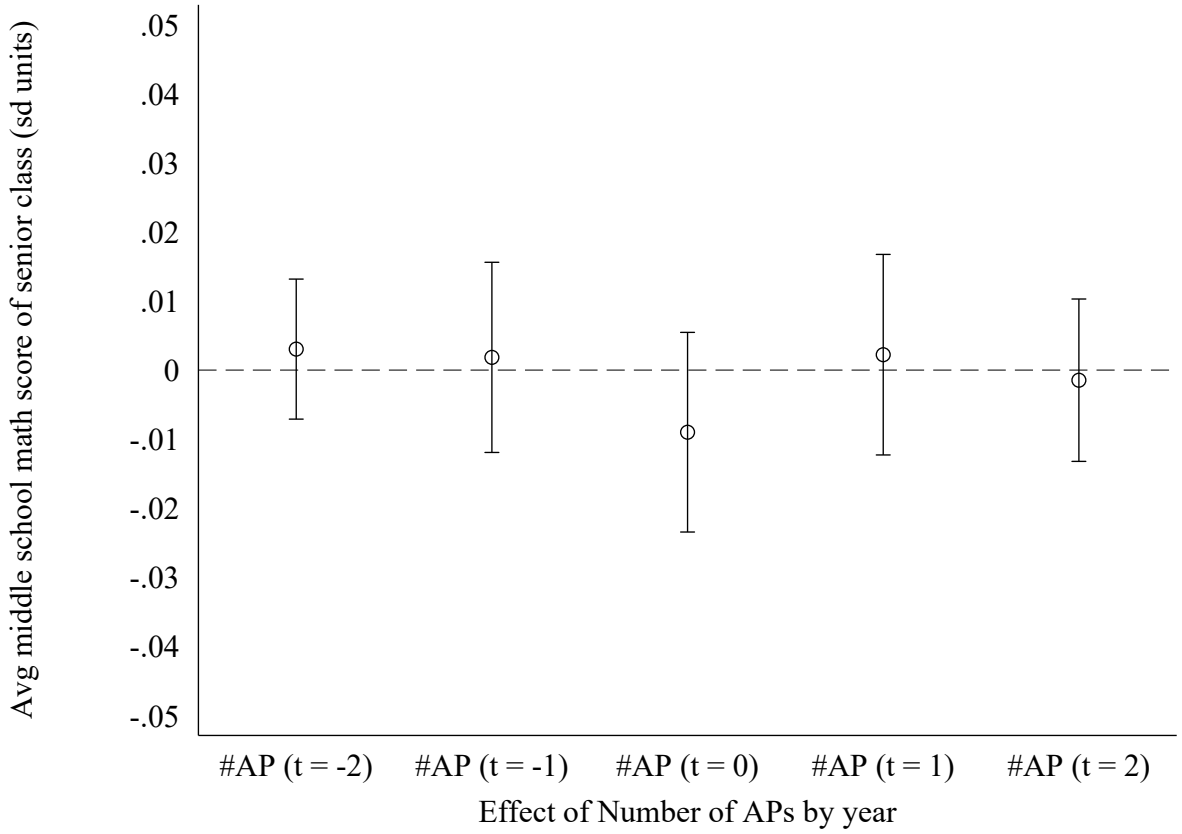
Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Middle school math test score is measured as a standardized scale score, standardized on the full population of test takers within year, grade, and subject. I use eighth grade test score if available and seventh grade score if not. Students missing a test score are not included in this analysis. Effects by academic preparation are estimated with separate estimations of Equation 3 by test score group. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. Group-level means of the outcome variables are in brackets. All college outcomes are unconditional on initial enrollment.

Table 10: First Stage, Reduced Form, and 2SLS Effects of AP Course Availability on Student Outcomes, by Alternative Cuts of Prior Achievement

		Part of middle school test score distribution			
	All	Top 50%	Top 25%	Top 10%	Top 5%
A. First Stage: Effect of # AP courses available on					
# AP courses taken	0.032***	0.048***	0.074***	0.117***	0.108**
	(0.009)	(0.017)	(0.022)	(0.032)	(0.046)
Kleibergen-Paap Wald F statistic	11.65	7.89	11.41	13.14	5.53
B. Reduced Form: Effect of # AP courses available on:					
Enrolled in any college	0.002	0.002	0.003	0.001	0.005
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Enrolled in 2-year college	-0.001	-0.000	-0.002	0.001	0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Enrolled in 4-year college	0.002	0.001	0.005**	0.001	0.005
	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)
Enrolled in competitive+ college	0.002	0.001	0.005*	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)
Earned BA in 4 years	0.001	0.001	0.007***	0.007	0.007
	(0.001)	(0.002)	(0.003)	(0.005)	(0.006)
Earned BA in 6 years	0.001	-0.000	0.004	0.006*	0.008
	(0.002)	(0.002)	(0.003)	(0.004)	(0.005)
C. IV Analysis: LATE of taking one additional AP course on:					
Enrolled in any college	0.049	0.038	0.046	0.010	0.044
	(0.067)	(0.046)	(0.034)	(0.026)	(0.038)
Enrolled in 2-year college	-0.034	-0.002	-0.023	0.006	0.010
	(0.058)	(0.048)	(0.036)	(0.023)	(0.029)
Enrolled in 4-year college	0.057	0.014	0.069**	0.010	0.042
	(0.054)	(0.040)	(0.031)	(0.026)	(0.038)
Enrolled in competitive+ college	0.060	0.013	0.064**	0.016	0.023
	(0.056)	(0.044)	(0.032)	(0.025)	(0.041)
Earned BA in 4 years	0.035	0.018	0.101**	0.062*	0.066
	(0.030)	(0.040)	(0.040)	(0.037)	(0.052)
Earned BA in 6 years	0.017	-0.007	0.059	0.056*	0.076
	(0.045)	(0.046)	(0.036)	(0.031)	(0.049)
N	173,151	76,888	38,230	15,120	7,656

Notes: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Middle school math test score is measured as a standardized scale score. I use eighth grade test score if available and seventh grade score if not. Students missing a test score are not included in any of the top X% columns. First stage effects come from estimating with Equation 1 on students in the top X% of the test score distribution, where X is indicated in the column headers. Reduced form effects come from estimating Equation 3. LATE effects are estimatead using two-stage least squares (2SLS). All regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses.

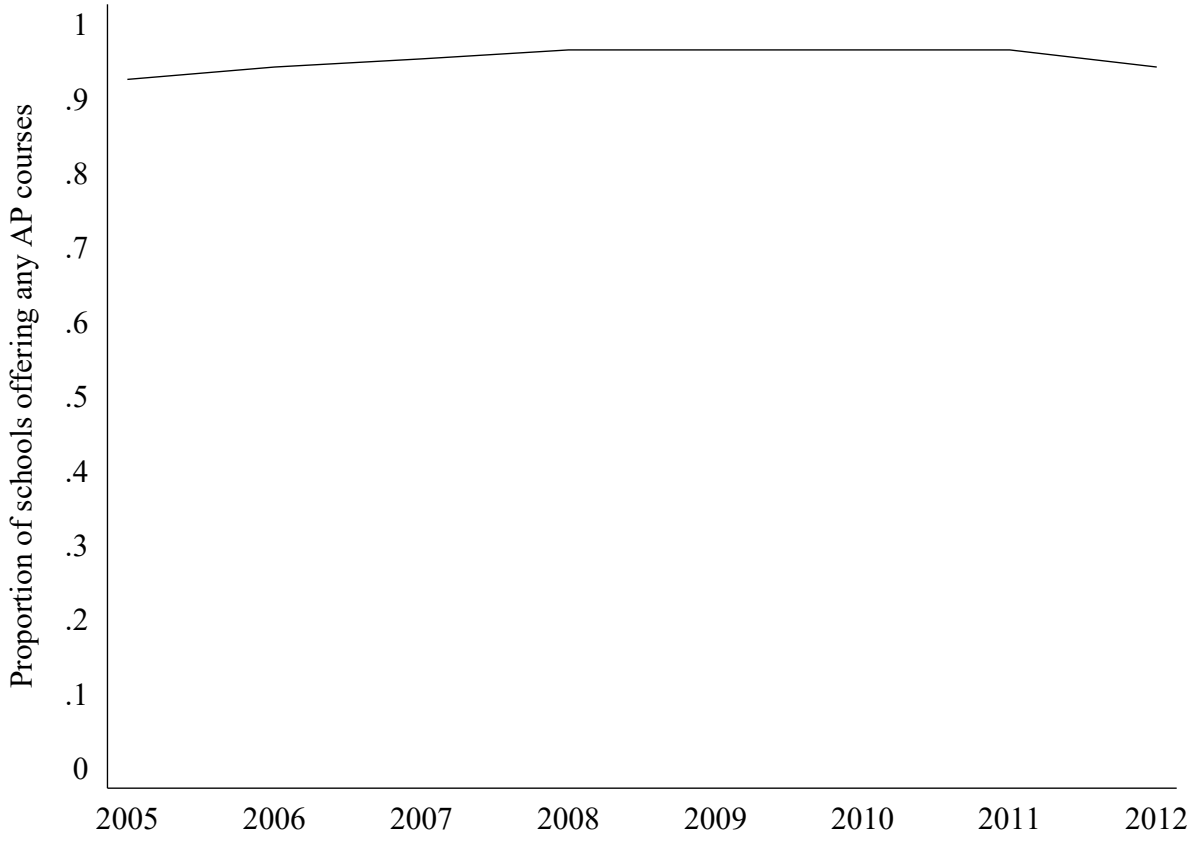
Figure 1: Test for Selection: Effect of Number of AP Courses Available on Average Middle School Math Test Scores of Senior Class



Notes: Figure shows estimated coefficients and 95 percent confidence intervals for the β_k's in Equation 5, which is a school-year-level regression of average standardized middle school math test score of the high school's senior class on the number of AP courses offered every year. Regressions control for school and year fixed effects and school-specific linear time trends.

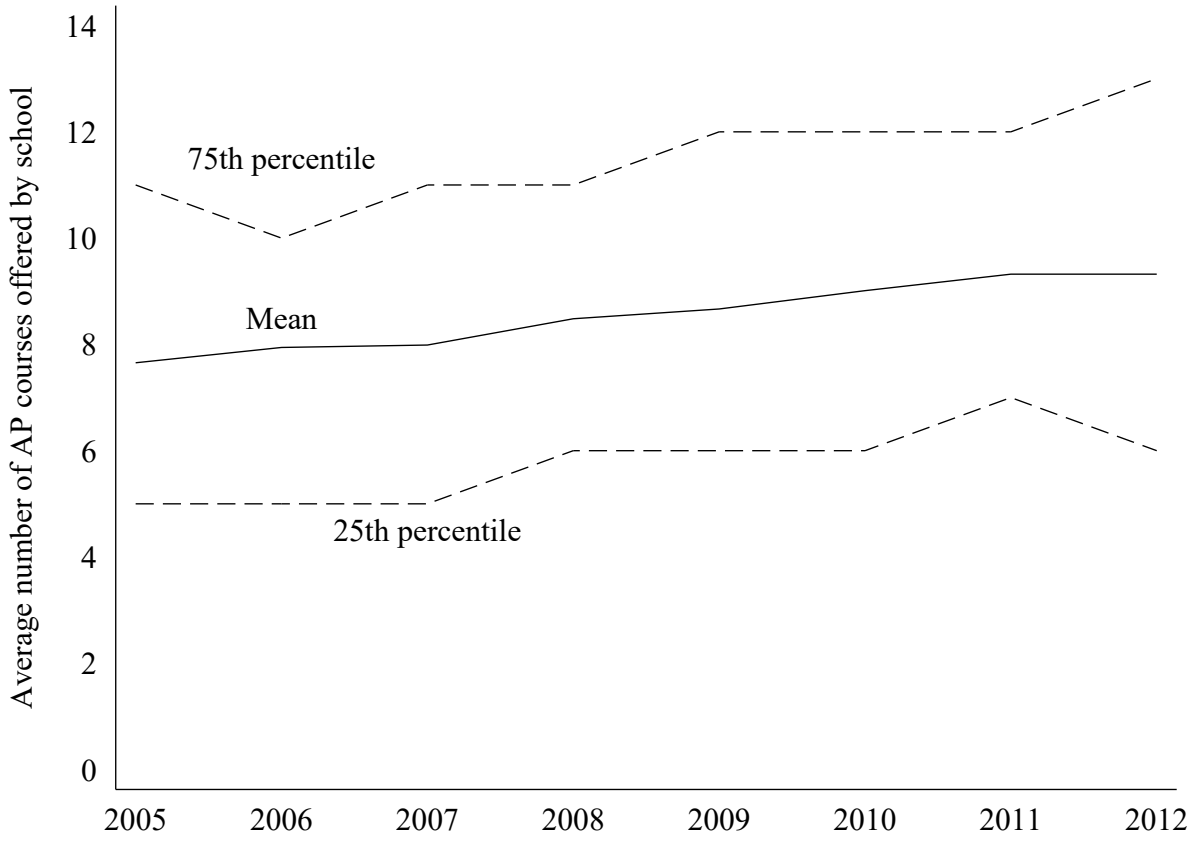
A. Appendix Tables and Figures

Figure A1: Proportion of Schools Offering Any AP Courses, by Cohort



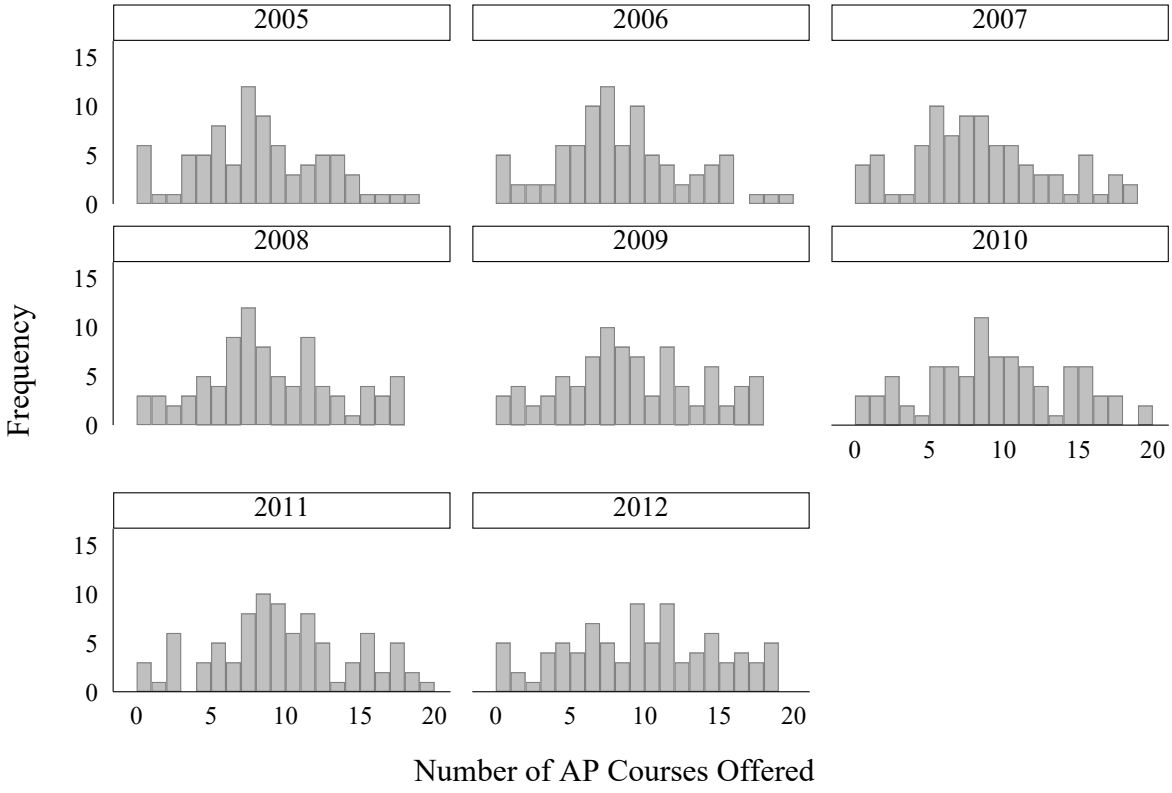
Notes: Unit of analysis is school-by-graduating-cohort. AP availability is based on what a cohort had available in their junior and senior year. For example, if a high school's graduating class of 2012 had at least one AP available to them their junior or senior year, the school is considered to have offered any AP for the cohort of 2012. Sample includes 87 unique schools and 689 school cohorts.

Figure A2: Average Number of AP Courses Offered by School, by Cohort



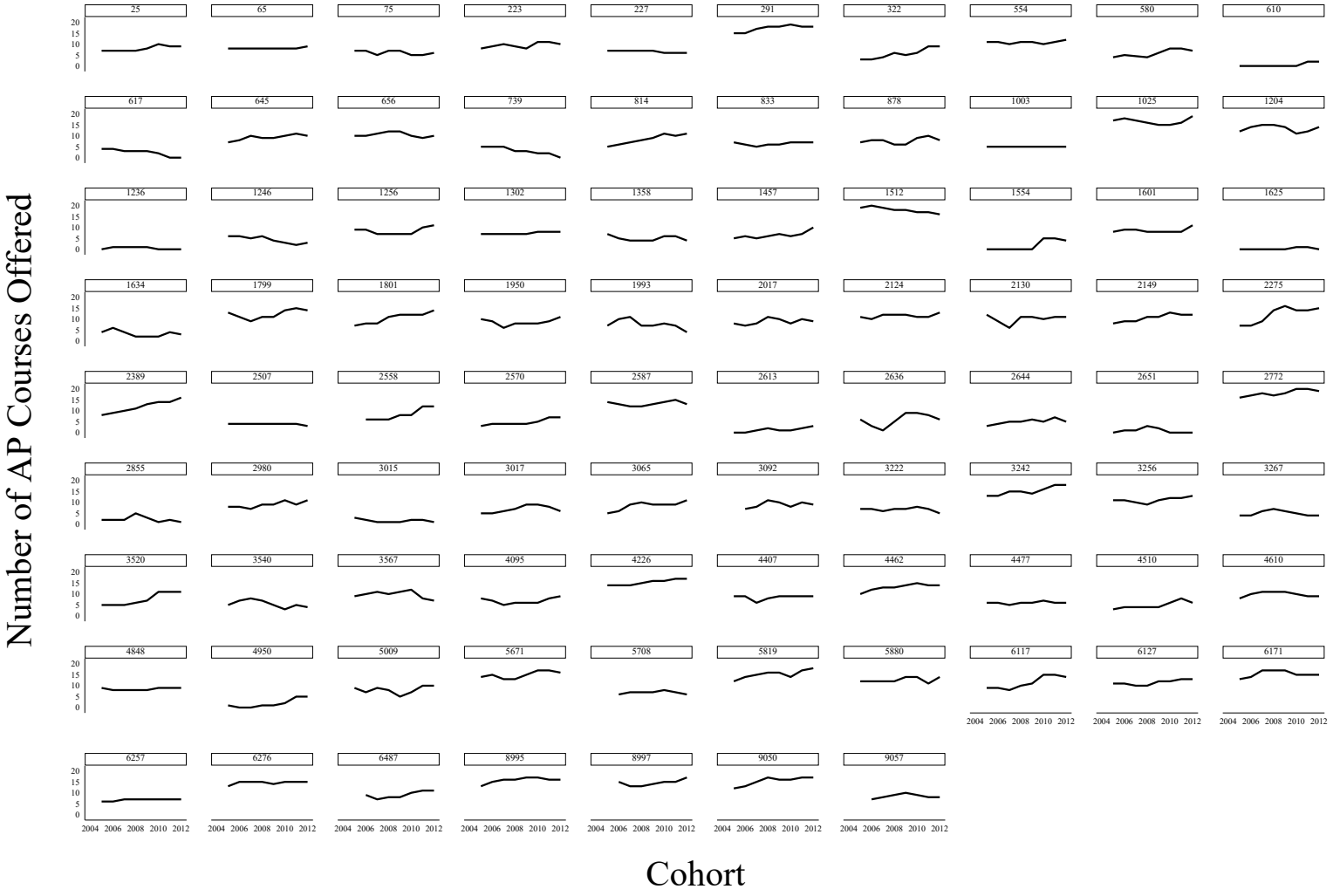
Notes: Unit of analysis is school-by-graduating-cohort. AP availability is based on what a cohort had available in their junior and senior year. For example, if a high school's graduating class of 2012 had five unique AP courses available to them their junior and senior year, the school is considered to have offered five APs for the cohort of 2012. Solid line shows the mean of AP courses offered, while the dotted lines show the 25th and 75th percentile of course offerings. Sample includes 87 unique schools and 689 school cohorts.

Figure A3: Distribution of Number of AP Courses Offered at a School, by Cohort



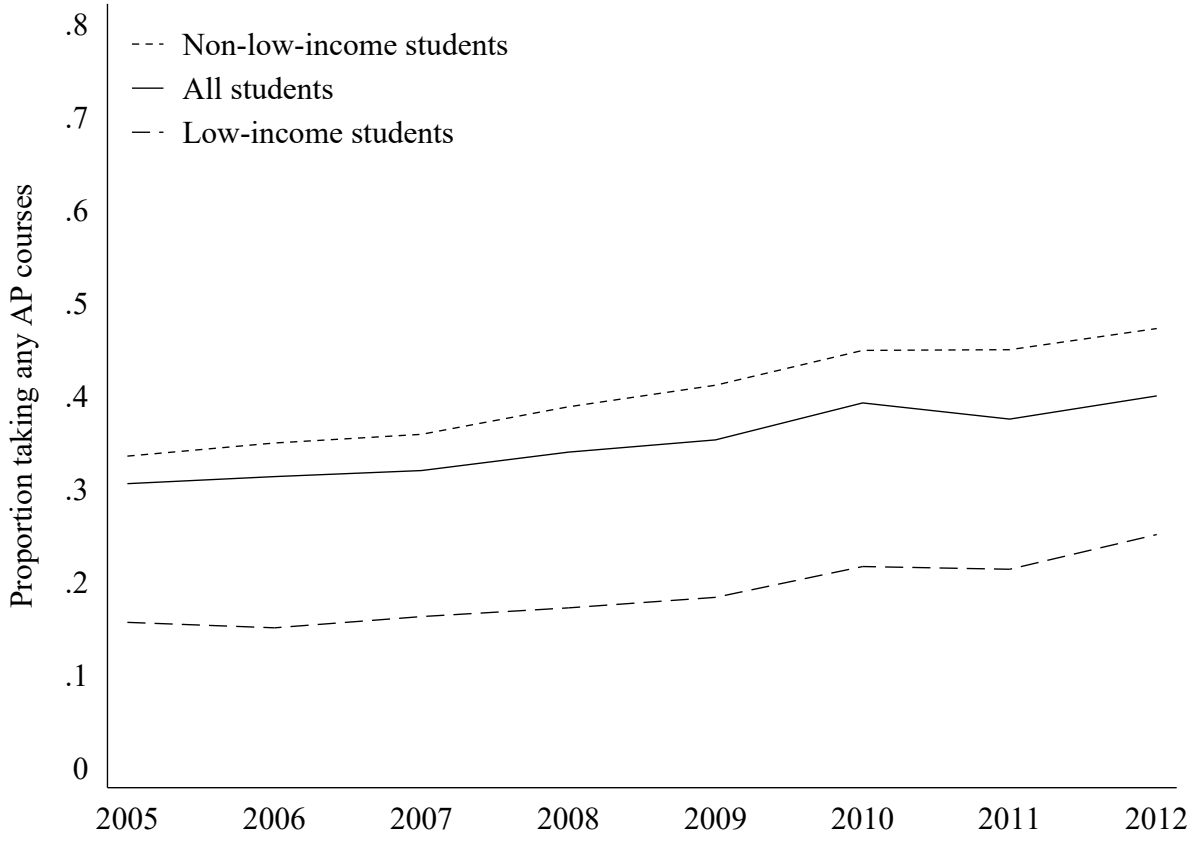
Notes: Unit of analysis is school-by-graduating-cohort. Graphs show the school-level distribution of AP courses available to each annual cohort. AP availability is based on what a cohort had available in their junior and senior year. For example, if a high school's graduating class of 2012 had five unique AP courses available to them their junior and senior year, the school is considered to have offered five APs for the cohort of 2012. Sample includes 87 unique schools and 689 school cohorts.

Figure A4: School-by-Cohort Variation in Number of AP Courses Offered



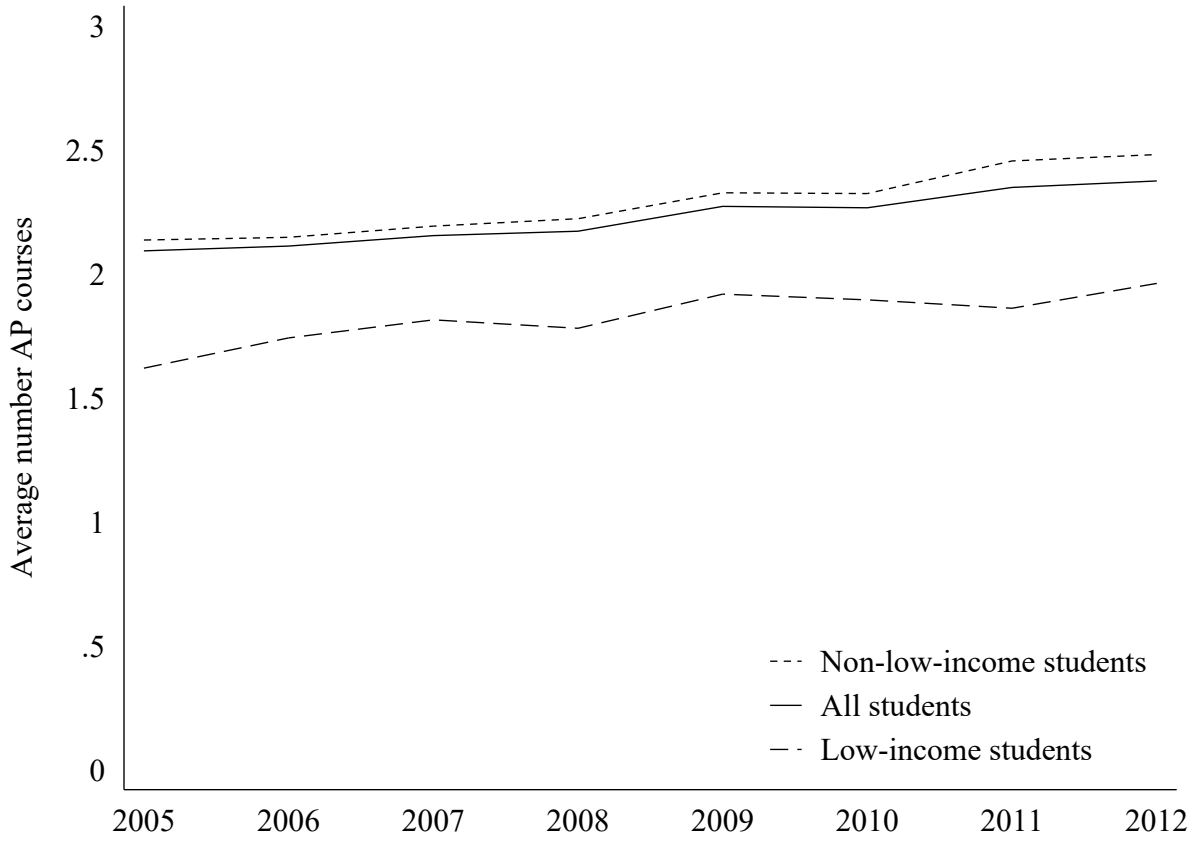
Notes: Unit of analysis is school-by-graduating-cohort. Each graph represents one of the 87 unique schools in the sample and shows the number of AP courses available to each annual cohort within that school. AP availability is based on what a cohort had available in their junior and senior year. For example, if a high school's graduating class of 2012 had five unique AP courses available to them their junior and senior year, the school is considered to have offered five APs for the cohort of 2012.

Figure A5: Proportion of Students Taking Any AP Courses, by Cohort and Family Income



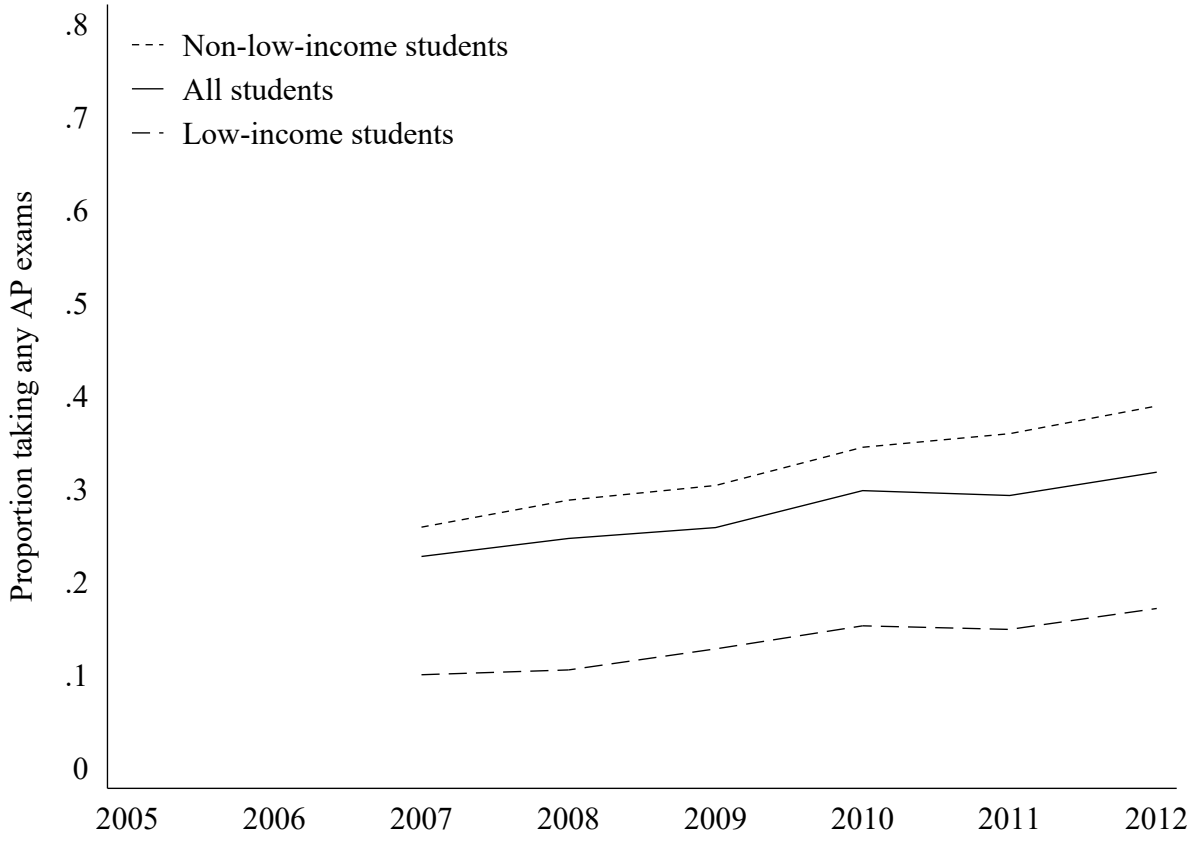
Notes: Unit of analysis is a student. Year refers to the spring of a student's 12th grade year. AP coursetaking is based on what a student took in their junior and senior year. If a student took at least one AP course in their junior or senior year, they are counted as having taken any AP. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Sample includes 173,151 students.

Figure A6: Average Number of AP Courses Taken by Students, Conditional on Taking Any AP, by Cohort and Family Income



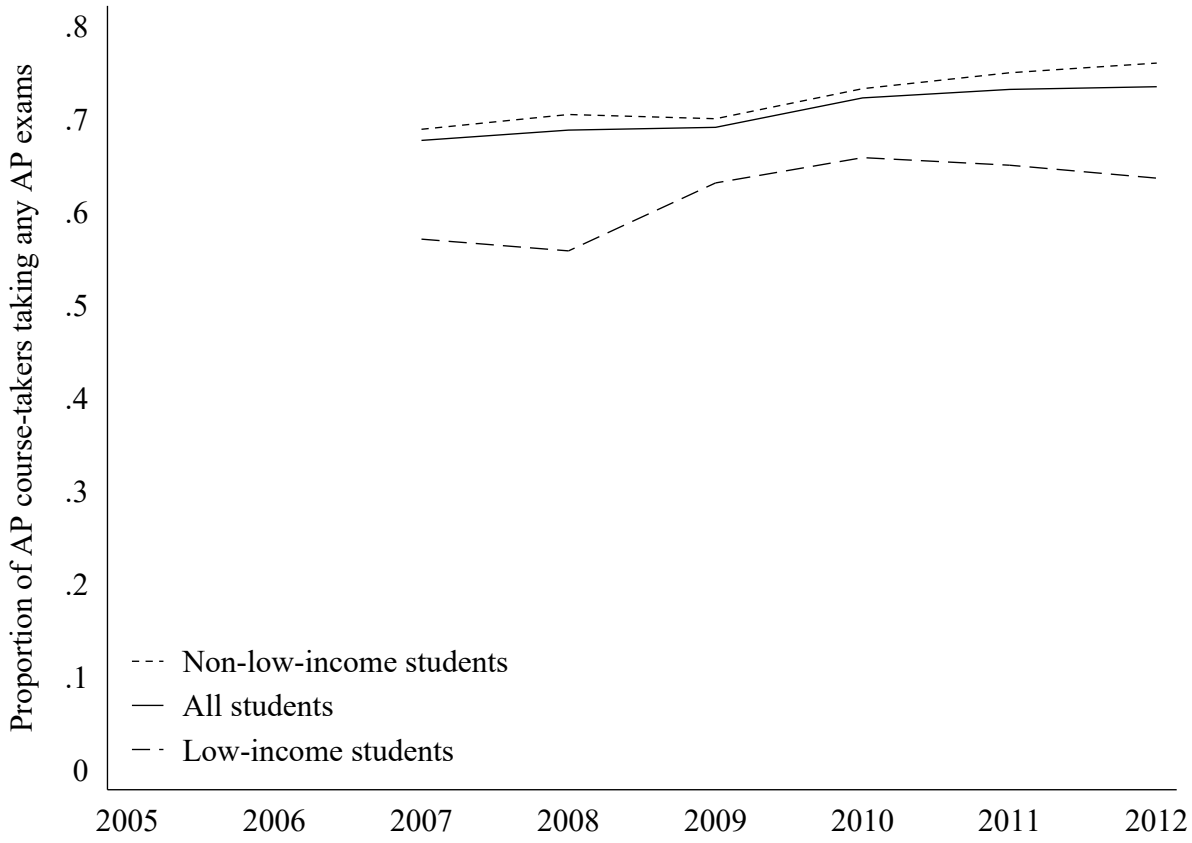
Notes: Unit of analysis is a student. Year refers to the spring of a student's12th grade year. AP coursetaking is based on what a student took in their junior and senior year. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Sample includes 60,815 students who took at least one AP in their junior or senior year.

Figure A7: Proportion of Students Taking Any AP Exams, by Cohort and Family Income



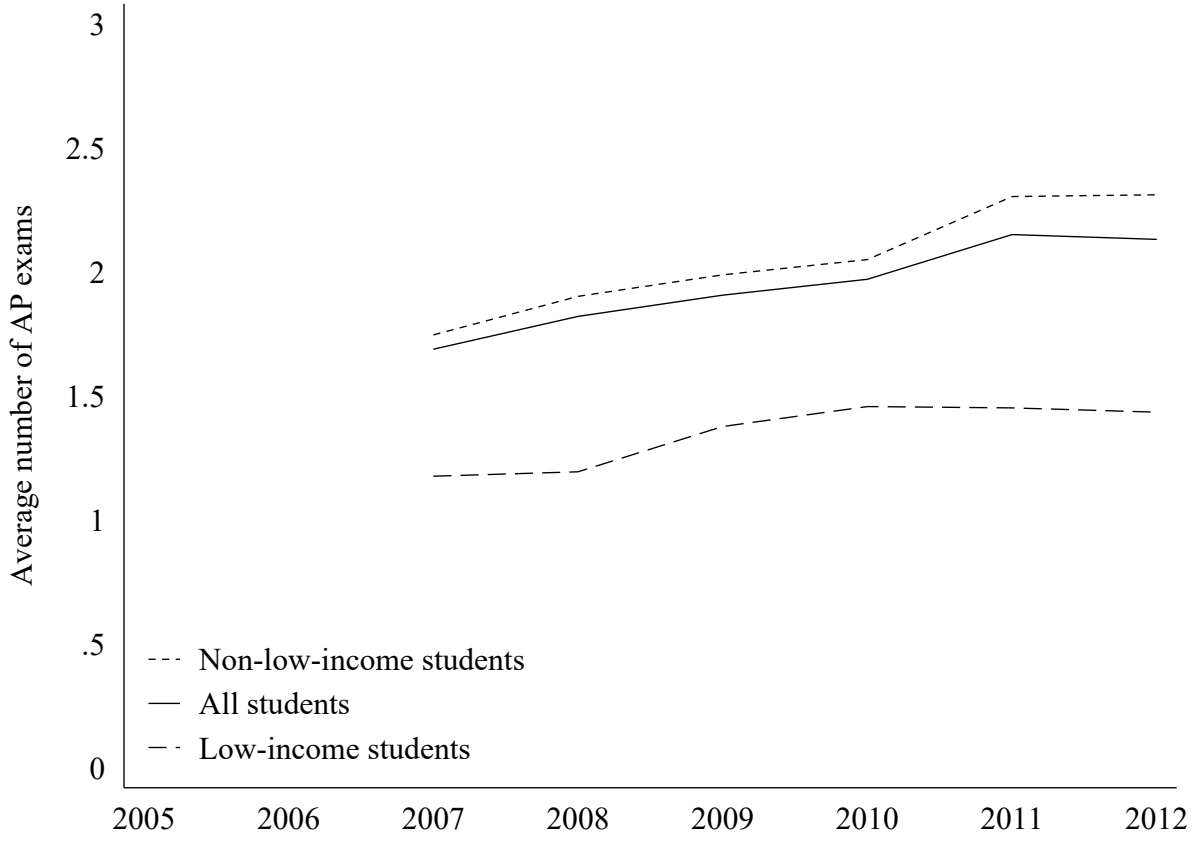
Notes: Unit of analysis is a student. Year refers to the spring of a student's 12th grade year. AP exam data does not include test dates, so exam-taking is based on all exams taken by a student. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Sample includes 135,272 students.

Figure A8: Proportion of Students Taking Any AP Exams,
Conditional on Taking Any AP Course, by Cohort and Family Income



Notes: Unit of analysis is a student. Year refers to the spring of a student's 12th grade year. AP coursetaking is based on what a student took in their junior and senior year. AP exam data does not include test dates, so exam-taking is based on all exams taken by a student. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Sample includes 49,092 students in the classes of 2007 to 2012 who took at least one AP in their junior or senior year.

Figure A9: Average Number of AP Exams Taken by Students, Conditional on Taking Any AP Course, by Cohort and Family Income



Notes: Unit of analysis is a student. Year refers to the spring of a student's 12th grade year. AP coursetaking is based on what a student took in their junior and senior year. AP exam data does not include test dates, so exam-taking is based on all exams taken by a student. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Sample includes 49,092 students in the classes of 2007 to 2012 who took at least one AP in their junior or senior year.

Table A1: Effect of AP Course Availability on AP Coursetaking, by Bins of AP Courses Taken

	(1) Took 0 AP courses	(2) Took 1-2 AP courses	(3) Took 3-4 AP courses	(4) Took 5+ AP courses
	A. Overall Effect			
# AP courses available	-0.011***	0.005**	0.003*	0.003**
junior and senior year	(0.003)	(0.002)	(0.002)	(0.001)
Mean of outcome variable	[0.649]	[0.235]	[0.085]	[0.031]
Observations	173,151	173,151	173,151	173,151
	B. Effect by Prior Achievment			
Effect of # available AP courses for:				
Bottom 75% of test score distn.	-0.012***	0.009***	0.003*	0.000
	(0.003)	(0.002)	(0.001)	(0.001)
Group mean	[0.750]	[0.200]	[0.042]	[0.008]
Observations	116,319	116,319	116,319	116,319
Top 25% of test score distn.	-0.012***	-0.002	0.004	0.010**
	(0.004)	(0.006)	(0.004)	(0.004)
Group mean	[0.294]	[0.368]	[0.231]	[0.106]
Observations	38,230	38,230	38,230	38,230

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimate of α_1 in Equation 1, which regresses student-level course-taking on AP course availability. In this specification, each outcome is an indicator for taking the specified number of AP courses. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Middle school math test score is measured as a standardized scale score. I use eighth grade test score if available and seventh grade score if not. Students missing a test score are not included in Panel B. Effects by academic preparation are estimated with separate estimations of Equation 1 by test score group. All regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses.

Table A2: Effect of Newly Available AP Courses on Marginal vs. Inframarginal AP Course Taking

	(1) # of new AP courses taken	(2) # of old AP courses taken
# of AP courses *newly* available at school in junior and senior year	0.023***	-0.008
	(0.003)	(0.009)
Mean of outcome variable	[0.018]	[0.784]
Observations	155,196	
Cohorts	2006-2012	

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimate of regressions where the treatment variable is the number of AP courses newly available to a high school cohort (that is, offered to them but not the cohort prior). The number of new AP courses taken are the number of AP courses a student takes which weren't available to the cohort immediately prior to theirs. The number of old AP courses taken are the number of AP courses a student takes which were available to the prior cohort. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses.

Table A3: Effect of AP Course Availability on College Enrollment, Disaggregating Enrollment by Selectivity Category

	(1) Enrolled non-compet. college	(2) Enrolled less compet college	(3) Enrolled compet. college	(4) Enrolled very compet. college	(5) Enrolled highly compet. college	(6) Enrolled most compet. college
# AP courses available junior and senior year	-0.001	-0.000	0.002*	-0.002*	0.001	-0.000
	(0.002)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)
Mean of outcome variable	[0.307]	[0.017]	[0.235]	[0.105]	[0.051]	[0.005]
Observations	173,151					
Cohorts	2005-2012					

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of β_1 from Equation 3, which regresses student-level college outcomes on AP course availability. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. All college outcomes are unconditional on initial enrollment.

Table A4: Effect of AP Course Availability on AP Course- and Exam-Taking, by Initial Size of School's AP Program

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Students in schools	0.016*	0.018	0.011	0.015
with 0-4 APs in 2005	(0.008)	(0.013)	(0.006)	(0.011)
Group mean	[0.150]	[0.241]	[0.097]	[0.162]
Observations	22,676	22,676	16,676	16,676
Students in schools	0.010***	0.034***	0.003	0.011
with 5+ APs in 2005	(0.003)	(0.011)	(0.002)	(0.008)
Group mean	[0.382]	[0.868]	[0.299]	[0.817]
Observations	150,475	150,475	118,596	118,596
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Initial number of APs are measured at the school level, for the high school graduating class of 2005 (or, the first year a school appears in the panel). Effects by initial AP offerings are estimated with separate estimations of Equation 1. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Regressions include school fixed effects, year fixed effects, school-specific linear time trends. Robust standard errors clustered at the school level in parentheses. Group-level means of the course- and exam-taking variables are in brackets.

Table A5: Effect of AP Course Availability on College Outcomes, by Initial Size of School's AP Program

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Students in schools	0.012**	0.006	0.005	0.005	-0.001	-0.001
with 0-4 APs in 2005	(0.005)	(0.004)	(0.005)	(0.004)	(0.001)	(0.002)
	[0.553]	[0.274]	[0.293]	[0.253]	[0.044]	[0.130]
Observations			22,676			
Students in schools	0.000	-0.002	0.001	0.002	0.001	0.001
with 5+ APs in 2005	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
	[0.722]	[0.290]	[0.450]	[0.415]	[0.175]	[0.349]
Observations			150,475			

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Initial number of APs are measured at the school level, for the high school graduating class of 2005 (or, the first year a school appears in the panel). Effects by initial AP offerings are estimated with separate estimations of Equation 3. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. Group-level means of the outcome variables are in brackets. All college outcomes are unconditional on initial enrollment.

Table A6: Effect of AP Course Availability on College Outcomes, Disaggregating AP Availability by STEM/non-STEM

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
# AP courses available in:						
STEM subjects	0.001	-0.000	0.002	0.002	-0.001	-0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.003)
Non-STEM subjects	0.002	-0.001	0.002	0.002	0.002*	0.001
	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Mean of outcome variable	[0.700]	[0.288]	[0.430]	[0.394]	[0.158]	[0.320]
Observations			173,151			
Cohorts			2005-2012			

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of β_1 and β_2 from Equation 4, which regresses student-level college outcomes on STEM and non-STEM AP course availability. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. STEM APs include calculus, statistics, physics, biology, chemistry, computer science, and environmental science; non-STEM includes all other subjects. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. All college outcomes are unconditional on initial enrollment.

Table A7: Effect of AP Course Availability on College Outcomes, Disaggregating AP Availability by Subject Group

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
# AP courses available in:						
English	0.008	0.010	-0.006	-0.003	-0.002	-0.005
	(0.015)	(0.012)	(0.009)	(0.009)	(0.005)	(0.009)
Science	0.001	0.001	0.000	0.000	-0.002	-0.002
	(0.005)	(0.004)	(0.004)	(0.004)	(0.002)	(0.003)
Math & Computer Science	0.001	-0.002	0.005	0.005	0.000	0.002
	(0.005)	(0.005)	(0.005)	(0.005)	(0.003)	(0.004)
History & Social Science	0.000	-0.002	0.000	0.001	0.001	-0.000
	(0.004)	(0.003)	(0.003)	(0.003)	(0.001)	(0.002)
Languages	0.005	-0.003	0.008*	0.006	0.004	0.004
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Arts	0.003	-0.002	0.004	0.002	0.006*	0.003
	(0.007)	(0.005)	(0.007)	(0.006)	(0.004)	(0.005)
Mean of outcome variable	[0.700]	[0.288]	[0.430]	[0.394]	[0.158]	[0.320]
Observations			173,151			
Cohorts			2005-2012			

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of a regression of student-level college outcomes on six subject-specific counts of AP course availability. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. Science APs include biology, chemistry, computer science, environmental science, and physics. Math and computer science includes calculus, statistics, and computer science. History and social science includes comparative government and politics; European history; human geography; economics; psychology; US history; US government and politics; and world history. Languages include Chinese, French, German, Italian, Japanese, Latin, and Spanish. Arts include art history, studio art, and music theory. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. All college outcomes are unconditional on initial enrollment.

Table A8: Effect of AP Course Availability on AP Course- and Exam-Taking, with Additional Student and School Controls

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
# AP courses available in junior and senior year	0.010*** (0.003)	0.032*** (0.010)	0.004** (0.002)	0.012 (0.008)
Mean of outcome variable	[0.351]	[0.786]	[0.274]	[0.736]
Kleibergen-Paap Wald F statistic	13.11	9.93	4.45	2.36
Observations	173,151	173,151	135,272	135,272
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimate of Equation 1. Regressions include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (race, gender, free or reduced price lunch status, and middle school standardized math test score), and time-varying school-level controls (average middle school test score, size of senior class, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. Estimates without controls appear in Table 2.

Table A9: Effect of AP Course Availability on AP Course- and Exam-Taking, by Family Income, with Additional Student and School Controls

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Low-income students	0.008**	0.010	-0.000	-0.008
	(0.004)	(0.008)	(0.003)	(0.008)
Group mean	[0.196]	[0.364]	[0.139]	[0.297]
Observations	41,974	41,974	35,378	35,378
Non-low-income students	0.010***	0.038***	0.005***	0.020**
	(0.003)	(0.012)	(0.002)	(0.009)
Group mean	[0.401]	[0.921]	[0.322]	[0.892]
Observations	131,177	131,177	99,894	99,894
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Effects by income are estimated with separate estimations of Equation 1 by FRPL status. Regressions include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (race, gender, and middle school standardized math test score), and time-varying school-level controls (average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. Means of the course- and exam-taking variables are in brackets. Estimates without controls appear in Table 3.

Table A10: Effect of AP Course Availability on AP Course- and Exam-Taking, by Race and Ethnicity, with Additional Student and School Controls

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Black, Hispanic, & Native students	0.011**	0.011	0.000	-0.003
	(0.005)	(0.009)	(0.003)	(0.007)
Group mean	[0.202]	[0.362]	[0.125]	[0.248]
Observations	37,018	37,018	29,041	29,041
White & Asian students	0.010***	0.036***	0.005**	0.017*
	(0.003)	(0.011)	(0.002)	(0.009)
Group mean	[0.392]	[0.901]	[0.315]	[0.870]
Observations	136,133	136,133	106,231	106,231
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $*p < 0.1$, $**p < 0.05$, $***p < 0.01$. Effects by race are estimated with separate estimations of Equation 1 by underrepresented minority status. Underrepresented minority includes students who identify as Black, Hispanic, American Indian, Native Hawaiian, or Pacific Islander. Regressions include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (gender, free or reduced price lunch status, and middle school standardized math test score), and time-varying school-level controls (average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. Means of the course- and exam-taking variables are in brackets. Estimates without controls appear in Table 4.

Table A11: Effect of AP Course Availability on AP Course- and Exam-Taking, by Prior Achievement, with Additional Student and School Controls

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
A. Linear Test Score Interaction				
# AP courses available at school	0.010***	0.023**	0.002	-0.005
in junior & senior year	(0.003)	(0.011)	(0.002)	(0.008)
Middle school math test score	0.168***	0.243***	0.126***	0.080
	(0.017)	(0.055)	(0.016)	(0.067)
# of AP courses available * math score	0.005***	0.043***	0.007***	0.065***
	(0.001)	(0.005)	(0.001)	(0.006)
Observations	154,549	154,549	123,003	123,003
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012
B. Top 25 vs. Bottom 75 Percent of Test Scores				
Effect of # available AP courses for:				
Bottom 75% of test score distribution	0.012***	0.023**	0.003	0.002
	(0.003)	(0.009)	(0.002)	(0.005)
Group mean	[0.250]	[0.442]	[0.170]	[0.330]
Observations	116,319	116,319	92,564	92,564
Top 25%	0.010**	0.069***	0.007	0.046*
	(0.004)	(0.024)	(0.004)	(0.025)
Group mean	[0.706]	[1.941]	[0.625]	[2.062]
Observations	38,230	38,230	30,439	30,439
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Middle school math test score is measured as a standardized scale score. I use eighth grade test score if available and seventh grade score if not. Students missing a test score are not included in this analysis. In Panel A, effects by academic preparation are estimated using a single equation (Equation 2), where course availability is interacted with the continuous measure of test score. In Panel B., effects by academic preparation are estimated with separate estimations of Equation 1 by test score group. All regressions in this table include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (race, gender, and free or reduced price lunch status), and time-varying school-level controls (average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. Means of the course- and exam-taking variables are in brackets. Estimates without controls appear in Table 5.

Table A12: Effect of AP Course Availability on College Outcomes, with Additional Student and School Controls

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
# AP courses available junior and senior year	0.001	-0.001	0.002	0.002	0.001	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Mean of outcome variable	[0.700]	[0.288]	[0.430]	[0.394]	[0.158]	[0.320]
Observations	173,151					
Cohorts	2005-2012					

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimate of Equation 3. Regressions include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (race, gender, free or reduced price lunch status, and middle school standardized math test score), and time-varying school-level controls (average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. All college outcomes are unconditional on initial enrollment. Estimates without controls appear in Table 6.

Table A13: Effect of AP Course Availability on College Outcomes, by Family Income, with Additional Student and School Controls

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Low-income students	0.004	0.001	0.001	0.001	0.000	-0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.002)
	[0.558]	[0.300]	[0.271]	[0.229]	[0.045]	[0.132]
Observations			41,974			
Non-low-income students	-0.000	-0.002	0.001	0.002	0.001	-0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
	[0.745]	[0.284]	[0.480]	[0.446]	[0.194]	[0.380]
Observations			131,177			

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Effects by income are estimated with separate estimations of Equation 3 by FRPL status. Regressions include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (race, gender, and middle school standardized math test score), and time-varying school-level controls (average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. Group means of the outcome variables are in brackets. All college outcomes are unconditional on initial enrollment. Estimates without controls appear in Table 7.

Table A14: Effect of AP Course Availability on College Outcomes, by Race and Ethnicity, with Additional Student and School Controls

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Black, Hispanic,	0.005	0.003	0.002	0.003	0.001	0.003
& Native students	(0.004)	(0.003)	(0.003)	(0.003)	(0.001)	(0.002)
	[0.589]	[0.274]	[0.330]	[0.284]	[0.054]	[0.147]
Observations			37,018			
White & Asian students	-0.000	-0.002	0.001	0.001	0.000	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
	[0.730]	[0.292]	[0.457]	[0.423]	[0.186]	[0.367]
Observations			136,133			

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Effects by race are estimated with separate estimations of Equation 3 by underrepresented minority status. Underrepresented minority includes students who identify as Black, Hispanic, American Indian, Native Hawaiian, or Pacific Islander. Regressions include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (gender, free or reduced price lunch status, and middle school standardized math test score), and time-varying school-level controls (average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. Group means of the outcome variables are in brackets. All college outcomes are unconditional on initial enrollment. Estimates without controls appear in Table 8.

Table A15: Effect of AP Course Availability on College Outcomes, by Academic Preparation, with Additional Student and School Controls

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Bottom 75% of test	0.001	-0.001	0.001	0.002	-0.001	-0.000
score distribution	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
	[0.678]	[0.339]	[0.358]	[0.318]	[0.096]	[0.245]
Observations			116,319			
Top 25%	0.003	-0.001	0.004*	0.004	0.005*	0.002
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
	[0.857]	[0.159]	[0.717]	[0.686]	[0.367]	[0.601]
Observations			38,230			

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Middle school math test score is measured as a standardized scale score. I use eighth grade test score if available and seventh grade score if not. Students missing a test score are not included in this analysis. Effects by academic preparation are estimated with separate estimations of Equation 3 by test score group. Regressions include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (race, gender, and free or reduced price lunch status), and time-varying school-level controls (average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. Group means of the outcome variables are in brackets. All college outcomes are unconditional on initial enrollment. Estimates without controls appear in Table 9.

Table A16: Effect of AP Course Availability on AP Course- and Exam-Taking, by Family Income, with Additional Student and School Controls, Estimated in a Single Regression

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Low-income students	0.004	0.009	-0.003	-0.015*
	(0.003)	(0.010)	(0.002)	(0.009)
Group mean	[0.196]	[0.364]	[0.139]	[0.297]
Non-low-income students	0.012***	0.039***	0.006***	0.022***
	(0.003)	(0.010)	(0.002)	(0.008)
Group mean	[0.401]	[0.921]	[0.322]	[0.892]
Observations	173,151	173,151	135,272	135,272
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). In this specification, effects by income are estimated with a single regression where the number of available AP courses is interacted with FRPL status. Regressions also include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (race, gender, and middle school standardized math test score), and time-varying school-level controls (average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. Group-level means of the course- and exam-taking variables are in brackets.

Table A17: Effect of AP Course Availability on AP Course- and Exam-Taking, by Race and Ethnicity, with Additional Student and School Controls, Estimated in a Single Regression

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Black, Hispanic, & Native students	0.005	0.002	-0.003	-0.028**
	(0.003)	(0.011)	(0.002)	(0.011)
Group mean	[0.202]	[0.362]	[0.125]	[0.248]
White & Asian students	0.011***	0.038***	0.006***	0.022***
	(0.003)	(0.010)	(0.002)	(0.007)
Group mean	[0.392]	[0.901]	[0.315]	[0.870]
Observations	173,151	173,151	135,272	135,272
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. In this specification, effects by race are estimated with a single regression where the number of available AP courses is interacted with underrepresented minority status. Underrepresented minority includes students who identify as Black, Hispanic, American Indian, Native Hawaiian, or Pacific Islander. Regressions also include school fixed effects, year fixed effects, school-specific linear time trends, student-level controls (gender, free or reduced price lunch status, and middle school standardized math test score), and time-varying school-level controls (average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year). Robust standard errors clustered at the school level in parentheses. Group-level means of the course- and exam-taking variables are in brackets.

Table A18: Effect of AP Course Availability on College Outcomes, with Combinations of Student and School Controls and School-Specific Time Trends

	Enrolled in competitive+ college				
	(1)	(2)	(3)	(4)	(5)
# AP courses available junior and senior year	0.004***	0.002	0.002	0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Mean of outcome variable	[0.394]				
	Earned BA degree in 4 years				
	(6)	(7)	(8)	(9)	(10)
# AP courses available junior and senior year	0.002**	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Mean of outcome variable	[0.158]				
	Earned BA degree in 6 years				
	(11)	(12)	(13)	(14)	(15)
# AP courses available junior and senior year	0.002	0.001	0.000	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Mean of outcome variable	[0.320]				
School controls	N	Y	Y	Y	N
Student controls	N	N	Y	Y	N
School-specific time trends	N	N	N	Y	Y
Observations	173,151				
Cohorts	2005-2012				

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimate of Equation 3, with the inclusion of the indicated controls for each column. Student-level controls include race, gender, free or reduced price lunch status, and middle school standardized math test score. Time-varying school-level controls include average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year. Robust standard errors clustered at the school level in parentheses. Estimates in the final column (specifications 5, 10, and 15) correspond to those in in Table 6.

Table A19: Effect of AP Course Availability on College Outcomes, with Combinations of Student and School Controls and School-Specific Time Trends, Top 25% of Test Scores Only

	Enrolled in competitive+ college				
	(1)	(2)	(3)	(4)	(5)
# AP courses available junior and senior year	0.004*	0.004**	0.003*	0.004	0.005*
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Mean of outcome variable	[0.686]				
	Earned BA degree in 4 years				
	(6)	(7)	(8)	(9)	(10)
# AP courses available junior and senior year	0.005	0.005	0.004	0.005*	0.007***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Mean of outcome variable	[0.367]				
	Earned BA degree in 6 years				
	(11)	(12)	(13)	(14)	(15)
# AP courses available junior and senior year	0.003	0.003	0.002	0.002	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Mean of outcome variable	[0.601]				
School controls	N	Y	Y	Y	N
Student controls	N	N	Y	Y	N
School-specific time trends	N	N	N	Y	Y
Observations	38,230				
Cohorts	2005-2012				

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimate of Equation 3, with the inclusion of the indicated controls for each column, estimated on the top 25 percent of the sample by middle school math test score. Student-level controls include race, gender, and free or reduced price lunch status. Time-varying school-level controls include average middle school test score, school enrollment, pupil:teacher ratio, per student instructional spending, and local unemployment, all measured in the student's sophomore year. Robust standard errors clustered at the school level in parentheses. Estimates in the final column (specifications 5, 10, and 15) correspond to those in in Table 9.

Table A20: Effect of AP Course Availability on AP Course- and Exam-Taking, DID_M Alternative to TWFE Estimates

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
# AP courses available junior and senior year	0.002	0.020	-0.001	0.003
	(0.006)	(0.016)	(0.005)	(0.020)
Mean of outcome variable	[0.351]	[0.786]	[0.274]	[0.736]
Observations	125,022	125,022	91,019	91,019
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of DID_M based on de Chaisemartin and d'Haultfoeuille (2020). Estimates include school fixed effects, year fixed effects, and school-specific linear time trends. Bootstrapped standard errors clustered at the school level in parentheses.

Table A21: Effect of AP Course Availability on AP Course- and Exam-Taking, by Family Income, DID_M Alternative to TWFE Estimates

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Low-income students	0.003	0.005	-0.000	-0.010
	(0.009)	(0.019)	(0.005)	(0.017)
Group mean	[0.196]	[0.364]	[0.139]	[0.297]
Observations	32,511	32,511	25,844	25,844
Non-low-income students	0.003	0.028	-0.001	0.010
	(0.006)	(0.019)	(0.006)	(0.026)
Group mean	[0.401]	[0.921]	[0.322]	[0.892]
Observations	89,887	89,887	65,173	65,173
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of DID_M, separately by income status, based on de Chaisemartin and d'Haultfoeuille (2020). Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Estimates include school fixed effects, year fixed effects, and school-specific linear time trends. Bootstrapped standard errors clustered at the school level in parentheses. Group mean of outcome variable in square brackets.

Table A22: Effect of AP Course Availability on AP Course- and Exam-Taking, by Race and Ethnicity, DID_M Alternative to TWFE Estimates

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Black, Hispanic, & Native students	-0.015	-0.013	-0.007	0.003
	(0.023)	(0.037)	(0.010)	(0.023)
Group mean	[0.202]	[0.362]	[0.125]	[0.248]
Observations	26,342	26,342	19,776	19,776
White & Asian students	0.005	0.034	-0.001	0.005
	(0.008)	(0.022)	(0.006)	(0.025)
Group mean	[0.392]	[0.901]	[0.315]	[0.870]
Observations	97,394	97,394	71,054	71,054
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of DID_M, separately by underrepresented minority status, based on de Chaisemartin and d'Haultfoeuille (2020). Underrepresented minority includes students who identify as Black, Hispanic, American Indian, Native Hawaiian, or Pacific Islander. Estimates include school fixed effects, year fixed effects, and school-specific linear time trends. Bootstrapped standard errors clustered at the school level in parentheses. Group mean of outcome variable in square brackets.

Table A23: Effect of AP Course Availability on AP Course- and Exam-Taking, by Academic Preparation, DID_M Alternative to TWFE Estimates

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
Effect of # available AP courses for:				
Students in bottom 75% of	0.004	0.011	0.001	-0.003
test score distribution	(0.006)	(0.013)	(0.004)	(0.013)
Group mean	[0.250]	[0.442]	[0.170]	[0.330]
Observations	86,632	86,632	63,895	63,895
Students in top 25%	-0.001	0.077**	-0.006	0.050
	(0.009)	(0.038)	(0.012)	(0.061)
Group mean	[0.706]	[1.941]	[0.625]	[2.062]
Observations	25,128	25,128	19,159	19,159
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of DID_M, separately by test score range, based on de Chaisemartin and d'Haultfoeuille (2020). Middle school math test score is measured as a standardized scale score. I use eighth grade test score if available and seventh grade score if not. Students missing a test score are not included in this analysis. Estimates include school fixed effects, year fixed effects, and school-specific linear time trends. Bootstrapped standard errors clustered at the school level in parentheses. Group mean of outcome variable in square brackets.

Table A24: Effect of AP Course Availability on College Outcomes, DID_M Alternative to TWFE Estimates

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
# AP courses available	-0.012	-0.015	0.002	0.002	-0.002	-0.004
junior and senior year	(0.009)	(0.012)	(0.007)	(0.007)	(0.003)	(0.004)
Mean of outcome variable	[0.700]	[0.288]	[0.430]	[0.394]	[0.158]	[0.320]
Observations	125,022	125,022	125,022	125,022	125,022	125,022
Cohorts			2005-2012			

Notes: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of DID_M based on de Chaisemartin and d'Haultfoeuille (2020). Estimates include school fixed effects, year fixed effects, and school-specific linear time trends. Bootstrapped standard errors clustered at the school level in parentheses.

Table A25: Effect of AP Course Availability on College Outcomes, by Family Income, DID_M Alternative to TWFE Estimates

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Low-income students	-0.005	-0.021	0.016	0.014	-0.003	-0.007
	(0.011)	(0.018)	(0.012)	(0.011)	(0.004)	(0.005)
	[0.558]	[0.300]	[0.271]	[0.229]	[0.045]	[0.132]
Observations			32,511			
Non-low-income students	-0.015	-0.013	-0.003	-0.002	-0.003	-0.004
	(0.011)	(0.009)	(0.006)	(0.006)	(0.003)	(0.004)
	[0.745]	[0.284]	[0.480]	[0.446]	[0.194]	[0.380]
Observations			89,887			

Notes: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of DID_M, separately by income status, based on de Chaisemartin and d'Haultfoeuille (2020). Low-income status is proxied by eligibility for free or reduced-price lunch (FRPL). Estimates include school fixed effects, year fixed effects, and school-specific linear time trends. Bootstrapped standard errors clustered at the school level in parentheses. Group mean of outcome variable in square brackets.

Table A26: Effect of AP Course Availability on College Outcomes, by Race and Ethnicity, DID_M Alternative to TWFE Estimates

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Black, Hispanic,	-0.009	0.004	-0.013	-0.016	0.003	0.002
& Native students	(0.019)	(0.020)	(0.019)	(0.019)	(0.007)	(0.011)
	[0.589]	[0.274]	[0.330]	[0.284]	[0.054]	[0.147]
Observations			26,342			
White & Asian students	-0.008	-0.010	-0.001	-0.001	-0.003	-0.004
	(0.015)	(0.012)	(0.007)	(0.007)	(0.003)	(0.005)
	[0.730]	[0.292]	[0.457]	[0.423]	[0.186]	[0.367]
Observations			97,394			

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of DID_M, separately by underrepresented minority status, based on de Chaisemartin and d'Haultfoeuille (2020). Underrepresented minority includes students who identify as Black, Hispanic, American Indian, Native Hawaiian, or Pacific Islander. Estimates include school fixed effects, year fixed effects, and school-specific linear time trends. Bootstrapped standard errors clustered at the school level in parentheses. Group mean of outcome variable in square brackets.

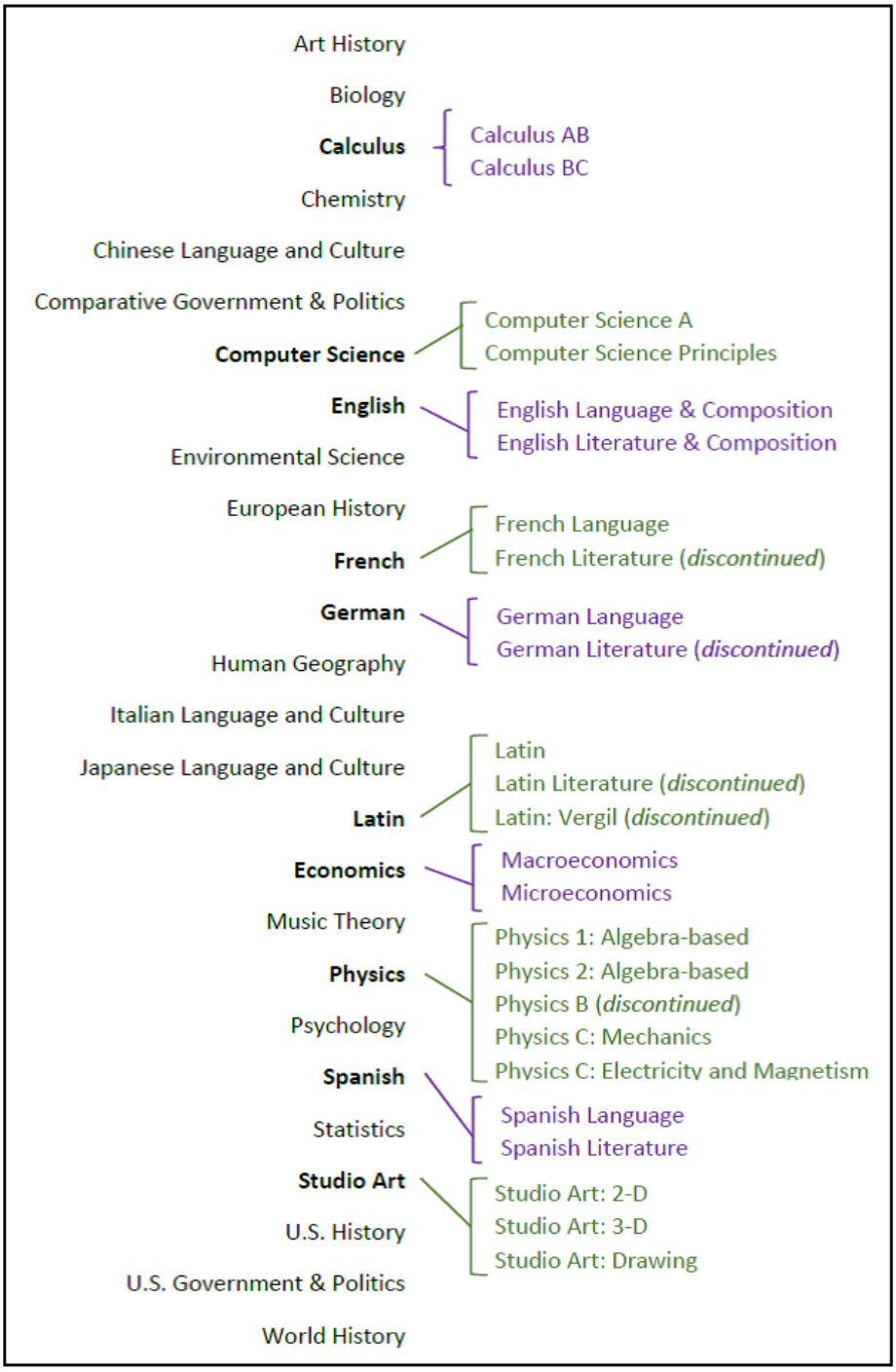
Table A27: Effect of AP Course Availability on College Outcomes, by Academic Preparation, DID_M Alternative to TWFE Estimates

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
Effect of # available AP courses for:						
Students in bottom 75%	-0.012	-0.019	0.005	0.004	-0.003	-0.003
of test score distn.	(0.008)	(0.013)	(0.009)	(0.009)	(0.003)	(0.004)
	[0.678]	[0.339]	[0.358]	[0.318]	[0.096]	[0.245]
Observations			86,632			
Students in top 25%	0.008	0.002	0.009	0.011	0.003	0.001
	(0.010)	(0.008)	(0.011)	(0.011)	(0.010)	(0.010)
	[0.857]	[0.159]	[0.717]	[0.686]	[0.367]	[0.601]
Observations			25,128			

Notes: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of DID_M, separately by test score range, based on de Chaisemartin and d'Haultfoeuille (2020). Middle school math test score is measured as a standardized scale score. I use eighth grade test score if available and seventh grade score if not. Students missing a test score are not included in this analysis. Estimates include school fixed effects, year fixed effects, and school-specific linear time trends. Bootstrapped standard errors clustered at the school level in parentheses. Group mean of outcome variable in square brackets.

B. Data Appendix

Figure B1: Coding of AP Courses by Subject



Notes: Subjects in bold have been collapsed from multiple AP subjects, corresponding to the bracketed courses, due to data limitations. This was done because in many cases it was impossible to distinguish, e.g., English Literature and Composition from English Language and Composition (because the school would list the course as "AP English.")

Table B1: Most Popular AP Courses Offered, Courses Taken, and Exams Taken, by Cohort

	Top 5 AP courses offered (school level)	Top 5 AP courses taken (student level)	Top 5 AP exams taken (student level)
2005	English	English	
	U.S. History	Calculus	
	Calculus	U.S. Government	
	Biology	Biology	
	Chemistry	U.S. History	
2006	English	English	
	Calculus	Calculus	
	U.S. History	U.S. Government	
	Chemistry	Biology	
	Biology	U.S. History	
2007	English	English	English
	Calculus	Calculus	Calculus
	U.S. History	U.S. Government	U.S. Government
	Chemistry	Biology	Biology
	Biology	Psychology	Psychology
2008	English	English	English
	Calculus	Calculus	Calculus
	U.S. History	U.S. Government	U.S. History
	Biology	Biology	Biology
	U.S. Government	Psychology	U.S. Government
2009	English	English	English
	Calculus	Calculus	Calculus
	U.S. History	U.S. Government	U.S. History
	Biology	Biology	Biology
	U.S. Government	Psychology	U.S. Government
2010	English	English	English
	Calculus	Calculus	Calculus
	U.S. History	U.S. Government	U.S. History
	Biology	Biology	U.S. Government
	U.S. Government	Psychology	Biology
2011	English	English	English
	Calculus	Calculus	Calculus
	U.S. History	U.S. Government	U.S. History
	Biology	Psychology	U.S. Government
	U.S. Government	Biology	Biology
2012	English	English	English
	Calculus	Calculus	Calculus
	Biology	Psychology	Psychology
	U.S. History	U.S. Government	U.S. History
	Chemistry	Biology	U.S. Government

Table B2: Count of AP Course Additions and Subtractions, by Course

AP Course	Additions	Subtractions	Changes
Art History	17	9	26
Biology	35	19	54
Calculus	10	6	16
Chemistry	28	18	46
Chinese	2	1	3
Comparative Government	5	13	18
Computer Science	28	24	52
Economics	39	21	60
English	13	12	25
Environmental Science	24	9	33
European History	22	25	47
French	14	12	26
German	4	5	9
Human Geography	20	12	32
Italian	1	1	2
Japanese	1	0	1
Latin	1	1	2
Music Theory	5	5	10
Physics	21	15	36
Psychology	41	30	71
Spanish	26	19	45
Statistics	35	17	52
Studio Art	19	15	34
US Government	31	21	52
US History	23	28	51
World History	44	23	67

Notes: Analysis done at the school-by-cohort level. An addition indicates that the course was available to a cohort in their junior or senior year but not available to the previous cohort. A subtraction indicates that the course was not available to a cohort but was available to the previous cohort.

Table B3: List of AP Exams in Dataset

AP exam name
Art History
Art: Drawing
2D Art and Design
3D Art and Design
Biology
Calculus AB
Calculus BC
Chemistry
Chinese Language and Culture
Comparative Government and Politics
Computer Science A
Computer Science AB *
English Language and Composition
English Literature and Composition
Environmental Science
European History
French Language and Culture
French Literature *
German Language and Culture
Human Geography
Italian Language and Culture
Japanese Language and Culture
Latin Language
Latin Literature *
Macroeconomics
Microeconomics
Music Theory
Physics B **
Physics C: Electricity and Magnetism
Physics C: Mechanics
Psychology
Spanish Language and Culture
Spanish Literature and Culture
Statistics
US Government and Politics
US History
World History

Notes: * Discontinued in 2009; ** Discontinued / replaced by Physics 1 and 2 in 2015. As of June 2023, the College Board listed four additional AP courses, all of which were introduced after the sample period of the current study: Physics 1: Algebra Based (introduced 2015); Physics 2: Algebra Based (2015); Computer Science Principles (2017); and Precalculus (introduced for 2023-24 school year).

Data Sources, Key Variables, and Sample Restrictions

Michigan High School Transcript Study (MTS)

My data source for AP course-taking and course availability is the Michigan High School Transcript Study (MTS). In describing the transcript study, I rely heavily on Wallsworth et al. (2015) and Kim et al. (2017), which describe the original data collection and cleaning process in detail. The original purpose of the transcript study was to evaluate the Michigan Merit Curriculum (MMC), "a state policy which sought to increase graduation requirements and promote college attendance and workplace success (effective for the graduating class of 2011)" (Wallsworth et al., 2015, p. i). For a full evaluation of the MMC as well as a summary of the MTS, see Kim et al. (2019).

The MTS attempted to collect school course catalog and student transcript data from a representative sample of 150 Michigan high schools for academic years 2001-02 through 2011-12 (Kim et al., 2017, 2019). At the time that I received access to the data (February 2017), the MTS research team had received data from 138 schools, but only 87 of those had provided the identifying information (name and birthdate) required to match students to the unique ID variable used in all other MEDC data sources. The analytic sample of schools are somewhat larger, more urban, and higher-achieving than the state as a whole (see Table 1).

Key variables derived from MTS data:

- *ap_courseX_jr** (student-level): 26 indicator variables denoting whether a student took each of the 26 AP subjects (Art History, Biology, Calculus, etc.) in their junior year. Equals 1 if student appears in MTS as taking a course flagged as AP subject X in the year they were in 11th grade. See more info about course codings below.
- *ap_courseX_sr** (student-level): 26 indicator variables denoting whether a student took each of the 26 AP subjects (Art History, Biology, Calculus, etc.) in their senior year. Equals 1 if student appears in MTS as taking a course flagged as AP subject X in the year they were in 12th grade.
- *ap_courseX_jrsr** (student-level): 26 indicator variables denoting whether a student took each of the 26 AP subjects (Art History, Biology, Calculus, etc.) in their junior or senior year. Equals 1 if *ap_courseX_jr* equals 1 or *ap_courseX_sr* equals 1.
- *num_ap_courses_jr** (student-level): Number of AP courses taken in a student's junior year. Sum of the 26 *ap_courseX_jr* variables.
- *num_ap_courses_sr** (student-level): Number of AP courses taken in a student's senior year. Sum of the 26 *ap_courseX_sr* variables.
- *num_ap_courses_jrsr* (student-level): Number of AP courses taken in a student's junior and senior year. Sum of *num_ap_courses_jr* and *num_ap_courses_sr*.

- *any_ap_courses_jrsr* (student-level): Indicator for taking any AP courses in a student's junior or senior year. Equals 1 if *num_ap_courses_jrsr* is greater than 0 and equals 0 otherwise.
- *ap_X_jrsr** (school-year-level): 26 indicator variables denoting whether a school offered each of the 26 AP subjects to a cohort in their junior or senior year. Equals 1 for a given cohort, t, and subject, X, if any student from the school appears in MTS as taking AP course X in year t or $t-1$.
- *num_ap_jrsr* (school-year level): Number of AP courses available. Sum of the 26 *ap_X_jrsr* variables. Maximum possible value is 26 (observed max is 20).

* These variables are not used in analysis; they used to create analysis variables.

Michigan Student Data System (MSDS), A.K.A. MEDC K-12 Student Demographic and Enrollment Data

The MSDS measures K-12 enrollment for all public school students in Michigan.[12] It is a student-by-year file. The version I use covers the 2002-03 through 2017-18 academic years. Each observation is a unique student-by-year record, and includes key variables such as school the student attended, grade, and demographic characteristics (gender, race, and subsidized lunch status). I use 12th grade observations (from the variable *grade_fnl*, which measures grade) to identify cohorts of high school students in the years and schools covered by the MTS (using the variables *year* and *bcode_spring*, which indicates school).

Key variables derived from MSDS data:

- *year*: Indicates the spring of a student's 12th grade year. For students who repeated 12th grade, the first observation is used.
- *bcode*: ID variable identifying a student's high school. I use the MSDS variable *bcode_spring*, which identifies the school a student attended in the spring of a given school year. I use the school code from a student's 12th grade observation. For students who repeated 12th grade, the first observation is used.
- *frpl*: Indicator variable measuring whether a student was eligible for free or reduced-price lunch in 12th grade. Derived from the variable *freereduceddummy*.
- *black*, *hisp*, *amerin*, *hawaiian*, *white*, and *asianamer*: Variables indicating mutually exclusive race/ethnicity categories. I use the MSDS indicator variables of the same names with no further cleaning. The "Native"

[12]This dataset, which serves as the base student population file for all MEDC data, has changed names several times over the years. The data used to be collected through a system called the Single Record Student Database (SRSD). Starting in the 2010 school year, a new system called the Michigan Student Data System (MSDS) was introduced. Currently, MEDC refers to the student enrollment data as K12 Student Demographic and Enrollment Data. Although the intake process has changed somewhat, all contain the same essential information, so I refer to them interchangeably.

category in Table 1 combines *amerin* and *hawaiian* into a single category. For heterogeneity by race, I compare white and Asian students to all underrepresented minorities (Black, Hispanic, and Native).

MEDC Assessment Data

To measure students' pre-high school academic preparation, I use a student-year level file of standardized test scores. The Assessment file has test scores going back to 1994. I use 7th and 8th grade test scores for the cohorts I study; since they were in 12th grade between 2005 and 2012, they were in 7th grade between 2000 and 2007 and 8th grade between 2001 and 2008. During these years, the state of Michigan administered a standardized test called the Michigan Educational Assessment Program. The test"has been administered to students in grades 3-9, for Math, Reading, Science, Social Studies and Writing English and Language Arts (ELA), though the subjects administered in any given grade have changed over this time" (University of Michigan, 2019). For example, 7th graders took the math assessment in 1994 through 2000 and 2006 through 2013; 8th graders took the math assessment in 2002 though 2013 only. 7th graders took the reading assessment from 1994-2000 and 2002-2013; 8th graders took reading between 2006 and 2013. This means that neither 7th nor 8th grade reading test scores are available for the senior cohort of 2006, who were in 7th grade in 2001. The ELA scores similarly do not fully cover my sample: 7th graders took ELA 2003-2009 and 8th graders 2006-2009, so the classes of 2003 to 2007 are missing ELA scores. For maximum test score coverage, I use math scores. I take a student's 8th grade score if available, and 7th grade if not. I use the standardized scale score, which is standardized within subject, year, and grade. For students who took a given subject-by-grade assessment multiple times, I use their first test.

Key variables derived from Assessment data:

- *gr78_math* (student-level): Student's score on the 8th or 7th grade MEAP math assessment. 8th grade score is used if available, 7th grade is used if not. Scores are standardized within grade and year. Derived from the variable *mathstdss*, as well as *grade*, *year*, *MEAP*, and *nthtest*.
- *gr78_math_miss* (student-level): An indicator for whether a student is missing a 7th or 8th grade math score.
- *avg_gr78_math* (school-year level): Average middle school math score of a sophomore cohort. Takes the average of *gr78_math* within a school and year. For example, for the 12th grade class of 2010 who attended school S, variable takes the average of *gr78_math* among 10th graders at S in 2008. Students missing test scores are not included in the average. Creation of this variable also uses MSDS data to identify cohorts of students by school.

AP Exam Data

Information on AP exams is not included in the MTS, and comes from a separate data source from AP course-taking. The AP exam file was shared by the College Board and matched to MEDC student ID by name, birthdate, race, gender, and home zip code. The file I use is student-level. It includes subject-specific scores for all AP exam scores taken by Michigan public school students between 2006 and 2013. If a student took a given subject test multiple times, their highest score is reported. Because I measure AP participation in students' junior and senior year, this covers junior and senior exam-taking for the 2007 through 2012 cohorts I study.

The AP exam dataset contains a variable measuring the number of unique AP subject tests (out of 37 possible) a student took during the 2006-2013 time period. I use this variable with no further cleaning (except setting it to zero for the 2005 and 2006 cohorts). Unlike with the course data, the College Board can measure precisely which exams a student took, so there is no collapsing of subjects. For example, if a student took both micro and macroeconomics exams, that would count as two tests. Table B3 lists the 37 exam subjects.

Key variables derived from AP Exam data:

- *num_tests*: Number of AP exams a student took, out of 37 possible. Derived from *num_tests* variable with no further cleaning. Set to zero for students in the 2005 and 2006 senior cohorts.
- *any_ap_tests*: Indicator for taking any AP exams. Equals 1 if *num_tests* is greater than zero, equals 0 otherwise.

MEDC School-Level Data

In sensitivity analyses, I include time-varying school-level controls to my empirical specifications. Descriptive statistics for these variables appear in Table 1. All school-level variables (with the exception of average middle school test score) come from the MEDC School-Level dataset, which is a school-year level dataset that measures key characteristics about public schools in Michigan such as physical location and school size. Information is pulled from various state and federal data sources.

I use variables from this dataset with little additional cleaning. For a student in 12th grade in school S in year t, all school-year level variables are from year $t-2$.

Key variables derived from School-Level data:

- *enroll_soph* (school-year level): Total school enrollment in a cohort's sophomore year. Derived from the variable *enroll*. Original source is the Common Core of Data, National Center for Education Statistics. For example, for the 12th grade class of 2010 who attended school S, this variable takes the value of *enroll* at school S in 2008.

- *puptch_soph* (school-year level): School pupil-to-teacher ratio in a cohort's sophomore year. Derived from the variable *puptch*. Original source is the Common Core of Data.
- *pp_tot_instr_exp_soph* (school-year level): School per-pupil total instructional expenditures in a cohort's sophomore year. Derived from the variable *pp_tot_instr_exp*. Original source is Michigan's Financial Information Database.
- *d_unemployment_soph* (school-year level): Student-weighted unemployment for the school district the school is in, measured in a cohort's sophomore year. Derived from the variable *d_unemployment*, which is pulled from the Bureau of Labor Statistics.

National Student Clearinghouse Data (NSC)

The NSC provides information on college enrollment at and degrees awarded by postsecondary institution in the country (with a few exceptions), by term of enrollment and institution. As of 2011, the NSC covered 95 percent of postsecondary institutions in Michigan (Dynarski et al., 2015); it currently covers 98 percent of all students in U.S. institutions (National Student Clearinghouse, 2023). For a detailed description of the NSC and its coverage, see Dynarski et al. (2015).

The NSC data file I use covers postsecondary enrollment for the population of students who attended Michigan public K-12 schools. It covers enrollment between 2000 and 2020. The file is a wide, student-level dataset. For a given student and academic term (e.g., Fall 2010), I observe which institution(s) a student attended (by name and OPEID), whether they attended full-time or part-time, whether the institution is a two- or four-year school, and the school's Barron's classification. The NSC dataset also includes information on degrees: for a given student, the date of each degree received and the type of degree (Bachelor's, Master's, Associate's, etc.)

Any student who does not appear in the NSC data is assigned a value of zero for all enrollment and degree variables.

Key variables derived from NSC data:

- *enroll_in1yr* (student-level): Indicator for whether a student enrolled in any postsecondary institution in the fall or spring following 12th grade. Derived from the *fall_Y_ftX*, *fall_Y_ltftX*, *fall_Y_missX*, *spring_Y_ftX*, *spring_Y_ltftX*, *spring_Y_missX* variables, where Y indicates an academic year, and X institution. "ft" refers to full-time enrollment, "ltft" to less than full time, and "miss" to unknown status. X ranges from 1 to 20.
- *enroll_in1yr_2yr* (student-level): Indicator for whether a student enrolled in a postsecondary institution classified by NSC as a two-year institution

in the fall or spring following 12th grade. The two- and four-year variables are not mutually exclusive; a student who enrolled in both types would have a 1 for both variables. Derived from the same variables as *enroll_in1yr*, plus the variable *four_yrX*, which classifies each institution a student attended as a four- or two-year.

- *enroll_in1yr_4yr* (student-level): Indicator for whether a student enrolled in a postsecondary institution classified by NSC as a four-year institution in the fall or spring following 12th grade. The two- and four-year variables are not mutually exclusive; a student who enrolled in both types would have a 1 for both variables. Derived from the same variables as *enroll_in1yr_2yr*.
- *enroll_in1yr_compplus* (student-level): Indicator for whether a student enrolled in a postsecondary institution classified by Barron's as competitive, very competitive, highly competitive, or most competitive in the fall or spring following 12th grade. Derived from the same variables as *enroll_in1yr*, plus the variable *barronsX*, which classifies each institution a student attended into one of six Barron's categories.
- *grad_4yrs* (student-level): Indicator for whether a student earned a bachelor's degree within four years after expected high school graduation. Derived from the variables *degree_D_colX* and *grad_dateD_X* where X refers to institution and D refers to degree. *degree_D_colX* lists degree title; degrees labeled as B.S., B.A., Bachelor of Business, or Other Bachelor's are coded as bachelor's degrees. If a student graduated high school in year t, they are coded as earning a degree within four years if the degree date is before September of year $t + 4$.
- *grad_6yrs* (student-level): Indicator for whether a student earned a bachelor's degree within six years after expected high school graduation. Derived from the same variables as *grad_4yrs*. If a student graduated high school in year t, they are coded as earning a degree within six years if the degree date is before September of year $t + 6$.

Sample Restrictions

I begin with Michigan public high school students who were in 12th grade between the 2003 and 2012 school years (N= 1,291,201 observations, 1,213,107 unique students; recall that the MEDC student-level begin in 2003). I limit the sample to students in one of the 87 high schools covered by the MTS (N=245,953 observations, 244,153 unique students). In cases of duplicate observations (generally due to students repeating grades, N = 1,677 unique students), I keep the student's first (earliest) 12th grade observation.

The raw MTS data includes 16,881,239 student-course observations from 87 schools. The raw data includes 415,539 unique students with a valid student ID variable. Coverage drops off in 2013, from around 1.5 million observations per

year to only around 300,000. I keep observations between the 2002 and 2012 school years (N= 401,826 unique students).

Of the 244,153 first-time 12th graders in the student level data, I keep those who merge to the transcript data, meaning they appear at least once in the MTS between 2002 and 2012. 189,917 12th graders appear in both datasets. The merge rate is much lower for the 2003 and 2004 cohorts, with only 27 and 45 percent appearing in the transcript data. I keep the 2005 to 2012 cohorts only, for whom the merge rate with the transcript data is 87 percent overall and over 75 percent in any given year. The final sample includes 173,151 unique students who were (first-time) 12th graders between the 2004-05 and 2011-12 academic years.

For heterogeneity analysis by students' middle school test score, I restrict the sample to students with an 8th or 7th grade math score (N = 154,549 students). For analysis of AP exam-taking, I limit the sample to the 2007 through 2012 cohorts (N = 135,272 students).

Description of AP Course Coding

The original high school transcript dataset contains 16,881,239 student-course observations from 87 schools. I dropped any observations without a year (N=9,657) or with a non-sensical year (N=6 observations with a year of 1000). The original transcript study was designed to follow students who entered high school starting in the 2002 school year, so I dropped observations from before 2002 (N=382,507). Coverage drops off in 2013, from around 1.5 million observations per year to only around 300,000, so I also dropped courses from 2013 onward (N=407,312). This leaves 16,081,757 student-course observations between the 2002 and 2012 school years.

Each course has a title, which I used to identify AP courses. I first flagged course titles that included variants of the phrase "AP" or "Advanced Placement." These included the letters "AP" with various combinations of periods and spaces before and after, as well as the phrases "ADV PL," "ADVANCED PL," "ADVANCED PL, " "ADVPL," and "AD PL." I excluded course titles that contained matching phrases but which seemed to not be AP, such as "PHOTOGRAP (BEG)" (which contains "AP" followed by a space). I also excluded anything that referred to a "pre-AP" course, or variations of "pre-calculus." This first step resulted in 445,051 student-course observations and 3,267 unique course names flagged as potentially AP.

Among the courses flagged as potentially AP, I classified them into 26 subjects based on course title. For example, if a course title was both (a) flagged as potentially AP and (b) contained the string "ART HIS," it was classified as AP Art History. Certain subjects had many more potential phrases and titles indicating a given subject. Below I list all course titles that are classified as AP, by the subject I coded them as. I was forced to collapse certain AP subjects due to the impossibility of distinguishing by name. For example, I could not always distinguish between the multiple Computer Science offerings, or the multiple Physics offerings. As another example, Microeconomics and Macroeconomics are two distinct subjects, but many schools just listed "AP economics." Appendix Figure B1 summarizes the subjects that were combined.

Classifying AP courses into subjects was done iteratively. I started with more obvious phrases, such as "US HISTORY" and "STATISTICS," then looked at the titles of remaining courses flagged as potentially AP and adding additional phrases (e.g., "AMHST" for American History).

A few AP course subjects have similar names, in particular Computer Science, English Language and Composition, English Literature and Composition, and Comparative Government and Politics, which all include "comp." For courses named "AP COMP" or similar, I cross-checked with the AP exam data. For example, if most students at a given school who took "AP COMP" also took

one of the AP Computer Science exams (and did not take an English exam), I classified that course as AP Computer Science.

After classifying most potential AP courses into one of the 26 subjects, I was left with 119 unique course titles (N= 1,841 observations) that included some variation of "AP" but were not an obvious AP subject. Some had generic names with no indicated subject, such as "AP ADV TOPICS" or "ADV PLACEMENT." Some had the phrase "AP" but seemed to be something else, such as "OOC Learning EXP AP" or "S BAS COM AP." Others referred to academic subjects but not specific AP courses (e.g., "MATH ANALYSIS 1AP" or "SOC STUDIES II TT AP"). Since I was not reasonably certain these 119 courses were in fact AP, I did not classify them as such. I test the sensitivity of my main results to this decision by creating a version of the data where these 119 titles are counted as AP.[13] Doing so increases the number of students taking any AP by 203 (0.12 percentage points) and the average number of APs taken by 0.002. At the school-cohort level, the average number of APs available per cohort increases by 0.2 courses. With this new dataset, I re-estimate the main effects on coursetaking and college outcomes from Tables 2 and 6. The results are in Appendix Tables B4 and B5. Although the course-taking effects are a bit stronger, the magnitudes are similar. The effects on college outcomes are unchanged.

This process resulted in 3,147 unique course titles and 443,209 student-course observations that were classified as AP between 2002 and 2012. A school j was considered to offer an AP course x in a given year t if any student in school j appeared in the transcript data as taking course x in year t.

[13] I ultimately only use courses from 2004 to 2012. In these years, there were 101 ambiguous course titles. Please see list of AP course titles, below, for the exact course names.

Table B4: Effect of AP Course Availability on AP Course- and Exam-Taking, Counting Ambiguous Courses as AP

	(1) Any AP courses taken	(2) # AP courses taken	(3) Any AP exams taken	(4) # AP exams taken
# of AP courses available at school in junior and senior year	0.012*** (0.003)	0.035*** (0.010)	0.004** (0.002)	0.011 (0.008)
Mean of outcome variable	[0.352]	[0.788]	[0.274]	[0.736]
Kleibergen-Paap Wald F statistic	15.54	12.53	4.76	2.06
Observations	173,151	173,151	135,272	135,272
Cohorts	2005-2012	2005-2012	2007-2012	2007-2012

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimate of α_1 in Equation 1, which regresses student-level college course- and exam-taking on AP course availability. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. In this analysis, courses originally not coded as AP for having ambiguous course titles are counted as AP, both for the students taking them and the schools offering them. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses.

Table B5: Effect of AP Course Availability on College Outcomes, Counting Ambiguous Courses as AP

	(1) Enrolled any college	(2) Enrolled 2-year college	(3) Enrolled 4-year college	(4) Enrolled compet.+ college	(5) Earned BA in 4 years	(6) Earned BA in 6 years
# AP courses available junior and senior year	0.002 (0.002)	-0.001 (0.002)	0.002 (0.002)	0.002 (0.002)	0.001 (0.001)	0.001 (0.001)
Mean of outcome variable	[0.700]	[0.288]	[0.430]	[0.394]	[0.158]	[0.320]
Observations	173,151					
Cohorts	2005-2012					

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Table reports estimates of β_1 from Equation 3, which regresses student-level college outcomes on AP course availability. AP availability is measured at the school-by-cohort level, and counts the number of AP courses available to a high school cohort in their junior and senior year. In this analysis, courses originally not coded as AP for having ambiguous course titles are counted as AP. Regressions include school fixed effects, year fixed effects, and school-specific linear time trends. Robust standard errors clustered at the school level are in parentheses. All college outcomes are unconditional on initial enrollment.

List of AP Course Titles, by AP Subject, 2004 to 2012 Academic Years

Art History:

"AP ART HIST", "AP ART HIST 1A", "AP ART HIST 1B", "AP ART HIST S1", "AP ART HISTORY", "AP ART HISTORY (MIVHS)", "AP ART HISTORY1", "AP ART HISTORY2", "AP Art History 1", "APX AP ART HISTORY", "ART HIS AP 1", "ART HIS AP 2", "Art History 1 AP", "Art History 2 AP", "GEN NET AP ART HISTORY", "I/S AP ART HIST", "INDEPENDENT STUDY-AP ART HISTORY", "L AP ART HISTORY", "MVHS: AP ART HISTORY I-A", "MVHS: AP ART HISTORY I-B", "VHS - AP ART HISTORY B", "VHS-AP ART HISTORY 1"

Biology:

"*AP BIOLOGY", "*AP BIOLOGY 10", "*AP BIOLOGY 1", "*AP BIOLOGY 2", "402275 AP BIOLOGY", "406117 AP BIOLOGY", "A P BIOLOGY", "A P Biology", "A.P. BIOLOGY", "A.P. BIOLOGY LAB", "ADV PL BIOLOGY", "ADV PL BIOLOGY S1", "ADV PL BIOLOGY S2", "ADVANCED PLACEMENT BIOLOGY", "ADVANCED PLACEMENT BIOLOGY A", "ADVANCED PLACEMENT BIOLOGY B", "ADVANCED PLACEMENT BIOLOGY IS", "AP - BIOLOGY", "AP BIO", "AP BIO TI", "AP BIO 1", "AP BIO 2", "AP BIO 2 (HP)", "AP BIO A", "AP BIO B", "AP BIO C", "AP BIO I A", "AP BIO II B", "AP BIO LAB", "AP BIO RETC S1", "AP BIO RETC S2", "AP BIO TEST", "AP BIO WT S1", "AP BIO WT S1 R", "AP BIO WT S1 (R)", "AP BIO WT S2", "AP BIOL AA", "AP BIOL BB", "AP BIOLOGY", "AP BIOLOGY -A", "AP BIOLOGY -B", "AP BIOLOGY -C", "AP BIOLOGY -A", "AP BIOLOGY -B", "AP BIOLOGY -C", "AP BIOLOGY S2", "AP BIOLOGY TI", "AP BIOLOGY 10", "AP BIOLOGY B", "AP BIOLOGY (HONORS CLASS)", "AP BIOLOGY (T)", "AP BIOLOGY 1", "AP BIOLOGY 1A", "AP BIOLOGY 1B", "AP BIOLOGY 2", "AP BIOLOGY A", "AP BIOLOGY A (CRESTWOOD H.S.)", "AP BIOLOGY A-BYU", "AP BIOLOGY AP IA OL", "AP BIOLOGY B", "AP BIOLOGY B-BYU", "AP BIOLOGY C", "AP BIOLOGY LAB", "AP BIOLOGY S1", "AP BIOLOGY S2", "AP BIOLOGY TC", "AP BIOLOGY TI", "AP BIOLOGY WT", "AP BIOLOGY-1", "AP BIOLOGY-1ST SEM.", "AP BIOLOGY-1st Sem.", "AP BIOLOGY-2", "AP BIOLOGY-2ND SEM.", "AP BIOLOGY-2nd Sem.", "AP BIOLOGY-3", "AP BIOLOGY-A", "AP BIOLOGY-B", "AP BIOLOGY-C", "AP BIOLOGY-R", "AP BIOLOGY-S1", "AP BIOLOGY-S2", "AP BIOLOGY-TR", "AP BIOLOGY/TI", "AP Biology", "AP Biology A-BYU", "APX AP BIOLOGY", "BIO AP", "BIOLOGY / AP", "BIOLOGY 1 AP", "BIOLOGY 1 AP T", "BIOLOGY 1AP", "BIOLOGY 2 AP", "BIOLOGY 2 AP T", "BIOLOGY 2 AP TI", "BIOLOGY 2AP", "BIOLOGY A P - T", "BIOLOGY AP", "BIOLOGY AP TI", "BIOLOGY I AP", "BIOLOGY, AP", "Biology AP", "Biology AP 1", "Biology DP AP", "CHARD AP BIO", "D AP BIOLOGY", "D AP BIOLOGY A", "D AP BIOLOGY B", "D AP BIOLOGY C", "DIRECTED STUDY - AP BIOLOGY", "IND-AP BIOLOGY", "KAMSC AP BIO", "KAMSC AP BIOL", "KAMSC AP BIOLOGY", "MSC AP BIOLOGY", "MST AP BIOLOGY", "MVHS AP BIOLOGY", "MVHS: AP BIOLOGY A (H)", "OL AP BIOLOGY", "OL AP BIOLOGY S2", "OLL AP BIO S1(R)", "OLL AP BIOLOGYWT", "OLL APBIO S1 (R)", "ON-LINE AP BIOLOGY", "ONLINE AP BIOLOGY", "SC AP BIOL", "SC BIOLOGYAP", "T - AP BIO LAB", "T - AP BIOLOGY", "T AP BIOLOGY", "TC AP BIOLOGY", "TR ADV PL BIO", "TR AP BIO", "TR AP BIOLOGY", "TR-AP BIOLOGY", "TRANS AP BIOLO", "TRANS AP BIOLOG", "TRAVEL AP BIO A", "TRNS BIO AP", "VH AP BIO", "VH AP BIOL", "VMV AP BIOLOGY", "Y AP BIOLOGY"

Calculus:

"*AP CALCULUS", "*AP CALCULUS 1", "*AP CALCULUS 2", "*AP CALCULUS AB", "*AP CALCULUS BC", "*AP CALCULUS BC 10", "406117 AP CALCULUS", "A P CALC", "A P CALCULUS", "A P CALCULUS AB", "A P CALCULUS BC", "A P Calculus AB", "A P Calculus BC", "A.P. CALCULUS", "ADV PL CALCULUS", "ADV PL CALCULUS 1S", "ADV PL CALCULUS 2S", "ADV PL CALCULUS S1", "ADV PL

CALCULUS S2", "ADVANCED PLACEMENT CALC MMSTC A", "ADVANCED PLACEMENT CALC MMSTC B", "ADVANCED PLACEMENT CALCULUS A", "ADVANCED PLACEMENT CALCULUS AB", "ADVANCED PLACEMENT CALCULUS B", "ADVANCED PLACEMENT CALCULUS BC", "AP - CALCULUS", "AP - CALCULUS AB", "AP - CALCULUS BC", "AP CALC", "AP CALC -A", "AP CALC -B", "AP CALC -C", "AP CALC TI", "AP CALC I.S.", "AP CALC - VHS", "AP CALC 12 S1", "AP CALC 12 S2", "AP CALC A", "AP CALC A/B", "AP CALC AA", "AP CALC AB", "AP CALC AB (1)", "AP CALC AB (2)", "AP CALC AB 1A", "AP CALC AB 1B", "AP CALC AB A", "AP CALC AB B", "AP CALC AB-A", "AP CALC AB-B", "AP CALC AB-C", "AP CALC AB1", "AP CALC AB2", "AP CALC B", "AP CALC BB", "AP CALC BC", "AP CALC BC A", "AP CALC BC B", "AP CALC BC A", "AP CALC BC B", "AP CALC BC I A", "AP CALC BC II B", "AP CALC BC-A", "AP CALC BC-B", "AP CALC BC-C", "AP CALC BC/TI", "AP CALC C", "AP CALC E2020", "AP CALC IA", "AP CALC IB", "AP CALC S1", "AP CALC S2", "AP CALC TEST", "AP CALC-1", "AP CALC-2", "AP CALC-3", "AP CALC/TI", "AP CALCAB AA", "AP CALCAB BB", "AP CALCBC AA", "AP CALCBC BB", "AP CALCUL AB", "AP CALCUL BC", "AP CALCULAS", "AP CALCULAS AB", "AP CALCULS", "AP CALCULUS", "AP CALCULUS -A", "AP CALCULUS -B", "AP CALCULUS -C", "AP CALCULUS AB 10", "AP CALCULUS AB AUDIT", "AP CALCULUS (1)", "AP CALCULUS (2)", "AP CALCULUS (3)", "AP CALCULUS (4)", "AP CALCULUS (A)", "AP CALCULUS (B)", "AP CALCULUS (C)", "AP CALCULUS - TR", "AP CALCULUS 1", "AP CALCULUS 1A (MIVHS)", "AP CALCULUS 1B (MIVHS)", "AP CALCULUS 2", "AP CALCULUS A", "AP CALCULUS A/B-S1", "AP CALCULUS A/B-S2", "AP CALCULUS A/T", "AP CALCULUS AB", "AP CALCULUS AB T", "AP CALCULUS AB (audited)", "AP CALCULUS AB 10", "AP CALCULUS AB (A)", "AP CALCULUS AB (B)", "AP CALCULUS AB (C)", "AP CALCULUS AB 1", "AP CALCULUS AB 10", "AP CALCULUS AB 2", "AP CALCULUS AB A", "AP CALCULUS AB B", "AP CALCULUS AB C", "AP CALCULUS AB TI", "AP CALCULUS ACC", "AP CALCULUS B", "AP CALCULUS B/C-S1", "AP CALCULUS B/C-S2", "AP CALCULUS BC", "AP CALCULUS BC T", "AP CALCULUS BC 10", "AP CALCULUS BC (A)", "AP CALCULUS BC (B)", "AP CALCULUS BC (C)", "AP CALCULUS BC 10", "AP CALCULUS BC A", "AP CALCULUS BC B", "AP CALCULUS BC C", "AP CALCULUS BC MIVHS", "AP CALCULUS BC-A (MVHS)", "AP CALCULUS BC-B (MVHS)", "AP CALCULUS BC-C (MVHS)", "AP CALCULUS C", "AP CALCULUS I", "AP CALCULUS I.S.", "AP CALCULUS II", "AP CALCULUS MVU", "AP CALCULUS S1", "AP CALCULUS S2", "AP CALCULUS-1ST SEM.", "AP CALCULUS-1st Sem.", "AP CALCULUS-2ND SEM.", "AP CALCULUS-2nd Sem.", "AP CALCULUS-A", "AP CALCULUS-B", "AP CALCULUS-IND. STUDY", "AP CALCULUS-S1", "AP CALCULUS-S2", "AP CALCULUS-U OF NEBRASKA", "AP CALCULUS/TRA", "AP CALCULUS2", "AP Calc 1Tri", "AP Calculus", "AP Calculus AB", "AP I.S. CALCULUS", "AP MS CALC BC S1", "AP MS CALC BC S2", "ATYP-AP CAL A/B", "ATYP-AP CAL B/C", "AV10-APCALC BC A", "CALC AP", "CALC/AB AP", "CALC/BC AP", "CALCULUS / AP", "CALCULUS 1AP", "CALCULUS 2AP", "CALCULUS AB - AP", "CALCULUS AB, AP", "CALCULUS AB, AP IS", "CALCULUS AP", "CALCULUS AP TI", "CALCULUS BC - AP", "CALCULUS BC, AP", "CALCULUS, AP ABII OL", "CALCULUS-BC AP", "CALUCLUS AP", "Calculus AP", "Calculus AP AB", "Calculus AP AB - do not use", "Calculus AP BC", "Calculus AP BC - do not use", "DS AP CAL AB", "DS AP CALC BC A", "DS AP Cal AB", "E AP CALC", "E AP CALC 3 - I.S.", "E AP CALC WP", "E AP CALC. 1 - IS", "E AP CALC. 2 - IS", "E AP CALC/MMSTC", "E AP CALC/MMSTC A", "E AP CALC/MMSTC B", "E AP CALC/MMSTC C", "E AP CALC/MMSTC-1", "E AP CALC/MMSTC-3", "E AP CALCULUS", "E AP CALCULUS 1", "E AP CALCULUS 2", "E AP CALCULUS A", "E AP CALCULUS B", "E AP CALCULUS C", "E AP CALCULUS II", "E AP CALCULUS III", "E AP CALCULUS-1", "E AP CALCULUS-2", "E AP CALCULUS-3", "E APCALCULUS", "E IS AP CALC", "E IS AP CALCULUS", "E

IS AP CALCULUS A", "GEN-AP CALC", "IND-AP CALCULUS", "IS AP CALCULUS", "KAMSC AP CAL BC", "KAMSC AP CALC", "KAMSC AP CALCULUS AB", "KAMSC AP CALCULUS BC", "KAMSC APCALC AB", "KAMSC APCALC BC", "KAMSC-AP CAL AB", "KAMSC-AP CAL BC", "M AP CALC", "M AP CALC 12", "M HON AP CALC", "MA AP CALCAB", "MA AP CALCBC", "MIVHS AP CAL AB", "MS AP CALCULUS", "MS AP Calculus", "MS/AP CALC AB", "MS/AP CALC BC", "MS:AP CALCULUS", "MSC AP CALC", "MSC AP CALCULUS", "MST AP CALC", "MST AP CALC 1", "MST AP CALC 2", "MST AP CALC AB", "MST AP CALCULUS", "MST AP CLAC", "MST AP Calc", "MVHS CALC AB AP", "MVHS CALCAB AP", "MVHS-AP B/C CALCULUS", "MVHS-AP CALCULUS", "MVHS-AP CALCULUS/BC", "MVS/AP CALC BC", "Ms AP Calculus", "OL AP CALCULUS", "OL AP CALCULUS S2", "ONLINE AP CALCBC", "ONLINE AP CALCULUS", "ONLINE AP CALCULUS-BC", "TC AP CALCULUS", "TR AP CALC AB", "TR AP CALC BC", "TR AP CALCULUS AB", "TR AP CLACULUS AB", "TR APCALC AB", "TR V AP CALCULS", "TR- AP CALC C", "TR- AP CALC A", "TR- AP CALC B", "TR- AP CALCULUS", "TR-AP CALCULUS", "TRANS/AP CALC", "TVL AP CALC BCA", "TVL AP CALC BCB", "TVL AP CALC BCC", "W E AP CALC", "Y AP CALCULUS"

Chemistry:

"*AP CHEM 10", "*AP CHEM 1", "*AP CHEM 2", "*AP CHEMISTRY", "A P CHEMISTRY", "A P CHEMISTRY -A", "A P CHEMISTRY -B", "A P CHEMISTRY -C", "A.P. CHEM 1", "A.P. CHEM 2", "A.P. CHEMISTRY", "A.P.CHEM. 1", "A.P.CHEM. 2", "ADV PL CHEMISTRY", "ADV PL CHEMISTRY S1", "ADVANCED PLACEMENT CHEMISTRY", "ADVANCED PLACEMENT CHEMISTRY 2", "AP - CHEMISTRY", "AP ADV CHEM", "AP BIO/CHEM LAB", "AP CHEM", "AP CHEM 10", "AP CHEM - 1", "AP CHEM - 2", "AP CHEM 1", "AP CHEM 12 S1", "AP CHEM 12 S2", "AP CHEM 2", "AP CHEM 2/3", "AP CHEM 3", "AP CHEM A", "AP CHEM AA", "AP CHEM AA *R*", "AP CHEM B", "AP CHEM BB", "AP CHEM C", "AP CHEM II", "AP CHEM S1", "AP CHEM S2", "AP CHEM TEST", "AP CHEM TI", "AP CHEM WT", "AP CHEM-1", "AP CHEM-2", "AP CHEM-3", "AP CHEM-TR", "AP CHEM/TI", "AP CHEMIST A", "AP CHEMIST B", "AP CHEMIST C", "AP CHEMISTRY", "AP CHEMISTRY -A", "AP CHEMISTRY -B", "AP CHEMISTRY -C", "AP CHEMISTRY T", "AP CHEMISTRY (MVHS)", "AP CHEMISTRY S1", "AP CHEMISTRY (1", "AP CHEMISTRY (2", "AP CHEMISTRY (3", "AP CHEMISTRY (4", "AP CHEMISTRY - OL", "AP CHEMISTRY - TR", "AP CHEMISTRY 1", "AP CHEMISTRY 1/2", "AP CHEMISTRY 1A", "AP CHEMISTRY 1A1", "AP CHEMISTRY 1B", "AP CHEMISTRY 1B1", "AP CHEMISTRY 2", "AP CHEMISTRY 4", "AP CHEMISTRY A", "AP CHEMISTRY A ", "AP CHEMISTRY B", "AP CHEMISTRY C", "AP CHEMISTRY S1", "AP CHEMISTRY S2", "AP CHEMISTRY TI", "AP CHEMISTRY WT", "AP CHEMISTRY-A", "AP CHEMISTRY-B", "AP CHEMISTRY-C", "AP CHEMISTRY/TI", "AP CHEMISTRY/TR", "AP CHEMSTY A", "AP CHEMSTY B", "AP Chemistry", "AP INORGANIC CHEM", "AP INORGNC CHEM I.S.", "APCHEM WT S1", "APCHEM WT S2", "CHEM AP 12 S2", "CHEM LAB AP", "CHEM LAB AP S1", "CHEM LAB AP S2", "CHEMISTRY &LAB AP", "CHEMISTRY / AP", "CHEMISTRY 1AP", "CHEMISTRY 2 AP", "CHEMISTRY 2AP", "CHEMISTRY AP", "CHEMISTRY AP 1S", "CHEMISTRY AP 2S", "CHEMISTRY AP S1", "CHEMISTRY AP S2", "CHEMISTRY AP T", "CHEMISTRY AP TI", "CHEMISTRY LAB, AP", "CHEMISTRY&LAB AP", "CHEMISTRY, AP", "Chemistry 1 AP", "Chemistry 1 AP Sem 2", "Chemistry 2 AP", "Chemistry AP", "D AP CHEM", "D AP CHEM C", "D AP CHEM CD", "D AP CHEM.", "D AP CHEMISTRY", "D AP CHEMISTRY A", "D AP CHEMISTRY B", "D AP CHEMISTRY C", "D AP CHEMISTRY-1", "D AP CHEMISTRY-2", "D AP CHEMISTRY-3", "DIR STDY: AP CHEM WORK", "ILP: AP CHEMISTRY", "IND - AP CHEMISTRY", "JST AP CHEMISTRY", "KAMSC AP CHEM", "KAMSC AP CHEMISTRY", "MS CHEM AP", "MS CHEM AP S1", "MS CHEM AP S2", "MSC AP CHEM", "MSC AP CHEM.", "MST AP CHEM", "MST AP CHEMISTRY", "OL: AP CHEMISTRY", "SC AP CHEM", "T - AP

CHEMISTR", "T- CHEMISTRY AP", "TR AP CHEM", "TR AP CHEM AA", "TR AP CHEM BB", "TR AP CHEMISTRY", "TR SC AP CHEMIST", "TR-AP CHEMISTRY", "TRANS AP CHEM", "TRANS/AP CHEM", "TRNS AP CHEM", "TRNS AP CHEMSTRY", "V VMV AP CHEM", "VHS - AP CHEM", "VHS-AP CHEM", "VHS-AP CHEMISTRY 1", "VHS-AP Chem", "VHS-AP Chemistry", "VMV AP CHEM 1A", "VMV AP CHEMISTRY", "Y AP CHEMISTRY"

Chinese:
"CHINESE AP CR", "TR-AP CHINESE"

Comparative Government and Politics:
"AP CMP GOV/POL", "AP COM GOV-1", "AP COMP POL", "AP COMP GOV", "AP COMP GOV/PO", "AP COMP GOV/POL", "AP COMP GOVT", "AP COMP GOVT 05", "AP COMP GOVT B", "AP COMPARATIVE GOV'T C", "AP COMPARE GOVERN", "C AP COMP GOVT/POLITICS", "COMP GOVT AP", "IND STDY/ AP COMP GOVT", "IND STUDY (AP COMP GOV)", "IS/AP CMP GV/PO", "IS/AP COMP GOV", "TR/TR AP COMPERATIVE POLITICS"

Computer Science:
"*AP COMP 1", "*AP COMP 2", "*AP COMP SCI JAVA", "ADVANCED PLACEMENT COMPUTER SCIENCE", "AP CMPSCI A A", "AP CMPSCI A B", "AP CMPSCI A IIB", "AP CMPSCI AB A", "AP CMPSCI AB B", "AP CMPT'R SCIENCE/TI", "AP CMPTR SC MVHS", "AP COMP PROG (MVHS)", "AP COMP SC A 1A", "AP COMP SC A 1B", "AP COMP SC A IA", "AP COMP SCI", "AP COMP SCI A", "AP COMP SCI B", "AP COMP SCI HOME", "AP COMP SCI1", "AP COMP SCI2", "AP COMP SCIA", "AP COMP SCIB", "AP COMPUTER PROGRAMMING", "AP COMPUTER SCI", "AP COMPUTER SCI (IS)", "AP COMPUTER SCI PART 1", "AP COMPUTER SCIENCE", "AP COMPUTER SCIENCE 1A OL", "AP COMPUTER SCIENCE 1B OL", "AP COMPUTER SCIENCE A", "AP COMPUTER SCIENCE AP IA OL", "AP COMPUTER SCIENCE B", "AP COMPUTER SCIENCE C", "AP COMPUTER WT", "AP CPSCI AA", "AP CPSCI BB", "AP CPT SCI WT", "AP JAVA STUDIES S2 05", "AP MS CMP SCI S1", "AP MS CMP SCI S2", "AP MS CP SCI 12 S1", "APCOMPSCI S2", "APCOMPSCIHS1", "BUSINESS COMPUTER AP", "CCSS/COMPUTER AP", "CMP SCI JAVA AP", "COLLEGE AP COMPUTER SCIENCE-MVU", "COMP SCIENCE 1AP", "COMP SCIENCE 2AP", "COMPUTER AP 1", "COMPUTER AP", "COMPUTER AP I", "COMPUTER EAP RD", "COMPUTER SCI AP", "COMPUTER SCIENCE - AP", "COMPUTER SCIENCE AP", "COMPUTER SCIENCE AP IB OL", "E AP C++ COMPUTER PROGRAM", "ER AP COMP SCI", "G COMPUTER AP", "GEN NET AP COMPUTER SCIENCE", "GENNET AP COMPUTER SCIENCE", "INTM.COMPUTER AP", "JAVA/AP PROGRAMMING", "KAMSC AP COMPUTER SCIENCE", "KAMSC APCOM SCI", "MICROCOMPUTER AP", "MS AP CMP SCI S1", "MS AP CMP SCI S2", "MS AP COMPUTER SCIENCE S1", "MS AP COMPUTER SCIENCE S2", "MS CMP SCI JAVA AP", "MS JAVA AP", "MSC AP COMPUTER", "MVHS APCOMPTRSCI", "MVHS COMP SCI AP", "MVHS COMPSCI AP", "MVHS-AP COMPUTER SCIENCE", "OL AP COMPUTER SCI", "ONLINE AP COMPUTER SCIENCE", "T - COMPUTER AP", "T-COMPUTER AP", "TC COMPUTER AP", "TR AP COMPUTER", "TR COMPUTER AP", "TR COMPUTER AP I", "TR-COMPUTERS AP", "V AP COMP PRG 2", "V AP COMP SCIENC", "V AP COMPSCI", "VHS - AP COMPUTER SCIENCE B", "VHS-AP COMPUTER SCI-A1", "VHS-AP Comp. Science", "VHS-AP Comp.Sci.A"

Economics:
"*AP MACROECONOMICS", "*AP MICROECONOMICS", "0 HR AP MICR", "AM ECONOMICS AP", "AP ECOMONICS A", "AP ECON", "AP ECON HOME SCH", "AP ECON MACRO", "AP ECON MICRO", "AP ECON MICRO & MACRO TI", "AP ECON-1", "AP ECON-2", "AP ECON-3", "AP ECONOMICS", "AP ECONOMICS -A", "AP ECONOMICS -B", "AP ECONOMICS A", "AP ECONOMICS B", "AP ECONOMICS C", "AP ECONOMICS S1", "AP ECONOMICS S2", "AP ECONOMICS TI", "AP

ECONOMICS-R", "AP M/M ECON1", "AP M/M ECON2", "AP M/M ECON3", "AP MA ECO 05", "AP MACRO ECO", "AP MACRO ECON", "AP MACRO ECON TI", "AP MACRO ECON.", "AP MACRO ECON. TI", "AP MACRO ECONOMICS", "AP MACRO ECONOMICS/TI", "AP MACROECON", "AP MACROECON (MVHS)", "AP MACROECON 05", "AP MACROECON (MVHS)", "AP MACROECON A (MVHS)", "AP MACROECON B (MVHS)", "AP MACROECON TI", "AP MACROECONOMICS", "AP MACROECONOMICS (IS)", "AP MACROECONOMICS (MVHS)", "AP MACROECONOMICS C", "AP MACROECONOMICS MIVHS", "AP MACROECONOMICS OL", "AP MACROECONOMICS-A", "AP MACROECONOMICS-B", "AP MIC ECO05", "AP MIC ECON 05", "AP MICRO ECON", "AP MICRO ECONOMICS", "AP MICRO ECONOMICS AVENTA", "AP MICRO ECONOMICS AVENTA", "AP MICRO ECONOMICS T AVENTA", "AP MICRO ECONOMICS - TR", "AP MICROECON", "AP MICROECON 05", "AP MICROECON - MI VIRT HS", "AP MICROECON 05", "AP MICROECONOMICS", "AP MICROECONOMICS A", "AP MICROECONOMICS B", "AP MICROECONOMICS OL", "AP MICROECONOMICS-A", "AP MICROECONOMICS-B", "AP Macroecon", "APEX APMICROECWT", "APMACRECN WT", "APMACRECN1WT", "APMACRECN1WT (R)", "APMICRECN WT", "APMICRECN2WT", "APMICRECN2WT (R)", "APMICRECON WT(R)", "APX AP MAECO", "APX AP MIECO", "C AP ECONOMICS", "C AP MACRO ECON", "C AP MACROECONOM", "C AP MICROECON", "DS AP ECON", "DS AP ECON B", "DS AP MIC ECN A", "ECON MA AP", "ECONOMICS 2AP", "ECONOMICS AP", "ECONOMICS AP CR", "ECONOMICS AP TI", "I.S. AP MACRO", "IND STUDY S2 (AP Macro Econ)", "ISAP ECON S2", "MACROECON AP", "MACROECONOMICS, AP", "MICHVIRT- AP MICROECONOMICS", "MICHVIRT-AP MACROECONOMICS", "MICRO ECON AP", "MICROECONOMICS AP", "MICROECONOMICS AP ", "MV AP MACROECON", "MV AP MACROECONO", "MV AP MICROECON", "MVHS AP MACROECON", "MVHS/AP MACROEC", "MVHS/AP MICROEC", "OL AP MACRO ECON", "ON-LINE AP MACROECONOMICS", "ON-LINE AP MICROECONOMICS", "ONLINE AP ECONOMICS", "SS AP MIECON", "TC AP MAC ECONO", "TR AP MACROECON", "TR AP MAECON", "TR AP MICRO ECO", "TR AP MICRO/MAC", "TR AP MICROECONOMICS", "V AP MIECON", "V SS AP MACROECO", "V SS AP MICROECO", "V SS APMACEC", "VHS AP MACRO ECONOMICS", "VHS AP MICRO ECONOMICS", "VHS AP MICROECONOMICS", "VHS-AP MICROECONOMICS", "VHS-AP Macro Econ", "VMV AP MACROECON", "VMV AP MICROECON"

English:

"*AP ENG LANG & COMP 10", "*AP ENGLISH", "*AP ENGLISH 1", "*AP ENGLISH 2", "*AP ENGLISH LITERATURE", "11 ENGLISH AP", "12 AP ENGLISH A", "12 AP ENGLISH B", "12 AP ENGLISH C", "12 ENGLISH AP", "402275 AP COLLEGE ENG", "402275 AP ENG LIT/COMP", "A P ENGLISH", "A P LIT/COMP", "A P Lit/Comp", "A.P. ENGLISH LIT & COMP", "A.P. ENGLISH LIT. & COMP.", "A.P. LANG & COMP.", "A.P. LANG & COMP", "A.P. LANGUAGE AND COMPOSITION", "ADV PL ENG/LANG COMP T", "ADV PL ENGLISH", "ADV PL ENGLISH 1S", "ADV PL ENGLISH 2S", "ADV PL ENGLISH S1", "ADV PL ENGLISH S2", "ADV PL LAN & COMP", "ADV PL LIT & COMP", "ADVANCED PLACEMENT LANGUAGE & COMP B IS", "ADVANCED PLACEMENT ENGLISH LANGUAGE/COMP", "ADVANCED PLACEMENT ENGLISH LITERATURE AN", "ADVANCED PLACEMENT LANGUAGE COMP A", "ADVANCED PLACEMENT LANGUAGE COMP B", "ADVANCED PLACEMENT LITERATURE A", "ADVANCED PLACEMENT LITERATURE B", "AHILL AP LIT TI", "AHILL AP LIT10TI", "AM LIT/ENG LANG COMP AP H T", "AMER LITERATURE- AP TR", "AP - ELA 10", "AP - ELA 11", "AP - ENG LANG.COMP - TR", "AP - LANGUAGE & COMP", "AP - LANGUAGE & COMP A", "AP - LANGUAGE & COMP B", "AP - LANGUAGE & COMPOSITION", "AP - LITERATURE & COMP.", "AP 11 LANG/COMP", "AP 12 LIT/COMP", "AP AM LIT

S1", "AP AM LIT S2", "AP AMER LIT", "AP AMERICAN LIT", "AP AMERICAN LIT. -A", "AP AMERICAN LIT. -B", "AP BRITISH LIT", "AP BRITISH LIT -A", "AP BRITISH LIT -B", "AP COL.ENG. (1)", "AP COL.ENG. (2)", "AP COL.ENG. (3)", "AP COL.ENG. (4)", "AP COLL ENGLISH", "AP COLLEGE ENG", "AP COMP & LI", "AP COMP 1", "AP COMP 2", "AP COMP 3", "AP COMP 4", "AP COMP A", "AP COMP B", "AP COMP C", "AP COMPOSITION", "AP Comp & Lit - MV", "AP EN LANG A", "AP EN LANG B", "AP EN LANG C", "AP ENG", "AP ENG LIT B IS ", "AP ENG (MVHS)", "AP ENG /IT/COMP", "AP ENG 1", "AP ENG 1-2", "AP ENG 11", "AP ENG 11-1", "AP ENG 11-2", "AP ENG 12", "AP ENG 12 A", "AP ENG 12 B", "AP ENG 12-1", "AP ENG 12-1 A", "AP ENG 12-1 B", "AP ENG 12-1 I A", "AP ENG 12-2", "AP ENG 12A", "AP ENG 12B", "AP ENG A", "AP ENG A/B", "AP ENG B", "AP ENG C L A", "AP ENG C L B", "AP ENG C L C", "AP ENG C/L A", "AP ENG C/L B", "AP ENG C/L C", "AP ENG COMP/TI", "AP ENG COMPTI", "AP ENG III", "AP ENG LAN/CMP", "AP ENG LAN/COMP", "AP ENG LANG", "AP ENG LANG S1", "AP ENG LANG & C", "AP ENG LANG & COMP", "AP ENG LANG & COMP 10", "AP ENG LANG & COMP 10", "AP ENG LANG & LIT", "AP ENG LANG (1)", "AP ENG LANG (2)", "AP ENG LANG A", "AP ENG LANG B", "AP ENG LANG COMP A", "AP ENG LANG COMP-LINCOLN PARK", "AP ENG LANG WT", "AP ENG LANG&COMP-LINCOLN PARK", "AP ENG LANG/COM", "AP ENG LANG/COMP", "AP ENG LANGUAGE (T)", "AP ENG LIT", "AP ENG LIT T1", "AP ENG LIT TI", "AP ENG LIT A", "AP ENG LIT B", "AP ENG LIT & COMP", "AP ENG LIT & COMP 10", "AP ENG LIT & COMP A", "AP ENG LIT (1)", "AP ENG LIT (2)", "AP ENG LIT A", "AP ENG LIT A IS", "AP ENG LIT B", "AP ENG LIT C", "AP ENG LIT C IS", "AP ENG LIT I.S.", "AP ENG LIT&COMP", "AP ENG LIT/CMP", "AP ENG LIT/COM", "AP ENG LIT/COMP", "AP ENG LITERATURE", "AP ENG LITS1", "AP ENG LITS2", "AP ENG LN/CM 1A", "AP ENG LN/CM 1B", "AP ENG LNG CMP S1", "AP ENG LNG CMP S2", "AP ENG LNG/COM", "AP ENG LNGS1", "AP ENG LNGS2", "AP ENG TEST", "AP ENG WT S1", "AP ENG WT S2", "AP ENG- LIT", "AP ENG-LIT", "AP ENG-LIT/COMP", "AP ENG. LANG/COMP 1", "AP ENG. LIT", "AP ENG.-LAN/COM", "AP ENG.LANG.& COMP.A", "AP ENG.LANG.& COMP.B", "AP ENG.LIT.& COMP. A", "AP ENG.LIT.& COMP. B", "AP ENGL 11", "AP ENGL 12", "AP ENGLISH", "AP ENGLISH WT", "AP ENGLISH (IS)", "AP ENGLISH (MVHS)", "AP ENGLISH - TR", "AP ENGLISH 1", "AP ENGLISH 11", "AP ENGLISH 11/TI", "AP ENGLISH 11A", "AP ENGLISH 12", "AP ENGLISH 12A", "AP ENGLISH 2", "AP ENGLISH 3/TI", "AP ENGLISH 5", "AP ENGLISH 6", "AP ENGLISH 9", "AP ENGLISH 9 - TR", "AP ENGLISH A", "AP ENGLISH B", "AP ENGLISH C", "AP ENGLISH COMP", "AP ENGLISH COMP-1ST SEM.", "AP ENGLISH COMP-1st Sem.", "AP ENGLISH COMP-2ND SEM.", "AP ENGLISH COMP-2nd Sem.", "AP ENGLISH COMP-S1", "AP ENGLISH COMP-S2", "AP ENGLISH LANG", "AP ENGLISH LANG & CO", "AP ENGLISH LANG & COMP A", "AP ENGLISH LANG & COMP B", "AP ENGLISH LANG & COMP C", "AP ENGLISH LANG & COMPOSITION", "AP ENGLISH LANG & COMPOSITION-A", "AP ENGLISH LANG & COMPOSITION-B", "AP ENGLISH LANG - TR", "AP ENGLISH LANG COMP - TR", "AP ENGLISH LANG/COMP A", "AP ENGLISH LANG/COMP B", "AP ENGLISH LANG/COMP C", "AP ENGLISH LANGUAGE", "AP ENGLISH LANGUAGE & COMP. B", "AP ENGLISH LANGUAGE & COMP. A", "AP ENGLISH LANGUAGE & COMP. B", "AP ENGLISH LANGUAGE & COMPOSITION A", "AP ENGLISH LANGUAGE & COMPOSITION B", "AP ENGLISH LANGUAGE A", "AP ENGLISH LANGUAGE AND COMP.", "AP ENGLISH LANGUAGE B", "AP ENGLISH LANGUAGE C", "AP ENGLISH LANGUAGE/COMP", "AP ENGLISH LANGUAGE/COMP A", "AP ENGLISH LANGUAGE/COMP B", "AP ENGLISH LIT", "AP ENGLISH LIT & COMP A", "AP ENGLISH LIT & COMP B", "AP ENGLISH LIT & COMP C", "AP ENGLISH LIT (IS)", "AP ENGLISH LIT A", "AP ENGLISH LIT AND COMP", "AP ENGLISH LIT AND COMP 12A", "AP ENGLISH LIT AND COMP 12B", "AP ENGLISH LIT AND COMP 12C", "AP ENGLISH LIT B", "AP ENGLISH LIT C", "AP ENGLISH LIT-1ST

SEM.", "AP ENGLISH LIT-1st Sem.", "AP ENGLISH LIT-2ND SEM.", "AP ENGLISH LIT-2nd Sem.", "AP ENGLISH LIT-S1", "AP ENGLISH LIT-S2", "AP ENGLISH LIT. & COMP. A", "AP ENGLISH LIT. & COMP. B", "AP ENGLISH LIT/TI", "AP ENGLISH LITERATURE", "AP ENGLISH LITERATURE & COMP", "AP ENGLISH LITERATURE & COMP-A", "AP ENGLISH LITERATURE & COMP-B", "AP ENGLISH LITERATURE & COMPOSITION A", "AP ENGLISH LITERATURE & COMPOSITION B", "AP ENGLISH LITERATURE AND COMP A", "AP ENGLISH LITERATURE AND COMP B", "AP ENGLISH LITERATURE AND COMP A", "AP ENGLISH LITERATURE AND COMP B", "AP ENGLISH LITERATURE AND COMP.", "AP ENGLISH LITERATURE-R", "AP ENGLISH MVHS", "AP ENGLISH TC", "AP ENGLISH TI", "AP ENGLISH WT", "AP ENGLISH/COMP", "AP ENGLISH/TI", "AP ENGLISH: LANGUAGE & COMP A", "AP ENGLISH: LANGUAGE & COMP B", "AP ENGLISH: LANGUAGE & COMP C", "AP ENGLISH:LITERATURE & COMP A", "AP ENGLISH:LITERATURE & COMP B", "AP ENGLISH:LITERATURE & COMP C", "AP ENGLIT AA", "AP ENGLIT BB", "AP ENGLNG AA", "AP ENGLNG BB", "AP Eng Lit&Comp", "AP English", "AP HNR ENG A", "AP HNR ENG B", "AP JUNIOR ENGLISH", "AP JUNIOR ENGLISH T", "AP JUNIOR ENGLISH T", "AP LANG & COMP 11 A", "AP LANG & COMP", "AP LANG & COMPOSITION", "AP LANG & LIT - TR", "AP LANG - TR", "AP LANG 11 A", "AP LANG 11 B", "AP LANG 11 C", "AP LANG AND COMP", "AP LANG ART T", "AP LANG COMP", "AP LANG COMP GF", "AP LANG COMP-B", "AP LANG-1", "AP LANG-2", "AP LANG-3", "AP LANG. & COMP. - TR", "AP LANG. & COMPOSITION", "AP LANG/ COMP", "AP LANG/AMERICAN PERSP", "AP LANG/CMP1", "AP LANG/CMP2", "AP LANG/COMP", "AP LANG/COMP T1", "AP LANG/COMP A", "AP LANG/COMP S1", "AP LANG/COMP S2", "AP LANG/COMP-A", "AP LANG/COMP-B", "AP LANG/COMP/TI", "AP LANGUAG-1", "AP LANGUAG-2", "AP LANGUAG-3", "AP LANGUAGE", "AP LANGUAGE 11", "AP LANGUAGE AND COMPOSITION", "AP LANGUAGE AND COMPOSITION-R", "AP LANGUAGE COMP/TI", "AP LIT", "AP LIT & COMP", "AP LIT & COMP (MVHS)", "AP LIT & COMP 12A (H)", "AP LIT & COMP 12B (H)", "AP LIT & COMP 12C (H)", "AP LIT & COMP-A", "AP LIT & COMP-B", "AP LIT & COMPOSITION", "AP LIT /COMP A", "AP LIT /COMP B", "AP LIT 1", "AP LIT 12 A", "AP LIT 12 B", "AP LIT 12 C", "AP LIT 2", "AP LIT AND COMP", "AP LIT COMP", "AP LIT-1", "AP LIT-2", "AP LIT-3", "AP LIT/COMP", "AP LIT/COMP S1", "AP LIT/COMP S2", "AP LIT/COMP-A", "AP LIT/COMP-B", "AP LIT/COMP1", "AP LIT/COMP2", "AP LIT/COMS2", "AP LITER/COMP", "AP LITERAT-1", "AP LITERAT-2", "AP LITERAT-3", "AP LITERATURE", "AP LITERATURE & COMP B", "AP LITERATURE & COMP", "AP LITERATURE & COMP A", "AP LITERATURE & COMP C", "AP LITERATURE & COMPOSITION", "AP LITERATURE & COMPOSITION A", "AP LITERATURE & COMPOSITION B", "AP LITERATURE 1", "AP LITERATURE 2", "AP LITERATURE A", "AP LITERATURE A-MVHS", "AP LITERATURE A-MVHS-R", "AP LITERATURE AND COMPOSITION", "AP LITERATURE B", "AP LITERATURE B-MVHS", "AP LITERATURE C", "AP LITERATURE INDEP STUDY", "AP LITERATURE.COMP A", "AP LITERATURE.COMP B", "AP LITERATURE/TI", "AP LNG/COMS2", "AP LONG/COMP", "AP Language & Composition", "AP Literature", "AP Literature 1", "AP Literature 2", "AP SENIOR ENGLISH", "APENG LANG/COMP TI", "APENG LIT/COMP", "APENGLANWTS1", "APENGLANWTS2", "APENGLITWTS1", "APENGLITWTS2", "APHS AP LANG", "APHS/APLANG+COMP", "APLAN/AMLIT", "APLAN/AMLITS1", "APX AP ENGLC", "APX AP ENGLISH C", "APX AP ENGLT", "ATYP - AP LANG", "ATYP - AP LIT", "ATYP AP COL ENG", "ATYP AP ENG A", "ATYP AP ENG B", "ATYP AP ENG LAN", "ATYP AP ENG LIT", "ATYP AP ENGLISH A", "ATYP AP ENGLISH B", "ATYP AP ENGLISH LANG & COMP", "ATYP AP ENGLISH LANG/COMP", "ATYP AP ENGLISH LIT & COMP", "ATYP AP ENGLISH LIT/COMP", "ATYP AP LANG", "ATYP-AP LIT", "B AP ENG 12", "B AP E

LIT 1", "B AP E LIT 2", "B AP E LNG 1", "B AP E LNG 2", "B AP ENG", "B AP ENG 10", "B AP ENG 11", "B AP ENG 11 A", "B AP ENG 11 B", "B AP ENG 12", "B AP ENG 9", "B AP ENG LAN", "B AP ENG LIT", "B AP ENG. - 1 I.S.", "B AP ENG.- 2 I.S.", "B AP ENG.-I.S.-3", "B AP ENGLISH", "B AP ENGLISH 11", "B AP ENGLISH 11C", "B AP ENGLISH 11D", "B AP ENGLISH-1", "B AP ENGLISH-2", "B AP ENGLISH-3", "B AP LANG/COMP A", "B AP LANG/COMP B", "B AP LANG/COMP C", "B AP LITERATURE A", "B AP LITERATURE B", "B AP LITERATURE C", "CA/ENG 3 AP", "CA/ENGLISH 3 AP", "CHAVEZ AP ENG", "CHS AP LANGUAG-1", "CHS AP LANGUAG-2", "CHS AP LANGUAG-3", "COMP AP I/II", "COMP AP II", "CSAP ENG 9", "DrStd AP Lit", "E AP ENG 11 CD", "EN AP ENGLAN", "EN AP ENGLIT", "ENCOMP12-1AP", "ENCOMP12-2AP", "ENG LA/LC AP", "ENG LANG/COMP AP", "ENG LIT AP TI", "ENG LIT COMP AP S1", "ENG LIT COMP AP S2", "ENG LIT/COMP AP", "ENG LNG/COMP AP", "ENGLISH / AP", "ENGLISH 10 - AP", "ENGLISH 11 AP", "ENGLISH 12 AP", "ENGLISH 5 AP", "ENGLISH 5AP", "ENGLISH 6 AP", "ENGLISH 6AP", "ENGLISH 7 AP", "ENGLISH 8 AP", "ENGLISH AP 1", "ENGLISH AP 2", "ENGLISH AP TI", "ENGLISH III AP", "ENGLISH LANG COMPOSITION AP IA OL", "ENGLISH LANG COMPOSITION AP IB OL", "ENGLISH LANGUAGE AND COMP AP (11)", "ENGLISH LANGUAGE AND COMP AP (11) IS", "ENGLISH LIT & COMP AP A", "ENGLISH LIT AP TI", "ENGLISH LIT COMPOSITION AP IA OL", "ENGLISH LIT COMPOSITION AP IB OL", "ENGLISH LITERATURE AND COMP AP (12)", "English Language Arts 11 AP", "English Language Arts 11 AP Sem1", "English Language Arts 11 AP Sem2", "English Language Arts 12 AP", "English Lit. & Composition 12 AP", "G AP ENG 11", "GENNET AP ENGLISH LANGUAGE A", "GLHS MVU - AP LANG AND COMP", "I/S AP LIT", "IND STUDY AP LIT", "IND-AP ENG LITERATURE", "IS AP ENG 12", "IS/AP ENGLSH 12", "LANG/COMP AP", "LAP ENG GR 9", "LAPEERE AP ENG11", "MVHS AP ENGLISH 1", "MVHS AP ENGLISH 2", "MVHS ENG COMP AP", "MVHS LIT AP", "MVHS LIT/COMP AP", "MVHS-AP ENG. COMP", "MVHS-AP LIT", "MVHS: AP ENG LANG & COMP I-A", "OL AP COMPOSITION", "OL AP ENG LIT/COMP", "OL ENGLISH AP", "ONLINE AP ENGLISH LIT.", "ONLINE AP LITERATURE", "PSJA AP ENG", "SR AP ENG A", "SR AP ENG B", "SR AP ENGLSH", "T - AP ENG LANG", "T - AP ENGL 12", "T - AP ENGL COM", "T - AP LANG & C", "T - AP LANGUAGE", "T- AP ENGLISH L", "T- AP ENGLISH-L", "T- AP LANG/COMP", "T-AP LANG COMP", "T-AP LIT/COMPOSE", "TC AP ENGLISH L", "TC AP LANG/COMP", "TO-AP ENGLISH & COMP", "TR A.P. LANG/COMP", "TR AP ENGLISH 11A", "TR AP BRIT LIT", "TR AP COMP/LANG", "TR AP COMPOSITI", "TR AP ENG", "TR AP ENG COMP", "TR AP ENG LANG", "TR AP ENG LIT/CO", "TR AP ENG LNG A", "TR AP ENGL LANG", "TR AP ENGL3A", "TR AP ENGL3B", "TR AP ENGLAN", "TR AP ENGLANG", "TR AP ENGLISH", "TR AP ENGLISH A", "TR AP ENGLISH B", "TR AP ENGLISH LANG COMP", "TR AP ENGLIT", "TR AP LANG & COMP 10", "TR AP LIT", "TR AP LIT ANAL/COMP II", "TR AP LIT AND C", "TR AP LITERATUR", "TR BRITISH COMP AP", "TR EN AP ENG LAN", "TR ENG LANG & COMP - AP", "TR ENGLISH III AP", "TR ENGLISH IIII AP", "TR V APLIT/CMPS2", "TR VAPLANG/CMPS1", "TR VAPLANG/CMPS2", "TR*AP ENG LITERATURE & COMP", "TR- AP ENGLISH", "TR-AP ENG LANG/COMP", "TR-AP ENG/LANG COM", "TR-AP ENG/LANG COMP", "TR-AP ENGLISH L", "TR/AP ENG LIT/COMP 9A", "TRANS AP ENG 11", "TRANS AP ENGLAN", "TRANS ENG 11 AP", "TRANS/AP ENGLISH", "TRNS AP ELANG", "TRNS AP LANG/COM", "TRNS ENG 2 AP", "TRNS ENG LNG AP", "TRS ENG LANB AP", "TRS ENG LANG AP", "TRVL AP LIT/CPB", "TVL AP LIT/CMPA", "V AP ENGLIT", "VH AP ENG 1", "VH AP ENG 2", "VH AP ENGLIT", "VH AP LIT 1", "VHS AP ENG LANG&COMP1", "VHS AP LANGUAGE & COMP", "VHS-AP ENG LANG", "VHS-AP ENG LANG&COMP", "VHS-AP ENG LANG&COMP1", "VHS-AP Eng & Comp", "VHS-AP Eng.Comp.", "VHS-AP LANG", "VHS-AP LIT & COMP", "Y AP ENGLISH"

Environmental Science:
"A P ENVIRONMENTAL SCI", "A P ENVIRONMENTAL SCIENCE", "ADV PLCMT EN SC", "ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE", "AP ENV SCI 1A", "AP ENV SCI 1B", "AP ENV SCI S1", "AP ENV SCI S2", "AP ENV SCI SM 1", "AP ENV SCI SM 2", "AP ENV SCI-A", "AP ENV SCI-B", "AP ENV. SCIENCE (CRESTWOOD H.S.)", "AP ENVIR SCI", "AP ENVIR SCI 10", "AP ENVIRN SCI A", "AP ENVIRN SCI B", "AP ENVIROMENTAL SCIENCE", "AP ENVIROMENTAL SCIENCE B", "AP ENVIRON SCI", "AP ENVIRON SCI (MVHS)", "AP ENVIRON SCI 2", "AP ENVIRON. SCI. -A", "AP ENVIRON. SCI. -B", "AP ENVIRONMENT SCI A", "AP ENVIRONMENT SCI B", "AP ENVIRONMENT SCIENCE A", "AP ENVIRONMENT SCIENCE B", "AP ENVIRONMENTAL SCIENCE A", "AP ENVIRONMENTAL SCIENCE B", "AP ENVR SCI", "AP ENVSCI AA", "AP ENVSCI BB", "AP Environmental Science", "D AP ENV SCI", "ENV SCI AP 10", "ENV SCI AP 1", "ENV SCI AP 2", "ENVIR SCI AP", "ENVIRON SCI AP", "ENVIRONMENTAL SCIENCE AP", "Env. Science 1 AP", "Env. Science 1 AP - do not use", "Environmental Science AP", "Environmental Science 1 AP", "Environmental Science 2 AP", "KAMSC AP EN SCI", "KAMSC AP ENV SC", "KAMSC AP ENVIRO", "KAMSC AP ENVIRONMENTAL SCIENCE", "MVHS AP ENVIRONMENTAL SCIENCE", "MVHS ENV SCI AP", "SC AP ENVSCI", "SC V AP ENSC", "T - AP ENV SCIE", "T AP ENV SCI", "T- AP ENVIRON S", "TR AP ENV SCI", "TR AP ENV SCIENC", "TR AP ENVIR SCI", "TR AP ENVIRONME", "TR AP ENVSCI", "TR ENV SCI AP", "TR-AP ENV. SCIE"

European History:
"*AP EUR HIST 10", "*AP EUROPEAN HISTORY", "*AP WESTERN CIV 1", "*AP WESTERN CIV 2", "402275 AP EURO HISTORY", "A P EURO HIST", "A P EURO HISTORY", "A P EUROPEAN HISTO-A", "A P EUROPEAN HISTO-B", "A P EUROPEAN HISTORY", "A P Euro Hist", "A.P. EURO HISTORY", "AP - EUROPEAN HISTORY", "AP E HIST AA", "AP E HIST BB", "AP EUR HIS A", "AP EUR HIS B", "AP EUR HIS C", "AP EUR HIS WT YR", "AP EUR HIST", "AP EUR HIST 10", "AP EUR HIST 10", "AP EUR HIST A", "AP EUR HIST B", "AP EUR HISTORY", "AP EUR HISTORYT1", "AP EURO HIST", "AP EURO HIST (IS)", "AP EURO HIST RESEARCH (IS)", "AP EURO HIST S1", "AP EURO HIST S2", "AP EURO HIST-A", "AP EURO HIST-B", "AP EURO HIST/TI", "AP EURO HISTORY", "AP EURO HISTORY A", "AP EURO HISTORY B", "AP EURO HISTORY/TI", "AP EURO HST", "AP EURO HST 1", "AP EURO HST S1", "AP EURO HST2", "AP EURO S1", "AP EURO S2", "AP EUROPE HIST", "AP EUROPEAN", "AP EUROPEAN HIS", "AP EUROPEAN HIST", "AP EUROPEAN HIST. A", "AP EUROPEAN HIST. B", "AP EUROPEAN HISTO -A", "AP EUROPEAN HISTO -B", "AP EUROPEAN HISTORY", "AP EUROPEAN HISTORY - TR", "AP EUROPEAN HISTORY A", "AP EUROPEAN HISTORY B", "AP EUROPEAN HISTORY C", "AP EUROPEAN HISTORY-TR", "AP EUROPEAN HST", "AP EUROPEAN HST A", "AP EUROPEAN HST B", "AP EUROPEAN HST C", "AP WESTERN CIV 1", "AP WESTERN CIV 2", "C AP E/HST 1", "C AP E/HST 2", "EURO HIST AP T", "EUROPEAN HST AP TI", "HISTORY, EUROPEAN AP", "HISTORY, EUROPEAN AP IS", "IND STUDY - AP EURO HIST", "IND STUDY -AP EURO HIST", "IND STUDY-AP EUROPEAN HISTORY", "IS APEURHIST", "IS/AP EURO HISTORY", "MVHS-AP EUROPEAN HISTORY", "T - AP EUROPEAN", "T AP EROPE HST", "T-AP EURO HIST", "TR AP EURO HIST", "TR AP EURO HSTRY", "TR AP EUROPEAN", "TR AP EUROPEAN HIST", "TR AP EUROPEAN HISTORY", "TR EURP HIST AP", "TR-AP EUROPEAN HISTORY", "TRANS AP EU HST", "TRANS AP EURHS", "TRANS AP EURHST", "TRANS AP EURO H", "TRANS AP EUROHS", "TRS EURP HIS AP", "VH AP E HIST"

French:
" AP FRENCH V 10", "*AP FRENCH", "A P FRENCH", "A P French", "AP FRENCH", "AP FRENCH (MIVHS)", "AP FRENCH (ON-LINE)", "AP FRENCH 4", "AP FRENCH

5", "AP FRENCH 5 A", "AP FRENCH 5 B", "AP FRENCH A", "AP FRENCH A (MVHS)", "AP FRENCH AA", "AP FRENCH B", "AP FRENCH BB", "AP FRENCH II", "AP FRENCH LANGUAGE A", "AP FRENCH LANGUAGE B", "AP FRENCH LANGUAGE C", "AP FRENCH LIT. S2 05", "AP FRENCH ON-LINE", "AP FRENCH S1", "AP FRENCH S2", "AP FRENCH V", "AP FRENCH VI A OL", "AP FRN5WT S1", "AP FRN5WT S2", "AP FRNCWT S1", "AP FRNCWT S2", "AP French Lit - IS", "APEX AP FRENCH", "DIRECTED STUDY - AP FRENCH 4", "DRSTD AP FRENCH", "DRSTDY AP FRENCH", "DrStd AP French", "DrStdy AP French", "FRENCH 5AP", "FRENCH 5AP S1", "FRENCH 5AP S2", "FRENCH 7 AP", "FRENCH 8 AP", "FRENCH AP", "FRENCH IV AP 10", "FRENCH LANGUAGE, AP", "FRENCH V AP 10", "FRENCH V AP CR", "FRENCH V AP OL", "FRENCH VI AP OL", "French Language AP", "IND APFRENCH", "IND STUDY-AP FRENCH", "IS-AP French", "ML AP FRENCH", "ML FRENCH4AP", "ML FRENCH5AP", "ML FRNCH5AP T/O", "TR- AP FRENCH", "TR-AP FRENCH", "TR-AP FRENCH LA", "TR-PSEO AP FREN", "V AP FRENCH", "Y AP FRENCH"

German:
"*AP GERMAN", "AP GER5WT S1", "AP GER5WT S2", "AP GERMAN", "AP GERMAN ", "AP GERMAN 4", "AP GERMAN AA", "AP GERMAN BB", "AP GRMNWT S1", "AP GRMNWT S2", "APGERMNWT S1", "APGERMNWT S2", "DRSTD AP GERMAN", "GERMAN IV AP 10", "GERMAN LANGUAGE AP IS", "GERMAN LANGUAGE, AP", "IS/AP GERMAN", "ML AP GERMAN", "ML GERM 4AP T/O", "ML GERMAN 4AP", "ML GERMAN4AP", "ML GERMAN4AP T/O", "ML GERMAN5AP", "ML GERMN4AP T/O", "TR-AP GERMAN", "TRANS GERM 4 AP"

Human Geography:
"AD PL HUMAN GEOG", "ADV PL HUMAN GEO", "AP GEOGORAPHY B", "AP GEOGRAPHY A", "AP GEOGRAPHY B", "AP GEOGRAPHY C", "AP GEOGRAPHY/TI", "AP HUM GEO S1", "AP HUM GEO S2", "AP HUM GEOG B", "AP HUMAN GEO", "AP HUMAN GEO S1", "AP HUMAN GEO S2", "AP HUMAN GEOG", "AP HUMAN GEOG T", "AP HUMAN GEOGRAP /TI", "AP HUMAN GEOGRAPHY", "AP HUMAN GEOGRAPHY T", "AP HUMAN GEOGRAPHY/TI", "AP Human Geography", "AP WRLD GEOG", "APHUM GEO ACAPM", "DS AP HUM GEO B", "GEOGRAPHY AP", "HUMAN GEOG AP", "HUMAN GEOGRAPHY AP", "HUMAN GEOGRAPHY AP", "ONLN AP HUM GEO", "TC AP HUM GEO 1", "TC AP HUM GEO 2", "TC AP HUMAN GEO", "TR AP GEOG", "TR AP H GEOG", "TR AP HUMAN GEO", "TR AP HUMAN GEOG", "TR AP HUMAN GEOGRA", "TR SS AP HUM GEO", "TR-AP HUMAN GEOGRAPHY", "TR-AP Human Geography", "TR/AP HUM GEOG/GIF"

Italian:
"IND STUDY ITALIAN V AP", "ITALIAN IV AP 10"

Japanese:
"AP JAPANESE WT", "AP JAPNESE WT", "AP JPN5WT S2", "AP JPNSWT S1", "AP JPNSWT S2"

Latin:
"IS LATIN 5AP S1", "LATIN 5AP S1", "LATIN 5AP S2", "LATIN IV AP 10", "LATIN LITERATURE, AP"

Music Theory:
"AP MUSC THRY", "AP MUSIC THEORY", "AP MUSIC THEORY (IS)", "AP MUSIC THEORY A", "AP MUSIC THEORY B", "AP MUSIC THEORY C", "AP MUSIC THRY A", "AP MUSIC THRY B", "AP MUSIC THY", "AP MUSIC THY A", "AP MUSIC THY B", "AP MUSIC THY C", "MUS TH IV AP 05", "MUSIC THEORY AP", "MUSIC THEORY IV AP 05", "TRANS MUSIC AP"

Physics:

“*AP PHYSICS 1”, “*AP PHYSICS 2”, “406117 AP PHYSICS”, “406117 AP PHYSICS (1)”, “406117 AP PHYSICS (2)”, “406117 AP PHYSICS (3)”, “406117 AP PHYSICS (4)”, “A P PHYSICS”, “A P Physics”, “ADV PL PHYSICS”, “ADVANCED PLACEMENT PHYSICS”, “ADVPL PHYS B S1”, “ADVPL PHYS B S2”, “ADVPL PHYS C S1”, “ADVPL PHYS C S2”, “AP PHY. SCIENCE”, “AP - PHYSICS”, “AP ADV PHYSICS”, “AP MS PHYSICS 12 S1”, “AP MS PHYSICS 12 S2”, “AP MS PHYSICS S1”, “AP PHY SCI CHEM”, “AP PHY SCI PHY”, “AP PHY SCI PHYS”, “AP PHY. SCIENCE”, “AP PHYS B S1”, “AP PHYS B S2”, “AP PHYS C”, “AP PHYS C S1”, “AP PHYS C S2”, “AP PHYS C: MECH”, “AP PHYS. SCI.PHY”, “AP PHYSIC AA”, “AP PHYSIC B SSOL”, “AP PHYSIC BB”, “AP PHYSICS”, “AP PHYSICS -A”, “AP PHYSICS -B”, “AP PHYSICS -C”, “AP PHYSICS 10”, “AP PHYSICS ”B“, “AP PHYSICS (1)”, “AP PHYSICS (2)”, “AP PHYSICS (3)”, “AP PHYSICS (4)”, “AP PHYSICS (BYU-ONLINE)”, “AP PHYSICS (MVHS)”, “AP PHYSICS - TR”, “AP PHYSICS /TI”, “AP PHYSICS 1”, “AP PHYSICS 10”, “AP PHYSICS 2”, “AP PHYSICS A”, “AP PHYSICS AB (A)”, “AP PHYSICS AB (B)”, “AP PHYSICS AB (C)”, “AP PHYSICS AUDIT”, “AP PHYSICS B”, “AP PHYSICS B “, “AP PHYSICS B 1”, “AP PHYSICS B 2”, “AP PHYSICS B/TI”, “AP PHYSICS C”, “AP PHYSICS C 1”, “AP PHYSICS C 2”, “AP PHYSICS C AA”, “AP PHYSICS C BB”, “AP PHYSICS C E & M”, “AP PHYSICS C MECHANICS”, “AP PHYSICS C: ELEC & MAGNETISM”, “AP PHYSICS C: ELEC & MAGNETISM”, “AP PHYSICS E & M ”C” C”, “AP PHYSICS I”, “AP PHYSICS LAB”, “AP PHYSICS MECHANICS ”C” A”, “AP PHYSICS MECHANICS ”C” B”, “AP PHYSICS-A”, “AP PHYSICS-B”, “AP PHYSICS-B A”, “AP PHYSICS-B B”, “AP PHYSICS-C”, “AP PHYSICS-C A”, “AP PHYSICS-C B”, “AP PHYSICS-TR”, “AP PHYSICS/TI”, “AP Phys C: Mech”, “AP Physics”, “AP Physics Online-MV”, “APPHYS BWTS1”, “APPHYS BWTS2”, “APPHYS CWTS1”, “APPHYS CWTS2”, “APPHYS WT S1”, “APPHYS WT S2”, “APPHYSBWTS1”, “APX AP PHYS”, “APX AP PHYSICS”, “D AP PHYSICS”, “DIRECTED STDY - ADV TOPICS AP PHYSICS”, “DIRECTED STUDY - AP PHYSICS SUPPORT”, “DS - AP PHYSICS C”, “DS AP PHYSC-C A”, “DS AP PHYSICS A”, “DS AP PHYSICS B”, “IND AP PHYSICS”, “IND STUDY AP PHYSICS”, “IND STUDY-AP PHYSICS”, “IND-AP PHYSICS”, “IND. SDY/AP PHYSICS-A”, “IND. STUDY - AP PHYSICS B”, “IND. STUDY - AP PHYSICS A”, “ISAPPHYSICSB”, “KAMSC AP PHYSI”, “KAMSC AP PHYSICS”, “MS PHYSICS AP”, “MS PHYSICS AP 12 S2”, “MS PHYSICS AP S1”, “MSC AP PHYSICS”, “MST AP PHYSICS B”, “MST AP PHYSICS C”, “MVHS-AP PHYSICS A”, “MVHS-AP PHYSICS B”, “MVHS-AP PHYSICS B-S2”, “MVU AP PHYSICS B”, “ONLINE AP PHYSICS”, “PHY C AP IND ST”, “PHYSICS 1AP”, “PHYSICS 2 AP”, “PHYSICS 2AP”, “PHYSICS B AP”, “PHYSICS C AP”, “PHYSICS C: MECHANICS, AP”, “PHYSICS, C AP ELEC & MAGN II CR”, “PHYSICS, C AP ELEC&MAGN I CR”, “Physics AP”, “Physics AP Sem 1”, “Physics AP Sem 2”, “SC AP PHYSIC”, “SC PHYSCS AP”, “T- AP PHYSICS B”, “TR AP PHYSICS”, “TR AP PHYSICS B”, “TR-AP PHYSICS”, “VH APPHYSIC1”, “VH APPHYSIC2”

Psychology:

“(WEB)AP PSYCHOLOGY 1 059”, “*AP PSYCH”, “*AP PSYCHOLOGY 1”, “*AP PSYCHOLOGY 2”, “A P PSYCHOLOGY”, “ADVANCED PLACEMENT PSYCHOLOGY”, “ADVANCED PLACEMENT PSYCHOLOGY A”, “ADVANCED PLACEMENT PSYCHOLOGY B”, “AP - PSYCHOLOGY”, “AP PSCHOLOGY TI”, “AP PSY RHS”, “AP PSYCH”, “AP PSYCH (1)”, “AP PSYCH (2)”, “AP PSYCH (3)”, “AP PSYCH 12A”, “AP PSYCH A”, “AP PSYCH AA”, “AP PSYCH B”, “AP PSYCH BB”, “AP PSYCH C”, “AP PSYCH I.S.”, “AP PSYCH O.L.”, “AP PSYCH S1”, “AP PSYCH S2”, “AP PSYCH SM2”, “AP PSYCH TI”, “AP PSYCH-A”, “AP PSYCH-B”, “AP PSYCH.-S1”, “AP PSYCH.-S2”, “AP PSYCHCOLOGY”, “AP PSYCHLOLGY/TI”, “AP PSYCHOGOLY B”, “AP PSYCHOGOLY C”, “AP PSYCHOLGY”, “AP PSYCHOLOGY”, “AP PSYCHOLOGY “, “AP PSYCHOLOGY -A”, “AP PSYCHOLOGY -B”, “AP PSYCHOLOGY (MVHS)”, “AP PSYCHOLOGY - OL”, “AP PSYCHOLOGY - TR”, “AP PSYCHOLOGY 05”, “AP PSYCHOLOGY 1”, “AP PSYCHOLOGY 10”, “AP

PSYCHOLOGY 1A", "AP PSYCHOLOGY 1B", "AP PSYCHOLOGY 2", "AP PSYCHOLOGY A", "AP PSYCHOLOGY A (H)", "AP PSYCHOLOGY B", "AP PSYCHOLOGY B (H)", "AP PSYCHOLOGY B-BYU", "AP PSYCHOLOGY C", "AP PSYCHOLOGY C (H)", "AP PSYCHOLOGY S2 05", "AP PSYCHOLOGY TI", "AP PSYCHOLOGY, PART 2", "AP PSYCHOLOGY-1ST SEM.", "AP PSYCHOLOGY-A", "AP PSYCHOLOGY-B", "AP PSYCHOLOGY-BYU", "AP PSYCHOLOGY/TI", "AP Psychology", "AP Psychology-BYU", "AP Psychology-MV", "APPSYCH", "APPSYCH S1", "APPSYCH WTS1", "APPSYCH WTS2", "APX AP PSYCH", "BYU - AP PSYCHOLOGY", "BYU - AP PSYCHOLOGY B", "BYU AP PSYCH WT", "C AP PSYC", "C AP PSYCH", "C AP PSYCH 1", "C AP PSYCH 2", "C AP PSYCH A", "C AP PSYCH B", "C AP PSYCHOL", "C AP PSYCHOLOGY", "C AP PSYCHOLOGY A", "C AP PSYCHOLOGY B", "C IS AP PSYC", "GLHS MVU - AP PSYCHOLOGY", "IB/AP PSYCH I", "INDEPENDENT STUDY-AP PSYCHOLOGY", "IS AP PSY", "IS/ AP PSYCH-B", "IS/AP PSYCH", "ISAP PSYCHS2", "LAPEERE AP PSYCH", "MIVHS AP PSYCH", "MSU AP PSYCH", "MV AP PSYCH", "MVHS - AP PSYCHOLOGY", "MVHS AP PSYCH", "MVHS AP PSYCHOLOGY", "MVHS PSYCH AP", "MVHS-AP PSYCHOLOGY", "OL AP PSYCH S2", "ON-LINE AP PSYCHOLOGY", "PSYCH AP 1", "PSYCH AP 2", "PSYCHOLOGY / AP", "PSYCHOLOGY AP", "PSYCHOLOGY AP OL", "PSYCHOLOGY AP T1", "PSYCHOLOGY AP TI", "Psychology AP", "Psychology AP 1", "SS AP PSYCH", "T - AP PSYCHOLO", "T-AP PSYCH", "TC AP PSYCHOLOG", "TR AP PSYCH", "TR AP PSYCHOLOG", "TR AP PSYCHOLOGY", "TR SS AP PSYCHOL", "TR V AP PSYCHLGY", "TR-AP PSYCHOLOGY", "TRANS AP PSY1", "TRANS AP PSY2", "TRANS PSYCH1 AP", "TRANS PSYCH2 AP", "TRANS/AP PSYCH", "TRNS AP PSYCH", "TRNS PSYCH AP", "V AP PSYCH", "VHS-AP PSYCHOLOGY", "VHS-AP Psyc", "VHS-AP Psych", "VMV AP PSYCH", "WHHS AP PSYCH TI"

Spanish:

"*AP SPANISH", "*AP SPANISH 1", "*AP SPANISH 2", "A P SPANISH", "A P Spanish", "A P Spanish Literature", "A.P. SPANISH", "AP - SPANISH", "AP I.S. SPANISH", "AP SPAN LANG", "AP SPAN LANG CO", "AP SPAN LANG-S1", "AP SPAN LANG-S2", "AP SPAN REV", "AP SPAN TEST", "AP SPAN V", "AP SPANISH", "AP SPANISH A", "AP SPANISH B", "AP SPANISH A", "AP SPANISH (IS)", "AP SPANISH - A", "AP SPANISH - B", "AP SPANISH 1", "AP SPANISH 2", "AP SPANISH 4", "AP SPANISH 4/TI", "AP SPANISH 4A", "AP SPANISH 4B", "AP SPANISH 5", "AP SPANISH 5 A", "AP SPANISH 5 B", "AP SPANISH 5-A", "AP SPANISH 5-B", "AP SPANISH 5A", "AP SPANISH 5B", "AP SPANISH A", "AP SPANISH A OL", "AP SPANISH B", "AP SPANISH B OL", "AP SPANISH C", "AP SPANISH IV", "AP SPANISH IV-1ST SEM.", "AP SPANISH IV-1st Sem.", "AP SPANISH IV-2ND SEM.", "AP SPANISH IV-2nd Sem.", "AP SPANISH IV-S1", "AP SPANISH IV-S2", "AP SPANISH LANG", "AP SPANISH LANGUAGE A", "AP SPANISH LANGUAGE B", "AP SPANISH LANGUAGE C", "AP SPANISH ON LINE", "AP SPANISH S1", "AP SPANISH S2", "AP SPANISH TC", "AP SPANISH TI", "AP SPANISH V", "AP SPANSH AA", "AP SPANSH BB", "AP SPN5WT S1", "AP SPN5WT S2", "AP SPNSWT S1", "AP SPNSWT S2", "AP Spanish", "APEX AP SPAN A", "DIR STDY: AP SPANISH", "DRSTD AP SPANISH", "DRSTDY AP SPANISH", "DS - AP SPANISH", "DS AP SPANISH", "F AP SPANISH", "F AP SPANISH-1", "F AP SPANISH-2", "F AP SPANISH-I.S.", "F IS AP SPANISH A", "IS/AP SPANISH 5", "ML AP SPANSH", "ML SPANSH4AP", "ML SPANSH5AP", "ML SPNSH4AP T/O", "MVHS AP SPANISH", "MVHS SPANISH AP", "MVHS: AP SPANISH A (H)", "OL AP SPANISH", "OL AP SPANISH S2", "OL SPANISH 5AP", "OL SPANISH AP S1", "OL: AP SPANISH LANGUAGE", "PRO-AP SPANISH E", "SPAN IV AP 10", "SPAN V AP 10", "SPANISH 5AP", "SPANISH 5AP S1", "SPANISH 5AP S2", "SPANISH 7 AP", "SPANISH 8 AP", "SPANISH 9 AP", "SPANISH AP", "SPANISH LANGUAGE AP A", "SPANISH LANGUAGE, AP", "SPANISH LIT AP TI", "SPANISH V AP 10", "Spanish IV AP", "Spanish IV AP Sem 1", "Spanish IV AP Sem 2", "Spanish Language AP", "TR

AP SPANSH", "TR-AP SPANISH", "TRANS SPANIS5AP", "VMV AP SPAN 1A", "VMV AP SPANISH", "Y AP SPANISH"

Statistics:

"*AP PROB STAT", "*AP STATISTICS 1", "*AP STATISTICS 2", "406117 AP STATISTICS A", "406117 AP STATISTICS B", "A P STATISTICS", "A P Statistics", "ADVANCED PLACEMENT STATISTICS", "AP - STATISTICS", "AP COLL STATISTICS S1", "AP COLL STATISTICS S2", "AP PROB AND STAT A", "AP PROB AND STAT B", "AP STAT", "AP STAT 2", "AP STAT II -VHS", "AP STATISTCS 1 NMP", "AP STATISTIC", "AP STATISTICS", "AP STATISTICS 10", "AP STATISTICS (A)", "AP STATISTICS (B)", "AP STATISTICS (MVHS)", "AP STATISTICS - OL", "AP STATISTICS 1", "AP STATISTICS 1& 2", "AP STATISTICS 1A", "AP STATISTICS 2", "AP STATISTICS A", "AP STATISTICS A -A", "AP STATISTICS A OL", "AP STATISTICS AP B OL", "AP STATISTICS B", "AP STATISTICS B -B", "AP STATISTICS C", "AP STATISTICS S1", "AP STATISTICS S2", "AP STATISTICS TI", "AP STATISTICS WT", "AP STATISTICS,S", "AP STATISTICS- MI Virtual HS", "AP STATISTICS-A", "AP STATISTICS-B", "AP STATISTICS-MVHS", "AP STATISTICS/TI", "AP STATS", "AP STATS -A", "AP STATS -B", "AP STATS A", "AP STATS B", "AP STATS 12 S1", "AP STATS 12 S2", "AP STATS A", "AP STATS AA", "AP STATS B", "AP STATS BB", "AP STATS C", "AP STATS S1", "AP STATS S2", "AP STATS-A", "AP STATS-B", "AP Stats", "APX AP STATS", "AVENTA-AP STATISTICS A", "DIRECTED STDY - ADV PLACEMENT STATISTICS", "DS AP STATS A", "DS AP STATS B", "E AP STATISTICS", "E AP STATS", "E IS AP STAT", "IS AP STATISTICS 1", "IS AP STATISTICS1B", "JST AP STATISTICS", "KAMSC AP STAT", "KAMSC AP STATISTICS", "KAMSC AP STATS", "MA AP STAT", "MST AP STATISTICS & PROBABILITY", "MST AP STATISTICS & PROBABLILITY", "MVHS AP STATISTICS", "MVHS STAT AP", "MVHS STATS AP", "MVHS-AP STATISTICS", "MVHS: AP STATISTICS I-A", "MVS-FLEX AP STATS", "OL AP STATISTICS", "OLSTATISTICS 1AP", "ON-LINE AP STATISTICS", "ONLINE AP STATISTICS", "Probability & Statistics AP", "STATISTICS - AP", "STATISTICS 1AP", "STATISTICS 1AP S1", "STATISTICS 1AP S2", "STATISTICS 2AP", "STATISTICS 2AP S2", "STATISTICS AP", "STATISTICS AP A OL", "STATISTICS AP IS", "STATISTICS AP OL", "STATISTICS AP TI", "STATISTICS, AP", "STATS AP 12 S1", "Statistics AP", "T - AP STATS", "T-AP STATISTICS", "TC AP STATISTIC", "TR AP START D", "TR AP STAT", "TR AP STATISTIC", "TR AP STATISTICS", "TR APSTATS ONL", "TR-AP STATISTICS", "V AP STAT", "V AP STATISTICS", "V AP STATS", "VH AP STAT"

Studio Art:

"*AP ART GP", "*AP ART PORTFOLIO 1", "*AP ART PORTFOLIO 2", "A P ART PORTFOLIO", "A P STUDIO ART", "A P STUDIO ART S1", "A P STUDIO ART S2", "A P Studio Art", "ADV PL STUDIO ART", "ADV PLACEMENT ART", "ADVANCED ART - AP", "ADVANCED PLACEMENT STUDIO ART A", "ADVANCED PLACEMENT STUDIO ART B", "ADVANCED PLACEMENT STUDIO IS ART B", "AP ART", "AP ART 2D", "AP ART 2D BB", "AP ART AA", "AP ART BB", "AP ART DRW/PAINT", "AP ART PORTFOLIO -A", "AP ART PORTFOLIO -B", "AP ART PORTFOLIO 1", "AP ART S1", "AP ART STUDIO / PORTFOLIO A", "AP ART STUDIO / PORTFOLIO B", "AP ART STUDIO PORTFOLIO A", "AP ART STUDIO PORTFOLIO B", "AP ART2D AA", "AP DR&PNT 1", "AP DR&PNT 2", "AP ST ART", "AP ST ART 1HR A", "AP ST ART 1HR B", "AP ST ART 2HR A", "AP ST ART 2HR B", "AP ST ART 3-D A", "AP ST ART 3-D B", "AP ST ART A", "AP ST ART B", "AP ST ART C", "AP STD ART B", "AP STD ART A", "AP STDIO ART AA", "AP STDIO ART BB", "AP STU ART", "AP STU ART PORT", "AP STU/ART PORT", "AP STUD ART", "AP STUDIO", "AP STUDIO AR S1", "AP STUDIO AR S2", "AP STUDIO ART", "AP STUDIO ART 1", "AP STUDIO ART 2", "AP STUDIO ART PORTFOLIO A", "AP STUDIO ART PORTFOLIO B", "AP STUDIO ART PORTFOLIO C", "AP STUDIO ART: 2-D COMM DSGN 10", "AP

STUDIO ART: 2-D PHOTO DSG 10", "AP STUDIO ART: 3-D DESIGN 10", "AP STUDIO ART: DRAWING 10", "AP Stu Art", "APSTDIOARTDRWAA", "APSTDIOARTDRWBB", "APSTUDIOART1", "APSTUDIOART2", "AR AP STUDIO", "AR STUDIO AP", "ART AP", "DS AP STUDIO ART", "I/S AP ART STD", "ILP: AP STUDIO", "IN ST AP ART AA", "IN ST AP ART BB", "INS AP ARTII", "INST AP ARTI", "IS AP ART", "IS/AP STUDIO ART", "L AP ART", "L AP ART 11", "L AP ART 2", "L AP ART I", "L AP HON ART", "STU ART AP 1", "STU ART AP 2", "TC AP STUDIO AR", "TR AP ART B DE", "TR AP ART JEWEL", "TR AP ART PHOTO", "TR AP ART ST GL", "TR AP BASIC DRA", "TR STUD ART AP", "TR-AP STUDIO ART"

U.S. Government and Politics:

" AP GOV'T/TI", " AP US GOVT", "*AP U.S. GOVT", "*AP US GOVT & POL 05", "406117 AP GOVERNMENT & POLITICS: U.S.", "A P GOVERNMENT", "A P POLI SCI", "A.P. U.S. GOVT & POLITICS", "A.P. GOVERNMENT", "A.P. U.S. GOVT & POLITICS", "AM GOVT AP", "AMER GOV AP", "AP US GOVT&POL", "AP AM GOV WT", "AP AM GOVT 1", "AP AM GOVT S1 R", "AP AM GOVT-2", "AP AM GOVT/POLITIC", "AP AMER GOV", "AP AMER GOV 1", "AP AMER GOV 2", "AP AMER GOVRMNT", "AP AMER GOVT", "AP AMER GVT1", "AP AMER GVT2", "AP AMER/COMP GOVT & POLITICS", "AP AMERICAN GOV'T-A", "AP AMERICAN GOVERNMENT 1", "AP AMERICAN GOVERNMENT 2", "AP AMGOV WT", "AP AMRGOV WT", "AP GOV", "AP GOV & POL", "AP GOV & POLITICS", "AP GOV A", "AP GOV A 0", "AP GOV A 0 HR", "AP GOV B", "AP GOV B 0", "AP GOV B 0 HR", "AP GOV C", "AP GOV C 0", "AP GOV C 0 HR", "AP GOV TI", "AP GOV'T/TI", "AP GOV. TI", "AP GOV/PLTCS", "AP GOV/POL S1", "AP GOV/POL S2", "AP GOV/POLITICS", "AP GOVERN /POL", "AP GOVERN S1", "AP GOVERN S2", "AP GOVERN.POLITICS A", "AP GOVERN.POLITICS B", "AP GOVERNMENT", "AP GOVERNMENT -A", "AP GOVERNMENT -B", "AP GOVERNMENT A", "AP GOVERNMENT & POLITICS", "AP GOVERNMENT & POLITICS: U.S.", "AP GOVERNMENT - TR", "AP GOVERNMENT 1&2", "AP GOVERNMENT 3", "AP GOVERNMENT A", "AP GOVERNMENT A 0", "AP GOVERNMENT AND POLITICS", "AP GOVERNMENT B", "AP GOVERNMENT B ", "AP GOVERNMENT B 0", "AP GOVERNMENT C", "AP GOVERNMENT-A", "AP GOVERNMENT-B", "AP GOVERNMENT-R", "AP GOVERNMENT-S1", "AP GOVERNMENT-S2", "AP GOVERNMT", "AP GOVNMNT", "AP GOVRNMT A", "AP GOVRNMT B", "AP GOVRNMT C", "AP GOVT", "AP GOVT & POLTC-LINCOLN PARK", "AP GOVT (TESTED OUT)", "AP GOVT 2ND", "AP GOVT A", "AP GOVT AND POLITICS: US", "AP GOVT AND POLITICS: US-R", "AP GOVT AND POLITICS:US", "AP GOVT AND POLITICS:US-R", "AP GOVT AND POLTICS:US", "AP GOVT AND POLTIICS:US", "AP GOVT POL", "AP GOVT S2", "AP GOVT S2 WT", "AP GOVT SM2", "AP GOVT TI", "AP GOVT WT", "AP GOVT/POL", "AP Government", "AP HON GOVERN", "AP POL & GOV 12", "AP POL & GOVT12", "AP POL SCI", "AP POLI SCI", "AP U.S. GOV'T/POLIT.", "AP U.S. GOVERNMENT", "AP U.S. GOVERNMENT & POLITICS", "AP U.S. GOVERNMENT A", "AP U.S. GOVERNMENT B", "AP U.S. GOVERNMENT-A", "AP U.S. GOVERNMENT-B", "AP U.S. GOVT A", "AP U.S. GOVT B", "AP US GOV-2", "AP US GOVT&POL", "AP US GOV", "AP US GOV & POL", "AP US GOV & POLITICS", "AP US GOV A", "AP US GOV AA", "AP US GOV BB", "AP US GOV POL/TI", "AP US GOV TI", "AP US GOV&POL", "AP US GOV'T", "AP US GOV'T I.S.", "AP US GOV'T/POL", "AP US GOV-1", "AP US GOV-2", "AP US GOV-3", "AP US GOV/POL", "AP US GOV/POLITICS A", "AP US GOV/POLITICS B", "AP US GOV/POLITICS C", "AP US GOVERNEMENT", "AP US GOVERNMENT", "AP US GOVERNMENT & POLITICS", "AP US GOVERNMENT & POLITICS A", "AP US GOVERNMENT & POLITICS B", "AP US GOVERNMENT & POLITICS C", "AP US GOVERNMENT & POLITICS IS", "AP US GOVERNMENT A", "AP US GOVERNMENT B", "AP US GOVERNMENT C", "AP US GOVERNMENT OL", "AP US GOVERNMENT TI", "AP US GOVERNMENT, POLITICS A", "AP US GOVERNMENT, POLITICS B",

“AP US GOVERNMENT/POLITICS”, “AP US GOVERNMENT/POLITICS A”, “AP US GOVERNMENT/POLITICS B”, “AP US GOVPOL”, “AP US GOVT”, “AP US GOVT & POL 05”, “AP US GOVT & POLITICS”, “AP US GOVT A”, “AP US GOVT A/B”, “AP US GOVT AND POLITICS”, “AP US GOVT I.S.”, “AP US GOVT& POL”, “AP US GOVT&POL”, “AP US GOVT-1”, “AP US GOVT-2”, “AP US GOVT/POLITICS”, “AP US GOVT/POLITICS AVENTA”, “AP US GOVTS1”, “AP US GOVTS2”, “AP US Govt&Pol”, “AP USGOVERNMENT”, “APAMGOVWT S1”, “APAMGOVWT S2”, “Amer. Government AP”, “Amer. Government AP - do not use”, “American Government AP”, “C AP AM GOV2”, “C AP GOVT”, “C AP GOVT S1”, “C AP GOVT S2”, “C AP US GOV/POL”, “C AP US GOV/POLA”, “C/AP GOVT S1”, “CHS AP US GOV-1”, “CHS AP US GOV-2”, “CHS AP US GOV-3”, “CHS/AP US GOV-1”, “CHS/AP US GOV-2”, “COL MVU AP GOV”, “DS AP GOVMNT B”, “DS AP GOVT A”, “GENNET AP US GOVERNMENT A”, “GOVERN AP”, “GOVERNMENT AND POLITICS, U.S. AP”, “GOVERNMENT AND POLITICS, U.S. AP “, “GOVERNMENT AP”, “GOVT AP”, “GOVT AP IND ST”, “GOVT. AP”, “GOVT/POLITICS AP”, “Government & Politics: US AP”, “HLHS A.P. GOVT”, “HLHS AP GOV’T TI”, “I/S-AP COMPARATIVE GOVERNMENT”, “IS AP GOV’T”, “IS AP GOVT”, “IS-AP US GOV & POLITICS”, “IS/AP GOVERNMT”, “IS/AP US GOV/PO”, “MIVHS AP US GOV”, “MIVHS-AP GOVT”, “MV AP US GOVT”, “MVHS GOVT AP”, “MVHS-AP GOVERNMENT”, “MVHS: AP US GOVERNMENT”, “OL AP US GOV”, “OL US GOV AP”, “OL: AP GOVERN&POL”, “ON-LINE AP GOVERNMENT”, “ONLINE AP GOVERNMENT”, “PLATO AP US GOV”, “SS AP GOVT”, “SS GOVT AP”, “T - AP GOVERNME”, “T - AP GOVT”, “T - AP GOVT-NSL”, “TC AP GOVERNMEN”, “TR AP AMER GOVT”, “TR AP GOVERNMENT”, “TR AP GOVERNMNT”, “TR AP GOVT”, “TR AP US GOVT”, “TR AP US GOVT/P”, “TR AP US GOVT/PO”, “TR POLITICAL SCIENCE AP”, “TR V AP GOVT”, “TR- AP GOVERNMENT”, “TR-AP GOVERNMENT”, “TR-AP Government”, “TRANS/AP GOVT”, “TRNS AP GOVT”, “US GOV AP”, “US GOV AP TI”, “V AP GOVT VM”, “VHS AP GOVERNMENT”, “VHS AP US GOVERNMENT & POLITICS”, “VHS-AP US GOV&POLITICS”, “VMV AP US GOVT”, “Y AP POLITICAL SCIENCE”

U.S. History:

“ AP US HIST/TI”, “*AP AMER HIST 1”, “*AP AMER HIST 2”, “*AP AMERICAN HISTORY”, “*AP UNITED STATES HISTORY”, “*AP US HIST”, “*AP US HIST 10”, “406117 AP U.S. HISTORY A”, “A P AMER HIST”, “A P AMERICAN HISTORY”, “A P Amer Hist”, “A P HISTORY”, “A P U.S. HISTORY”, “A P U.S. HISTORY”, “A.P. AMER. HISTORY”, “A.P. AMERICAN HISTOR”, “A.P. U.S. HISTORY”, “ADVANCED PLACEMENT US HISTORY A”, “ADVANCED PLACEMENT US HISTORY B”, “ADVANCED PLACEMENT US HISTORY B IS”, “AM HIS 1 AP”, “AM HIS 2 AP”, “AM HIST 2 AP”, “AM HIST AP”, “AM HIST AP 1S”, “AM HIST AP 2S”, “AM HISTORY AP”, “AMER HISTORY / AP”, “AMER HISTORY 1 AP”, “AMER HISTORY 2 AP”, “AMERICAN HISTORY/GEOGRAPHY AP”, “AP - U.S. HISTORY - TR”, “AP AM HIS WT S1”, “AP AM HIS/GEO-A”, “AP AM HIS/GEO-B”, “AP AM HIST”, “AP AM HIST (1)”, “AP AM HIST (2)”, “AP AM HIST (3)”, “AP AM HIST (4)”, “AP AM HIST 1”, “AP AM HIST 2”, “AP AM HIST-1”, “AP AM HIST-2”, “AP AM HISTORY”, “AP AM. HISTORY”, “AP AME HISTORY”, “AP AMER HIST”, “AP AMER HIST 1”, “AP AMER HIST 2”, “AP AMER HIST WT”, “AP AMER HISTORY”, “AP AMER HST”, “AP AMER IST”, “AP AMERICAN HIST”, “AP AMERICAN HISTORY”, “AP AMERICAN HISTORY A”, “AP AMERICAN HISTORY B”, “AP AMERICAN HISTORY C”, “AP AMERICAN HISTORY-R”, “AP AMHISWT S1”, “AP AMHISWT S2”, “AP AMHISWTS1”, “AP AMHISWTS1 (R)”, “AP AMHISWTS2”, “AP American History”, “AP American History “, “AP American History C”, “AP HIST C”, “AP HIST TEST”, “AP HISTORY”, “AP HISTORY A”, “AP HISTORY B”, “AP HISTORY WT”, “AP U. S. History”, “AP U.S. HIST”, “AP U.S. HIST A”, “AP U.S. HIST B”, “AP U.S. HIST.”, “AP U.S. HISTORY”, “AP U.S. HISTORY -A”, “AP U.S. HISTORY -B”, “AP U.S. HISTORY

T", "AP U.S. HISTORY A", "AP U.S. HISTORY B", "AP U.S. HISTORY C", "AP U.S. HISTORY-S1", "AP U.S. HISTORY-S2", "AP U.S. History", "AP U.S.HIST", "AP UNITED STATES HISTORY", "AP UNITED STATES HISTORY-R", "AP US HIS S1", "AP US HIS/GEO-A", "AP US HIS/GEO-B", "AP US HIST", "AP US HIST S2", "AP US HIST WT", "AP US HIST 10", "AP US HIST 1", "AP US HIST 2", "AP US HIST A", "AP US HIST A S1", "AP US HIST A TI", "AP US HIST A/B", "AP US HIST B", "AP US HIST B S2", "AP US HIST C", "AP US HIST GIFT", "AP US HIST I.S", "AP US HIST S1", "AP US HIST S2", "AP US HIST TI", "AP US HIST WT", "AP US HIST-1", "AP US HIST-2", "AP US HIST-3", "AP US HIST-TR", "AP US HIST. B TI", "AP US HIST. C TI", "AP US HIST/POLITICS (MVHS)", "AP US HIST/TI", "AP US HISTOR", "AP US HISTORY", "AP US HISTORY TI", "AP US HISTORY (CRESTWOOD)", "AP US HISTORY - IND STUDY", "AP US HISTORY - TR", "AP US HISTORY 1", "AP US HISTORY 2", "AP US HISTORY A", "AP US HISTORY A TI", "AP US HISTORY B", "AP US HISTORY B OL", "AP US HISTORY C", "AP US HISTORY I", "AP US HISTORY INDEPENDENT STUDY", "AP US HISTORY S1", "AP US HISTORY S2", "AP US HISTORY T1", "AP US HISTORY TI", "AP US HISTORY WT", "AP US HISTORY-A", "AP US HISTORY-B", "AP US HISTORY-TI", "AP US HISTORY-TR", "AP US HISTORY/TI", "AP US HISTORYB-TR", "AP US HISTORYTI", "AP US HISTRY", "AP US HST S1", "AP US History", "AP USHIST AA", "AP USHIST BB", "AP USHISTWT S2", "AP USHISTWTS1(R)", "AP Y US HISTORY & GEOGRAPHY", "APUSHISTA/BS1", "APUSHISTA/BS2", "APX AP HIST", "APX AP HISTORY", "APX AP HISTORY A", "APX AP HISTORY B", "American History AP", "C AP AM HST1", "C AP AM HST2", "C AP HISTORY", "C AP U.S. HIST", "C AP US HIST", "C AP US HIST A", "C AP US HISTORY", "C AP US HISTORY A", "C AP US HISTORY B", "C AP US HISTORY C", "CHAVEZ AP US HIS", "CTD AP US HIS WT", "DRST AP US HISTORY", "GENNET AP US HISTORY A", "HISTORY, U.S. AP", "HISTORY, U.S. AP (R1)", "IND STUDY AP US HIST", "IS AP US HISTORY A", "IS/AP US HISTOR", "LAPEERE AP USHIS", "MIVHS AP HIST", "MV AP US HIST", "MV AP US HISTORY", "MVHS - AP US HISTORY B", "MVHS AP US HISTORY A (X)", "MVHS US HIST AP", "MVHS USHIT AP", "MVHS-AP US HISTORY", "MVHS: AP US HISTORY A (H)", "OL AP HISTORY 1B", "OL AP US HISTORY", "OL US HISTORY AP", "OL: AP US HISTORY", "OLLAPAMHISTWT(R)", "ONLINE AP HIST", "PSJA AP US HIS", "SS AP USHIST", "SS USHIST AP", "T - AP US HISTO", "T AP US HISTORY", "T- AP HISTORY A", "T- AP HISTORY B", "T- AP US HISTOR", "T-AP US HIST", "T-AP US HISTORY", "TC A.P. US HIST", "TR A.P. US HISTORY", "TR AP AMER HISTORY", "TR AP AMERICAN HISTORY", "TR AP HISTORY", "TR AP U.S. HIST", "TR AP US HIS", "TR AP US HIST", "TR AP US HIST 1", "TR AP US HIST 2", "TR AP US HIST A", "TR AP US HIST B", "TR AP US HISTOR", "TR AP US HISTORY", "TR AP US HST", "TR AP US HSTRY", "TR AP USHIST", "TR SS AP US HIST", "TR V AP USHIST1", "TR-AP US HISTOR", "TR-AP US HISTORY", "TRANS AMHIST1AP", "TRANS AMHIST2AP", "TRANS AMHST1 AP", "TRANS AMHST2 AP", "TRANS AP AMHST", "TRANS AP US HIS", "TRANS AP US HIST", "TRANS AP US HST", "TRANS AP USHIST", "TRANS AP USHST", "TRANS/AP HISTORY", "TRANS/AP US HIST", "TRNS AP US HIST", "U S HISTORY AP", "U.S. HIST AP A", "U.S. HIST AP B", "U.S. HIST AP C", "U.S. HISTORY 1AP", "U.S. HISTORY 2AP", "U.S. HISTORY AP", "U.S. HISTORY AP A", "U.S. HISTORY AP A T", "U.S. HISTORY AP B", "U.S. HISTORY AP C", "U.S. HY 10, AP T", "US AP HISTORY T1", "US HIST AP", "US HIST AP 1", "US HIST AP 2", "US HIST AP T", "US HISTORY 1AP", "US HISTORY 2 AP TI", "US HISTORY 2AP", "US HISTORY AP", "US HISTORY AP 1", "US HISTORY AP 2", "US HISTORY AP 2 OL", "US HISTORY AP A", "US HISTORY AP B", "US HISTORY AP C", "US HISTORY AP TI", "US HISTORY AP OL" "Unites States History AP", "V AP US HIST", "V AP US HIST SM2", "VH AP USHIST", "VMV AP US HIST", "VMV AP US HIST 1", "VMV AP US HIST A", "VMV AP US HIST B", "VMV AP US HIST I", "WHH AP US HIS TI"

World History:

"*AP WORLD HISTORY", "0 HR AP WORLD HIST A", "A.P. WORLD HISTORY & GEOGRAPHY", "AP WHIS WTS1", "AP WHIS WTS2", "AP WHIST A/B S2", "AP WLD HIS", "AP WLD HIS A", "AP WLD HIS B", "AP WLD HIS C", "AP WLD HIS/GPHY", "AP WLD HISTORY/TI", "AP WOR HIST GIFT", "AP WORLD HIS S1", "AP WORLD HIST", "AP WORLD HIST A", "AP WORLD HIST B", "AP WORLD HIST-A", "AP WORLD HIST-B", "AP WORLD HIST/TI", "AP WORLD HISTOR", "AP WORLD HISTORY", "AP WORLD HISTORY /TI", "AP WORLD HISTORY 1", "AP WORLD HISTORY A", "AP WORLD HISTORY B", "AP WORLD HISTORY C", "AP WORLD HISTORY TI", "AP WORLD HISTORY-R", "AP WORLD HISTORY/TI", "AP WORLD HISTRY", "AP WORLD HST AA", "AP WORLD HST BB", "AP WORLD HST S1", "AP WORLD HST S2", "AP WRL HIS/GE-A", "AP WRL HIS/GE-B", "AP WRLD HIS S1", "AP WRLD HIST", "AP WRLD HIST S2", "AP WRLD HIST A", "AP WRLD HIST B", "AP WRLD HIST GIF", "AP WRLD HIST S1", "AP WRLD HIST S2", "AP WRLD HIST TI", "AP WRLD HISTORY", "APWHISTA/B S1", "BLYTHE APWLD HIS", "C AP WORLD HISTORY", "CHAVEZ AP W.HIST", "DS AP WLD HIS A", "DS AP WLD HIS B", "DS AP WORLD HIST", "INDEPENDENT STUDY-AP WORLD HIST", "ONLINE AP WORLD HISTORY", "SS AP WLDHIS", "T AP WORLD HISTORY A", "T AP WORLD HISTORY B", "T- AP WORLD HIS", "TC AP WORLD HIS", "TR AP WL HISTOR", "TR AP WL HISTORY", "TR AP WLD HSTRY", "TR AP WLDHIS", "TR AP WORLD HI", "TR AP WORLD HIS", "TR AP WORLD HIST 10", "TR AP WORLD HISTORY", "TR AP WORLD HISTORY 9", "TR MOD W HIST AP", "TR WRLD HIST AP", "TR-AP WORLD CIVILIZATIONS", "TR-AP WORLD HIS", "TR-AP WORLD HISTORY", "TR-AP World History", "TRNS W HIST AP", "TRNS WRLD HIS AP", "TRVL AP W HISTA", "TVL AP WLD HISB", "WORLD HIST 1 AP", "WORLD HIST 2 AP", "WORLD HIST AP", "WORLD HISTORY AP", "WORLD HISTORY AP T", "WORLD HISTORY/GEOGRAPHY AP"

Ambiguous course titles (counted as AP in sensitivity analysis only)

"*AP ADV TOPICS", "ADV PLACEMENT", "ALGEBRA A AP", "ALLSAINT COMP AP", "AP ADV PRG III 05", "AP ADV PROG III 05", "AP ADV PROGRAMMING (IND STUDY)", "AP CPT WT S1", "AP CPT WT S1 R", "AP CPT WT S2", "AP CPT WT S2 R", "AP CPT WT2S1", "AP ENRICHMNT", "AP EVOL SCI", "AP LAB", "AP MATH 1", "AP MATH I", "AP MATH II", "AP MATH III", "AP MATH/TI", "AP SCI ON LINE", "AP SUPP", "AP TECH 1S", "AP TECH 2S", "AP TECH A", "AP TECH B", "AP THOUGHT & WRITING", "AP TOOLING 1", "AP WLD STUDIES/TI", "APEX AP AHST", "BA COMP AP 1", "BST/SOFT AP 1", "BU COM AP II", "BU COMP AP 1", "CMU HIST&AP CINE", "COLL MVU AP CS", "COM GRAP WEB", "COMP AP 9", "COMP AP 9A", "COMP AP 9B", "CPT AP TECH", "DOW KEYB/COMP AP", "DS AP PYSC-C B", "DUAL ENROLLMENT WCC INTRO COMP & SOFT AP", "E2020 M ML & AP", "G BASIC AP", "GENNET OFFICE AP", "HEBREW AP TI", "HUMAN AP TI", "IND STUDY AP 10", "KEYBO COMP AP 2B /TI", "KEYBO COMP AP 3C /TI", "KEYBOARD/COMP AP", "KEYS AP TECH - TR", "KVCC-BUS COM AP", "L.E.A.P.", "LI SK MAT AP", "MATH ANALY 1AP IS", "MATH ANALYSIS 1AP", "MATH ANLS AP S1 TO", "MATH ANLS AP S1 TO (R2)", "MATH ANLS AP TO", "MGMT COMP AP", "MIDL KEY/COMP AP", "OL BAS SOFTWARE AP", "OOC Learning EXP AP", "S BAS COM AP", "SOC STUDIES II TT AP", "SOCIAL STUDIES AP TI", "T - AP COLLEGE", "T - BUSINESS AP", "T- BUS CMP AP A", "T- BUS CMP AP B", "T-AP DRAFTING 2B", "TO-COMP AP 1", "TR AP ACRYLIC P", "TR AP AMERICAN", "TR AP GAME PROG", "TR AP INTRO SOF", "TR AP STUDY", "TR AP SUPP", "TR COM KEY / AP", "TR COMP KEY / AP", "TR DIG GRAP MEDI", "TR EN ELL APCOMP", "TR KEY/COMP AP I", "TR WINDOWS AP", "TR-AP BUSINESS", "TR-AP INTRO TO", "TR-AP MATHEMATI", "TR-COM KEY 1 AP", "TR-COMP AP 9 A", "TR-COMP AP 9 B", "TR-CSAP READING", "TR/BSTI COMP AP", "TRAN AP ABNRML", "TRANS COMP 1 AP", "TRANS COMP 2 AP", "TRANS/APWLD LIT", "V MA AP CMSC", "VIR

BAS SFTWARE AP.”