



International Baccalaureate®  
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# RESEARCH SUMMARY

*First college courses taken by Florida IB students*

**Based on a research report prepared for the IB by**

Kyra Caspary, Center for Education Policy, SRI International

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International Baccalaureate®

## PROJECT OVERVIEW

The International Baccalaureate (IB) curriculum is designed to provide rigorous preparation for college. In order to understand better if this aim is achieved, empirical evidence examining the relationship between performance on IB exams and college course performance is particularly useful. To this end, the IB research department commissioned SRI International to perform such an analysis using data for IB students from Florida, which has a large number of high school students participating in IB and maintains a comprehensive state data system that includes enrollment, course, and graduation information for in-state public postsecondary institutions. The study focused on the University of Florida, the postsecondary institution where the greatest proportion of IB students attends college.

Specifically, the study (i) identified the first college course taken by IB students enrolled at the University of Florida in each of the seven focal subjects: Physics, Chemistry, Biology, Mathematics, English, Spanish and French, and (ii) compared performance in those courses for students who scored at varying levels on the corresponding IB subject exam.

The student cohort included in the analysis comprised 4,845 students who took IB exams between spring 2000-2005 and who entered the University of Florida the following fall. 98% of these students were diploma candidates (4,728 students), of which 84% earned the IB diploma (3,961 students). Table 1 shows a detailed breakdown of the student cohort by certificate and/or diploma candidature status. Table 2 shows the number of students in the cohort that took the IB exams in each of the seven focal subjects, while Table 3 shows the college disciplines mapped to the IB exam subjects.

IB Status	Number	Percent
<b>All IB Students</b>		
Certificate Candidates	117	2
Diploma Candidates	4728	98
Total	4845	100
<b>Diploma Candidates</b>		
Diploma Received	3961	84
Diploma Not Received	767	16
Total	4728	100

Table 1: Student cohort breakdown by certificate/diploma candidature status<sup>1</sup>

Subject	SL Exam	HL Exam	Total	
			Number	Percent
Physics	606	357	963	20
Chemistry	663	731	1394	29
Biology	875	2146	3021	62
Mathematics	4338	431	4769	98
English	183	4607	4790	99
Spanish	3424	302	3726	77
French	786	80	866	18

Table 2: Student cohort breakdown by IB exams taken

<sup>1</sup> Students who are enrolled in the full IB Diploma Programme for their last two years of high school are considered diploma candidates, while students who take at least one IB exam in their junior or senior year of high school without the intention of completing the IB diploma are classified as IB certificate candidates.

IB Subject	Corresponding College Discipline(s)
Physics	Physics
Chemistry	Chemistry and Biochemistry
Biology	Biological Sciences
Mathematics	Mathematics, Statistics, Engineering (all)
English	English Language and Literature, Language Arts and English Education
Spanish	Spanish Language and Literature
French	French Language and Literature

Table 3: College disciplines mapped to IB exam subjects<sup>2</sup>

The study identified all the college courses that each student took in each focal subject within two years of matriculating at the university, and then isolated the first course taken for each student in each subject area. After identifying the highest frequency first course in each subject area, students' grades in these courses were then examined based on their performance on the corresponding IB subject exam. For each IB subject exam, students were grouped into three score bands: (i) 1 to 3, (ii) 4 and 5, and (iii) 6 and 7. The grade distribution in the first college courses taken by students in each of these score bands was then reported.<sup>3</sup>

Key findings on the highest-frequency first college course taken by IB students for each focal subject and subsequent analyses of grades earned in these courses are summarized in the following section.

## SUMMARY OF KEY FINDINGS

On the whole, IB students who scored higher on both the higher level (HL) and standard level (SL) exams were noted to enroll in more advanced college courses than their lower-scoring peers. More notably, the analyses revealed a positive association between students' scores on a given IB subject exam and students' grades in their first college courses in that subject. In other words, students who perform better on IB subject exams tend to earn higher grades in their first college courses in those subjects than students who do not perform as well on those same exams.

### First college course enrollment patterns of IB students

The first college course corresponding to each of the seven IB exam subjects with the highest number of enrolments by IB students are listed in Table 4.

In the Sciences (Physics, Chemistry, Biology) and Spanish, the highest-frequency first course undertaken was the same for IB students who took HL exams as it was for those who took SL exams. In Mathematics, English, and French, the highest-frequency first course differed by IB exam level. However, on the whole, more variation in course enrollment patterns was attributable to IB exam performance rather than the level of exam taken (HL or SL), with higher-scoring

<sup>2</sup> All courses at the University of Florida are assigned to broader discipline categories through the Florida Department of Education's Statewide Course Numbering System.

<sup>3</sup> In the analyses, the grade of W for withdrawn was included, but students who took the class pass/fail or received other non-standard grade awards were excluded.

students on both SL and HL exams entering more advanced college courses than their lower-scoring peers.

IB exam subject	Highest-frequency first college course
<b>Physics</b>	Physics 48: General Physics with Calculus I
<b>Chemistry</b>	Chemistry 45: General Chemistry (1 of 2)
<b>Biology</b>	Biological Sciences 10: General Biology
<b>Mathematics</b>	Mathematics (Calculus and Precalculus) 147: Precalculus Algebra/Trigonometry
<b>English</b>	English Composition 210: Technical Writing
<b>Spanish</b>	Spanish Language 240: Intermediate Conversation I
<b>French</b>	French Language 241: Intermediate French Conversation II

Table 4: Highest frequency first college course taken by IB students

### **Relationship between IB exam performance and first college course grades**

On the whole, students who performed better on IB subject exams earned higher grades in their first college course in the same subject than students who performed less well on these exams. This trend was noted across all subjects examined, and also held true regardless of whether students undertook the IB subject exams at the higher level (HL) or standard level (SL). It is important to note, however, that IB students who took HL exams did particularly well in their first college courses.

- Overall, 59% of students who scored a 6 or 7 on an IB exam in a given subject earned an A in their first college course in that subject.
- 71% of HL students who scored a 6 or 7 in their IB exams earned As in their first college courses in the corresponding subjects.
- This percentage of As earned by students who scored a 6 or 7 was highest for English courses (72%), followed by Sciences<sup>4</sup> and French courses (65% and 66% respectively), Spanish courses (59%) and Mathematics courses (53%).

### **Sciences**

Overall in the Sciences, 34%, 35% and 65% of IB students who scored 1-3, 4-5 and 6-7 respectively in their IB exams achieved As in their corresponding first college science course. In general, IB students who took HL and SL exams performed comparatively well in their first college science course.

In General Chemistry 1 for example, students in all three IB exam score bands, whether they took the HL or SL exam earned As more frequently than any other grade, although As were far more common for high-scoring students than for low-scoring students.

While not great in number, students who entered directly into the second semester of General Chemistry or General Biology earned high grades in these subjects.

- 156 students who took the IB Chemistry exam and scored a 4 or higher enrolled in General Chemistry II as their first college chemistry course. Half of these students who

<sup>4</sup> This term refers to the aggregated first college courses of Biology, Chemistry and Physics.

scored a 4 or 5 on the IB exam earned As in the course, and nearly three quarters of those who scored a 6 or 7 earned As in the course (Exhibit 23).

- 296 students who took the IB Biology exam enrolled in General Biology II as their first college biology course. Approximately 33% of these students who scored a 4 or 5 on the IB exam earned As in the class, and 59% of those who scored a 6 or 7 earned As in the course.

### **Mathematics**

Students who took the IB exams in Mathematics earned high grades in their first college Mathematics course. This trend applied to both HL and SL students, although HL students earned particularly high grades in their first college Mathematics course.

- Precalculus Algebra/Trigonometry and Introduction to Engineering were the most common first courses taken by students who took the SL exam and HL exam respectively.
- While IB students earned more Bs than As in Precalculus Algebra/Trigonometry, 80% or more of IB students who enrolled in Introduction to Engineering earned an A in the course. These students varied in their IB exam level (HL and SL) and scores. Specifically, 82%, 88% and 95% of IB students who scored 1-3, 4-5 and 6-7 respectively in their IB Mathematics exams scored As in the Introduction to Engineering course.
- In particular, IB students who took the HL exam in Mathematics performed extremely well in Introduction to Engineering, with 83%, 94% and 100% of students who scored 1-3, 4-5 and 6-7 respectively in their IB Mathematics HL exams scored an A in the course.

### **English**

IB students generally earned high grades in their first English course in college regardless of their IB exam score bands. Specifically, 70%, 87% and 93% of students who scored 1-3, 4-5, and 6-7 respectively in their IB English exams earned an A or a B in their first college English courses. This trend applied across all first college English courses, including Freshman Composition Skills I and Technical writing.

### **Spanish and French**

Very few students who scored 1-3 in their IB Spanish and French exams went on to take these languages at college level. In general, the same trend of positive association between IB exam scores and corresponding first college course grade achieved held true. Specifically, the majority of students, namely 91% and 95% respectively, who scored highly (6-7) in their Spanish and French IB exams went on to achieve As and Bs in their first college Spanish and French courses.

## **CONCLUSION**

The findings of this study go some length to validate the IB curriculum as rigorous preparation for college success, particularly in terms of the positive associations between IB exams scores and grades achieved in corresponding first college courses in the seven focal subject areas of Physics, Chemistry, Biology, Mathematics, English, Spanish and French.

While the design of this study does not permit claims about whether students achieved these

college results as a direct result of their engagement with the IB curriculum, it is clear that IB students (both certificate and full diploma candidates) who performed well in the IB exams, whether HL or SL, generally achieve good academic grades in their first college courses across the seven subject areas examined.

This summary was developed by the IB Research Department. A copy of the full report prepared by SRI International is available here: <http://www.ibo.org/research>. For more information on this study or other IB research, please email [research@ibo.org](mailto:research@ibo.org).

To cite the full report, please use the following:

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